



MINISTERUL CERCETĂRII,
INOVĂRII ȘI DIGITALIZĂRII

Proceedings of
The 16th Edition of

E U R O I N V E N T
EUROPEAN EXHIBITION OF
CREATIVITY AND INNOVATION



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EUROINVENT 2024

IN MEMORIAM



Professor Emeritus Phys. PhD.
Octavian Ioan BALTAG
(1945 – 2024)

Prof. Octavian Ioan BALTAG obtained a B.S. degree in Electro-radio-physics from Alexandru Ioan Cuza University of Iasi in 1971 and a Ph.D. degree in physics from the Central Institute of Physics, Bucharest, in 1982. From 1971 to 2000, he was a Researcher at the Institute of Technical Physics of Iasi. Also, from 2001 he was a University Professor at Grigore T. Popa University of Medicine and Pharmacy in Iași, Faculty of Medical Bioengineering. Here he will teach several subjects, among which: Physics; Bioelectromagnetism; Metrology and Systemic Biometrology; Sensors, Transducers and Biosensors; Applications of Microwaves in Medicine; Physical Principles of Medical Imaging Systems; Scientific Research Methodology.

He was director, coordinator, or member of various research teams for 85 projects (79 national and 6 international). Prof. Octavian Ioan Baltag's journey is a testament to dedication, innovation, and scholarly pursuit. From his foundational years in academia to his groundbreaking contributions in the fields of physics and bioengineering, his legacy is one of excellence and impact. Through his prolific research, mentorship, and leadership, he has not only advanced scientific knowledge but also inspired generations of scholars.

EUROINVENT 2024

IN MEMORIAM



Professor Emeritus Dr.Habil. PhD.

Constantin SPÎNU

(1950 – 2024)

Professor Constantin SPÎNU was born on March 19, 1950 in Nicoreni commune, Rîscani district, Republic of Moldova. In 1973, he graduated from the Faculty of Preventive Medicine of the State Institute of Medicine in Chisinau.

He worked successively in management positions, so that in the last part of his life he was the head of the Research and Innovation Directorate within the National Agency for Public Health. He actively participated in the development and implementation of the National Programs to combat and eliminate poliomyelitis, viral hepatitis B, C, D, enteroviruses, the national immunization program. For merits in the field, Dr. Constantin SPÎNU is mentioned with the Certificate of Appreciation and the Gold Badge of the World Health Organization.

Under the personal aegis of the university professor, Mr. Constantin SPÎNU, in his capacity as supervisor and scientific consultant, more than 20 doctorate theses in medicine, including 4 habilitation doctorates, were completed and defended. He is the author of more than 100 international indexed works, 27 monographs and more than 100 invention patents.

With an illustrious career, Constantin Spinu was a notorious personality in fields such as medical virology, microbiology, epidemiology and public health, a true mentor, contributing to the training and guidance of numerous doctoral students and qualified doctors, who, in turn, continued to continue. share his knowledge and passion for medical science.

Date: 06. May. 2024
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Message

Dear Pioneers, Inventors and Innovators,

As we embark on the journey into 2024, a year brimming with promise and potential, I am delighted to extend my heartfelt congratulations to the Romanian Inventors Forum (FIR) for orchestrating yet another remarkable edition of EUROINVENT, the hallmark of European creativity and ingenuity.

With each passing year, EUROINVENT continues to serve as a beacon of inspiration, igniting the flames of innovation and pushing the boundaries of the possible. This year marks the 16th edition of this prestigious event, a testament to its enduring legacy and impact on the world of invention and innovation.

In the spirit of collaboration and progress, the International Federation of Inventors Association (IFIA) stands as a steadfast champion, dedicated to fostering a culture of invention on a global scale. IFIA reaffirms its commitment to providing a platform where inventors and innovators from around the world can converge to exchange ideas, share insights, and shape the future.

I am thrilled to extend a warm invitation to all members, inventors, innovators, and researchers to join us for EUROINVENT 2024, scheduled to take place from June 6th to 8th at the Palace of Culture, Iasi, Romania.

EUROINVENT 2024 promises to be a celebration of creativity and collaboration, offering a unique opportunity to explore groundbreaking ideas and cutting-edge technologies. It serves as a testament to the transformative power of innovation to drive positive change and propel us towards a brighter future.

May this year's event inspire new partnerships, spark bold innovations, and pave the way for a world where creativity knows no bounds.

Yours sincerely,
Alireza Rastegar



President of IFIA





LETTER OF RECOMMENDATION

2024/5/07

Dear Inventors, Innovators and Young Students Around the World,

On behalf of World Invention Intellectual Property Associations (WIIPA), I would like to advance my deepest gratitude and appreciation to Romanian Inventors Forum for the great deal of effort they have devoted into organizing their annual event: 2024 European Exhibition of Creativity and Innovation (EUROINVENT 2024) in Iasi, Romania.

Throughout the last 16 years, it was evident to see that **EUROINVENT** has truly made one of the biggest cultural impacts for the global community of inventors and innovators by merging many creative minds and souls from **2008 to 2024**. The Romanian Inventors Forum Team's hard work and dedication for promoting inventors and entrepreneurs while facilitating social exchange, innovation marketing, licensing, and manufacturing have truly been remarkable and effective.

WIIPA fully supports this spectacular event 2024 European Exhibition of Creativity and Innovation and our honorable cooperation partner, Romanian Inventors Forum in Romania. Accordingly, **we highly recommend all member states of WIIPA as well as inventors, students, researchers, scientists, entrepreneurs, and enterprises to take their best shot to grasp the opportunity to participate in EUROINVENT 2024** and capitalize all fruits of beneficial means in this excellent competition in Romania.

Sincerely Yours,

Manli Hsieh
President

World Invention Intellectual Property Associations (WIIPA)



World Invention Intellectual Property Associations (WIIPA)

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The Youngest Inventor Award	The CyberLife Award
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The Green Environment Award	Pro Scientia et Innovatio
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The International Delegation Award	Silver Medal
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EXHIBITS CLASSIFICATION

1	Environment - Pollution Control
2	Energy and sustainable development
3	Agriculture and Food Industry
4	Medicine – Health Care – Cosmetics
5	Industrial and laboratory equipments
6	Mechanical Engineering – Metallurgy
7	Buildings and Materials
8	Aviation, car industry and transportation
9	Chemical and Textile Industry
10	Information Technology and Communication
11	Printing and advertising
12	Safety, protection and rescue of people
13	Sports, Games and Leisure
14	Other
X	Innovative Research

P R E A M B L E

The Inventions' exhibitions and shows, national or international ones, represent one of the exogenous determining factors, with multiple effects on the creative process. The system is one of the most encouraging, an interactive manner to disseminate inventions, a competitive background generating innovative ideas, while as an evaluative scientometric system, allow attracting the potential applicants or inventions' owners. It is the best medium for negotiating, conveying or transferring inventions, the place where the complete new results are exhibited.

The past 30 years experience, a time in which many Romanian inventors took their new releases in international exhibitions and were rewarded with numerous medals, orders, distinctions and diplomas, situated each time Romania, in unofficial statistics, on the first places. The honours list of the Romanian inventions create a paradoxal result of the two very close fields, the technological or applied research and on the other hand the fundamental or scientifically research. If the scientific output, represented by papers published in ISI Thomson acknowledged journals, situate Romania dragging behind the second league, in compensation, the patented awarded inventions turn it in one of first countries. So much more we should focus especially on the organizing of this kind of shows which offer real opportunities to many inventors to see their dreams come true by putting their results into a competitive-interactive system of evaluation.

Interdisciplinarity of inventics as a science is approached today in a connected, integrated way (education-research-production), with both educative and research functions, carrying great attractivity for the young generation and increasing standards both for inventors and for their products. In this respect, it is necessary to pay a special attention to the inventics schools, as they have, beside the role to form characters, professions, as well as vocations and talents, the mission to stimulate the technical creativity. We should underline the fact that after 1990 we noticed a slight lowering of the Iași inventics school contribution in its aim to form young inventors. Meetings and workshops in the inventions exhibitions should put light on and find

solutions to turn the inventics schools in institutions and to improving and harmonizing the laws regarding the intellectual propriety and the industrial one.

Another serious, upsetting and alarming aspect which I want to put light on is the fact that about 60 to 70% of the Romanian specialists with international output accepted to work abroad, where they are appreciated and stimulated according to their value. We should as well attract them and offer the opportunity to reevaluate them selves at home and participate to such representative competitions.

A peculiar notice is the fact that many Romanian inventors of success, internationally acknowledged, are invited in organizing committees, in international juries and are active members or founders of associations or professional clubs. The Romanian delegations created a tradition in the international exhibitions, to organize a Romanian event, the so-called “The Romanian Inventors Day”, where they present in a festive atmosphere their inventions, their contributions and offer diplomas and small gifts to the hosts and the other participants.

This edition of EUROINVENT sent invitations to inventors associations from many countries. A big number of institutions and individual inventors are participating from Romania, a remarkable fact being to have here many young inventors (from schools or universities) as well as older inventors. Considering the pandemic time and the geopolitical situation, this show is exhibiting more than 700 inventions and research projects from over 30 countries.

With pleasure and gratitude, acknowledgements to all the persons, institutions and organizations who participate to EUROINVENT, to the partners, Romanian Inventors Forum, EUROPE-DIRECT Iasi, “Gheorghe Asachi” Technical University of Iași and “Alexandru Ioan Cuza” University of Iasi and all the partners for all their support and efforts to organize the events.

Prof. Ion SANDU – Honorary President of Romanian Inventors Forum

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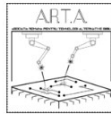
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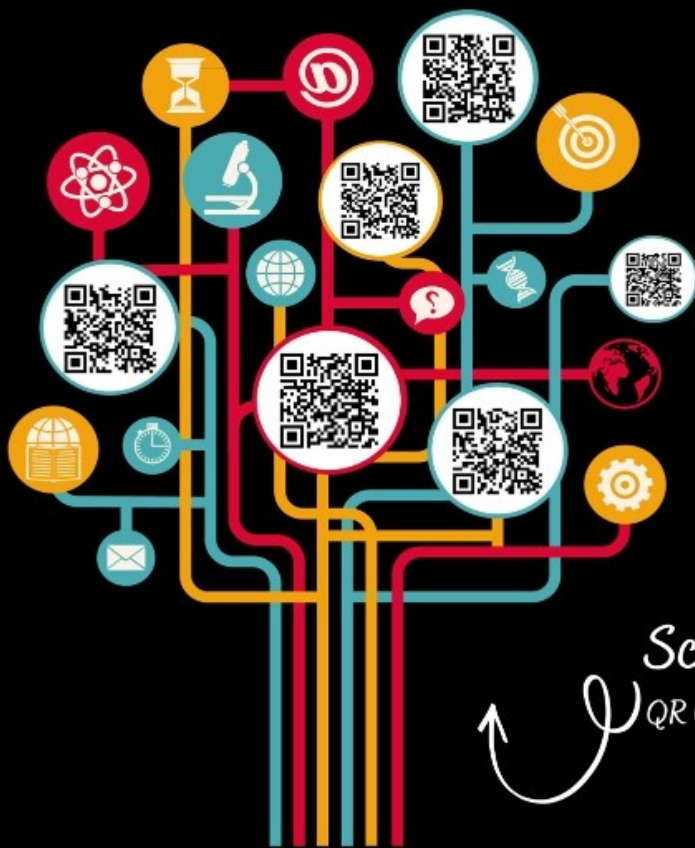


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Introduction

In 2010, it was founded by Mr. Hsieh Hsin-Ming. At the moment, 50 member countries and partners have joined the "WIIPA Family" with the goal of promoting invention, innovation and intellectual property rights around the globe.

Founder

Since 1993, Mr. Hsieh Hsin-Ming has formed "TIPPA" Successfully, opened up a way for Taiwan's products to be in line with international standards and also laid the foundation for the establishment of WIIPA.

History

In 2000, Mr. Hsieh Hsin-Ming felt that the main axis of TIPPA is limited to Taiwan. With a vision to gain access in the international stage, he dedicated his time and effort to gather transnational forces to put his vision at work.

Fueled with a vibrant ideology, he continued to open doors of opportunities for young and talented inventors to a global level and thrived on gaining international attention for the establishment of WIIPA as a multinational organization.


Our Goal


WIIPA upholds the spirit of globalization and extends its vision across the globe. With technology, using network interface allows a fluid communication pattern for a more innovative exchange of ideas and information among stakeholders.


Members

WIIPA member states span across continents. The member countries in the "WIIPA Family" currently has 50 member states and partners.

WIIPA put great emphasis on "common concept" and "substantial participation". WIIPA members have certain privileges other associations aspire for. One of them is taking part in WIIPA meetings, conferences as well as exchange activities from time to time to have a full understanding and mastery of the development and complexity of international inventions.

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Oficiul de Stat pentru Invenții și Mărci

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Oficiul de Stat pentru Invenții și Mărci (OSIM), autoritate unică pe teritoriul României în acordarea protecției proprietății industriale, are ca principală misiune susținerea inovării, competitivității și profitabilității ca factori de creștere economică.

OSIM furnizează servicii de specialitate de calitate prin acordarea drepturilor de proprietate industrială, promovează proprietatea industrială prin toate mijloacele și asigură cooperarea României în relațiile internaționale, în conformitate cu tratatele, convențiile și acordurile în domeniu, la care țara noastră este parte.

Atribuțiile OSIM :

- înregistrează și examinează cererile din domeniul proprietății industriale, eliberând titluri de protecție care conferă titularilor drepturi exclusive pe teritoriul României;
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- editează și publică Buletinul Oficial al Proprietății Industriale al României;
- editează și publică fasciculele brevetelor de invenție;

- administrează și conservă Colecția națională de proprietate industrială, întreține și dezvoltă baza de date informatizată în domeniul său de activitate, inclusiv prin schimburi internaționale;
- efectuează, la cerere, servicii de specialitate în domeniul proprietății industriale;
- publică on-line, pe site-ul oficial al instituției, la cerere, în mod gratuit și fără acordarea de drepturi de autor, articole destinate promovării domeniului proprietății industriale;
- atestă consilierii în domeniul proprietății industriale și ține evidența acestora în registrul național al cărui depozitar este;
- acordă, la cerere, consultanță de specialitate în domeniul proprietății industriale și organizează cursuri de instruire, seminarii și simpozioane în domeniu;
- asigură armonizarea cadrului legislativ național cu reglementările internaționale și europene în domeniul protecției proprietății industriale;
- inițiază, negociază și participă, în condițiile legii, la încheierea de convenții, acorduri, protocoale și alte înțelegeri interne și internaționale în domeniul protecției proprietății industriale;
- participă și implementează prin specialiștii Oficiului de Stat pentru Invenții și Mărci proiecte europene și regionale în domeniul proprietății industriale, finanțate parțial sau integral de către organisme cu care oficiul dezvoltă relații de cooperare;
- îndeplinește orice alte atribuții în domeniul proprietății industriale, care decurg din dispozițiile legale în vigoare și din acordurile internaționale la care România este parte.



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The State Agency on Intellectual Property of the Republic of Moldova (AGEPI) is an administrative central authority subordinated to the Government, responsible for promoting and implementing activities in the field of legal protection of intellectual property.

Through AGEPI you can effectively protect your intellectual property (IP) in the territory of the Republic of Moldova:

- Inventions, plant varieties, topographies of integrated circuits, product and service trademarks, industrial designs, geographical indication, appellations of origin, traditional specialties guaranteed;
- Literary, artistic, scientific works, computer programs and other objects of copyright and related rights.

AGEPI issues titles of protection for IP objects, provides information and legal advice about protection and enforcement of IP rights, publishes the Official Bulletin of Intellectual Property (BOPI), promotes and propagates intellectual property, organizes the attestation of patent attorneys, conducts trainings and professional development courses, provides IP pre-diagnosis and other related services.

Since 2015, it is possible to validate European patents in the Republic of Moldova through the European Patent Office (EPO). The single procedure for issuing European patents provides for simpler and more cost-effective protection of inventions in the EPO Member States but also in extension and validation states, including in the Republic of Moldova.

AGEPI services are provided according to the Quality Management System ISO 9001:2015, which ensures a quality according to international standards.

Agenția de Stat pentru Proprietatea Intelectuală a Republicii Moldova (AGEPI) este o autoritate administrativă centrală din subordinea Guvernului, responsabilă de promovarea și realizarea activităților în domeniul protecției juridice a proprietății intelectuale.

Prin intermediul AGEPI vă puteți proteja eficient proprietatea intelectuală (PI) pe teritoriul Republicii Moldova:

- Invenții, soiuri de plante, topografiile ale circuitelor integrate, mărci de produse și de servicii, desene și modele industriale, indicații geografice, denumiri de origine, specialități tradiționale garantate;
- Opere literare, artistice, științifice, programe pentru calculator, alte obiecte ale dreptului de autor și drepturilor conexe.

AGEPI eliberează titluri de protecție a obiectelor de PI, oferă informații și consultații juridice ce țin de protecția și realizarea drepturilor de PI, editează Buletinul Oficial de Proprietate Intelectuală (BOPI), promovează și popularizează proprietatea intelectuală, organizează atestarea mandatarilor autorizați, cursuri de instruire și perfecționare a specialiștilor în domeniu, acordă servicii de prediagnoză a PI și alte servicii aferente.

Din 2015 este posibilă validarea brevetelor europene pe teritoriul Republicii Moldova prin intermediul Oficiului European de Brevete (OEB). Procedura unică de eliberare a brevetelor europene asigură obținerea printr-o modalitate mai simplă și cu mai puține costuri a protecției invențiilor în statele membre ale OEB, dar și în statele de extindere și validare, inclusiv în Republica Moldova.

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Romanian Inventors Forum



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Romanian Inventors Forum (FIR) is a professional association which aims to support, stimulate the development and valorization of scientific and technical creative activities, and cultural - artistic, but also copyright problems of its members, diversification of research and technological development, design, scientific investigation, micro-production etc.

Research and development institution **certified** by the National Authority for Scientific Research (ANCS), according to HG. 551/2007, Decision ANCS no. 9708/29.07.2009.

FIR was established in 2003 by a group of university professors, elite inventors and researchers from the University Center in Iasi.

**FIR is official delegate yearly for more than 20
international invention shows**

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Universiti Malaysia Perlis (UniMAP) is Malaysia's 17th public institution of higher learning. It was approved by the Malaysian Cabinet on May 2001. Originally known as Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM), or Northern Malaysia University College of Engineering, it was renamed as Universiti Malaysia Perlis (UniMAP) in February 2007. The first intake consisted of 116 engineering students who started classes on June 2002. Currently, UniMAP has approximately 14,000 students and a workforce of more than 2,100 academic and non-academic staff members. Universiti Malaysia Perlis (UniMAP) offers 14 programs of Bachelor in Engineering, 13 programs of Bachelor Engineering Technology, 6 programs of Bachelor Technology, 2 Bachelor in Business programs, 1 Bachelor in New Media Communication program and 6 Diploma level and over than 50 postgraduate programs that lead to the Master of Science in Engineering and PhD degrees.



Center of Excellence Geopolymer & Green Technology (CEGeoGTech) lead by Vice Chancellor Universiti Malaysia Perlis (UniMAP), Professor. Dr. Kamarudin Hussin. CEGeoGTech located at the School of Materials Engineering, Kompleks Pusat Pengajian Jejawi 2, Taman Muhibbah, 02600 Arau, Perlis. CEGeoGTech has been established on July 2011 with the intention to induce innovation in green material technology among researchers in Universiti Malaysia Perlis. CEGeoGTech are able combining their expertise and skills in various fields to support the academic structure in the generation of human capital that contributes to the development of high quality research. This center also can become a pillar of academic activities, especially regarding research, development and innovation. CEGeoGTech have 8 fields of research includes:

- Geopolymer
- Polymer Recycling
- Electronic Materials
- Ceramic
- Electrochemistry Materials & Metallurgy
- Environmental
- Manufacturing and Design
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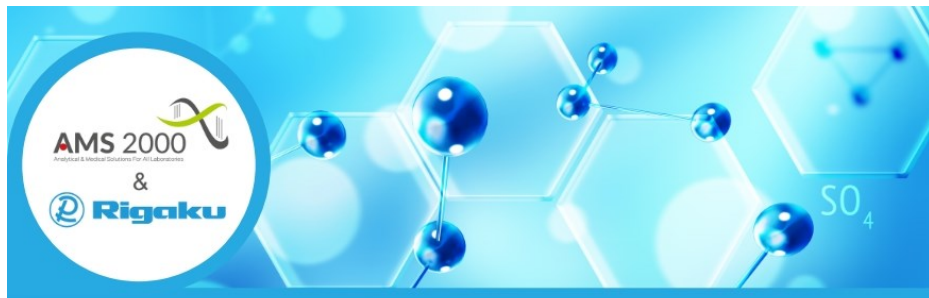
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The proposed project **“A new generation of metallic biomaterials as health solution for a sustainable life”** aims to obtain a new alloys system containing Titanium, Molibdenum, Niobium and Tin (Ti-Mo-Nb-Sn), with characteristics suitable for medical applications. The new generation of biomaterials will overcome the limitations of the titanium, cobalt and stainless-steel alloys as: high elasticity model and low corrosion resistance and biocompatibility. Hence, to achieve long-term stability and rapid osseointegration in orthopedic implants, surface modification of the implant surface is required. In this sense, the new titanium-based alloys will undergo specific heat treatments to obtain alloys with good mechanical properties intended for orthopedic applications.

Originality of the proposed approach consists in the development and characterization of Ti-based alloys containing unique combination of nontoxic alloying elements that are enhancing the Young modulus (in order to have properties closer to the attached/replaced tissue). The newly developed alloys will be thermally treated at different temperature levels in order to obtain optimal characteristics.

The **success of the project** is ensured by the quality of the human resource, the state-of-the-art material base, as well as the dissemination of the experimental results in international conferences or workshops in the field, respectively by opening new collaborations of the research team from: TUIASI - “Gheorghe Asachi” Technical University of Iasi (**P1**), INCDPM - National Institute for Research and Development in Environmental Protection (**P2**), UCAM - Fundación Universitaria San Antonio de Murcia, Spain (**P3**), UCTM -University of Chemical Technology and Metallurgy from Bulgaria (**P4**).



Empowering Romanian Research: Rigaku's Advanced Analytical Instruments Enter the Market Through AMS 2000 Trading Impex

Keywords: XRD, XRF, Micro CT, MicroED, SCX, Portable Raman

Under the aegis of the prestigious Japanese company, Rigaku Corporation, present on the international market for more than seven decades, AMS 2000 have brought to the Romanian market scientific and industrial instruments based on X-ray technologies, as well as Raman spectroscopy technology.

AMS 2000 started operating back in 1997 and since 2010, the year when the analytical Department was established within, the company aimed to develop as a market leader in the X-ray equipment supply segment in both academia and industry.

Today, with hundreds of major innovations to their credit, the Rigaku group of companies are world leaders in the fields of general X-ray diffraction, thin film analysis, X-ray fluorescence spectrometry, small angle X-ray scattering, protein and small molecule X-ray crystallography, Raman spectroscopy, X-ray optics, semiconductor metrology, X-ray sources, computed tomography, nondestructive testing and thermal analysis, MicroED – a revolutionary technique for obtaining 3D structures from nanocrystalline materials.

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- X-ray microscopy systems
- X-ray residual stress measurement systems
- MicroED
- Micro CT (computed tomography) systems

Raman technology equipment:

- Raman portable spectrometers

„At AMS 2000 Trading Impex, we are proud of our reputation built in the 14 years of collaboration with researchers in Romania, which positions us as a reliable and reliable partner in this high-level scientific community. We understood from the very beginning the challenges facing the research field and we are committed to providing the best equipment to researchers, sometimes unique at the national and global level, at the highest level of service, with on-going technical and scientific support from the manufacturer Rigaku Corporation.” mentions Claudia Gavrilescu, Sales Manager within the Analytical Department.

If you would like to find out more about the projects implemented using Rigaku equipment distributed by AMS 2000 Trading Impex, please contact us or meet us to our booth during the ICIR EUROINVENT Conference, 6-7th of June 2024.

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BG.1

Title

Ecotoxicity assessment of geopolymerization process applied on mine mailing from Spain.

Authors

Lyudmila ANGELOVA, Darya ILIEVA, Temenuzhka RADOIKOVA, Andriana SURLEVA

Institution

University of Chemical Technology and Metallurgy, Sofia, Bulgaria

Description EN

The mining and coal combustion industry produces a large number of mine tailings and fly ash byproducts. Most of them are classified as harmful to the environment but have a wide variety of applications. Raw materials recycling and their application in newly synthesized eco-friendly materials are the focus of scientists. In this regard, geopolymer technology is applied as an innovative approach.

In the RecMine project, mine tailings and fly ashes from different sources are studied as byproducts for geopolymers production. A series of chemical and physicochemical characteristics of the raw materials are studied also as the obtained new materials. The potential mobility of Cd, Cr, Cu, Zn, Pb, and Ni in different media is evaluated, by applying a BCR sequential extraction procedure. Moreover, heavy metals mobility factor and individual and global contamination factors were calculated.

BG.2**Title**

Life Cycle Assessment of Geopolymers obtained from Bulgarian Industrial Wastes

Authors

Nina PENKOVA, Andriana SURLEVA, Kalin KRUMOV, Darya ILIEVA

Institution

University of Chemical Technology and Metallurgy, Sofia, Bulgaria

Description EN

A computational algorithm for material and energy balance of a technology for production of geopolymers from fly ash at coal combustion, copper mine tailings and sodium silicate solution is developed. It is applied for determining of utilized wastes, embodied energy and carbon footprint of the products. The initial, critical and equilibrium moisture content of the geopolymers, the drying shrinkage and the energy consumption for the process at industrial conditions are obtained by experimental drying. Options for free drying in environmental conditions in order to save energy are discussed. The influence of the shrinkage during the casting of the geopolymer bodies on their design and use in the construction is considered.

The research is a continuation of the achievements of an international team that developed the technology for obtaining geopolymers during the implementation of a Project КП-06-ДО 02/5 “RecMine – Environmental footprint reduction through eco-friendly technologies of mine tailings recycling”, funded by Bulgarian Ministry of Education and Science and ERA-Min3 program.

Cambodia

Norton University

KH.1.

Title	NU E-ASSIGNMENT SYSTEM
Authors	Sek Socheat, Luy Mithona, Din Somnang, Kim Pareach, Nan Sopheaktra
Institution	Norton University
Patent	-
Description	<p>The E-assignment System, short for Electronic Assignment System, refers to a digital platform or software designed to streamline and manage the process of assigning, submitting, grading, and providing feedback on academic assignments in an electronic format. This system leverages technology to enhance the efficiency and effectiveness of the student's assignment workflow. With additional features include:</p> <ul style="list-style-type: none"> - Auto-generate assignment group for each class - QR code scanning for attendance check - Batch uploading with CSV files - Report file exportation - Multiple field reports filter. - PHP Mailer to send email to users.

KH.2.

Title	ARTIFICIAL INTELLIGENCE: KHMER OKK GAME
Authors	Chhoeung Rachana, Sek Socheat, Luy Mithona, Heangleng (Steven) Taing
Institution	Norton University
Patent	-
Description	<p>Okk or Chaktrang, a captivating and complex variant of traditional board game, has enthralled players in Cambodia for centuries. Its unique board setup, diverse pieces, and intricate rules offer a challenging test of tactical skill and strategic foresight. With integrated AI-powered player, this game bring more fun, creativity, and bridge the gap between ancient square board and modern digital screen.</p>

KH.3.	
Title	TOILET
Authors	So Sokuntheary, Chuop Sopheak, Tol Sokmean, Mao Sothea, Y Lina
Institution	Norton University
Patent	-
Description	<p>Cambodia is a developing country, although we can see that Phnom Penh is modern, but if we look at some provinces, it still seems weak in terms of economy, education and sanitation. Most occur in villages, communes bordering. The remoteness from the city center is almost without electricity and difficult to travel.</p> <p>Due to the fact that primary schools are located far away from the city or town, some schools lack the ability to build standard toilets.</p> <p>So my team came to an agreement on how to solve all these problems. Then we decided to come up with an idea to create a toilet that has many features and is very economical.</p>

KH.4.	
Title	RESTORATION OF KHMER ARCHITECTURE BENG MEALEA TEMPLE 3D VR
Authors	So Sokuntheary, Chuop Sopheak, Hout Romnea
Institution	Norton University
Patent	-
Description	<p>THE BENG MEALEA TEMPLE will be a place from the historical fair, which is divided into several sections for displaying artifacts and history to create a more attractive historical site where people will come to visit. Visit, gather, study, research, find out, walk and enjoy various services. It is also a place that shows the living history of the people in that period. What is special is the location that uses the new 3D VR technology to see the original temple, which is now destroyed by war and nature. An area where future generations can learn more about Khmer history and learn more about ancient history</p>

KH.5.

Title **KHMER CIVILIZATION OUTDOOR SEATING**
So Sokuntheary, Chuop Sopheak, Mao Sothea, Lim Thiden, Nget Sokly
Authors
Institution Norton University
Patent -

In the heart of Phnom Penh, by the Chaktomuk River, stands the Royal Palace where the king resides. This spot attracts both local and international visitors, offering a refreshing atmosphere. It's unique feature lies in it's riverside location, providing fresh air and boasting centuries of geographical significance

Description The area in front of the palace by the river is spacious, but there isn't enough bench for visitors to relax or enjoy the scenery, including those from both within the country and abroad. Despite this, it's a popular spot for people to gather and admire the palace alongside the river, which is renowned for its four iconic faces.

Our team has decided to create a project called the Khmer Civilization Bench, which will incorporate various features inspired by Khmer style.

KH.6.

Title **FAMILY HEALTH CARE SYSTEMS WITH SMART WATCH**
Authors **Chan Mithona, Ul Dara, El Eseor, Hach Phanong, Ratha Sophanith, Sambath Vibol**
Institution Norton University
Patent -

Description Nowadays, technology is very developed, and it facilitates a lot of work for people and institutions. Among those technologies, we created "Family Health Care System with Smart Watch." This system is very useful, and it has many functions to use, such as measuring heart rate, measuring blood pressure, and tracking location, which make it convenient for family members and doctors to track healthy problems. And what is even more special is that the doctor can advise and consult with patients online.

KH.7.

Title **ECO PLASTIC BOTTLES RECYCLING**
Authors **Chan Mithona, Ul Dara, El Eseor, Hach Phanong, Ratha Sophanith, Sambath Vibol**
Institution Norton University
Patent -
Description Plastic bottles are a ubiquitous part of our lives, but their environmental impact is a growing concern. However, there's good news! "Eco-Plastic Bottle Recycling" offers a sustainable solution by transforming used bottles into recyclables by grinder machines, and we can recycle the bottles that we grind for general use. Especially our system has rewards for people who put plastic bottles in the trash bin. And our system will inform the bin collector when it is full.

KH.8.

Title **SMART UMBRELLA**
Authors **So Sokuntheary, Chuop Sopheak, Mao Sothea, Lim Thiden, Chhuon Virak**
Institution Norton University
Patent -
Description In recent years, the world is experiencing climate change caused by global warming, depletion of the ozone layer and a sharp increase in the number of people consuming more natural resources will emit various toxic chemicals that affect climate change. So, we need to know what Phnom Penh needs to do to help protect humanity from the effects of global warming.

KH.9.	
Title	NU YOUTH & INNOVATION IDEA
Authors	Phy Lymann, Rin Rov, Samnang Sokhorn, Samrang Seila, Ngoun Viravud, Luy Mithona
Institution	Norton University
Patent	- NU Youth & Innovation IDEA Web Application
Description	NU Youth and Innovation IDEA is a groundbreaking platform designed to empower the vibrant youth of Cambodia to unleash their creativity and drive positive change within their communities. With this innovative application, young Cambodians are provided with a dedicated space to submit their visionary proposals and groundbreaking innovation ideas, regardless of their background or expertise.

KH.10.	
Title	SMART MICROB GROWING TRACKER
Authors	Ung Vannthoeun, Chan Mithona, Ul Dara, El Eseor, Hach Phanong, Ratha Sophanith, Sambath Vibol
Institution	Norton University
Patent	-
Description	The health system is improved by highly advanced laboratory equipment, which provides benefits to individuals worldwide. Among those technologies, we created "Smart Micro Growing Tracker" This system is an advanced project designed for quick and accurate virus detection. It uses digital microscopes to photograph viruses, which are converted into digital images. These images are analysed by a neural engine, which uses machine learning to identify types of viruses. The system generates reports of virus characteristics and quick responses to the types of viruses. With its streamlined process, Smart Microb Growing Tracker offers a powerful tool to recognise and prevent viral virus threats effectively.

Canada

by

Toronto International Society of Innovation & Advanced Skills (TISIAS)

CA.1.

Title **The FlipNDrip Server™ : Combined Salad Bowl Drainer**
Authors Avia Annemarie Lee & Anthony Alphanso Lee
Institution **The FlipNDrip Server™**
Patent no. US 7,537,130

Description The FlipNDrip Server™ is a 2-tiered bowl serving system consisting of a solid bowl and a strainer. The design is light weight, fun, and easy to use. Great for home, cottage, camping use and more. The FlipNDrip Server™ makes rinsing, straining and drip-drying of foods, sink optional. Never reach for another bowl when making salads or pasta dishes. The FlipNDrip Server™, with its easy locking mechanism, allows bowls to lock in place and rotate 360 degrees. Simply flip, drip, and serve food in the FlipNDrip Server™. This creative, next generation product helps home cooks as well as food service professionals reduce both food waste and time to prepare fruits, salads, vegetables and pastas with ease and convenience.

China

CN.1.

Title

The Compact Wind-Powered Environmental Electric Carrier"

Authors

Li Zhaorun, Jiang Yihong

Institution

Dalian No. 11 High School

Description

The "EcoBreeze" is an innovative solution for promoting environmental conservation and sustainability. Harnessing the power of wind energy, this compact electric donkey offers clean and renewable transportation in urban and rural areas alike. With its small wind turbines mounted on board, the "EcoBreeze" captures the natural force of the wind, converting it into electrical power for propulsion. This renewable energy source reduces reliance on fossil fuels and minimizes carbon emissions, contributing to a cleaner and healthier environment.

Designed to be compact, lightweight, and agile, the "EcoBreeze" navigates narrow streets, crowded marketplaces, and off-road terrain with ease. Its versatility makes it suitable for various applications, including transportation of goods and passengers, agricultural activities, and recreational use. With fewer moving parts and no need for gasoline or diesel fuel, the "EcoBreeze" boasts low maintenance and operating costs, making it an attractive option for individuals and businesses seeking sustainable transportation solutions.

The "EcoBreeze" represents a step forward in sustainable transportation technology, offering an environmentally friendly and cost-effective alternative to traditional vehicles. By harnessing the power of wind energy, this electric donkey helps reduce air pollution, mitigate climate change, and protect the planet for future generations. With the "EcoBreeze," individuals and communities can embrace clean and renewable transportation while preserving the natural beauty of our world.

CN.2.

Title **The Fully Automated Bathtub Experience"**
Authors **Lin Jinghao**
Institution Dalian No. 15 Middle School

Description

In order to facilitate the elderly to soak their feet, it solves the problem of the elderly to pour water, and it also solves the problem that the water will not cool down, which also makes it convenient for the foot soaking medicine to play a greater role. This machine can be loaded with batteries, because there is no plug-in board in some places, so it will be more convenient to install batteries.

Smart Connectivity: The bathtub can be integrated with smart home systems, allowing users to control and monitor bath settings remotely via smartphone or voice commands. This feature enhances convenience and accessibility for users.

Overall, the "AutoSpa" redefines the bathing experience with its advanced automation, customizable settings, and luxurious features. Whether for relaxation, therapy, or rejuvenation, this fully automated bathtub offers a seamless and indulgent bathing experience for users of all ages.

Croatia

Represented by
CROATIAN INVENTORS NETWORK

HR.1.

Title

Application of printed computer-generated holograms as security elements

Authors

asst. prof. VLADIMIR CVILJUSAC, Ph.D.

Institution

University of Zagreb Faculty of Graphic Arts

Description

The innovation is in the algorithm for computer-generating holograms and making preparations for printing in correlation with the parameters of production printing techniques. This enables the quick and low cost production of unique CGH that have broad applications in security. The final product, the security element is not only based on a hologram diffraction grating. Instead, the innovation offers a synergy of three security elements; computer manipulation of objects and composition of holo-blocks in order to achieve a large number of combinations; progressive binarization, which is used to imprint the image on the surface of the hologram and connect the input parameters of the algorithm with the parameters of the printing technique used. All this strengthens security while preserving the ability to print at low cost on standard commercial machines.

HR.2.

Title

Integrated micro/millsystem for continuous extraction of macromolecules

Authors

ANITA SALIC, doc. dr. sc.; MARKO BOZINOVIC, univ. mag. ing. cheming.; IVAN KARLO CINGESAR, univ. mag. ing. cheming.; DOMAGOJ VRSALJKO, prof. dr. sc.; BRUNO ZELIC, prof. dr. sc.

Institution

University of Zagreb Faculty of Chemical Engineering and Technology

Description

The reduction in size and the specific performance of micro- and millistructured devices have led to numerous advantages and expanded their application possibilities compared to

existing macroscopic systems. Small dimensions increase the multifunctionality of the entire system, as several physico-chemical processes: reactions, separation and analysis, can take place simultaneously in one cell. The innovation of the integrated micro/milli system for continuous extraction of macromolecules lies in its ability to combine the best features of microextractors and millisecond separators in a unique platform. This integrated system enables the simultaneous application of microsystem for the fast and efficient extraction of macromolecules and use of millisecond system for the precise and continuous separation of extract and raffinate phase. In addition, the integration of the two processes enables continuous sample processing without interruptions, resulting in improved productivity and shorter processing time. This results in higher process efficiency with minimal losses and resource consumption, making this system attractive for various applications in biotechnology, production of pharmaceuticals and other industries.

HR.3.
Title

Measurement system for measuring the acoustic impedance of polymers during ultrasonic welding

Authors

DUBRAVKO ROGALE, ZELJKO KNEZIC, SINISA FAJT

Institution

***University of Zagreb Faculty of Textile Technology;
University of Zagreb Faculty of Electrical Engineering and Computing***

Description

To determine the ultrasound welding time, it is necessary to know the values of 43 different parameters. One parameter is the speed of propagation of sound in the polymer material, which determines its acoustic impedance. It is well known for some chemically pure polymers, but not for textile fabrics (woven, knitted, nonwoven). This innovation determines the velocity of propagation of ultrasound in these materials using an ultrasound transmitter and receiver at a given distance. The distance and delay of the measurement signal from the transmitter to the receiver. The calculated propagation rate based on the measured distance between the receiver and the transmitter and the signal delay on the receiver, if the density of the material is known, shall be used to calculate acoustic impedance and the total time required for ultrasonic connection of the material.

HR.4.**Title*****MRAssistant*****Authors***TOMISLAV BRONZIN***Institution*****CITUS d.o.o.*****Description**

MRAssistant is an innovative digital platform that enables the contextualization of the industrial environment using mixed reality and is intended to improve the process of production, assembly, installation, assembly, and monitoring of plants and monitoring systems in various vertical industries (energy, transport, production, construction, shipbuilding, general security, etc.) using artificial intelligence (UI) or virtual reality (VR), augmented reality (AR) and mixed reality (MR) technologies. The option of precise digital detection of body/hand gestures in real-time, and positioning within the VR/AR/MR environment, opens the door to complete freedom of managing/shaping the virtual space. The mentioned scenario enables the creation, manipulation, updating, and visualization of 3D content at the level of physical representation. Intelligent control of the user interface through a combination of gestures and voice commands in augmented reality (AR) enables the freedom to manipulate real objects with hands.

HR.5.**Title*****ÜBERENIGMA*****Authors***Author: DOMINIK DESPOT; Mentor: DANIEL BELE***Institution*****ALGEBRA UNIVERSITY COLLEGE*****Description**

Überenigma is one of the most advanced modern cryptographic algorithms used for encrypting and decrypting data such as binary strings, text files, images, etc. It represents the next step in the evolution of cryptographic algorithms for data protection due to its complexity but also due to its lightning-fast speed, which enables encrypting and decrypting huge blocks of data (1TB+) in just a couple of seconds.

Due to its complexity and speed, compared to the competition, Überenigma is by far the fastest. That speed stems all the way from the program being written in C language due to its superior speed, in which every single bit of used memory is manually allocated, to the lack of a graphical interface to save the processor's resources. The

core of the algorithm is based on extremely complex mathematical functions, and its 7.45×10^{316216} combinations make it unbeatable up to the arrival of quantum computers. The innovation's purpose is to protect the operational and end security of all digital systems. That includes everything from data centers and military usage to end users. Due to the rapidly evolving nature of the digital world, the need to secure the extreme amounts of data generated by our modern world is becoming all the more important. Absolute security guarantees absolute privacy, no matter the use case.

HR.6.

Title

RAPID MICROWAVE-ASSISTED SYNTHESIS OF MAGNETICALLY SEPARABLE CORE-SHELL $Fe_3O_4@SiO_2@TiO_2$ PHOTOCATALYST

Authors

IVANA GABELICA, LIDIJA CURKOVIC

Institution

University of Zagreb Faculty of Mechanical Engineering and Naval Architecture

Description

The microwave-assisted synthesis of magnetic $Fe_3O_4@SiO_2@TiO_2$ core-shell nanocomposite was developed. The magnetite core (Fe_3O_4) is coated with a protective layer of SiO_2 (the first shell), followed by the deposition of a photocatalytic layer of TiO_2 (the second shell) for application in advanced oxidation processes. The functionality of the magnetic core-shell $Fe_3O_4@SiO_2@TiO_2$ nanocomposite was confirmed by monitoring the photocatalytic degradation of the antibiotic ciprofloxacin as an organic micropollutant.

HR.7.

Title

FIREBOT

Authors

Author: FRAN HRUSKAR; Mentor: prof.dr.sc. ZELJKO SITUM

Institution

University of Zagreb Faculty of Mechanical Engineering and Naval Architecture

Description

A robotic system for extinguishing fires with water was designed and built. Water is supplied by connecting to a naval vehicle or tanker truck. Smaller dimensions allow it to be used in closed spaces. The robot has the ability to test and determine the concentration of individual gases in a closed

space. The system also contains a camera that enables remote control of the system via the network, and contains an infrared sensor that can be used to detect where the temperature is highest in the room. The undercarriage is made with tracks that allow the robot to move on stairs and steep terrain. The advantages of the developed robotic system are smaller dimensions, the possibility of remote control in order to reduce the danger for firefighters, and the possibility of measuring harmful gases in the machine's surroundings. The robot is intended for extinguishing fires in open and closed spaces, especially in places where there is a great danger to the life and health of firefighters.

HR.8.
Title

ISOLATION PROCESS OF LIGNOCELLULOSIC FIBERS FROM ENERGY CULTURES

Authors

SANDRA BISCHOF, ZORANA KOVACEVIC, TAJANA KRICKA, NIKOLA BILANDZIJA

Institution

University of Zagreb Faculty of Textile Technology, University of Zagreb Faculty of Agronomy

Description

*The invention discloses a process for the isolation of lignocellulosic fibers from the shredded aerial parts of the energy crops miscanthus (*Miscanthus x giganteus*) and/or giant reed (*Arundo donax* L.), which is based on the chemical treatment of the biomass with a solution of citric acid (5.0 - 15.0% w/v), hydrogen peroxide (H₂O₂; 2.0-6.0% w/v) and edetate disodium salt dihydrate (Na₂EDTA·2H₂O; 0.005-0.03% w/v) at 60-65 °C with thermal treatment by microwaves (MW) at 2.450 MHz for 30-60 minutes, with subsequent defibering in a mill to the level of 10-40 °SR, and squeezing and drying, whereby lignocellulosic fibers are obtained that at least 90% correspond to the length specification 0.1-10 mm and 10-20 μm in diameter. The invention includes the use of widely available and sustainable lignocellulosic biomass (LCB) of energy crops as a raw material to produce fibers, preferably with the following dimensions: length of approx. 0.1-10 mm and diameter of approx. 10-20 μm. Lignocellulosic fibers obtained according to the invention can be used to produce composite materials with the possibility of application in various industries: in the textile industry for the production of non-woven and other technical textiles, in the construction*

industry for the production of insulation boards, for the production of paper such as kraft paper, industrial paper or cardboard, and for various purposes in agriculture (agro-textiles).

HR.9.

Title

MV-3 - COUNTER TERRORISM ROBOTIC SYSTEM

Authors

VJEKOSLAV MAJETIC

Institution

DOK-ING d.o.o.

Description

The MV-3 is a multi-mission vehicle intended for support in counter terrorism, hostage and other crisis tasks and missions. Counter terrorism interventions pose significant threats to tactical teams due to limitations of personal ballistic protection. MV-3 gives the tactical team possibility to use the system with or without the tactical team, which allows the flexibility and modular approach without necessity to put tactical members in harm's way.

SUITABLE FOR INDOOR & OUTDOOR OPERATIONS

The MV-3 is intended to be used by police and military special force for indoor and outdoor operations. The vehicle can be quickly adapted to various tasks, e.g. foldable ballistic shields and interchangeable tools enable easier and faster approach to operational area.

HR.10.

Title

Humiditas Lux

Authors

Author: BORNA KRPAN; Mentor: SINISA TEVELLY

Institution

Technical School Zagreb

Description

Illumination of road markings and its edges during rain or fog in combination with darkness at night to help drivers in such conditions. ESP32 detects rain or fog with DHT11 temperature and humidity sensor and light, or in this case darkness with Photoresistor.

It is simple to install and apply humidity and darkness detection stations as well as LED lights in the road.

The purpose of the innovation is to help drivers when driving in rain or fog in combination with darkness at night, since the road and the markings on it, such as lines for separating lanes, are imperceptible.

Cyprus

CY.1.

Title

CXAI Technology

Authors

Dr. Catherine Demetriades

Description

CXAI Technology is the first Actual Intelligence technology in the world. It extracts the information within the human Influential Matrix and decodes both recent and genetic subconscious thought and emotional patterns from Quanta. It can read complex computational thought patterns both recent and genetic memory and even dissect conglomerate masses unreadable by humans. This will uncover mysteries of science and medicine such as in Coma, Sleep, Anesthesia. Newborn Babies will now have a reading of their subconscious genetic memory. The list goes on for the vast number of biological sciences CXAI Technology can be implemented as it compliments new portals of science.

Czech Republic

CZ.1.	
Title	Local mechanical properties evaluation of magnetron deposited TiN coatings
Authors	<i>Jan Tomastik, Lukas Vaclavek, Libor Nozka, Thomas Lindner, Alina Vladescu (Dragomir), Tapan Barman, Radim Ctvrtlik</i>
Institution	<i>Palacký University in Olomouc, Faculty of Science, Joint Laboratory of Optics of Palacký University and Institute of Physics AS CR, 17. listopadu 12, 771 46 Olomouc, Czech Republic</i>
Patent no.	-
Description EN	<p><i>Titanium nitride (TiN) coatings are extensively used for their mechanical, corrosion-resistant, and aesthetic properties, particularly in high-stress applications like drills or mills. Studied since the 1930s in bulk form and since the 1970s in thin film form, TiN is considered a crucial technological material. Its production via chemical vapor deposition (CVD) and physical vapor deposition (PVD) techniques, including magnetron sputtering, offers precise control over deposition parameters and structure. While numerous studies have examined the impact of deposition conditions on mechanical properties, there's a growing need for comparative studies with fine parameter adjustments, particularly with modern processes like HiPIMS.</i></p> <p><i>In this research two groups of TiN thin films were deposited on silicon substrates using reactive magnetron sputtering in pulsed DC mode and HiPIMS mode, varying nitrogen content while keeping argon constant along with other parameters like pressure, power, and deposition time. Mechanical and adhesive-cohesive properties were assessed using nanoindentation and scratch tests, with latter enhanced by simultaneous acoustic emission detection. Results showed that mechanical properties increased with nitrogen concentration in both groups but plateaued or slightly declined after reaching peak values. The highest hardness was achieved at specific nitrogen/argon flow rate ratios for each deposition mode. In scratch tests, samples with certain nitrogen/argon flow rates exhibited slightly higher resistance, showing variations in damage modes at different nitrogen concentrations.</i></p>

CZ.2.	
Title	Varied utilization of Acoustic Emission in scratch testing
Authors	<i>Lukas Vaclavek, Jan Tomastik, Libor Nozka, Thomas Lindner, Alina Vladescu (Dragomir)</i>
Institution	<i>Palacký University in Olomouc, Faculty of Science, Joint Laboratory of Optics of Palacký University and Institute of Physics AS CR, 17. listopadu 12, 771 46 Olomouc, Czech Republic</i>
Patent no.	-
Description	<i>The scratch test is commonly employed to assess the cohesive and adhesive properties of thin films and coatings. Typically, its evaluation relies on analyzing the depth-load-time record and microscopic observation of the residual scratch groove. While visual analysis of the residual groove offers detailed insight into surface damage (such as crack patterns, extent of plastic deformation, delamination), it can be time-consuming. Conversely, continuous recording of indenter penetration depth and applied load provides immediate information about material performance but may lack a sufficient description of deformation behavior. Therefore, complementary techniques are required to describe the deformation response to scratch loading. One potential solution is the continuous recording of acoustic emission (AE) generated during the test. Particularly crucial is AE's capability to detect initial and even subsurface material failures, which are otherwise inaccessible. Moreover, AE is non-destructive and can be performed online.</i>
EN	<i>In principle, acoustic emission method can be employed for a wide range of materials explored via scratch test. The possibilities of use of AE for extending the analysis of the nano/micro scratch test will be demonstrated on various types of materials including thin films, durable metallic and ceramic coatings as well as bulk materials.</i>

Germany

DE.1.	
Title	Surface hardening of selective laser melted 17-4 PH by interstitial nitrocarburization to increase the fracture resistance of $(Cr_xTi_{1-x})N$ thin films
Authors	<i>Thomas Lindner, Jan Tomáščík, Radim Čtvrtlík, Alina Vladescu, Thomas Lampke</i>
Institution	<i>Materials and Surface Engineering, Institute of Materials Science and Engineering, Chemnitz University of Technology, 09107 Chemnitz, Germany</i>
Patent no.	-
Description EN	<i>This study deals with the development of a process chain for the surface functionalization of selective laser melted (SLM) 17-4 PH by interstitial diffusion hardening to increase the fracture resistance of thin film deposition. By means of metallographic preparation and glow discharge spectroscopy, an interstitial diffusion zone of about 30 μm thickness was detected by low-temperature gas nitrocarburization. This was associated with an increase in the microhardness of the 3D printed 17-4 PH surface from 7 GP to over 13 GP. This provides a significant improvement in local impact resistance for the approximately 2 μm thick $(Cr_xTi_{1-x})N$ thin films with hardness up to 26 GPa. Both indentations with different loads and scratch tests under increasing load showed a significant improvement compared to the as printed condition. In addition, reciprocating scratch tests showed a ductile layer behavior of the thin films and support structure. Deformations could thus be compensated.</i>

DE.2.**Title****M24 Health - AI meets health monitoring and prevention****Authors**

Valentin POPOVICI, Radu SOIMU

Institution

M24 Labs GmbH, Munich, Germany

Patent no.

-

M24Health, an innovative health management application, harnesses the power of AI to analyze data from blood pressure monitors and smart scales. Providing personalized reports, M24Health ensures seamless communication by automatically sharing vital information with healthcare providers and family members. This proactive approach facilitates timely interventions, creating a collaborative environment for maintaining optimal health and well-being.

Description**EN**

Smart Digital Scale: *Track your progress, seamlessly synced* Digital scale that measures weight and various health metrics via Bluetooth connection to a smartphone app. It provides comprehensive health tracking and helps monitor progress towards fitness goals.

Family Alert Integration: *Alerting the family through M24Health* is vital for holistic care. Automated health data sharing fosters an efficient support network, enabling timely emotional and logistical assistance. This transparency ensures family involvement in maintaining a healthy lifestyle.

Stay on top of your heart health, wirelessly: High performance upper arm blood pressure monitor. The device's Bluetooth connectivity to a smartphone allows for easy access and sharing of blood pressure readings.

M24Health facilitate effective remote patient monitoring for people who need home care or require extended clinical observation. The platform we can build makes it possible to transmit patient vitals like blood pressure, heart rate, blood glucose, weight, and so forth to providers in real time.

Egypt

EG.1.**Title**

An emergency landing runway for planes during landing & failure the wheels. It works by means of an airbag with a sand basin

Authors

Dr. Zaky Abd ELatif Zaky Abdellatif

Description EN

It's used for aircraft landings. It has a suitable inclination to the top, like the start of a bridge rise, and this inclination helps to slow down the speed of a broken plane as its wheels descend. The runway also has a sizable basin filled with sand, whose width is greater than that of a large aircraft. The sandy basin's surface is covered in a significant number of air cushions, which operate to absorb the powerful shocks caused by the plane descending over it in the event of a malfunction or the wheels not falling.

India

IN.1.

Title

PCSmart IoT Node - Data Acquisition System

Authors

Raman Teja Venigalla, Aashay Reddy Gouni, Devi Kavya Potluri

Institution

PHYSITECH CONSULTANCY SERVICES PVT LTD

Patent no.

-

Description EN

PCS IoT Data Acquisition system is a robust, portable measurement device that can be deployed in a wide range of scenarios for monitoring and recording the electrical parameters of devices and equipment. PCS IoT Data Acquisition System can be used for Electric Vehicle Battery Health monitoring during the charge-discharge cycles. The IoT compatible data acquisition system designed to measure parameters such as voltage, current, temperature, and humidity within a range of 0 to 110 volts DC and 0 to 20 amps. It offers a high level of accuracy with $\pm 0.1\%$ for voltage and $\pm 1\%$ for current, along with a resolution of 100 millivolts and 100 milliamperes. Connectivity options include Wi-Fi and Bluetooth, and it features a built-in LCD display for convenient readouts. Additionally, the system's IP rating is customizable to suit various environmental conditions. Optional features include the PCS IoT Dashboard and RS485 compatibility.

Class no.

Electronics, Automation and IoT

Indonesia

Represented by

Indonesian Invention And Innovation Promotion Association (INNOPA)

ID.1.	
Title	Analysis Effect of CNC Milling Machine Parameters Using Cooling Variations on Surface Roughness and Micro Hardness on Titanium Ti-6AL-4V
Authors	Muhamad Rizky Akbar, Rhesa Rama Reyhan, Muhammad Zacky Syah, Muhammad Faizullah Pasha, Muhammad Wahid Darmawan, M. Hasbi Ash Shiddieqy, Andika Rafi Ryansyah
Institution	State University of Malang
Description EN	Titanium has a high conductivity that creates a reaction rate and diffusion during the machining process which causes tool wear. Tool wear impacts the surface quality of the product. Tool wear impacts the surface quality of the product. Optimizing the milling process on CNC machines using N2-Nanofluid as coolant is an innovative solution to overcome these problems.
ID.2.	
Title	Energy Absorption Analysis of Kevlar + STF + B4C Composite Materials For Soft Body Armor Performance Enhancement
Authors	Muhammad Zacky Syah, Rio Anugrah Vidyanto, Saiful Anwar, Bagas Dwi Cakra Suryadi, Muhammad Faizullah Pasha, Muhammad Wahid Darmawan, M. Hasbi Ash Shiddieqy
Institution	State University of Malang
Description	The composite material is comprised of Kevlar fibers, 200 MW polyethylene glycol (PEG) from Sigma Aldrich, 20 nm silicon dioxide (SiO ₂) with 99% purity (Hebei Suoyi, China), 2.45 μm boron carbide (B ₄ C) (Hebei Suoyi, China), and 99% ethanol (Sigma Aldrich). Performance will be evaluated via energy absorption testing and density area analysis (SEA, EER). The energy absorption test will measure residual energy after a ballistic impact according to the NIJ Armor Type IIIA standard.

Iran

Represented by
IR TOP INVENTORS

IR.1.**Title**

A non-invasive relief device for the symptoms of heel spurs

Authors

Alimohammad Jafarijahed, Fatemeh Hashemi, Ehsan Mahdavi-majd, Ghazal Makki, Alireza Hashemi

Institution

IR TOP INVENTORS

Patent

N7648543

Our innovative device aims to address the treatment of plantar fasciitis and alleviate associated pain. It incorporates fundamental features including massage therapy, electrotherapy, cold therapy, and cryotherapy. These features are seamlessly integrated, providing a comprehensive treatment approach. Additionally, the device integrates a monitoring system to track progress and optimize treatment outcomes. This non-invasive solution empowers users to effectively manage and ameliorate symptoms of plantar fasciitis, reducing dependence on traditional, time-consuming treatments.

**Description
EN**

his cutting-edge portable device provides a comprehensive home treatment solution for plantar fasciitis, combining cold therapy, electrical stimulation, cold hydration, and vibrating massage. Cold therapy reduces inflammation and alleviates heel pain, while electrotherapy not only targets pain but also eases cramps and muscle spasms throughout the foot associated with plantar fasciitis. Cold hydration ensures proper moisture levels, facilitating faster recovery and preventing tissue damage. Vibration massage enhances blood circulation, promoting quicker healing. Additionally, the device features an advanced monitoring system that tracks the patient's progress and adjusts therapeutic settings for optimal results. Other customizable features include temperature adjustments for cold therapy and hydration, as well as modifications to vibration intensity, touchscreen interface, and rechargeable battery. This innovative tool offers a range of practical therapies, making it indispensable for individuals seeking relief from plantar fasciitis pain.

Iraq

IQ.1.

Title
Multifunctional medical wound adhesive
Authors
Omar Sadik Shalal
Institution

Middle Technical University, Iraq

Patent
8076 | 2024
**Description
EN**

The patent idea consists of manufacturing an adhesive that contains a piece of cotton fabric saturated with three basic compounds, namely 1- The antibiotic: Gentamycin, For Gram-positive and Gram-negative bacteria + (Clotrimazole, an antifungal). 2- Adrenaline (to stop bleeding and treat acute infections and allergies) 3- Lidocaine and works on Masking pain and local anesthesia of the affected area. This patch will help those with wounds and bruises, as well as treat injuries at the same time, and soothe the pain associated with the wounds. It was manufactured in different sizes and shapes to cover all types of wounds

IQ.2.

Title
The Novel Design of Gas system and develop culture medium for the isolation and sulfur reducing bacteria within short time
Authors
Adnan Neamah Abdulridha Al-Baidhani
Institution

Bilad Alrafidain Univesity College, Iraq

Patent
646/2018
**Description
EN**

The current study has developed a proprietary system and a special device for the supply of oxygen free nitrogen gas with a mixture of carbon dioxide and 80 20 according to the laboratory conditions required for the growth of sulfur reducing bacteria To find the best medium that fits the bacteria in those environments with shortening incubation period, the new medium developed is available in the specification of planting rich in energy sources, minerals and vitamins and high reduction ability promotes the early growth of sulfur reducing bacteria

IQ.3.

Title	A new method for preparing a bacterial medium for bacterial growth
Authors	Ali Abdulhussein Mahdi
Institution	Middle Technical University, Iraq
Patent	4335 \ 2015
Description	It is a new method for preparing an enriched culture medium for cultivating multiple types of bacteria, and they can be differentiated from each other through the phenomenon of growth. Thus, it is important in diagnosing dangerous and medically important bacteria and integrating blood and glycated media into one medium.
EN	

IQ.4.

Title	The use of purified laccase enzyme from local isolate of Klebsiella pneumonia for breast cancer treatment
Authors	Essam Fadel Alwan Al-Jumaili, Ferial Hayawi Mohammed
Institution	University of Baghdad
Patent	6697 \ 2020
Description	Treating breast cancer cells with purified laccase enzyme from local isolate of klebsiella. <i>Klebsiella pneumonia</i> .
EN	Cancer is one of the serious diseases that result from the abnormal and uncontrolled division of cells and its main cause is the genetic mutation in the genetic material due to several factors, including environmental, genetic, hormonal, lifestyle and other factors. Breast cancer is one of the most common types of cancer among women and is common in many countries. Enzymes are used in the treatment of cancer, for the features of which have been shown to have anti-cancer activity and in addition to cheap enzymes' source and it has lower risks. The laccase enzymes, that purified from locally isolated klebsiella from different environmental sources , was used to study its effect on breast cancer <i>in vitro</i> and <i>in vivo</i> , it was found that the laccase has anti-cancer activity against cell lines and in mice.

IQ.5.

Title **Microscopic separation technique**
Authors **Rabab Mohammed Abbood**
Institution Middle Technical University, Iraq
Patent **4322 – 2024**

Description
EN

The idea of innovation depends on the shed electric potential difference within the amount of electrical amperage taking any job model can researcher chosen (human cells, parasites, bacteria, fungi, protein particles) and the passage of this quantity of electric charges through the form for Using two slices of pure gold and watch over the changes and the movement of clusters of particles or cells through microscopic examination of it and study of the behavior of these cells by electrical stimulation it, where it was noted that some of the cells moving toward the anode and the other toward the cathode within the amount of charge and amperage electrical precisely defined through the control unit attached to a glass slide. This innovation opens the door to future research in various medical fields and microbiology

IQ.6.

Title **Developing a microscope to 3-dimensional microscope**
Authors **Mustafa Ali Hussein**
Institution Medical Technical University, Iraq
Patent **2009 \ 2024**

Description
EN

The image that we see in the ordinary light microscope is in fact a false image with dimensions greater than the real size that the model under the microscope looks like because it represents the shadow of the model and not the image of the original model and this image has only two dimensions; And since some laboratory diagnoses depend in their diagnosis on the shape and dimensions of cells, there was a need to manufacture a three-dimensional vision microscope system, which shows us the true image of the model and its three dimensions by placing a laser diodes system that is installed on the ordinary optical microscope simply and easily. Through this microscope, our concept of the images taken by the ordinary microscope will change from the images taken by the three-dimensional vision microscope.

IQ.7.

Title	Manufacture of turbine Choke valve to generate electric power used in gas production from gas fields
Authors	Tahseen Hameed Khlaif
Institution	University of Kerbala, Iraq
Patent	7556/2021
Description EN	This Patent reveals the invention design and new shape of the conical choke valves, to provide fluidity of movement and control of flow through the ability to move up and down. Also, to avoid current choke valve problems, such as high-pressure drop, erosion, Cavitation, etc. A new addition has been added, which is the turbine, which is linked to the dynamo, and this turbine rotates to convert part of the flow momentum of the gas into electrical energy. The importance of this choke valve design is to generate green electrical energy from the gas without combustion.

Kazakhstan

KZ.1.**Title**

Controlled Installation for Laser Spraying of a Coating on the Inner Surface of a Tubular Product

Authors

Savinkin Vitaliy Vladimirovich, Sen Dmitry Olegovich

Patent no.

Eurasian patent 044342

Description

The invention relates to the field of mechanical engineering, materials science, metallurgy and other industries, and specifically to the technique and technology of laser welding production, having a laser head, a mirror reflector, a pulse discharge lamp, a movable carriage, a cooling system, a welding unit providing restoration and modification of a worn surface, laser welding, hardening, application of protective coatings on the internal working surfaces of cylinders of oil-producing deep-rod pumps and long-length steel pipes of small diameter.

The proposed device can be used for coating multicomponent powder materials on the inner surface of the cylinder of a downhole rod deep pump, applying protective anticorrosive coatings, coatings made of ceramics and polymer materials.

The objective of the present invention is to ensure technological efficiency, automation of adaptive control of the laser installation and improvement of the quality of laser spraying of powder materials on the inner surface of long pipes of small diameter (such as deep pumps).

The technical result achieved by the invention consists in increasing the constructive and technological efficiency of the operation of a portable laser installation, including through automated control, adaptability, increased productivity, reduced labor intensity of work and expanded its functionality, as well as improving the quality of adhesion of the coating to the substrate when restoring the inner surfaces of small diameter long pipes of the SHGN pump type.

KZ.2.**Title**

Electric Cartridge with Contact Magnet for Quick Fixing of the Lamp

Authors

Savinkin Kirill Vitalievich

Patent no.

KZ No. 6225

Description EN

The transition to a new type of energy-saving lamps entails the modernization of their design, appearance, and a change in the fastening and connecting element - the base and the cartridge.

When choosing a specific model of light bulbs, in addition to overall dimensions, the types of lamp bases play an important role. There are various types of lamp bases. The lack of a single standard has led to a large number of different sizes, shapes, types of contacts and the power of lamps and their bases. A greater variety of shapes and sizes of plinths has increased the number of different cartridges, which are not always safe and convenient when replacing light bulbs.

A greater variety of cartridges with large design differences has created a technical problem in the development of a universal safe quick-release cartridge. The proposed utility model "Electric cartridge with a contact magnet for quick fixing of the lamp" is applicable in the field of electric power engineering, energy communications of buildings, in the field of electrical engineering, lighting engineering and energy conservation.

Korea

by

Toronto International Society of Innovation & Advanced Skills (TISIAS)

KR.1.

Title

Automatic Posture Custom Motion Chair

Authors

KIM GIYOON

Institution

Samil Technical High School

Patent

N/A

Description EN

In the case of general chairs, the backrest is manually adjusted, and in the case of the invention, the backrest is automatically adjusted to fit the human body shape using a servo motor, and the height of the chair can be adjusted using a ball screw and a servo motor to match the length of the human leg. Depending on the person, the chair is automatically adjusted to maintain the right posture, so that the right body shape can be maintained. Regular chairs are usually adjusted by loosening the spring and then fixing the spring again. In the case of the above invention, the angle of the back plate is adjusted using a servo motor. The height of the chair can be adjusted by mounting a servo motor on a lead screw or a ball screw computer bolt, or by using a hydraulic cylinder. This idea came from a chair that can be adjusted only in Chinese characters, which is an existing industrial product, but it is still difficult to use ordinary chairs according to our body like custom-made chairs. This invention chair is a chair that can be freely adjusted at angles like our joints, so both men and women can automatically set the right posture and sit on chairs that fit their bodies. It has the potential for industrial use as recognized by the Korean Patent Office of Patent and Trademark Office. It's going to be an investment in people's right posture.

Japan

JP.1.

Title

Automated Sanitization Solution: Harnessing Arduino Technology"

Authors

Rintarō Fujiya, Makiko Hatai

The Arduino-based Smart Sanitising Space is a technological innovation aimed at creating a safe and hygienic environment by leveraging Arduino microcontrollers and sensor technology. This system combines hardware components and software programming to automate the sanitization process, ensuring optimal cleanliness and disinfection in various spaces such as offices, classrooms, and public areas.

The key components of the Arduino-based Smart Sanitising Space include Arduino microcontrollers, sensors (such as ultrasonic sensors, infrared sensors, or temperature and humidity sensors), actuators (such as motors or solenoid valves), and sanitizing agents (such as disinfectant sprays or UV-C lights). These components work together seamlessly to detect the presence of individuals or objects within the space and initiate the sanitization process as needed.

Description

The operation of the system is governed by a set of programmed instructions designed to monitor the environment and respond accordingly. For example, when individuals enter a room or approach a designated area, the sensors detect their presence and trigger the activation of the sanitization mechanism. This could involve dispensing a fine mist of disinfectant spray or activating UV-C lights to eliminate harmful pathogens on surfaces.

Additionally, the Arduino-based Smart Sanitising Space may incorporate features such as real-time monitoring and data logging to track sanitization activities and ensure compliance with hygiene standards. This data can be analyzed to identify trends, optimize sanitization protocols, and improve overall effectiveness.

Overall, the Arduino-based Smart Sanitising Space represents a practical and innovative solution for promoting hygiene and reducing the spread of infectious diseases in various settings. By harnessing the power of Arduino technology, this system offers an automated and efficient approach to sanitization, contributing to the creation of safer and healthier environments for all.

Lebanon

Represented by

National Association for Science and Research

LB.1.

Title

G-F Energy Project

Authors

Hussein El-Husseini, Zeinab Abbass, Ahmad Nasrallah,

Mahdi Hoteit, Mohammad Hoteit

Institution

Supervisor : Maher Osman

Lycée Libanais De Kinshasa

The project to convert plastic and organic waste into biofuel is a unique innovation that combines technical challenge with environmental necessity. Through an innovative industrial personal home protocol, the project, in parts, converts plastic waste into petroleum, and food waste into biogas. This paradigm shift requires advanced technology and comprehensive cooperation between the public and private sectors. The benefits are also evident in protecting the environment from pollution and providing alternative and sustainable energy sources. The project also works to achieve economic and social sustainability by reducing financial burdens on consumers and providing new job opportunities. This innovation can contribute to promoting prosperity and sustainable development in local communities, making it a comprehensive and necessary solution to our current environmental and economic challenges.

Description

1.Environmental: The project contributes to protecting the environment by reducing plastic and organic waste and thus their pollution effects on the environment and nature, which preserves the beauty of nature and protects wildlife and marine life.

2.Economic (Green Economy): The project reduces economic costs for consumers and promotes economic growth by creating job opportunities and stimulating investment in renewable energy.

The project contributes to improving the economic and social conditions of local communities by providing job opportunities and improving infrastructure.

The project provides tangible economic benefits, such as providing heating and reducing energy costs, and it contributes to improving the quality of life and well-being of local residents.

3.Humanitarian/Social: The project provides support to local communities and contributes to providing energy and heating in remote and poor areas.

OBJECTIVES

1.Effective disposal of plastic waste and converting it into valuable energy resources.

2.Providing alternative and sustainable sources of energy and fuel.

3.Reducing dependence on fossil fuels and reducing carbon emissions.

Macau

Represented by WIIPA

MC.1.

Title	Automotive engine carbon deposition dry ice cleaning machine and advanced operating methods
Authors	Jiang Hairong, Jiang Hongbo, Ren Chenglong, Wang Junjie, Chen Hong
Institution	Zhejiang Shentong Times Automotive Sales and Service Co., Ltd, Hangzhou Yuantong Meilin Automobile Sales and Service Co., Ltd, Shaoxing Shangyu District Vocational Education Center, Zhejiang Shentong Automobile Co., Ltd
Patent	ZL 2022 1 1032153.5 The car engine carbon deposition dry ice cleaning machine uses high-pressure air to spray dry ice particles onto the surface of the engine piston through the dry ice cleaning equipment. By utilizing the physical reflection of temperature difference, the carbon deposition on the engine piston is detached. This equipment can achieve energy-saving and environmentally friendly cleaning, and the engine components are undamaged. Through clever design, there is a bendable component between the dry ice cleaning machine nozzle and the nozzle that can adjust the degree of bending, making the nozzle orientation adjustable to meet various cleaning needs. The nozzle orientation can be adjusted without the need to replace the nozzle, making it more convenient to use and improving work efficiency, making up for the shortcomings of existing technology. After a long period of application, advanced operating methods have been summarized and refined. This method can intuitively observe the cleaning condition, ensure maintenance quality, improve work efficiency, reduce wear and tear, and ensure vehicle and personal safety.
Description EN	Patented products have clever design, convenient use, strong practicality, low cost, strong market competitiveness, and good economic and social benefits. Authorized invention patent number for carbon deposition dry ice cleaning machine and advanced operation method for automotive engines: ZL 2022 1 1032153.5 The characteristics of invention and innovation:

1. Strong versatility, meeting the needs of the vast majority of different fuel vehicles on the market;
2. The gun head is cleverly designed and does not require replacement, making it easy to use;
3. Low consumption of dry ice, energy saving and consumption reduction;
4. Improve the quality and efficiency of engine cleaning, with a clear and precise understanding of the carbon accumulation during cleaning;
5. It can ensure personal safety and ensure that the cleaned vehicle is undamaged;
6. The operation process is professional, efficient, safe, standardized, and advanced.

MC.2.

Title

Development of Regular Macroporous Structure for Highly Efficient Hydrogen Evolution Reaction

Authors

HU KA WAI, PUN CHI KIN, LEONG POK HEI, SEAK MEI IAN, LEONG KA CHAI,

Institution

PUI CHING MIDDLE SCHOOL

Patent

-

Description

EN

Combining electronic and structural engineering to enhance the efficiency of alkaline hydrogen evolution reaction (HER) is challenging. In this study, a hierarchical and diverse Mo₂C/NC-Ru superstructure was successfully created. It consists of ultrathin Ru nanoclusters supported on 3D ordered macroporous Mo₂C-embedded nitrogen-doped carbon. The Ru-NC heterostructure exhibits controlled electronic properties and optimized adsorption energy with intermediate H*. The Mo₂C-NC heterostructure promotes the Volmer reaction due to its strong water dissociation ability. The hierarchical macroporous structure improves mass transport and gas release. The catalyst's mass activity is over 17 times higher than Pt/C. When combined with an OMS Mo₂C/NC-Ru-derived OMS MoO₃-RuO₂ catalyst for overall water splitting, it outperforms the state-of-the-art Pt/C||RuO₂ electrolyzer. This work provides guidance for designing efficient 3D ordered macroporous multi-component catalysts.

MC.3.**Title****Smart garbage classifier****Authors**

CHAO KEI KUAN, LAU SAM U

Institution**Pui Ching Middle School Macau****Description****EN**

We saw that the recycling rate in society was very low, so we made a device called a "smart garbage classification system" that can reduce the recycling pollution rate.

Smart garbage classifier is a system that uses artificial intelligence and machine learning technology to automatically identify and classify garbage items. Its goal is to help people sort waste more efficiently to reduce negative impacts on the environment and promote sustainable development. Smart garbage classifiers use image recognition technology to identify and classify garbage items. It can identify and separate different types of waste, such as paper, plastic, metal and glass. These items often need to be handled differently in the recycling process, so correct sorting is crucial for effective recycling and reuse.

MC.4.**Title****Smart Glasses for Dementia Patients****Authors**

WEN TENG HOU, LEE NGOU IN

Institution**Pui Ching Middle School Macau****Description****EN**

I have a relative who suffers from dementia and often forgets my appearance and his home address. I hope I can help him solve this problem. My work uses AI artificial intelligence and laser cutting technology to make a glasses frame. The Erha module is placed on one side of the frame. This component can allow people with dementia to see the surrounding environment at the same time. In addition, the Erha module is placed on the other side. A speech synthesis module will also be placed on the edge of the glasses. My work can help people with dementia recognize and read the identities of their loved ones in front of them. In addition, as long as the QR code of the home address is provided, the glasses can recognize the QR code and read the address, helping patients with dementia remember their home address. This work is based on Arduino modules, one of which is the "Erha module", which can identify its own relatives. Another module is the "speech synthesis module", which is used to synthesize speech. Overall, this work

combines facial recognition technology and QR code technology as innovative elements in eyewear design to help people with dementia.

MC.5.

Title

Smart parking lot to deal with flooding

Authors

Choi Chi Lok, Juan Pui Peng

Institution

Pui Ching Middle School Macau

Patent

-

The purpose of this product is to design an intelligent parking lot that can effectively deal with flooding. It is specially designed to help the parking lot in low-lying places, to avoid damaging the lives and property of citizens in bad weather. And giving a better protection to against flooding.

The product will be modeled to simulate the real parking lot. We will set one water level sensor both inside and outside of the parking lot, to detect water level anytime.

When indoor's water level sensor detects water level is over a specified value, which means the flooding situation become worse:

Description

EN

1. The gate outside the parking lot will automatically raise to prevent the water flooding into the parking lot.
2. The voice system of the parking lot will automatically remind people to evacuate as soon as possible, and the danger warning will be displayed through the screen.
3. Object recognition through the HUSKYLENS AI Camera, to determine whether there is a car in the parking space. After identifying which parking space has a car, the parking space will automatically rise through the motor to avoid the flooding.
4. At the same time, the water pump in the parking lot will drain the water automatically.
5. Until parking lot's water is gone completely, the parking space will go down and the gate will open again.

MC.6.**Title**

Voice Intelligent Traditional Chinese Medicine Box Classifier

Authors

Leong In, LOI CHI FAI, IONG CHIN SENG, LI YINGFENG

Institution

ESCOLA TONG SIN TONG

**Description
EN**

structure of work: Appearance: An easy-to-carry medicine box with a medicine storage area inside. Intelligent control system: responsible for controlling functions such as switches, access and reminders. Display or indicator light: used to display information, reminders, display settings, etc. Internal storage area: An area for placement, separated and classified according to medications. Main features :

Voice control: It can be operated through voice commands, and you can easily control the medicine box by simply speaking the specified commands. Drug management: There are separate areas inside to classify and store different drugs, making it easier for users to find the drugs they need. Medication Reminder: You can set a medication reminder to remind you of the medication time according to the summation time schedule to reduce the risk of missing medication. Drug information display: Drug information can be displayed on the display or indicator lights to facilitate users to understand the use of drugs. Advantages of the work :

Convenience: Users can easily operate the medicine cabinet by speaking. Reminder function: It has a reminder function to reduce risks and is suitable for long-term or multiple drug users. Drug management: Separated areas and drug information display functions make management more convenient and help users better understand their drug status. Personalized settings: Provides a variety of setting options, such as reminder time, medication dosage, etc., which can be personalized according to needs to provide a medication experience that is more in line with personal needs.

Malaysia

Represented by University Malaysia Perlis

MY.1.

Title	NoVity Brush
Authors	Nur Hanis Asilah Binti Hamdan, Nur Amna Aisha Binti Mohd Nadzri, Nur Izzah Hanani Binti Yusri, Ross Amirah Khairizan Binti Rosmadi, Munifah Asfa Qaisara Binti Hazhari, Norfathiah Nadzirah Binti Muhamad, Aqilah Binti Ahmad Hishamuddin, Norlela Binti Mohammad
Institution	FEDERAL ISLAMIC SECONDARY SCHOOL OF KAJANG
Patent no.	NO
Description	<p>This abstract highlights the NoVity Brush, an innovative toothbrush design specifically designed for individuals with hand amputations, aiming to enhance their accessibility to oral care. With an estimated global population of over 30 million hand amputees, this unique toothbrush design addresses a critical need for this underserved community. The specially designed toothbrush incorporates several key features to accommodate the specific challenges faced by hand amputees. The body is ergonomically shaped, with a built-in magnet to be attached to the slap band and facilitating easy manoeuvrability. The brush head is equipped with silicone-materialled bristles that gently clean the teeth and gums, ensuring optimal oral hygiene. To further enhance usability, the toothbrush incorporates a secure and adjustable strap mechanism with built-in magnet that allows users to secure the toothbrush to their residual limb. This enables individuals with hand amputations to independently perform their oral care routine with confidence and ease. In conclusion, the NoVity Brush, an innovative toothbrush design for hand amputees presented in this abstract offers a practical solution to address the unique challenges faced by this underserved community. By enhancing accessibility and promoting independence in oral care, this innovation has the potential to significantly improve the oral health and overall quality of life for individuals with hand amputations. Further research and development, along with collaboration with healthcare professionals, are crucial to fully realise the benefits of this innovative toothbrush design</p>

MY.2.

Title	Candyle
Authors	Nur Qistina Adriana Binti Yusli, Nik Aneesa Husna Binti Nik Mohamad Anuar, Nur Arissa Insyirah Binti Ahmad Basyir, Nur Marissa Eryna Binti Mohd Sharul@Ahmad Khairul, Nur Izzah Binti Ridwan, Airis Sofea Binti Mohd Shuufi, Norlela Binti Mohammad
Institution	FEDERAL ISLAMIC SECONDARY SCHOOL OF KAJANG
Patent no.	NO
Description EN	<p>In the developed world today, candles are used mainly for their aesthetic value and scent, particularly to set a soft, warm, or romantic ambiance, for emergency lighting during electrical power outage failures, and for religious or ritual purposes. Unfortunately, the problems that are usually faced by users are that the candles are only single-used and could produce lots of waste. Of course, the flame of a candle does not burn forever. In fact, most candles have a maximum "life" of about fifteen hours. So, that's where Candyle comes in handy. Candyle is reusable as it is refillable and allows us to refill the wax, giving the candle jar a longer lifespan and reducing waste. The "reusable candle holder" existed today is made from iron that is a heat conductor which disables people from being able to move it. So, to overcome this problem, Candyle is made from silicone which is a heat insulator and this makes it easier for people to move it anywhere even when the candle is lighting up. This also makes Candyle a portable product as silicone is elastic and can be fold. Thus, this makes it easy for people to keep it in a bag and bring it anywhere. Another unique feature of Candyle is it has an aromatic scent. What's so special about that? The latter does not just simply smell good, but also has the ability to trigger areas of your brain that can enhance your health and mood</p>

MY.3.	
Title	ENVIRO-INK
Authors	Sofea Batrisyia Sharil Fadli, Marissa Daania Qystiena Mafeitzeral, Qasrina Zahra Zafaris, Amal Syifa' Asim, Nur Zahra Bilqis Mohd. Fadzly, Muhammad Khazin Norisham, Mukhlis Nazmi Zulzaimi, Muhammad Za'Im Arsyad Mohd Shahidan, Lisneza Roseli
Institution	HULU SELANGOR SCIENCE SCHOOL Enviro-Ink is a white board marker ink made out of expired lotion, water and food coloring in a fix ratio. This unique ink composition is designed to provide a cost-effective, low-odor alternative made from recycled materials. After experimenting on the many possible ratios, we eventually found the ideal ratio. The ink formed had a long cap-off lifespan, a long total lifespan, clear writing performance, and effortless erasability without leaving any stains. From the results of the experiment, we manage utilized sustainable materials and also reused waste materials to create a marker pen ink and eventually a marker pen which not only had high quality but also cost effective. This invention has high commercial potential, user friendly and environmental friendly.
Description EN	
MY.4.	
Title	Peel N' Crunch
Authors	Qhilfi Ukasyah Ghazali, Aasif Arfan Azizuraidy, Muaz Mustakim Murtadza, Muhammad Khazin Norisham, Mukhlis Nazmi Zulzaimi, Rayyan Amsyar Mohd Rusdy, Muhammad Hafizuddin Noorazlan, Muhammad Amsyar Zakwan Arshad, Lisneza Roseli
Institution	Hulu Selangor Science School Peel N' Crunch a product of potato peel chips,represents a groundbreaking innovation in the snacking industry,offering a sustainable,affordable,and nutritious alternative to traditional chips.This product is specially designed to overcome the issue of food waste by purposing potato peels that are commonly discarded.By transforming this peels into delectable chips,a previously underutilized resource is transformed into delicious snack that appels eco-conscious consumers.The main aim of Peel N' Crunch is to reduce food wastage while
Description EN	

promoting sustainability and resource efficiency. This innovative approach aligns with the broader goal of minimizing environmental impact and fostering a circular economy within the food industry. By utilizing the often overlooked potato peels, this product actively contributes to reducing food wastage. Notably, 'Peel N' Crunch offers affordability without compromising on quality or flavor. The efficient use of potato peels, a by-product of potato processing, minimizes production costs, resulting in a more cost-effective snacking option compared to traditional chips made from whole potatoes. Despite their affordability, these chips are expertly seasoned with a blend of herbs and spices, ensuring a delightful flavor profile that rivals that of conventional chips.

MY.5.

Title	Ant Fly-Away
Authors	Aasif Arfan Azizuraidy, Qhilfi Ukasyah Ghazali, Muaz Mustakim Murtadza, Muhammad Afiq Hakim Mohd Saiful, Dzakwan Mohd Saad, Marissa Daania Qystiena Mafeitzeral, Sofea Batrisyia Sharil Fadli, Muhammad Za'Im Arsyad Mohd Shahidan, Lisneza Roseli
Institution	Hulu Selangor Science School
	<p>We introduce our invention of the innovative yet useful “Ant Fly-away” which is a handmade candle that can repel ants and flies and acts as an aromatherapy. It can be used anywhere. Our product is made from soy wax, coffee, cloves, mints and cinnamon. These materials produce an aromatic scent that can also repel ants and flies. This is different from an ordinary repellent that produces unpleasant smell.</p> <p>You need to buy an aromatherapy to combat the smell. Why not just buy a regular aromatherapy product? This is because the regular aromatherapy product cost RON210.8 – RON467 per ounce. Without realizing, you have already spent more than you should. To put it simply, our product saves you a lot of money.</p>
Description EN	<p>There are three primary goals of making this product, the aromatherapy will release aromatic scent that can help you ease your stress, anxiety and depression. Thus, you can relax with a nice scent. Secondly, our product repels ants and flies instead of killing them. Why is killing ants a bad idea? Dead ants will release pheromones that trigger more ants to come and cause more trouble for you. Finally, our product aims to reduce</p>

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chemical waste by replacing chemical materials in aromatherapy with organic materials. Furthermore, these chemicals might be harmful to people with allergies that can endanger their life. Last but not least, our product Ant Fly-away is eco-friendly, cost-friendly, and user-friendly where it is easy to make and is multipurposed.

MY.6.

Title

From Fields to Bytes (F2BIT): Optimizing Fruit Farming with IoT and Advanced Disease Detection

Authors

Muhammad Faiz Aiman Bin Mohamed Zaini, Khairul Bin Ali Hassan, Fathinul Syahir Bin Ahmad Sa'ad, Sukhairi Bin Sudin, Muhammad Zunnurrainie Bin Zulkifli

Institution

Universiti Malaysia Perlis

Patent no.

LY2024P01128

**Description
EN**

This project aims to implement the concept of IoT on a soil monitoring system to monitor the condition of trees based on data acquired using a soil sensor that indicate the level of Nitrogen, Phosphorous, Potassium, pH, temperature, humidity and electrical conductivity in the soil. By combining different parameters, an AI application can be used to make targeted management decisions and optimize resource utilization. This new approach can offer a valuable solution by providing real-time monitoring of essential parameters using mobile application platform. It is able to aid farmers in monitoring the development of trees as this system is developed to be straightforward, cost-efficient, minimise labour expenses and boost crop yields and productivity, as well as a smart farm.

MY.7.

Title

"Empowering Student Leaders: Creating a Student Leadership Development Module For University Students"

Authors

Mohamad Hafiz Mohamad Shokri, Hanum Hassan, Mohd Mustafa Al Bakri Abdullah, Mohd Arif Anuar Mohd Salleh, Farah Farhana Zainal, Ahmad Mu'adz Nazari

Institution

Universiti Malaysia Perlis

Patent no.**Description
EN**

With the growing student leadership development role in campus community and contributing to academic success,

there is an increasing demand for structured leadership programs within higher education institutions. The module is proposed aims to address this need by providing leaders students with a comprehensive framework for cultivating essential leadership skills and competencies.

Drawing upon contemporary theories of leadership and best practices in higher education, the module is designed to be dynamic and interactive, catering to the diverse needs and interests of students across various disciplines. It encompasses a range of topics, including effective communication, teamwork, problem-solving, decision-making, and ethical leadership, all of which are essential for success in both academic and professional contexts.

The development process involves collaboration among faculty members, student affairs professionals, and student representatives to ensure relevance and alignment University mission. The module incorporates experiential learning opportunities, such as workshops, seminars, case studies, and community engagement projects, to enhance students' leadership capabilities through real-world application and reflection.

By implementing this module, its will aims to empower students to become proactive agents of change within the university community and beyond. Through the acquisition of leadership skills and experiences, students will be better equipped to navigate challenges, inspire others, and make meaningful contributions to society. Ultimately, the student leadership module serves as a strategic initiative to foster a culture of leadership excellence and innovation at university.
Top of Form

MY.8.	
Title	Innovative CoCrFeMnNi High Entropy Alloy for antenna applications.
Authors	Nur Izzati Muhammad Nadzri, Mohd Arif Anuar Mohd Salleh, Nur Hidayah Ramli, Dewi Suriyani Che Halin, Nurul Razliana Abdul Razak, Arnita Surieya Sangar
Institution	Universiti Malaysia Perlis
Patent no.	PI2022004718
Description	Metal patch antennas are gaining significant attention for 6G applications due to their compact size, light weight, ease of production, and integrated design. Compared to traditional
EN	

copper materials, high entropy alloy (HEA) materials exhibit substantially higher electron mobility. Copper typically has an electron mobility of $4 \times 10^{-3} \text{m}^2 \text{V}^{-1} \text{s}^{-1}$ at ambient temperature. This increased electron mobility in HEA enhances electrical conductivity, leading to a greater flow of current. The efficient movement of electron carriers ensures closely matched input and output impedance, reducing signal reflections and optimizing power transfer.

HEA-based antennas offer wide signal transmission ranges, minimal frequency drift, and resilience to temperature fluctuations and better corrosion resistance. Furthermore, they can be manufactured at scale while meeting strict industrial standards. These qualities underscore the superiority of HEA over copper in antenna applications, promising enhanced performance and reliability for future communication systems.
(max 250 words)

MY.9.

Title	INNOVATIVE HIGH-TEMPERATURE Sn-10Cu-xIn SOLDER ALLOYS FOR ADVANCED POWER ELECTRONICS APPLICATIONS
Authors	Mohd Arif Anuar Mohd Salleh, Nur Syahirah Mohamad Zaimi, Muhammad Fadlin Hazim Baser, Muhammad Izhad Zakir Mahathir, Hamim Khairul Amirin Mohamed Hani, Emir Dzafran Haziq Mohamad Hafiz, Fatin Qistina Mohd Redza, Awatiff Aleesya Fathulbari, Umair Rayyan Mukhriz Zafri, Rizq Azman, Ahmad Hafiz Ahmad Ramdan Nur Adelia Mohd Albar
Institution	SBPI GOMBAK, MALAYSIA PI2021004223 : Transient Liquid Phase Solder Paste Composition and a Method of Production
Patent no.	PI2023004020 : Solid Solution Strengthening for Producing Robust Lead-free Solder
Description EN	A robust high temperature Sn-10Cu-xIn solder alloys was invented as an alternative to replace the conventional Pb-Sn solder alloys with high lead content. In this invention, Sn-10Cu solder alloys with the addition of indium metal was fabricated through casting method. The main purpose of this invention is to produce a high temperature Sn-10Cu-xIn solder material that results in strong and resilient solder joints for extreme environment conditions such as advanced power electronics systems.

MY.10.**Title****ROLLRINE****Authors**

Nurrul Syairah A Shukor, Rayyan Rayqal Ruslizam, Puteri Naylisha Sofiea Hamzaki, Mardhiah Sofiah Mohd Taufiq, Muhammad Hazim Zulkifli, Nadzrul Zarfah Sharul Azly, Noor Azizah Mat Hassan, Azreen Shazlies AB Aziz, Hamim Khairul Amirin Mohamed Hani, Fatin Qistina Mohd Redza, Ilsa Sarah Nor Azuairi, Muhammad Farhad Aidid Norhisham, Nuha Faqihah Muhammad Fadzli, Nur Zulaikha Mohd Norhazlee

Institution**SBPI GOMBAK, MALAYSIA****Patent no.**

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Description

Urinary tract infections (UTIs) are a common health concern, affecting millions of individuals worldwide. Prompt detection and early intervention are crucial in managing UTIs to prevent complications and reduce the burden on healthcare systems. This study proposes a novel approach to identify UTIs using a biodegradable toilet roll infused with a natural pH indicator, Butterfly pea (*Clitoria ternatea*). The toilet roll's baseline color is purple, owing to the presence of Butterfly pea extract. The objective of this research is to establish the effectiveness of the Butterfly pea-infused toilet roll in detecting UTIs based on changes in color upon contact with infected urine. The problem statement revolves around the need for a quick and accessible prophylactic measure for identifying urine infections. Current diagnostic methods often involve laboratory tests, which can be time-consuming and require specialized equipment. The methodology involves infusing the toilet roll with Butterfly pea extract and assessing its color changes in the presence of alkaline urine, indicative of UTIs caused by urea-splitting organisms like *Proteus mirabilis*. The toilet roll's purple color changes to yellowish-green upon contact with alkaline urine, providing a visual indication of a possible UTI. The prospective application of this product is to offer a convenient, cost-effective, and rapid method for individuals to monitor their urinary health at home. It can act as an early warning system, prompting users to seek medical attention if a color change is observed. Moreover, the biodegradable nature of the toilet roll ensures environmental sustainability. In conclusion, the

biodegradable Butterfly pea-infused toilet roll demonstrates promise as a quick prophylactic measure for detecting urine infections. Further research and clinical trials are warranted to evaluate its sensitivity, specificity, and usability in real-world settings. The potential impact of this innovation on early UTI detection and prevention could significantly improve patient outcomes and reduce healthcare costs.

MY.11.**Title****MASKCRETE****Authors**

Muhammad Nabil Abdullah, Qurratul Ain Muhd Aizuddin, Sophea Humaira Muhammad 'Abid, Maya Qalesya Hafisma Abdul Hafiz, Thariq Ziyad Rizaidi, Muhammad Farhad Aidid Norhisham, Muhammad Izhad Zakir Mahathir, Emir Dzafran Hazique Mohammad Hafiz, Nur I'rdina Abdul Hanan, Sharifah Zahra Syed Hamadah, Muhammad Hazim Zulkifli, Sufecya Inas Suzool Hilmi, Maya Qalesya Hafisma Abdul Hafiz, Puteri Naylisha Sofiea Hamzaki
SBPI GOMBAK, MALAYSIA

Institution**Patent no.**

-

Since the COVID-19 pandemic hits the world last few years, innumerable number of used masks were thrown away leading to the buildup of enormous waste. This issue has impacted our nature in various ways and needs to be resolved with eco-friendly approach. Maskcrete is a concrete that utilised used masks as product base. Surgical masks, the commonly used masks contain polypropylene fibres which capable in replacing cement in the composition of concrete to achieve maximum strength on par with the cement-based concrete. Hence, repurposing of used masks waste by inventing Maskcrete will lead to the reduction of mask waste as well as reducing the world dependability towards cement and promoting eco-friendly constructions. Polypropylene fabrics will be mixed with sand, aggregate stone, eggshell and water to create Maskcrete that can be used as concrete. based but only at a fraction of the normal costs. We have tested Maskcrete for its strength, inflammability and hardness by comparing it to the normal cement-based concrete. The result has proved the uses on polypropylene have improved the mechanical properties of concrete. We believe that Maskcrete will be an imperative solution to solve this current waste management issue in an eco-friendly way

Description**EN**

MY.12.

Title	Lo-EM Hydroxyapatite Ceramics : Fabrication Of Monoclinic Hydroxyapatite Ceramics At Lower Energy Consumption
Authors	Wan Mohd Arif W.Ibrahim, Noorina Hidayu Jamil Suraya Shabingin, Ilsa Sarah Nor Azuairi. Nur I'rdina Abdul Hanan, Sharifah Zahra Syed Hamadah, Aqmal Haziq Mohd Halim, Rizq Azman, Ahmad Hafiz Ahmad Ramdan, Mohd Ashraff Basir, Qurratul Ain Muhd Aizuddin, Sophea Humaira Muhammad 'Abid, Thariq Ziyad Rizaidi, Mardhiah Sofiah Mohd Taufiq, Adi Iskandar Mohd Kamal, Muhammad Fayyadh Dayyaan Fariz
Institution	SBPI GOMBAK, MALAYSIA
Patent no.	P12022005701
Description EN	<p>Introducing Lo-EM Hydroxyapatite, an innovative hybrid ceramic material crafted through a groundbreaking process that significantly reduces energy consumption. Our unique method starts with the activation of hydroxyapatite using advanced Alkaline Activation Materials (AAM). This innovative approach enables the sintering of hydroxyapatite ceramics at just 900°C in traditional sintering furnaces, a substantial decrease from common sintering temperatures.</p> <p>This breakthrough aligns perfectly with Sustainable Development Goal 7: Affordable and Clean Energy, marking a new era in ceramic manufacturing that prioritizes energy efficiency without compromising quality.</p> <p>The novelty of Lo-EM Hydroxyapatite is its 'activated-technology', a novel technique that successfully produces hydroxyapatite with the coveted monoclinic structure (P21/b). This is a remarkable achievement, as it overcomes the typical challenge of achieving a monoclinic structure at a low sintering temperature of 900°C, where hydroxyapatite traditionally retains a hexagonal structure.</p> <p>The transformation into a monoclinic structure endows Lo-EM Hydroxyapatite with superior qualities, particularly beneficial in biomedical fields. It boasts enhanced structural and chemical stability, exceptional biocompatibility, and osteoconductivity. These attributes make Lo-EM Hydroxyapatite an ideal material for advanced biomedical applications, setting new standards in the industry. Embrace the future of sustainable and efficient ceramic fabrication with Lo-EM Hydroxyapatite</p>

MY.13.**Title*****BIOLIPID X*****Authors**

Muhammad Nabil Abdullah, Nurrul Syairah Abd Shukor, Nuha Faqihah Muhammad Fadzli, Sufecya Inas Suzool Hilmi, Nur Zulaikha Mohd Norhazlee, Adi Iskandar Mohd Kamal, Nur Adelia Mohd Albar, Muhammad Fayyadh Dayyaan Fariz, Awatiff Aleesya Fathulbari, Umair Rayyan Mukhriz Zafri, Aqmal Haziq Mohd Halim, Nadzrul Zarfan Sharul Azly, Rayyan Raiqal Ruslizam, Mohamad Al Azani Zainal

Institution

SBPI GOMBAK, MALAYSIA

**Description
EN**

BIOLIPIDX introduces an innovative approach to address the persistent problem of oil-contaminated wastewater resulting from routine activities like dishwashing and handwashing after consuming oily foods. This pioneering solution integrates the remarkable oil-absorbing capabilities of coconut husk and coffee ground with the enzymatic prowess of lipase-producing bacteria encapsulated within agar spheres. Coconut husk, recognized for its natural absorbent properties, forms the cornerstone of BIOLIPIDX. The project harnesses this feature to capture and retain oil particles present in household wastewater, effectively preventing oil-related drain blockages and minimizing the discharge of pollutants into sewage systems. The incorporation of lipase-producing bacteria, break down trapped oil molecules into harmless constituents, ensuring the transformed wastewater is devoid of oil contamination. The development process involves grinding the mixture of coconut husk and coffee ground before mixing it with agar to form small, convenient-to-use sphere-shaped containers. Placing these "digestive balls" into sewage systems allows them to interact with oil-laden wastewater. The coconut husk and coffee ground absorbs oil, and the encapsulated bacteria commence the enzymatic breakdown of lipids. The coffee ground also act as pH stabiliser to ensure optimum bacterial growth condition. The result is visibly cleaner wastewater that poses minimal threat to drainage systems and the environment. BIOLIPIDX is a promising stride towards sustainable wastewater management. By merging natural materials with biodegradable encapsulation and enzymatic action, this innovative concept has the potential to alleviate drain clogs and reduce water pollution caused by oil-contaminated wastewater. This approach not only underscores environmental consciousness but also highlights the efficacy of science in providing practical solutions to everyday challenges.

MY.14.**Title**

Preliminary Design of Urban Rooftop-Wind Turbine with Delta Orientation

Authors

Gan Chong Yao

Institution

UNIVERSITY MALAYSIA PERLIS (UniMAP)

Description

EN

Over 60% of global electricity generated so far in 2023 was produced by fossil fuels. Generation of electricity instead of combusting fossil fuels is using renewable energy - Wind energy. Wind turbines are required to convert the kinetic energy available in wind into mechanical energy and then electrical energy. Wind turbines can be classified into two main types which are Horizontal Axis Wind Turbines (HAWT) and Vertical Axis Wind

Turbines (VAWT). HAWT are the most common type and have blades that rotate around a horizontal axis, while VAWT have blades that rotate around a vertical axis. In fact, flow direction of wind may change frequently with different amplitudes. It influences the performance of turbine negatively if the turbine is unidirectional capable. The wind flows on top of tall buildings are highly turbulent too. Less power be produced and less cost-effective compared to ground mounted turbine. Installations of rooftop wind turbines on high buildings are also difficult & risky. This further increase the installation costs. This project focuses on designing, analysing & testing of wind turbine with delta orientation compared to existing H Darrieus VAWT in the market. The prototype able to perform in turbulence wind conditions with omni-directional capable. Simple & easier installations on high building were considered too in the design.

MY.15.**Title**

PERMEABLE ROAD BY USING NO FINE CONCRETE

Authors

Darsshah Batumalai

Institution

University Malaysia Perlis

Patent no.**Description**

EN

Romania is a flood-prone nation. Since 2000, floods have killed over 240 people in the country. The 2005 and 2006 floods alone affected over 1.5 million people, killing 93, destroying an important part of the country's flood risk management infrastructure, and causing estimated damages of over €2 billion. Climate change will further

increase these risks. So we have come through with a model which can overcome this conflict by in terms of Civil Highway Engineering. No-Fines Concrete is a lightweight concrete made up of only coarse aggregate, cement and water by omitting fines (sand or fine aggregates) from normal concrete. Advantages, limitations and mix proportions of no- fines concrete is discussed. The single sized aggregates make a good no-fines concrete, which in addition to having large voids and hence light in weight, also offers architecturally attractive look. This model can extract water form the road

surface to unsure there in no water on the surface of the road with some guidance of properiate draiage system.

MY.16.

Title	MAPPING OF PM2.5 CONCENTRATION IN THE PENINSULAR MALAYSIA USING GEOSPATIAL APPROACH
Authors	Hamizan Abdullah, Norazian Mohamed Noor, Norazrin Ramli, Zulkarnain Hassan, Mohamad Anuar Kamaruddin, Mohd Remy Rozainy Mohd Arif Zainol
Institution	Universiti Malaysia Perlis LY2023P01474
Description EN	Fine particulate matter is one of the atmospheric contaminants that exist in the atmosphere. The purpose of this study is to evaluate spatial-temporal changes in PM 2.5 concentrations in the Peninsular Malaysia from 2019 to 2020. The study area involves twenty monitoring stations, using monthly and annual means of PM 2.5 concentrations. Moran’s I is used to determine spatial autocorrelation while three semi-variogram models are used to measure the spatial variability of PM 2.5. Three kriging methods, Ordinary Kriging (OK), Simple Kriging (SK), and Universal Kriging (UK), were used for interpolation and comparison. The findings provide a complete map of the variations of PM 2.5 for the peninsular Malaysia region and the interpolation methods are beneficial and could be extended for the investigation of air pollution distributions in other regions of Peninsular Malaysia.

MY.17.

Title	Mechanical Performance, Microstructure, and Porosity Evolution of Fly Ash Geopolymer After Ten Years of Curing Age
Authors	Mohd Mustafa Al Bakri Abdullah, Ikmal Hakem A. Aziz, Rafiza Abdul Razak, Zarina Yahya, Mohd Arif Anuar Mohd Salleh, Muhammad Faheem Mohd Tahir, Liyana Jamaludin, Romisuhani Ahmad, Wan Mastura Wan Ibrahim, Noorida Hidayu Jamil, Alida Abdullah, Mohammad Firdaus Abu Hashim, Liyana Ahmad Sofri
Institution	Universiti Malaysia Perlis MY148054A - Cement Composition And a Method Of Producing An Environmentally Friendly Concrete US8337612B2 - Environment Friendly Composite Construction Materials
Description EN	This paper elucidates the mechanical performance, microstructure, and porosity evolution of fly ash geopolymer after 10 years of curing age. Given their wide range of applications, understanding the microstructure of geopolymers is critical for their long-term use. The outcome of fly ash geopolymer on mechanical performance and microstructural characteristics was compared between 28 days of curing (FA28D) and after 10 years of curing age (FA10Y) at similar mixing designs. The results of this work reveal that the FA10Y has a beneficial effect on strength development and denser microstructure compared to FA28D. The total porosity of FA10Y was also lower than FA28D due to the anorthite formation resulting in the compacted matrix. After 10 years of curing age, the 3D pore distribution showed a considerable decrease in the range of 5–30 μm with the formation of isolated and intergranular holes.

MY.18.**Title**

SARVIDROS: A Technical Revolution in Disaster Management

Authors

Narendran Ramasenderan, Vinesh Thiruchelvam, Hema Latha Krishna Nair, Krishna Ravinchandra, Ng Joo Kiat, Cajun Tai Ka Joon, Ang Jia Ze

Institution

Asia Pacific University, Iotech Solutions

Patent no.

Patent Pending

LY2023W03287, LY2023W03286, LY2023W03285,
LY2023W03284, LY2023W03283, LY2023W03282,
LY2023W03281, LY2023W03280

Description

SARVIDROS (Search and Rescue Vision Drone System) revolutionizes disaster management through advanced technology integration. Swarm drones and quadrupedal robots continuously update a detailed Azure Digital Twin of the environment for proactive modeling. During a crisis, LLMs analyze live data against the digital twin to optimize evacuation, deploy robotic assets, and streamline decision-making. SARVIDROS enhances post-disaster search and rescue with drones and robotic aids, using machine vision for rapid debris mapping and recovery. Real-time public updates via chatbot foster trust and empower communities. The core of SARVIDROS is Rescue AI. This system fuses diverse data streams for real-time anomaly detection and predictive risk assessment. A custom-built AI language model generates early warnings and preemptive response plans, even translating these into instructions for drones and human personnel. The LLM seamlessly integrates with drone control, dynamically adjusting flight paths for optimal data collection. SARVIDROS aims to transform disaster response from reactive to proactive. Its unique combination of drones, LLMs, digital twins, and robotics saves lives, protects the environment, and builds resilient cities for the future.

MY.19.

Title	ACTRIC PAINT
Authors	Ng Li Yun, Abregail Gwee Tong En, Sim Hui Xin, Wong Minh Chjiat Isabelle
Institution	SMK Dato' Jaafar
Patent no.	Copyright (1) CRLY2022J05234 (2) CRLY2023J05680
Description	According to the Solid Waste Management and Public Cleansing Corporation (SWCorp), Malaysians discards approximately 39,078 tonnes of solid waste daily, averaging 1.17kg per person. On the other hand, the value of copper imports to Indonesia from Malaysia increased from around 96.74 million USD to 102.03 million USD according to the Statista Research Department. Thus, we thought of a solution, where disposed fruit peels are used to produce activated carbon which can be served as pigments for conductive paint. The conductive paint produced was objected to replace the usage of conventional copper wirings in domestic households. The production of this paint will also reduce at least 14% of copper usage. This project has won Eleven (11) Awards and obtained two (2) Intellectual Properties (IP) from the Intellectual Property Corporation of Malaysia. We tested the effect of thickness of the activated carbon paint on the conductivity by measuring the brightness of the bulb connected to a 12V battery with ACTRIC PAINT. Our experiment shows that the conductivity of paint increases with the thickness of the paint. This paint plays a role in reducing food waste in landfills by about 4.7 million tonnes annually in Malaysia. This project won eleven (11) international and local awards, including a Gold Award in Sustainable Energy & Green Technology International Innovation Awards held by Malaysia Technology Expo (MTE).

MY.20.	
Title	Living soils for living plants and environment
Authors	Prof. Dr. Ahmed Osumanu Haruna (Project Leader), Dr. Latifah Binti Omar, Assoc. Prof. Dr. Rose Binti Abdullah, Dr. Nur Thaqifah Salihah Binti Mohd Salleh, Dr. Syahirah Binti Haji Shahlehi, Ng Ji Feng, Dr. Adiza Alhassan Musah
Institution	UNISSA / UPMKB
Patent no.	1. Patent, Date of filing: 18 June 2014, File number: EP 12822678.4 (Europe) 2. Patent, Date of filing: 8 August 2012, Grant number: US 9,139,485 B2 (USA) 3. Patent, Date of filing: 7 February 2014, Grant number: 140100682 (Thailand)
Description	Yearly, many solid wastes and degraded forests, lands, and soils occur worldwide. These global issues are threatening the efforts for achieving sustainable food security especially in this era of increasing human population, climate change, food wastes, and scarcity of natural resources. Tropical soils' acidity reduces crop productivity including yield and quality. Excessive use of chemical fertilizers in cash crops cultivation has not been successful because of soil health degradation, poor crop yield and quality, and environmental pollution. This causes low economic income of farmers and poor environmental quality via the greenhouse effect. We are promoting regenerative and climate smart farming by transforming zeolite, slag, agro-industrial, and food wastes into solid and liquid amendments for improving afforestation and reforestation programmes, yield, and quality of rice, maize, oil palm, black pepper, papaya, and pineapples through rejuvenation of nutrient deficient tropical peat and mineral soils.

Moldova

Technical University of Moldova

MD.1.

Title	Process of feeding bees
Authors	Eremia Nicolae, Macaev Fliur, Krasociko Petru, Coșeleva Olga, Sucman Natalia, Pogrebnoi Serghei, Modvala Susana, Mardari Tatiana
Institution	Universitatea Tehnică a Moldovei, Universitatea de Stat din Moldova
Patent no.	Patent application no. s 2023 0086 din 2023.10.31

Description

Process of feeding bees, which includes feeding them during the spring period, in the absence of a maintenance honey collection, with a mixture of 50% sugar syrup and an aqueous solution of 3% glucuronic acid as a biostimulator, added in quantity of 1.30... 3.70 ml/L of syrup, at the same time feeding is carried out with 1.0 L of the mixture per bee family every 10 days, from March until the main harvest. The result of the invention consists in increasing the strength of the bee families, the brood of the queens, the number of hatched brood and the production of honey.

MD.2.

Title	Process of feeding bees
Authors	Macaev F., Eremia N., Sucman N., Pogrebnoi S., Znagovan A., Coșeleva O., Jereghi V.
Institution	Universitatea Tehnică a Moldovei Universitatea de Stat din Moldova
Patent no.	Patent: MD nr. 1716 Z 2024.04.30

Description

The invention relates to beekeeping, namely to a method of feeding bees. The process, according to the invention, includes feeding the bees during the spring with a mixture of 50% sugar and 1.25-3.5 ml/l of a 2% aqueous solution of hexaaminocobalt(III) chloride, in an amount of 1,0 l of mixture to a family of bees, over every 7 days, from April until the main harvest. The result of the invention consists in increasing the strength of the bee families, the brood of the queens, the number of hatched brood and the production of honey.

MD.3.**Title****PROCESS FOR PRODUCING WINE****Authors***Balanuță Anatol, Covaci Ecaterina, Scifos Aliona and Patras Antoanela***Institution***Technical University of Moldova***Patent no.***Short term patent MD 1679 from 31.10.2023***Description**

The invention relates to a process for producing wine. The process, according to the invention, comprises accepting the grapes of white or red varieties, their crushing and destemming to obtain fresh marc, infusing the marc, separating and clarifying the fresh must, alcoholic fermentation of the must, at the same time closer to the end of alcoholic fermentation or after its completion, a solution of plasmolyzed yeast is introduced, obtained by mixing dry yeast with must or with a solution of granulated sugar.

MD.4.**Title****Optimizing food processing technologies in the context of the circular bioeconomy and climate change, bio-optehpas****Authors****Covaci Ecaterina and Botezatu Nadejda****Institution**

Technical University of Moldova

Patent no.

Institutional Project, subprogram 02.04.05

Description

The project focuses on the development of innovative food products and their exploitation in the food industry, taking into account the impact on nutritional health; the valorization of agri-food by-products/waste and the development of new products with increased biological value, contributing to the reduction of waste and the optimization of the resources use.

The exploratory analysis of food security provides critical information for the development and implementation of national food resource management strategies. Overall, this research makes a significant contribution by effectively integrating agri-food resources into the domestic food industry, thus supporting the goals of sustainability, innovation and food security at the national level. It provides a comprehensive perspective on how local resources can be exploited sustainably to meet the current and future needs of society, including for the research training of young specialists.

Research has shown that grape pomace is a rich source of extractable phenolic antioxidants (polyphenols, especially flavonols, tannins), trace elements, non-fermentable sugars, pigments and other compounds with functional properties. It can be used to fortify food and as a supplement for a dietary cure.

MD.5.

Title	Adjusting sustainable and ecological technologies of fruit production in quantitative and qualitative aspects depending on the integrity of the culture system and climate change
Authors	Balan Valerian, Peșteanu Ananie, Manziuc Valerii, Vămășescu Sergiu, Bîlici Inna, Buză Corneliu, Talpalaru Dumitru, Russu Stanislav, Gaberi Valentin
Institution	Technical University of Moldova
Patent no.	02.11.01

The research was carried out in 18 agricultural households and 3 specialised laboratories. Within the project, 27 experiences were mounted on 7 fruit species. Within the project 02.11.01 patents were elaborated: MD 1076, 1077, 1189, 1190, 1229, 1230, 1398, 1432, 1443, 1450. The aim was to create sustainable and high-performance orchard systems, which ensure high quality and efficient fruit yields, but also the protection of natural resources. The obtained results allow modelling the orchards of the future by establishing the optimal cultivation conditions of the fruit species, the structure of the plantation, the programming of the maximum production according to the environmental conditions, the maintenance technique of the orchard and the operation during the pre-and post-harvest period of the fruits. It also ensures the correct use of natural resources and provides conditions for the application of accumulated knowledge on the existing interactions between plants and the environment, on the nutritional reserves of the land and the physiology of the plant. Scientific and practical recommendations have been developed for growers of fruit species. Promoting the transfer of knowledge and technologies in high-level conditions, in the context of sustainable agriculture through APEF "Moldova fruct", UAPCN "Asociația Nucicultorilor din Moldova", AO "Pomușoarele Moldovei".

MD.6.

Title	Young Researchers Project – FLORINVIN ”Valorization of the indigenous flora of Ștefan Vodă wine-growing region in order to increase the authenticity and competitiveness of Moldovan wines”
Authors	Covaci Ecaterina, Vladei Natalia
Institution	Technical University of Moldova
Patent no.	Project nr: 23.70105.5107.04T
Description	<p>We live in a consumerist society in constant development. Therefore, the consumer society implies an ever-increasing circulation of new food and wine products on the market, at a developing speed and with a shorter life cycle.</p> <p>The originality and typicality of the product present on the market is an important decision factor in its choice by the consumer, therefore it is considered appropriate and necessary to appreciate and capitalize the indigenous flora of the Ștefan Vodă viticultural region, in order to increase competitive of wine production on international markets by using autochthonous grape varieties.</p> <p>The realization of this project will allow the development of modern technologies for the appreciation and valorization of local microbiota and the diversification of wine assortments, which is already a current task for the wine sector in the Republic of Moldova in order to increase the authenticity and competitiveness of wines with sensory characteristics specific and typical to our country.</p> <p>On the economic and social level, the realization of the project and the implementation of the obtained results will determine the following benefits: the creation of personalized wines with an emphasis on the terroir character of the Ștefan Vodă wine region, the increase in the export of local wine production, the increase in allocations to the State budget due to additional incomes, and others.</p>

MD.7.

Title	Impeller of the hydraulic centrifugal pump
Authors	Bostan Viorel, Petco Andrei
Institution	Technical University of Moldova
Patent no.	Decision of granting of short term patent, MD, No. 10387 of 2024.01.25.
Description	The invention relates to the machine building, namely to

the centrifugal hydraulic pump's impellers. The application of CFD simulations coupled with optimization algorithms led to the increase of the hydraulic efficiency of the optimized pump impeller, compared to the original rotor, from 56% to 61%. The efficiency of the centrifugal pump with optimized impeller increased by 3.2%.

MD.8.**Title**

Technology for cultivation of marine red microalga *Porphyridium cruentum*

Authors

Rudi Ludmila, Chiriac Tatiana, Cepoi Liliana, Rudic Valeriu, Valuța Ana, Djur Svetlana, Iațco Iulia, Miscu Vera

Institution

Institute of Microbiology and Biotechnology of Technical University of Moldova / Research subprogram 020101

Patent no.

4859 MD / 31.01.2024

The invention refers to microalgae biotechnology and bionanotechnology, namely to a technology for cultivation of marine red microalga *Porphyridium cruentum* of technological interest in order to obtain the high lipid content biomass.

Description

Porphyridium cruentum is a marine red microalga known as a producer of lipids, in particular omega-3 polyunsaturated fatty acids which provide various biological properties. AuNPs are known for various medical applications (e.g., tumor therapy) and biological activities, as well as for their role as components in anti-aging cosmetics. More recently, AuNPs can be applied in the biotechnology and bionanotechnology of microalgae to stimulate the production of various biologically active molecules.

The proposed technology for cultivation of microalga *Porphyridium cruentum* CNMN-AR-01 comprises its cultivation on a nutrient medium containing, g/L: KCl - 16.04; NaCl - 12.52; KNO₃ - 1.24; MgSO₄·7H₂O - 2.5; CaCl₂ - 0.118; K₂HPO₄·3H₂O - 0.5; KI 0.05; KBr - 0.05; 1 mL/L solution containing, mg/L: H₃BO₃ - 2.86; MnCl₂·4H₂O - 1.81; CuSO₄·5H₂O 0.08; MoO₃ 0.015, FeEDTA - 0.5 mL, Au 10 nm nanoparticles stabilized in citrate in a concentrations of 0.023 - 0.027nM, at a temperature of 25 - 28°C, pH 6.8 - 7.2, constant lighting of 50 - 57 μM photons/m²/s, for 14 days.

The result of the invention consists in lipids biosynthesis increasing by 39%, and their accumulation in *Porphyridium*

cruentum microalga biomass. Biomass obtained can be used for the development of new original remedies and active principles based on omega-3 microalgal lipids with antioxidant, anti-inflammatory, antiatherogenic and regenerative properties.

MD.9.

Title

MODULAR DRYING INSTALLATION

Authors

BALAN Mihail, ȚISLINSCAIA Natalia, VIȘANU Vitali, MELENCIUC Mihail, POPESCU Victor, BALAN Tatiana, BERNIC Valentin, CAISÎM Natalia.

Institution

Technical University of Moldova

Patent no.

MD 1736, from 31.01.2024

Description

The invention relates to the food industry, in particular to modular plants for drying fruits and vegetables, and can be used at food industry enterprises, in peasant farms engaged in growing orchards, as well as individually, for dehydration of agri-food products.

The plant, according to the invention, comprises a drying chamber, consisting of three modules (A, B, C), connecte in series to each other by means of closing clamps (7) and equipped with mounting plates (2) and rotary wheels (6). In the first module (A) is made a loading door (8) for trolleys (10) with product and guides (9). The module (A) is rigidly connected to a suction pipe (1) for air with low humidity, a recirculation channel (3) of the coolant, and to a linear hydraulic motor (5). The second module (B), the middle one, is made removable. In the third module (C) is made an unloading door (16) for trolleys (10). The module (C) is rigidly connected to an air branch pipe (11) and is equipped with an electric heater (14) with a fan assembly (15).

MD.10.

Title

PRECESSIONAL GEAR TRANSMISSION

Authors

Viorel BOSTAN; Ion BOSTAN; Valeriu DULGHERU; Maxim VACULENCO; Ion BODNARIUC; Radu CIOBANU; Oleg CIOBANU; Dumitru VENGHER.

Institution

Technical University of Moldova

Patent no.

Patent obtained in Germany: DE 21 2020 000 799 U1 of 23.09.2022.

Description

The technical result of the invention consists of:

- Increasing the carrying capacity of the transmission by engaging the teeth in contacts with convex-concave geometry and the minimum difference in the curves of the mating flanks;

- Increasing the mechanical efficiency by changing the tooth shape, reducing the pressure angle between the flanks and at the expense of increasing the roll rate of the gear teeth by decreasing the relative friction slip between the flanks with a reduction in the degree of frontal overlap and a compensatory increase in the degree of longitudinal overlap with pure lamination of the tooth in the sphero-spatial interaction of the mating wheels with the nutation angle;

- Expanding cinematic and technological possibilities.

The transmission contains the housing, the satellite gear with two bevel gears and driven with the crankshaft in spherospacial motion around a fixed point, two central bevel gears and one fixed fixed in the housing and another movable mounted on the driven shaft.

The teeth of the crowns and the satellite wheel have a flank profile in a circular arc, and those of the central bevel wheels and variable curvature, depending on the angles θ and δ , the number of teeth Z and the ratio of the numbers of teeth of the conjugate wheels in the gears $(Z_1 - Z_2)$ and $(Z_3 - Z_4)$, as well as the radius r of the circular arc of the tooth profile of the crowns. The configuration of the numerical values of the mentioned parameters determines the geometry and kinematics of the convex-concave contact of the teeth, the degree of front coverage, expressed by the number of pairs of teeth simultaneously in gear, and defines the pressure angle between the conjugate flanks.

The technical project and the industrial prototype are developed.

MD.11.

Title	PROCESSES AND DEVICES FOR ADDITIVE MANUFACTURING OF GEARWHEELS AND PRECESSIONAL GEARS
Authors	Valeriu DULGHERU; Ion BOSTAN; Ion BODNARIUC; Radu CIOBANU; Oleg CIOBANU
Institution	Technical University of Moldova

Patent no.	Patent nr. 4861, BOPI nr. 6/2023. of 2023.06.30. The invention relates to mechanical engineering, in particular to additive technologies for the manufacture of gearwheels of planetary precessional transmissions. The processes for additive manufacturing of gearwheels consist in the fact that deposition of the layer of polymeric material, which forms the core of the gearwheel tooth is carried out of dodecahedral cellular elements with a fine structure or of metal powders of dodecahedral cellular elements with a fine structure, at the same time deposition of the layer of polymeric material, which forms the surface layer of the gearwheel tooth, is carried out of diamond-type cellular elements with a coarse structure or of metal powders with the addition of a solid lubricant of rhomboid cellular elements with a coarse structure. The deposition of the layer of polymeric material of diamond-type cellular elements with a coarse structure on the surface of teeth with a convex-concave profile is carried out of polymeric material or metal powders of dodecahedral cellular elements with a fine structure. Deposition is carried out by sphero-spatial motion.
Description	

MD.12.

Title	WIND SYSTEM
Authors	Valeriu DULGHERU; Cătălin DUMITRESCU; Liliana DUMITRESCU; Radu RĂDOI; Corneliu CRISTESCU; Radu CIOBANU; Oleg CIOBANU.
Institution	Technical University of Moldova
Patent no.	Patent nr. 133193 B1 RO din 30.01.2023. The invention relates to wind energy conversion systems, and in particular to multi-rotor wind systems. The wind system includes the tower 1 in the form of an open metal construction, in which the vertical rotors 2 and 3 are located in the upper part. The blades 4 of the vertical rotor 2 are fixed at an angle to the rotor with a helix angle α to the right. The blades 5 of the vertical rotor 3 are fixed at an angle with the helix angle $360^\circ - \alpha$ to the left. Between the rotors 2 and 3 is placed the electric generator with permanent magnets with radial flux 6, the rotor 7 which is connected with the shaft 8 of the vertical rotor 2, and the stator 9 of the electric generator with permanent magnets with radial flux 6 is rigidly connected with the shaft 10 of the vertical rotor 3.
Description	

MD.13.

Title PLANETARY PRECESSIONAL TRANSMISSION
Authors Viorel BOSTAN; Ion BOSTAN; Maxim VACULENCO
Institution Technical University of Moldova
Patent no. Patent nr. 4834 MD of 2023.06.30

The technical result is an increase in load-bearing capacity and mechanical efficiency, as well as a widening of the kinematic and functional possibilities.

This result is achieved due to the kinematic scheme of the transmission, as well as the specificity of the gear of the gear wheels of the satellite wheels driven in spherospacial motion gearing with the teeth of the fixed central wheel and the teeth of the crown of the satellite wheel with the teeth of the movable conical central wheel.

Description Transmission with pre-gearing which includes a housing, crankshaft and coaxial driven shaft, two gear wheels with toothed crowns, movable and immobile central conical wheels, characterized in that the transmission consists of at least two kinematic satellite wheels connected consecutively by at least one intermediate crankshaft installed on the bearing bracket in the housing and which is fitted laterally with a notched offset from the notation angle θ to the common axis of the center wheels, at the same time the first satellite wheel by means of a bearing mounted on the end of its half-axis is kinematically coupled to the crankshaft, and the second satellite wheel by means of a bearing mounted on the end of its semi-axle is kinematically coupled to the intermediate crankshaft housing offset from the notation angle θ to the common axis of the central wheels and conical crowns of the satellite wheels of immobile and movable conical central wheels conjugate between they multiply in convex-concave contacts.
 The technical project and the industrial prototype are developed.

MD.14.

Title PRECESSIONAL TRANSMISSION
Authors Ion BOSTAN; Valeriu DULGHERU; Ion BODNARIUC; Stanislav SLOBODEANIUC; Radu CIOBANU; Oleg CIOBANU
Institution Technical University of Moldova

Patent no.	<p>Positive resolution granting the patent nr. 10391 of 2024.02.06</p> <p>The invention relates to machine construction, in particular to precessional transmissions.</p> <p>The problem that the invention solves is to simplify construction, increase reliability by reducing dynamic loads and reducing the level of noise and vibration.</p> <p>The precessional transmission includes the housing (1), in which the satellite block (2) with toothed crowns (3) and (4), fixed central gears (5), rigidly connected with the transmission cover (6), and furniture (7) are located, rigidly connected to the driven shaft (8). The satellite block (2) is installed on the inclined bushing (9), connected by means of the pin (10) with the driving shaft 11. The pin (10) is located in the groove (13), executed in the inclined bushing (9), ensuring longitudinal axial microdisplacements the node of the inclined bushing (9) with the satellite block (2). At the same time, the inclined bushing (9) is made of material with a low friction coefficient. When rotating the driving shaft (11) with the input angular velocity ω, the satellite block (2), installed on the inclined bushing (9), performs regular precession movement around the precession center O (12).</p> <p>The location of the connecting pin of the driving shaft (11) and the inclined bushing (9) in the longitudinal groove (13) allows the node "<i>inclined bushing (9) - satellite block (2)</i>" to perform longitudinal axial micro-displacements, which ensures the compensation of this possible error Δa.</p>
Description	

MD.15.

Title	Manufacturing process of vegetable sponge
Authors	MAZUR Mihail, BULGARU Viorica, CELAC Valentin, STURZA Rodica, GHENDOV-MOȘANU Aliona
Institution	Technical University of Moldova
Patent no.	15787 from 2024.02.29
Description	<p>The invention refers to the food industry, namely to a method of manufacturing vegetable sponge cake based on the water for boiling legumes. The process, according to the invention, includes the preparation of the dough by beating the boiling water of the legumes (chickpeas or lentils or soybeans) with sugar, adding the emulsion obtained from the boiling water (chickpeas or lentils or soybeans) and fat-soluble extract of sea buckthorn berries or rose hips or dogwood, beating until a stable foam is obtained, adding the foam to a mixture of high-quality wheat flour and baking powder, mixing the ingredients, pouring into the baking</p>

form, baking, cooling and packaging, at the same time it is foreseen to swell the dry legumes in water, boiling the puffed grains (chickpeas or lentils or soybeans) in water, filtering the boiling water, concentrating, cooling, fat-soluble extract is obtained by mixing the powder of sea buckthorn berries, or rose hips, or safflower with sunflower oil deodorized, ultrasonic extraction and subsequent vacuum filtration.

MD.16.**Title****The beauty and variety of nature.****Authors****Frunze Nina****Institution**

Technical University of Moldova

Patent no.

Certificate of registration of the object of copyright or related rights Serial OŞ no. 7743 of 22.01.2024 issued by State Agency for Intellectual Property of the Republic of Moldova+

Description

In modern conditions when children from a young age use the Internet, television, computer programs, a new type of information perception has been formed. For them the textbook or the teacher's speech lose their previous meaning. Digital education has become a ubiquitous reality and turned into a priority. The mere incorporation of automation algorithms and artificial intelligence in the education sector does not have the potential to achieve a decent education. Learning, including outside school, requires special measures that must enable students to benefit from well-thought-out, high-quality and accessible digital teaching and learning resources. This option requires both up-to-date scientific benchmarks and modern methodologies. Part of its are the lessons, all the auxiliary materials and even the digital textbooks for school subjects, the realization of which continues to be long-awaited appearances. This innovation presents a digital lesson in the biological discipline Sciences (Knowledge of the World) for the 5th grade, it contains 20 files, thematically illustrated. It demonstrates the richness and variety of nature, that it is tenders and authentic, it is the home in which we live. But man has a consuming attitude towards natural resources, polluting them in such a way that his activity becomes incompatible with the survival of mankind. For Nature to persist for future generations and survive, man must protect and conserve it, using natural resources with care and wisdom.

Moldova State University

MD.17.

Title

Method for assessing the sensitivity of cervids to stress factors

Authors

Ștefan RUSU, Dumitru ERHAN, Anatol SAVIN, Ion TODERAȘ, Maria ZAMORNEA, Oleg CHIHAI, Viorelia RUSU, Ion GOLOGAN

Institution

Moldova State University, Institute of Zoology

Patent no.

MD 1667Y/2023.01.31; Patent application No. 05/2023

Description

The invention "Method for assessing the sensitivity of cervids to stress factors" deals with the protection of hunting fauna, especially deer populations, and relates to a method for assessing the sensitivity of cervids to stress factors. The method, according to the invention, consists in sedation of the animal using a pneumatic weapon intramuscular injection of a 1% solution of suxamethonium iodide in a dose of 0.06 mg/kg, blood sampling from the jugular vein using a syringe with a needle lumen diameter of at least 0.9 mm, mixing blood with a 0.1% solution of adrenaline hydrochloride at a temperature of 37.5-39.5C for at least one minute on a watch glass heated to the same temperature, placing the mixture in a pipette of an instrument for determining the erythrocyte sedimentation rate placed at an angle of 45°, maintaining for 30 min., determining the erythrocyte sedimentation rate and comparing it with the erythrocyte sedimentation rate of a control sample. At the same time, if the erythrocyte sedimentation rate in the studied blood sample is at least 10 mm higher compared to that in the control sample, an increased sensitivity of cervids to stress factors is established.

MD.18.

Title

Ecobiological modeling of natural reproduction of tench (*Tinca tinca*) in water bodies of Moldova (Device of ecological-industrial reproduction of tench)

Authors

Oleg CREPIS, Dumitru BULAT, Elena ZUBCOV, Denis BULAT

Institution

Institute of Zoology, Moldova State University

Patent no.

Patent no. MD 1735/2024.01.31
MD s 2023 0041/2023.05.10

Description	<p>The invention relates to fish farming, namely to methods for eco-biological modeling of natural reproduction of tench (<i>Tinca tinca</i>). The method includes installing rectangular spawning cages in a reservoir in areas 0.5-1.0 m deep, placing artificial substrates on their bottom for laying eggs, planting fish breeders in cages, periodically checking nests for the presence of eggs and transferring nests with eggs to incubation tanks, as well as observation and care of cages, nests and producers and differs from known methods in that cages of a new construction are installed in the natural spawning zone of fish on specially prepared areas of the bottom (clearing of aquatic plants and compaction with sand). At the same time, thickets of reeds and other plants are left outside along the perimeter of the site to protect the cages from wind and waves. Artificial spawning nests of a new construction with a combined substrate are installed in the corners of the cages on their bottom, simulating dense thickets of aquatic plants.</p> <p>The catch of spawners is carried out at night, during the period of concentration of fish ready for reproduction on the spawning grounds, using minimally stressful methods of catching and transporting them. Cages, if necessary, are connected to each other with a special device to ensure the independent transition of producers from one cage to another.</p> <p>The result of the inventions: increasing the efficiency of the process of artificial reproduction of fish by creating optimal parameters for environmental stimulation of the spawning process of producers.</p>
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MD.19.	
Title	1-((2-(2,4-Dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl)methyl)-4-(4-methyl-2-oxopentyl)-1H-1,2 bromide ,4-triazol-4-ium and its use as an active remedy against the fungi <i>Fusarium avenaceum</i> and <i>Fusarium oxysporum</i>
Authors	Fliur MACAEV, Galina LUPASCU, Eugenia STANGACI, Serghei POGREBNOI, Natalia SUCMAN, Lucian LUPASCU, Svetlana GAVZER, Nicolae CRISTEA
Institution	Moldova State University, Institute of Chemistry, Institute of Genetics, Physiology and Plant Protection
Patent no.	MD a 2022 0047 / 2022.10.26

The invention relates to chemistry and agriculture, and in particular to a quaternary derivative of 1,2,4-triazole and its use as a fungicidal remedy against the fungi *F. avenaceum* and *F. oxysporum*.

The essence of the invention is that a new compound from the class of 1,2,4 triazoles is claimed: 1-((2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl) methyl)-4-(4-methyl-2-oxopentyl)-1H-1,2,4-triazol-4-yl bromide which can be used as an active remedy against phytopathogenic fungi of the species *F. avenaceum* and *F. oxysporum* – some of the causative agents of root rot. Active concentrations vary in the range of 0,00125...0,01%.

Description

The advantages of the invention consist in the accessibility of the reagents used, the reduced number of synthesis steps, a high level of stereoselectivity.

The technical result consists in increasing the fungitoxic activity of the compound of the invention in relation to the closest solution by 28...69% for the fungus *F. avenaceum* and by 22...48% for *F. oxysporum* in the concentration range 0,01...0,00125 %, respectively, in the last days of fungus cultivation.

MD.20.

Title

Portable installation for testing filter materials and technologies for potabilization of natural waters

Authors

Oleg PETUHOV and Tudor LUPASCU

Institution

Moldova State University, Institute of Chemistry

Patent no.

MD a 2023 0011 / 2023.05.19

Description

The semi-pilot installation according to the invention has the advantage that it is mobile, it works autonomously, it allows the simultaneous testing in dynamic conditions of water treatment technologies used on a large scale, it makes it possible to combine several water treatment processes and change their consecutiveness, it allows testing the loads for the columns filters (carbonic and mineral adsorbents, filter and catalytic materials, ion exchangers, etc.) both commercial ones and those obtained in the laboratory, the possibility of monitoring the water parameters in real mode after each stage of treatment, is of interest to young specialists which studies water purification processes as demonstration equipment.

MD.21.	
Title	Nitrate of 2,6-diacetylpyridine-bis(picolinoylhydrazone)-(aqua)(nitrate)cadmium(II)–monohydrate with photoluminescence properties
Authors	Olga DANILESCU, Ion BULHAC, Lilia CROITOR, Pavlina BOUROSH, Olga KULICOVA
Institution	Moldova State University, Institute of Chemistry, Institute of Applied Physics, Chisinau, Republic of Moldova
Patent no.	MD 4884 / 2024.01.31
Description	The invention relates to coordination chemistry, in particular to the synthesis of a new coordination compound nitrate of 2,6-diacetylpyridine-bis(picolinoylhydrazone)-(aqua) (nitrate)cadmium(II) –monohydrate with the formula $[\text{Cd}(\text{H}_2\text{L})(\text{H}_2\text{O})_2(\text{NO}_3)]\text{NO}_3 \cdot \text{H}_2\text{O}$, $\text{H}_2\text{L} = 2,6$ -diacetylpyridine bis(picolinoylhydrazone), with photoluminescence properties. The claimed complex exhibits photoluminescent activity about 300 times more intense than the free ligand (H_2L), a fact established by evaluating the effect of the fluorescent emission in the range 400-500 nm which can be observed even with the naked eye. $[\text{Cd}(\text{H}_2\text{L})(\text{H}_2\text{O})_2(\text{NO}_3)]\text{NO}_3 \cdot \text{H}_2\text{O}$ is proposed as a applicable material for obtaining blue light sources.
MD.22.	
Title	Advanced approach to effective activated sludge management in wastewater treatment systems
Authors	Alexandru VIȘNEVȘCHI, Petru SPĂȚARU, Oxana SPÎNU, Tudor SPĂȚARU, Igor POVAR
Institution	Moldova State University, Institute of Chemistry
Patent no.	10319/2023.09.19
Description	The invention, an advanced approach to effective activated sludge management in wastewater treatment systems, aims to efficiently dewater activated sludge from various sources such as residential sewage treatment facilities, livestock farms, and food processing plants handling meat, milk, and juices. The primary goal is to streamline the dewatering process while addressing the specific needs of diverse industries. The solution involves the use of a unique mixture containing basic components $\text{Ca}(\text{NO}_3)_2 + \text{NaNO}_2$, which facilitates

flotation separation. This process is driven by the generation of molecular nitrogen microbubbles resulting from denitrification within activated sludge granules. As a result, the activated sludge is effectively separated, leading to a concentration of solids.

Remarkably, this innovative approach achieves a concentration increase of approximately tenfold without incurring additional energy costs. Moreover, the concentrated solid obtained from the process can be repurposed to enhance and revitalize depleted soils, offering an eco-friendly solution to waste management.

One of the key benefits of this invention is its ability to significantly reduce foul odors associated with wastewater treatment processes. By effectively managing activated sludge, the procedure minimizes unpleasant odors, contributing to a more pleasant and environmentally friendly working environment.

Additionally, the separated water exhibits low levels of NH_4^+ and NO_3^- , further highlighting the efficiency and effectiveness of this advanced approach. Overall, this invention represents a significant advancement in wastewater treatment technology, offering a comprehensive solution to the challenges associated with activated sludge management.

MD.23.

Title	Device for decontamination liquid
Authors	Ion MUNTEANU, Nicolae ENAKI
Institution	Quantum Optics and Kinetic Processes Laboratory Institute of Applied Physics, Moldova State University
Patent no.	MD s 0031 / 02.08.2023

Description	<p>Currently, the application of Ultraviolet C Radiation is gaining notoriety for the decontamination and annihilation of pathogens frequently present in polluted fluids, which is used in various fields such as food, Health, Hygiene, Medicine, etc. To improve the efficiency of decontamination, we pay attention to equipment prepared from quartz rods/spherical optics related to the rotational movement of the contaminated fluid through the screw channels. The main idea of the proposed device is related to the rotation of contaminated liquids and gases under the action of UV-C through the screw channels, prepared from</p>
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the quartz rod in the torsion configuration, where the contaminated liquids are rotated along the flow direction. The particularity of the proposed device is the introduction of a quartz spiral inside the decontaminating tube, which increases the efficiency of the disinfection rate of the infected liquid.

MD.24.**Title****New Tomato Cultivar – *PETRAMAK*****Authors**

Milania MAKOVEI

Institution**Moldova State University, Institute of Genetics, Physiology and Plant Protection****Patent no.****MD 424 / 2023. 12. 31**

PETRAMAK - New tomato cultivar of determinant type of growth (*sp*). The length of the main stem is 58...65 cm. The number of internodes on the main shoot is 8...10. Internode length 6...7cm. Growing period from mass sprouting to the beginning of ripening – 114...117 days.

Simple inflorescence of 5...7 flowers. The first inflorescence appears after the 7th-8th node, the following ones after 2...1...1. Number of inflorescences on the main axis – 4...6. Pedicel of fruit, without geniculate joint.

The fruits are large, round, smooth, pink-intensive with thick pericarp (0.5-0.7cm). Fruit mass 120...150 g. Fruits have high taste properties due to high dry substance content – 5.4...6.1%; sugar – 4.9...5.3%; vitamin C – 33.1...34.8mg/% and total acidity – 0.48%. The presence of the *rin* gene in the genome of *PetraMak* cultivar ensures high fruit density and their persistence on the bushes at the biological stage of maturity without signs of softening for 20...25 days. Total yielding capacity is of 58.6...62.7 t/ha, with fruit vendibility 92.4...96.7%. It is resistant to high temperatures during seedling emergence (93.5%); to heat (71.7%) and drought (64.5%) in the mature male gametophyte phase. Cultivar resistant to a complex of diseases: *Verticillium*, *Fusarium*, *Alternaria*, relatively resistant to *Phytophthora*.

Description

Recommendation. The cultivar *PetraMak* are predestined for fresh use, producing juice and other tomato products. It is recommended to be grown by seedling in open field with a plant density – 55...56 thousand threads

per 1 ha.

Application domain - Agriculture (cultivation in private associations farmers and households in individual)

Homologated in Republic of Moldova – 2021.

MD.25.
Title

A stimulator of the total antioxidant status of the hemolymph of bees

Authors

Aurelian GULEA, Olga GARBUZ, Victor ȚAPCOV, Ion TODERAȘ, Vasilii GRAUR

Institution

Moldova State University, Institute of Chemistry, Scientific Research Laboratory “Advanced Materials for Biopharmaceuticals and Technics”

Patent no.

MD a 2023 0014 / 2023.05.23

Description

The invention pertains to chemistry and apiculture, specifically to a biologically active cobalt coordination compound which stimulates the total antioxidant status of the hemolymph of *Apis mellifera* bees and their larvae to enhance their resistance to diseases. Addition of this substance at the first feeding after wintering enhances the total antioxidant status of the bee's hemolymph and bee larval hemolymph by 5.4-7.9 times in comparison to control, and up to 5.3 times in comparison with prototype.

MD.26.
Title

New antibacterial agents & diagnostic of overactive bladder

Authors

Aurelian GULEA, Emil CEBAN, Roman RUSNAC, Vasilii GRAUR, Greta BĂLAN, Carolina LOZAN-TÎRȘU, Victor ȚAPCOV, Ion TODERAȘ, Vasile LOZAN

Institution

Moldova State University, Institute of Chemistry, Scientific Research Laboratory “Advanced Materials for Biopharmaceuticals and Technics”

Patent no.

MD 4883/2024.01.31; MD 4842/2023.08.31

Description

The invention relates to chemistry and medicine, namely to the biologically active coordination compounds that manifests high antibacterial activity against the species *Streptococcus pneumoniae*. The claimed substances exceed by 66-263 times analogous characteristics of the Ampicillin and 8-16 times the characteristics of the structural analog.

The discovered properties of these substance are of interest for medical practice in terms of expanding the arsenal of antibacterial remedies.

MD.27.

Title	Original antibacterial remedia
Authors	Aurelian GULEA, Emil CEBAN, Vasilii GRAUR, Dorin ISTRATI, Victor ȚAPCOV, Nicolae STOROJOV, Vasile LOZAN, Lilian CĂLĂRAȘ, Greta BĂLAN
Institution	Moldova State University, Institute of Chemistry, Scientific Research Laboratory “Advanced Materials for Biopharmaceuticals and Technics”
Patent no.	MD 4810/2023.01.31; MD 4759/2022.02.28
Description	The invention relates to chemistry and medicine, namely to the biologically active coordination compounds that manifests high antibacterial activity against the species <i>Streptococcus pneumoniae</i> . : The activity of claimed compounds against bacteria of the species <i>Acinetobacter baumannii</i> exceeds 4-16 times analogous characteristics of the prototype and 10-41 times the characteristics of the structural analog. The discovered properties of these substances are of interest for medicine and veterinary medicine in terms of expanding the arsenal of antibacterial remedies.

MD.28.

Title	Procedure for treating the seeds of <i>Echinaceae purpurea</i> L. before sowing
Authors	Sergiu DOBROJAN, Victor MELNIC, Gheorghe JIGĂU, Galina DOBROJAN, Cristin MELNIC
Institution	Moldova State University
Patent no.	MD a 2024 0003 / 06.03.2024
Description	The procedures consist in treating the seeds of <i>Echinaceae purpurea</i> L. before sowing by soaking them for 3 hours in the solution with a concentration of 1-4% obtained from the biomass of the cyanobacteria <i>Nostoc gelatinosum</i> CNMN-CB-06, <i>Nostoc punctiforme</i> CNMN-CB-21 and <i>Nostoc link</i> CNM-CB-03. The application of the procedures results in the acceleration of the germination process of <i>Echinaceae purpurea</i> L. seeds (which germinate in 5 days) and also in the increase of the number of seeds that germinate.

MD.29.

Title	The model for evaluating the approach of measuring the contribution of agribusiness to the creation of the well-being of the Republic of Moldova
Authors	Irina GOLOCHALOVA, Maria COJOCARU
Institution	Moldova State University
Patent no.	24.80013.0807.1TR
Description	<p>Evaluating the approach to measuring the contributions of agribusiness and related sectors of the real economy to the well-being of the Republic of Moldova (RM) is a mandatory condition for aligning the current methodology of generating information on the state of utilized ecosystem assets in agribusiness with the socio-economic development paradigm. Meeting this condition is possible through the development of a model for evaluating the adopted approach to measuring contributions to the formation of macroeconomic indicators such as the Value of Industrial Production (VIP) and Gross Value Added (GVA), and justifying the effectiveness of its application.</p> <p>The application of the developed model for evaluating the approach to measuring the contribution of agribusiness to VIP and GVA involves following a specific action scheme – a three-stage algorithm. At the <i>first stage</i>, economic activities associated with agribusiness are identified. Within the <i>second stage</i>, a formula is developed to assess the contribution of one conditional percent of agribusiness and related sectors to VIP and GVA, along with the proposal of corresponding indicators (β). Comparing the indicators (for agribusiness: $0,67 \leq \beta'_{ag} \leq 0,95$, $1,23 \leq \beta''_{ag} \leq 1,40$; for related sectors, the average value: $1,31 \leq \beta'_{pp} \leq 1,84$, $1,01 \leq \beta''_{pp} \leq 2,01$) allows for qualifying the methodology of measuring the state of utilized ecosystem assets as oriented towards government policies aimed at supporting agribusiness-taxpayers, which contradicts the principles of the Sustainable Development Concept. The <i>third stage</i> aims to confirm the results obtained in the second stage and involves calculating the return on investment in the long-term assets of the researched sectors. For this purpose, a formula for calculating the return on investment coefficient (K) is proposed. The comparison of coefficients for agribusiness (return per one MDL of investment: in VIP - $5.96 \leq K'_{ag} \leq 11.53$; in GVA - $7.01 \leq K''_{ag} \leq 9.31$) confirms the conclusion made about the state support of agribusiness as taxpayers through the application of reduced income tax rates and the provision of subsidies.</p> <p>The <i>proposed model</i>: Facilitates the evaluation of the current state of the methodology for measuring the contribution of agribusiness to the well-being of RM. Demonstrates the orientation of state policy towards maintaining agribusiness as a taxpayer in</p>

contradiction with the socio-economic paradigm. Proves the asymmetry of the approach to measuring the contribution of agribusiness and related industries of the real sector to the well-being of RM. Justifies the imperative need to revise the current methodology for measuring the contribution of agribusiness to the well-being of the national economy, taking into account modern trends in International Financial Reporting Standards and System of Environmental-Economic Accounting. Provides for the fact that the underestimation of the contribution of agribusiness to well-being creation facilitates investor decisions that may lead to the decline of RM agribusiness in the context of the global food crisis. At the same time, it serves as the basis for the development of reporting in agribusiness aimed at disclosing information about its contribution to maintaining natural capital and the state of the ecosystem assets it utilizes.
Agriculture and Food Industry.

MD.30.

Title

UAV-Based Advanced Technologies for Physical Resilience Assessment and Modeling

Authors

Veaceslav SPRINCEAN, Marianna SAVVA, Marian JALENCU, Liviu DONȚU, Roman BUIMESTRU, Mihail CARAMAN, Alexandr A. BARSUK, Arcadi CHIRITA, Florentin PALADI

Institution

Moldova State University, Institute of Applied Physics, Scientific Research Laboratory “Environmental Physics and Modeling Complex Systems”

Patent no.

**011210; NATO SPS G6140;
MD 1706/2023.07.31**

Description

Research is focused on the development of physical methods for measuring environmental factors, computational modeling, analysis, and risk forecast to increase the resilience to biotic and abiotic factors. Use of drones with small size and weight of pollutants collection device allows solid particle collection at various altitudes and over extended areas, as well as the possibility to study directly airborne microparticles collected on different substrates. In particular, systemic approach inspired by the interdisciplinary applications, computational modeling of environmental factors, UAV-based 3D mapping through Pix4Dmapper photogrammetry allow formulation of scientifically based recommendations regarding the adjustment of technological processes with the aim of reducing the effects of atmospheric pollution, soil surface degradation and the instability of urban and natural ecosystems, e.g., solid pollutant particles are collected from diesel exhaust and examined directly by means of optical

microscopy and AFM. Actual system is proven in operational environment. Also, the recently developed *eALERT* platform for the real-time environmental monitoring and instant warning will be integrated into a complex national monitoring and surveillance system. For this purpose, the established wireless network LoRaWAN is used to store and process multiple monitoring and surveillance data on the dedicated *eALERT* platform server. Moreover, main current outcomes include integration of the *eALERT* platform for real-time environmental monitoring and instant warning into a complex monitoring and surveillance platform in Chisinau, integration of LiDAR technology into an advanced monitoring and surveillance platform, and development of physical technologies with the UAV application in monitoring and precise quantitative analysis of critical infrastructures.

MD.31.**Title**

Exploring Cultural Heritage: A Multiword Expression Learning Mobile Application with Augmented Reality

Authors

Inga TITCHIEV, Olesia CAFTANATOV, Dan TALAMBUTA, Ana NASTASIU

Institution

Moldova State University, Vladimir Andrunachievici Institute of Mathematics and Computer Science

Patent no.

011301

Description

Multiword expressions (MWEs) are sequences of words that function as a single semantic unit, often conveying a specific meaning that cannot be easily inferred from the individual words alone. These expressions include idioms, collocations, phrasal verbs, compounds, and other lexical combinations that are commonly used in natural language. Multiword expressions (MWEs) play a crucial role in language comprehension and communication, yet they pose challenges for language learners due to their idiomatic nature.

Using Augmented reality for MWEs can enhance their understanding, learning and practice in an engaging and interactive way. It is important to create experiences that are relevant, useful and user-friendly to maximize the impact and benefits of using AR technology in this context.

Thus, the aim of this research is to explore the intersection of language learning, cultural heritage exploration, and technology through the development and implementation of a mobile application. The augmented reality (AR) technology offers promising opportunities to enhance language learning experiences in this sense. This study highlights the potential of technology-enhanced solutions to enrich language learning experiences, foster cultural understanding, and contribute to the preservation of cultural heritage in a digital era.

MD.32.**Title****Preserving Romanian Printed Heritage:
The HeDy Digitization Project****Authors**Tudor BUMBU, Lyudmila BURTSEVA, Svetlana
COJOCARU, Alexandru COLESNICOV, Ludmila
MALAHOV**Institution****Moldova State University, Vladimir Andrunachievici
Institute of Mathematics and Computer Science
The platform is developed within the project # 011301,
SIBIA**

Recent advancements in digital technologies, particularly in artificial intelligence, underscore the imperative to automate text digitization processes, which play an important role in generating resources for the development of large linguistic models. Our project contributes to the creation of such kind of resources for Romanian.

Description

The HeDy platform is a software tool, the web version of which can be accessed freely. It processes documents printed in Romanian in various historical periods, using Cyrillic, transitional, and modern Latin alphabets. Heterogeneous documents containing images, formulas (mathematical and chemical), diagrams, musical scores, etc. are processed alongside plain texts. To make our printed heritage accessible as widely as possible we not only limit ourselves to the optical recognition of the characters but also transliterate the texts into the modern Latin spelling of the Romanian language. In developing the platform we used convergent technologies to integrate existing software modules with those developed by the project team. The original developments include the font classification module based on neural networks, the transliteration program, optical recognition models for various historical periods (two for the 17th century, three for the 18th, four for the 19th, and one for the 20th century), document's fragmentation and assembling modules. Processing accuracy: 95% for OCR, 96% for font classification, and 98% for transliteration. A mathematical monograph and a novel have been republished using the HeDy platform.

HeDy is useful for libraries, publishers, and researchers who hold collections of documents in Romanian, it facilitates access to our literary-historical treasure for the general public.

MD.33.

Title	Methods and procedures for maintenance and conservation of biodiversity depending on the integrity of gametogenesis and food variability
Authors	Valentina CIOCHINĂ, Ion BALAN, Nicolae ROȘCA, Vladimir BUZAN, Sergiu BALACCI, Galina OSIPCIUC, Ion MEREUȚA, Vlada FURDUI, Vasile HAREA, Roman CRETU, Gheorghe BACU, Parascovia ȚURCANU
Institution	Moldova State University, Institute of Physiology and Sanocreatology
Patent no.	# 011001
Description	The problem of biodiversity conservation and reproduction of healthy offspring has a special significance and requires multilateral study. The need to solve this problem is determined by the disturbance of the biodiversity characteristics and the reduction of physiological indicators of spermatogenesis, which are directly proportional to the fertility of gametes and consists in creating optimal conditions for the formation, maturation, storage and conservation of the reproductive cells relative to genetic, physiological, morphological, biochemical, functional and other indicators. Within the project, the objectives were achieved: identification and study of the determining physiological factors in the evolution of spermatogenesis, depending on the variability of the reproducers diet; estimation and research the influence of the food ration which causes essential metabolic disorders, function and morphology of reproductive cells; establishment of delimitations of the periodic character of morphological and functional processes of spermatogenesis at physiological conditions and their deviations; evaluation of the features of the beneficial effect of feed variability on spermatogenesis processes in practical conditions, the possibility of influencing on genetic resources and fecundative properties of gametes; study of the structural and compositional variability of synthetic mediums to ensure the integrity of reproductive cells; application of the achievements of biotechnology and their systematic improvement to improve the protocol for the conservation of seed material and development of methods and recommendations for the maintenance, conservation and optimization of biodiversity in accordance with the integrity of gametogenesis and variability of the food ration.

**Nicolae Testemitanu State University of Medicine and
Pharmacy of the Republic of Moldova**

MD.34.

Title	Acetato-2-[(metilsulfanil)(prop-2-en-1-il)amino]metiliden}hidraziniliden)metil]fenolatoaquacupru în calitate de activator al catalazei
Authors	Pantea Valeriana, Gudumac Valentin, Gulea Aurelian, Graur Vasilii, Țapcov Victor, Andronache Lilia, Matcovschi Valerii
Institution	Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	MD 4862 C1, BOPI 01/2024
Description	<p>The invention relates to chemistry and medicine, in particular to a biologically active copper coordination compound of the class of transition metal thiosemicarbasonates. This coordination compound can be used in medicine as a synthetic catalase activator, which, by activating the production of catalase in the organism, can prevent and/or reduce the occurrence of neurodegenerative, renal and cardiovascular pathologies, atherosclerosis and carcinogenesis, inflammatory processes, the development of cellular and tissue injuries associated with excessive accumulation of oxygen free radicals.</p> <p>Summary of the invention consists in obtaining a catalase activator based on acetato-2-[(metilsulfanyl)(prop-2-en-1-yl)amino]methylidene}hydrazinylidene)methyl]phenolatoaquacopper of the formula:</p> <p>The claimed compound expands the arsenal of catalase activators with high biological activity.</p>

MD.35.

Title	Antiglaucoma shunt with two valves
Authors	Bendelic Eugeniu, Alsaliem Sulaiman
Institution	Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	MD 1670 Y, BOPI 06/2023
Description	The invention relates to medical equipment, in particular to an antiglaucomatous shunt with two valves, and can be used in eye microsurgery for surgical treatment of patients with

glaucoma. Summary of the invention consists in that the shunt comprises two tubes that intersect perpendicularly, crosswise and communicate with each other, one tube is made of two longitudinal arms (1, 3), and the second tube - of two transverse arms (2, 4). One of the longitudinal arms (1) is made with a length of 2...3 mm, an outer diameter of 1.5 mm and an inner diameter of 0.9 mm. Both transverse arms (2, 4) are made with a length of 5 mm, an outer diameter of 250 μm and an inner diameter of 100 μm . The second longitudinal arm (3) is made with a length of 2...3 mm, an outer diameter of 1.5 mm and an inner diameter of 0.9 mm. In the first longitudinal arm (1) is placed a valve (5) in the form of a truncated cone, with its base directed towards the exit from the arm (1) of the tube. In the second longitudinal arm (3) is placed another valve (6) in the form of a truncated cone, the vertex of which is directed towards the exit from the said arm (3). In each valve is made one hole with a diameter of 0.20 μm and having the possibility of expanding under pressure up to 0.42 μm . The shunt is made of medical grade silicone. Prototype has been obtained

MD.36.**Title**

Method for reducing portal hypertension for the treatment of patients with liver cirrhosis

Authors

Anghelici Gheorghe, Crudu Oleg, Pisarenco Serghei, Lupu Gheorghe, Grib Andrei

Institution

Nicolae Testemițanu State University of Medicine and Pharmacy of the Republic of Moldova

Patent no.

MD 1712 Z, BOPI 03/2024

Description

The invention relates to medicine, in particular to vascular surgery and hepatology, and can be used for endovascular reduction of portal hypertension for the treatment of patients with liver cirrhosis by reducing blood flow in the splenic artery. Summary of the invention consists in that it is performed the puncture of right femoral artery, through which is introduced a contrast agent, then simultaneously under X-ray imaging is introduced a guide through the celiac trunk and up to the proximal third of the splenic artery. Along the said guide is introduced A catheter with a vascular stent with a diameter corresponding to the lumen of the splenic artery, is inflated the balloon and is installed the

stent. The procedure is repeated twice with the installation of three stents one inside the other, then, after the installation of the last stent in the splenic artery, the catheter is removed from the said arterial vessels.

The problem that the invention solves consists in the development of an effective method for reducing portal hypertension with the aim of preventing variceal hemorrhages and the disadvantages of known methods. The result of the invention consists in the effective reduction of portal hypertension with the minimization of the risk of variceal hemorrhages, ascites and the avoidance of other severe complications, such as hepatic encephalopathy. The advantages of the invention consist in: - miniinvasive endovascular method; - minimization of portal hypertension; - avoiding the complications of severe liver cirrhosis; - avoiding hemorrhages from the spleen in patients with liver cirrhosis by applying fibrin glue.

MD.37.

Title	Prediction of the efficacy of methotrexate treatment in juvenile idiopathic arthritis in children and adolescents
Authors	Ninel Revenco, Vladimir Iacomi
Institution	<i>Nicolae Testemitanu</i> State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	OȘ 7776 from 12.02.2024
Description	Method for predicting the effectiveness of methotrexate treatment in juvenile idiopathic arthritis, which consists in performing the analysis of isolated genomic DNA using the polymerase chain reaction, where the presence of the combined heterozygous genetic polymorphism C677T/A1298C and the homozygous genetic polymorphism T677T is established in the methylenetetrahydrofolate reductase gene. The analytical observational case-control study included 68 JIA patients from the Pediatric Rheumatology Department receiving methotrexate. These children were evaluated according to a unique protocol that included the clinical examination by assessing the disease activity index (DAS28, JADAS 71), treatment efficacy (ACR Pedi 30), therapeutic intolerance (MISS Score); and the paraclinical examination: blood count and biochemistry, liver ultrasound examination,

liver elastography, ECG and echocardiography, all in relation to the revealed mutations.

MD.38.

Title	Diagnostic algorithm for patients with overactive bladder including urological and psychovegetative indices
Authors	Ivanov Mihaela, PhD student, university assistant Ceban Emil, PhD, university professor, m.c. of ASM (Republic of Moldova) Lacusta Victor, PhD, university professor, academician of ASM (Republic of Moldova)
Institution	Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	PhD project (Copyright: Series OȘ Nr. 7783, OȘ Nr. 7782, OȘ 7781, OȘ Nr. 7780 from 12.02.2024- AGEPI) The PhD project refers to highlighting interdisciplinary diagnostic methods for establishing an algorithm in the targeted etio-pathogenetic diagnosis of overactive bladder. The essence of the project lies in the possibility of applying new indices in the diagnostic process, based on modern hypotheses and concepts analyzed between general vegetative disturbances and the clinical, urodynamic, psychomotional and neurophysiological indices of OAB patients. The integration of urodynamic evaluation, vegetative aspects, and psychomotional components provides a more comprehensive and detailed perspective on the patient's condition.
Description	The problem addressed by this innovation lies in applying new indices in the diagnostic process, based on modern hypotheses and concepts analyzed between general vegetative disturbances and clinical, urodynamic, and psychoemotional indices of OAB patients, which will enable physicians to better understand the complex interactions between different systems of the body. The integration of urodynamic assessment, vegetative aspects, and psychoemotional components provides a more comprehensive and detailed perspective on the patient's condition. The innovation is part of the development process carried out within the doctoral research supported by the author and the results are registered the Copyright and Related Rights at AGEPI (OȘ No. 7783 from 12.02.2024; OȘ No. 7782 from 12.02.2024; OȘ No. 7781 from 12.02.2024, OȘ No. 7780 from 12.02.2024) and the Innovator's certificate No. 6162 from 02.01.2024, „Nicolae Testemitanu” SUMPh of the Republic of Moldova implemented in clinical practice of „Timofei Mosneaga” Clinical Republican Hospital of the Republic of Moldova.

MD.39.

Title	Surgical method of implantation of the antiglaucoma shunt with valve
Authors	Maria Iacubitchii, Ala Paduca, Alsaliem Sulaiman, Eugeniu Bendelic
Institution	<i>Nicolae Testemitanu</i> State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	-
Description	<p>Copyright certificate OȘ nr 7554 from 28.06.2023, PhD project</p> <p>The proposed surgical technique is an effective, safe, simple, and economical method to optimize the surgical treatment of glaucoma or it can be used as a first-line method when conventional treatment methods are unlikely to be successful.</p> <p>The surgical method of antiglaucoma valve shunt implantation starts with topical anesthesia, asepsis, and blepharostat placement followed by conjunctival incision.</p> <p>The surgical procedure is represented by the formation of the scleral flap at 12 o'clock with a 2/3 from its thickness. The flap has a rectangular shape with dimensions 2.5×2.5 mm. At the base of the flap is made a 1.5 mm incision with the implantation of the antiglaucoma shunt with valve (Patent No 1516) at the bases of the scleral flap. The shunt is placed in the anterior chamber with avoidance of contact between the device, cornea, and iris. The scleral flap is secured with nylon and the conjunctiva is closed with suture.</p>

MD.40.

Title	Information record of bio-specimens within the Biobank
Authors	Puia Raisa, Buta Galina, Todiraș Mihail, Romanciuc Grigore
Institution	<i>Nicolae Testemitanu</i> State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	-
Description	<p>The scientific work "Information architecture and systematization of bio-specimens within the Biobank</p> <p>Seria OȘ, no. 7541, 16.05.2023, 5 Innovator Certificates: no. 5999, no. 6036, no. 6037, no. 6038, no. 6051 in the <i>Nicolae Testemițanu</i> SUMPh.</p> <p>In the project "Informational record of bio-specimens within</p>

the Biobank" of the *Nicolae Testemițanu* SUMPh was developed and implemented the software "Informational record of bio-specimens within the Biobank".

The software contributes to the effectiveness and efficiency of personalized medicine processes, to the qualitative management of information about research subjects and is a strategic tool of the competitive clinical management. of health services.

The project ended with the registration at SAIP of the scientific work "Information architecture and systematization of bio-specimens within the Biobank", Seria OȘ, no. 7541, 16.05.2023, and obtaining 5 Innovator Certificates: no. 5999, no. 6036, no. 6037, no. 6038, no. 6051 in the *Nicolae Testemițanu* SUMPh.

The results of the project contribute to the qualification of human resources, by attracting and involving collaborators in research activities.

The potential beneficiaries: scientific researchers, collaborators of scientific laboratories, teaching and scientific staff of the *Nicolae Testemițanu* SUMPh. will benefit from a comprehensive informational support for the record of bio-specimens within of the SUMPh Biobanks and will have possibilities to streamline the activity of research.

MD.41.

Title

International research network on health determinants in the context of climate change (ReSanClim)

Authors

Elena Ciobanu, Cătălina Croitoru, Victoria Bologan, Ioana Caliga, Maria Curteanu, Cristina Dumitraș

Institution

***Nicolae Testemițanu* State University of Medicine and Pharmacy of the Republic of Moldova**

Patent no.

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Description

The project addresses the issue of the impact of climate change on the quality of drinking water, which also emerges from the announcement of 2024 - the year of adaptation to climate change. With the global average temperature increasing by 1.5°C in the last decade, and an expected future increase of 2-3°C by 2050, the need to understand and counter the effects of these changes becomes critical. The essence of the project consists in the thorough study of the chemical parameters that influence the quality of drinking

water: pH, total hardness, dry residue, calcium, magnesium, fluorine, chlorides, potassium, sodium, ammonia, nitrites and nitrates. The project directly addresses the deterioration of drinking water quality under the influence of climate change, which can lead to increased concentrations of mineral salts and chemical compounds. It focuses on identifying the health risks associated with these changes and developing effective strategies to monitor and improve drinking water safety. One of the main advantages of this project is the ability to provide essential data for the development of policies and intervention practices aimed at protecting the health of the population against the risks associated with climate change. By promoting knowledge and good practices among the population, the project contributes to reducing the negative impact of climate change on drinking water quality. Benefits include increasing public awareness of climate risks, as well as promoting sustainable solutions for adapting to the effects of climate change. In addition, the results of the project will support the development of evidence-based intervention strategies, contributing to strengthening the resilience of communities in the face of climate change.

MD.42.

Title

Medico-legal identification of physical domestic violence – Research project results

Authors

Andrei Pădure, Petru Glavan, Anatolii Bondarev, Doina Cazacu, Oleg Arnaut

Institution

Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova

Patent no.

-

Description

Health and medico-legal systems are key authorities in providing evidence of domestic violence. One of their important tasks is to identify domestic violence victims, but medical professionals must have appropriate knowledge and be provided with practical tools. The research project aimed to assess the physicians' level of knowledge in the field of gender-based violence and improve their ability to identify adult victims of domestic violence based on the victim's profile and injury pattern. To achieve this goal, 832 medical students and doctors were questioned and 801 forensic medical reports regarding domestic violence victims were

studied. The survey showed doctors strongly need to be trained to strengthen their capacity to adequately respond to cases of domestic violence. Medical respondents are affected by some stereotypes as other society members but to a lesser extent. It was found that an ordinary victim of domestic violence is a woman aged 39.4 years, affected regardless of her residence place, employed, and mostly assaulted by her life partner at home in January, June, and July, on Weekend, between 5-10 p.m., medico-legally examined 2.6 days after the assault. Injuries were especially inflicted by blunt objects, mostly by the aggressor's body parts, averaging 4.6 in number, multipolar located predominantly on the face, arm, forearm, hand, and thigh, represented by soft tissues insignificant injuries; their severity is influenced by the alcohol consumption, the victim's age and gender. The study results will be used by medical and forensic doctors as evidence-based tools to identify adult victims of domestic violence.

MD.43.

Title	Diagnostic and prognostic markers of beta frequency fluctuations determined on high-density video-EEG in patients with epilepsy
Authors	Groppa Stanislav, Vataman Anatolie, Chiosa Vitalie, Ciolac Dumitru
Institution	<i>Nicolae Testemitanu</i> State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	-
Description	State Program (2020-2023) Health strategic priority 20.80009.8007.40 Using high density video-EEG (HD-vEEG) recordings in patients with epileptic seizures, the organization and dynamic properties (flexibility and controllability) of brain network modules (communities) during the transition from the resting state to the interictal and ictal state were investigated. Controllability is the ability of a network to be switched from its current state to a target state, and flexibility is the frequency with which a functionally defined region of interest changes its assigned community over time. Several modules comprising specific cortical and subcortical regions were identified in the beta frequency, depending on the analyzed time periods of the HD-vEEG recordings.

HD-vEEG recordings were epoched into non-overlapping 5-s time windows - two periods before the interictal or ictal spike wave discharges (SWDs), pre-SWD-1 and pre-SWD-2 time windows, and one interictal or ictal time window.

Analyzing the interictal discharges, six modules were identified in the baseline time period, the same six modules were identified in the pre-SWD-1 time period. In the pre-SWD-2 time period, two additional modules were detected, and also two additional modules during the SWD-interictal time period.

Approaching brain network abnormalities in patients with epileptic seizures, we demonstrated a modular organization of communities in cortico-subcortical networks during the transition to interictal and ictal states. These changes were accompanied by dynamic changes in the flexibility of the fronto-parietal networks in beta frequency, with evidence of increased controllability immediately before ictal discharges. The timing of observed changes in brain connectivity could serve as diagnostic and prognostic markers in patients with epileptic seizures.

MD.44.

Title	Hybrid materials functionalized with carboxyl groups based on plant metabolites acting against human and agricultural pathogens
Authors	¹ Macaev F., ¹ Pogrebnoi V., ¹ Bilan D., ¹ Cojocari S., ¹ Ciobanu N., ¹ Sucman N., ¹ Pogrebnoi S., ¹ Lupașcu L., ¹ Stingaci E., ² Eremia N., ² Coșeleva O., ² Mardari T., ² Cataraga I., ² Modvala S., ³ Znagovan A., ³ Tincu S., ³ Pînzari C., ³ Topchin-Matei R.
Institution	1. State University of Moldova; 2. Technical University of Moldova; 3. Nicolae Testemițanu State University of Medicine and Pharmacy of the Republic of Moldova
Patent no.	MD 1598 Z, BOPI 09/2022; MD 1607 Z, BOPI 10/2022; MD 1611 Z, BOPI 11/2022; MD 1612 Z, BOPI 11/2022
Description	State Program (2020-2023), Innovative materials, technologies and products 20.80009.5007.17. P1P2-0487 1. Selective chemical transformation of the diterpenoid glycosides Steviozide and Rebaudiozide A into functionalized derivatives with carboxyl groups was carried out, retaining the native 19-O-glycosidic and ent-cauranoidic shells. Symmetric

and asymmetric molecules with naturally occurring structural fragments joined via linker groups of different length and nature were obtained. Structure-property relationships have been determined for a series of new derivatives of the diterpenoid glycosides Steviozide and Rebaudiozide A. The level of inhibition of HIV-1 (strain IIIB) and HIV-2 (strain ROD) replication in acutely infected MT-4 cells was determined, with parallel determination of their cytotoxicity in the same cells. A number of new compounds were tested at different doses to reveal the optimal dose and their action on the facultative pathogen *Botrytis cinerea* Pers. The compounds MF-MZ-16, MF-EPS-165, MF-EPS-853 and MF-EPS-866 showed the most pronounced inhibitory activity for *F. oxysporum* and *F. aquaeductuum*. On the basis of the studies, new model formulations with the most effective properties were selected and developed, necessary to develop the optimal formulation for testing in the next steps under small plot production conditions to assess their fungistatic and fungicidal action.

2. As a result, the influence of new generation bioregulators in bee feed on the immunity, overwintering resistance and productivity of bee families was determined. The following patents were obtained during the project: MD 1598 Z 2022.09.30; MD 1607 Z 2022.10.31; MD 1611 Z 2022.11.30; MD 1612 Z 2022.11.30. Physico-chemical indices and the presence of heavy metals in bee products from different pedoclimatic zones were determined.

3. Active substances and auxiliaries were selected for the development of model formulations with plant metabolites, hybrid materials functionalised with carboxyl groups - bioregulators and natural stimulators for agriculture. In accordance with the properties and purpose of the active substances needed for the development of model formulations, the selection of auxiliary substances was carried out with emphasis on the groups of auxiliary substances recognised in the production of syrups by the mass-volume method. As auxiliary substances were tested: sugar, invert sugar, ethyl alcohol, purified water, glucose. Optimum ratio Sac: Or constitutes 1:63 - 1:33.

MD.45.

Title **New diagnostic score of acute appendicitis in the elderly**
Authors Gaitur Alexandr, Revencu Sergiu, Rojnoveanu Gheorghe
Institution *Nicolae Testemitanu* State University of Medicine and Pharmacy of the Republic of Moldova

Patent no. -

The PhD project presents the results obtained in the diagnosis of destructive acute appendicitis (AAD) in the elderly through the implementation of a new diagnostic score (NDS) and its clinical application algorithm. The essence of the project lies in the fact that by point-wise evaluation of AAD symptoms according to the newly developed SD AA, the diagnosis of AA can be established or excluded. For interpreting the value intervals of the point sums of the algorithm for applying the new DS AAD, a graphical representation of the sensitivity-specificity ratio for different point sum intervals was conducted. The highest specificity in establishing the diagnosis is demonstrated by the new DS AAD with a total of 3 to 10 points (green sector). This point sum corresponds to the values of the new DS AAD "AA is established". Patients in this group should undergo surgery. The highest accuracy in excluding the diagnosis of AA is demonstrated by the SD at a sum of -3 to 2 points (red sector). This point sum corresponds to the value of the new DS AA "AA is excluded". Patients in this group do not require surgical treatment for AA. The intermediate group that accumulated a sum of 2 to 3 points (yellow sector of the graphical representation) is characterized by very low, insufficient sensitivity. Under these conditions, establishing the diagnosis of AA using the new DS AA is impossible, increasing the risk of a significant number of "missed" cases of AA. The specificity index for excluding the diagnosis of AA is also low, leading to a high risk of "negative" appendectomies.

Description

MD.46.

Title

Cardiovascular comorbidities in patients with chronic obstructive pulmonary disease in exacerbation

Authors

Popa Ana, Caproş Natalia (Scientific coordinator)

Institution

Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova

Patent no.

-

Description

Field of study: internal medicine, pulmonology, cardiology.
The purpose of the study: Evaluation of cardiovascular comorbidities (CVC) in patients with chronic obstructive pulmonary disease (COPD), in exacerbation, and

development, improvement of the „Algorithm for early diagnosis of the risk of cardiovascular complications in patients with COPD”.

Research objectives: Study of clinical and paraclinical parameters relevant in stratification of patients with COPD, exacerbation, identification of respiratory and cardiovascular risk factors, evaluation of frequency of cardiovascular comorbidities and their association with clinical variants of COPD, examination of the impact of cardiovascular comorbidities on mortality and readmission rates, creation of a predictive model in the probability of survival of patients with COPD, associated with CVC, elaboration of an “Algorithm for early diagnosis of major cardiovascular events in patients with COPD, associated with CVC”.

Implementation of scientific results: The results of the study are implemented as conceptual support in the Clinical Department of Pulmonology of IMPS Holy Trinity Municipal Clinical Hospital, as well as in the study program at the Discipline of Clinical Synthesis of the *Nicolae Testemitanu* State University of Medicine and Pharmacy.

MD.47.

Title

Nutritional assessment of patients with chronic liver disease

Authors

Lupașco Daniella

Institution

***Nicolae Testemitanu* State University of Medicine and Pharmacy of the Republic of Moldova**

Patent no.

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Description

Master's study program „Human Nutrition” MNU group 2201

The aim of the actual study is nutritional evaluation of patients with chronic liver disease with differential phenotyping. The actual research project relates to medicine, specialty gastroenterology, with elaboration of a special non-invasive method that can be used for assessment of patient’s nutritional status, namely the part of food intake peculiarities in chronic liver disease. Nutritional status assessment is a key tool in the diagnosis, prevention and treatment of chronic hepatopathies. For the first time in the Republic of Moldova, the nutritional status of a group of 623 people with chronic liver pathologies was examined by

the non-invasive method, of which 333 men and 290 women, with diagnosis of liver cirrhosis 393 patients, with associated metabolic fatty liver disease - 81, with chronic hepatopathy of viral etiology - 82 and 22 patients with associated pathologies Patients were evaluated by using the special designed questionnaire "Evaluation of the diet, the composition of the diet and special diet variants in chronic liver patients regarding the risks associated with impact on the nutritional status" that was implemented in gastroenterology and hepatology units of Central Republican Hospital of Chisinau. Implementation of this instrument identify the nutritional status deregulation caused by incorrect food intake. In our research project some specific nutritional phenotypes were identified that lead to different corporal composition and disnutritional issues of patients in chronic liver diseases that can serve in early diagnosing of different liver hepatopathies patients with future recommendation in dietary requirements on the individual basis.

MD.48.**Title****GRAFT FOR BONE DEFECTS REPAIR****Authors**

JIAN Mariana, FICAI Anton, FICAI Denisa, NACU Viorel, COBZAC Vitalie, MOSTOVEI Andrei, SOLOMON Oleg, CHELE Dumitru

Institution

„Nicolae Testemitanu” State University of Medicine and Pharmacy

Patent no.

Patent application No. 2520/2024

Description

The invention relates to regenerative medicine, tissue engineering, dentistry and orthopedics, and can be used to repair bone defects. According to the invention, the graft for bone defects repair is composed of collagen, extracted from the umbilico-placental complex, and hydroxyapatite, obtained by direct mineralization of collagen with precursors (Ca^{2+} and PO_4^{3-}).

The problem that the invention solves, consists in obtaining of a graft with the potential for bone defects restoration, which is composed of allogeneic collagen, extracted from the human umbelico-placental complex and hydroxyapatite. The obtained graft is porous, biocompatible, biodegradable and allogeneic, which has the potential for bone regeneration

and excludes the transmission of zoonotic infections and graft rejection. The used collagen is non-immunogenic and has a high purity due to the surfactants utilisation during its extraction, in order to eliminate blood cells and DNA. In accordance with the origin of the biomaterial (human collagen), the proposed graft has a more advantageous structure for the recipient area (human bone), compared to grafts of xenogeneic origin (bovine or porcine).

MD.49.

Title	Method of obtaining the biological dressing from the collagen membrane
Authors	Macagonova Olga, Cociug Adrian, Țărălungă Tatiana, Nacu Viorel
Institution	Laboratory of Tissue Engineering and Cells Cultures; State Medical and Pharmaceutical University “Nicolae Testemitanu”
Patent no.	Patent application No. s 2023 0046
Description	The invention consists in the method of obtaining the biological dressing from the membrane of collagen isolated from porcine dermis sterilized in 70% ethanol, obtained by digestion of decellularized, morcellated and lyophilized dermis in 0.5 M acetic acid solution with 5% pepsin and sedimentation in 2.5 M NaCl being dissolved in 0.5 M acetic acid, collagen suspension obtained by dialyzing against 0.05 M acetic acid mixed with 80 mg of gentamicin and lyophilized for 72 hours until obtaining the disk dried fibrous used for therapeutic purposes for skin wounds.. Applications: regenerative medicine, tissue engineering, dermato-surgery.

MD.50.

Title	Silicon Key for Individualized Healing Abutment Creation
Authors	RUSU Vasile, SOLOMON Oleg, EARAR Kamel, SCHIPOR Ovidiu, MATEI Madalina Nicoleta
Institution	„Nicolae Testemitanu” State University of Medicine and Pharmacy
Patent no.	-

Description

The present invention relates to an innovative silicon key used for manufacturing individualized healing abutments in implant dentistry. This silicon key allows for the precise reproduction of the emergence profile of existing natural teeth, thereby ensuring an individualized approach in the treatment of prosthetic restorations on implants.

The proposed silicon key involves direct modeling of the emergence profile, taking into account the specific anatomy of the patient's teeth. Through this technique, an exact replica of the shape and dimensions of the natural teeth is obtained, enabling the creation of a personalized healing abutment.

The device includes three different sizes of silicon keys, adapted according to the size of the remaining teeth. This variety of sizes ensures a precise fit in creating the emergence profile, minimizing peri-implant bone resorption and optimizing the healing process.

By using the silicon key for individualized healing abutment creation, a prosthetic restoration with an emergence profile that seamlessly integrates with the natural teeth is achieved, providing aesthetic and functional harmony within the dental arch restoration.

In conclusion, the proposed silicon key in this invention represents an innovative solution for the production of individualized healing abutments in dentistry. Through the precise reproduction of the emergence profile of existing natural teeth, personalized prosthetic restorations are obtained, offering significant benefits to patients and dentists in the field of dentistry.

MD.51.

Title	Determination of the severity of the dysfunctional symptomatology in the screening of patients with myogene-arthrogen temporomandibular disorders at different phases of disease evolution (acute/chronic)
Authors	FACHIRA A., SOLOMON Oleg, RUSU V., NUCA M., SEMENIUC V., OINEAGRĂ V.
Institution	„Nicolae Testemitanu” State University of Medicine and Pharmacy
Patent no.	Patent application No. 6085/2023

Description	<p>In clinical practice, it is often necessary to use a rapid screening tool for patient triage and management. Helkimo, TMI, and DC/TMD instruments require advanced prior training and are not part of the standard instrumentation of the general dentist. For this purpose, the FAI index, originally developed and validated by Dr. Dickson da Fonseca in Sao Paulo, Brazil, was evaluated. Its structure consists of 10 questions assessing the absence/presence of the most common symptoms caused/associated with TMD and their severity (mild, moderate and severe). Although the DC/TMD protocol is a standardized and widely used test for the diagnosis of TMD, the complexity of its use has led to the use of other, less difficult diagnostic tests such as the FAI. In addition, the FAI can be self-completed by the patient. Based on a study evaluating the clinimetric properties (diagnostic performance) of the FAI index, a comparison of its performance against the Helkimo and TMI indices, against the gold standard (DC/TMD) in patients with different forms of temporomandibular dysfunction was carried out (acute/chronic) through the statistical method of determining ROC curves (receiving operating characteristic curve) and AUC parameters (area under curve)</p>
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MD.52.

Title The screening of the psycho-emotional state in patients with temporo-mandibular dysfunctions at different phases of evolution (acute/chronic)

Authors FACHIRA A., SOLOMON Oleg, RUSU V., NUCA M., SEMENIUC V., OINEAGRĂ V.

Institution „Nicolae Testemitanu” State University of Medicine and Pharmacy

Patent no. Patent application No. 6086/2023

Description A psycho-emotional state screening tool tested in the study, alternative to the GAD-7 and PHQ-9 instruments from Axis II, was the K10 (Kessler Psychological Distress Scale – 10 items) (Fig. 2.10). This instrument was developed by Kessler et al., being published in 2002 [12]. The K10 questionnaire includes 10 items, intended to summarize the patient's self-perception regarding his state of suffering/psychological distress, which reflects the state of comfort/general psycho-emotional affect. The evaluation is done by the patient on a 5-level Likert scale, with the frequency of the presence of the states contained in the questionnaire questions being recorded (1 – never, 2 – rarely; 3 – sometimes; 4 – often; 5 – very often) (Andrews, 2001) . The questionnaire is widely used in the clinical practice of various medical specialties in Australia and other English-speaking countries. Its usefulness arises from the fact that most clinical interpretations are done for screening purposes, thus the total K10 score is used to highlight the initial state of the patient and to monitor the progression of symptoms during therapy. The questionnaire includes symptoms of Anxiety and Depression, so due to its smaller size (10 items vs. 7 items in GAD-7 and 9 items in PHQ-9), it could replace the classic instruments from DC/TMD in general clinical dental practice. The total score is calculated based on the sum of the coefficients for the answers to the 10 questions.

For the assessment of anxiety in people with temporomandibular disorders, the K-10 index demonstrates a high diagnostic performance – 0.968 (remarkable discrimination ability, $AUC > 0.9$), with a high sensitivity and specificity (90.91% and 89.58%, respectively). For the assessment of depression in people with temporomandibular disorders, the K-10 index demonstrates a good diagnostic performance – 0.757 (excellent discrimination ability, $0.8 \geq AUC > 0.7$), with a high sensitivity (87.50%) and an acceptable specificity (59.26%) . Given that the K-10 is a questionnaire intended for the screening of psycho-emotional state impairment (psychological discomfort/distress level), the high AUC and specificity/sensitivity values can recommend it for the screening of psycho-emotional state in dental patients.

The Institute of Emergency Medicine
Nicolae Testemitanu State University of Medicine
and Pharmacy of the Republic of Moldova

MD.53.**Title**

METHOD OF TREATMENT OF OPEN MULTIPLE FRACTURES OF PELVIC BONES

Authors

**KUSTUROV Vladimir, CIOCANU Mihail,
KUSTUROVA Anna, SÎRGHI Grigore, ROȘU
Gheorghe**

Institution

The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMIȚANU”

Patent no.

AGEPI MD patent pending s 2023 0035 din 2023.04.20

The invention relates to medicine, namely Traumatology, injury surgery and is intended for the treatment of multiple open fractures of pelvic bones, with extensive traumatic injury of soft tissues, open or closed fractures of the pelvis with septic - necrotic complications.

Description

The essence of the invention is that it presents a combination of the essential criteria necessary for obtaining the technical solution and consists in stabilizing the bones of the pelvic ring with external fixation device, radical surgical processing of the wound and repositioning of bone fragments under visual control with the creation of compression forces between fragments, hemostasis. The porous sponge made of polyurethane foam is applied after The Shape of the wound cavity connected with drainage tubes with many holes. Tight application of the bandage ensures uniform spread of negative pressure throughout the wound and adequate evacuation of the wound removals. Hermetization is provided with an adhesive hermetic film. It connects the device for the formation of negative pressure in the wound up to 120 mm Hg.

The result of the invention is the preliminary stabilization of the pelvic ring with an external fixation device with the maintenance of the ratio of traumatized anatomical structures in their initial mutual localization, the avoidance of the risk of additional trauma and infection during phased surgical processing of the wound, is achieved due to the stable fixation of the basic bone fragments of the pelvic ring and the creation, repositioning of uni-momentary or gradual bone fragments and their stable fixation with the creation of a permanent active aspiration into the wound with the help of a negative pressure forming device is carried out.

MD.54.**Title*****DEVICE FOR THE TREATMENT OF POSTPARTUM PUBIC DIASTASIS*****Authors****KUSTUROV Vladimir, KUSTUROVA Anna, CIOCANU Mihail, PALADI Irina****Institution**

The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMIȚANU”

Patent no.

AGEPI MD patent pending s 2023 0036 din 2023.04.20

Description

The device for the treatment of postpartum diastasis of the pubic symphysis, designed to restore the integrity of the pelvic ring in case of postpartum rupture of the pubic symphysis, which includes fixing the pubic symphysis with an original device, containing two symmetrical, tubular plates, curved along the contour of the bodies of the pubic bones, connected plates, with the possibility of reciprocal movement, having connecting channels with internal thread, for inserting fixers into the bone and guides equipped with a stepped connection, which ensures, the device is also equipped with a removable compression unit. The realization of the proposed method is explained by the following schemes.

For the installation of the given device along the upper surfaces of the upper arch of the pubic bones, an operative access is needed, with the separation of soft tissues and, accordingly, their traumatization, with significant blood loss, especially considering that the curved part of the plate permanently injures soft tissues when the anterior abdominal wall is strained, partially affected nerve endings in this area, urinary and genital organs. The authors of the fixative themselves warn of possible bladder damage when using this fixative.

The technical result of using the invention is to simplify the process of intervention and reduce the degree of tissue trauma, creating adjustable compression force at the junction of fragments and reducing the recovery period by minimizing trauma, improving the quality of life of the patient and the possibility of early care of the newborn.

The proposed device allows minimally invasive fixation with minimal risk of injury to intrapelvine organs with the provision of cushioning functions in the area of the pubic joint in the future.

MD.55.

Title	<i>Psychosocial research of persons after stroke. The refined and optimized methodology of scientific research. Evaluation of the effectiveness of the rehabilitation program in the Republic of Moldova</i>
Authors	GLAVAN Aurelia , GROPPA Stanislav
Institution	The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMIȚANU”
Patent no.	Certificate cycle SAIP AGEPI MD series OȘ nr. 7686, 7687,7688 din 27.09.2023
Description	<p>In the Republic of Moldova, psychosocial rehabilitation has become a scientific prioritization. The national clinical protocol “Medical rehabilitation of patients with stroke” is limited, being oriented, mainly, towards determining the level of functional-kinetic rehabilitation and only sporadically towards psychological evaluation and intervention. In accordance with the international requirements for the competent approach of post-stroke people, it is obvious the need to promote social policies and rehabilitation interventions, aimed at strengthening the individual potential of post-stroke people based on an integrated non-discriminatory concept, which would ensure quality of life in the social environment. Services in this regard must be adequate and equitable, open to change and modernization</p> <p>We can draw the psychological profile of the person after stroke, the significant features being deduced according to the results of the studies performed. The creation of a psychological profile of the person after the stroke involved the indication of impairments in cognitive, affective functions, personality (motivation, will, self-esteem) and personality resources, allowed the application of psychotherapeutic methods to help the person to understand the inclination to endure unpleasant situations, taking responsibility for his reactions, along with a better adaptation to the environment.</p>

MD.56.

Title	<i>The method of improving the combination therapy of patients with moderate forms of Sars-Cov-2 infection in the department of resuscitation and intensive care in the institute of emergency medicine.</i>
Authors	CERNEI Natalia , BALTAGA Ruslan , ŞANDRU Serghei , CHESOV Ion , ARNAUT Oleg , COBÎLEȚCHI Serghei
Institution	The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMIȚANU”
Patent no.	Certificate cycle SAIP AGEPI MD series OŞ nr. 7711, 7712 din 27.11.2023
Description	<p>The aim is to improve the treatment process by applying major ozonate autohemotherapy in the clinical course of patients with SARS-CoV-2</p> <p>To date, there is no effective antiviral treatment against SARS-CoV-2 and the main health strategy is focused on symptomatic support. For the first time, the experimental use of ozone therapy in COVID-19 patients has been clinically justified. Ozone treatment is a shrewd method for inactivating viruses and must be perceived as a viable weapon in the global fight against COVID-19. In mild-moderate pneumonia, caused by the novel SARS-CoV-2 coronavirus, complementary treatment with ozone may be beneficial, due to its antiviral, antioxidant, anti-edematous, anti-inflammatory, immunomodulatory effects and its ability to facilitate the transport of oxygen.</p> <p>Major ozonized autohemotherapy-intravenous infusion of a volume of 80-120 ml of venous blood, enriched with oxygen-ozone gas mixture in a ratio of 1:1 with an ozone concentration of 40 MB/mL, is effective and can be applied to patients with COVID-19 of medium severity as an adjunct to standard treatment regimens.</p> <p>The problem that the data work solves is the development of a new ozone treatment algorithm in order to optimize the management of the patient infected with SARS-CoV-2, which would remove the disadvantages of other methods, would allow faster and stable reduction of clinical manifestations, such as fatigue and Asthenic Syndrome, dyspnea, reflected by objective examination data, oxygen saturation values, heart rate and blood pressure, with the purpose of prophylaxis of occurrence of severe acute respiratory syndrome and complications from vital organs and can be used for complex treatment of infection with SARS-CoV 2.</p>

MD.57.**Title*****IMPROVING THE QUALITY OF LIFE OF PATIENTS WITH DIABETIC RETINOPATHY IN THE REPUBLIC OF MOLDOVA*****Authors****CHIȘCA Veronica, CORDUNEANU Angela, GROPPA Stanislav****Institution****The Institute of Emergency Medicine, The State University of Medicine & Pharmacology "Nicolae TESTEMITANU"****Patent no.**Certificate cycle SAIP AGEPI MD series OȘ
nr. 7770 din 26.01.2024 , 7779 din 12.02.2024**Description**

At present, there are a large number of definitions of the concept of quality of life, dimensions used to evaluate it, due to the increased attention given to it. This leads to the development of a multitude of tools for assessing the quality of life in relation to the state of Health. The World Health Organization defines quality of life as "the individual's perception of his position in life, in the context of the cultural and value system in which this individual lives, and in relation to the goals, expectations, standards and references that he has". The objectives consist in identifying the spectrum of neuroophthalmological complications in patients with different degree of RD; studying the Doppler-Duplex parameters of intra-extracranial vessels, including the ophthalmic artery; evaluating the role of the ENP examination; estimating the determinants that contribute to the occurrence of neuroophthalmological complications; arguing the treatment with sulodexide in the patient with RD; evaluating the quality of life of patients with RD that allow the implementation in practice of some tactics of conduct of diabetic patients. Accurate data of neuroophthalmological complications in diabetes mellitus were obtained, the role of instrumental examinations, such as ENP and vascular ultrasonography of carotid and ophthalmic arteries, in the evaluation of the diabetic patient was also established. Was developed the algorithm of conduct of the diabetic patients in the context of early diagnosis and treatment of Ocular Complications.

MD.58.	
Title	<i>Prediction of severity and prognosis of morphological and functional changes of patients with traumatic brain injury at the pre-hospital stage and in the emergency medicine department in the Republic of Moldova</i>
Authors	MOCANU Natalia, ZAPUHLÎH Grigore, MANEA Diana, REZNEAC Larisa, CIOCANU Mihail
Institution	The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMIȚANU”
Patent no.	Certificat SAIP AGEPI MD series OȘ nr. 7820 din 18.03.2024
Description	<p>Injury scoring systems are useful for the recognition of critical trauma patients and are a prerequisite for improving AMU performance in the pre-hospital and in the DMU, resulting in better outcome prediction and optimal triage of patients, as well as transport to an efficient trauma center.</p> <p>Injury scoring systems are also useful for risk stratification, particularly for physicians and emergency physicians, as they work with little clinical information in the field. Most research in the literature focuses on the accuracy of injury scoring systems and long-term outcomes. Therefore, the relationship between clinical criteria and short-term outcomes remains unclear. In practice, only short-term outcomes are specific to the triage of patients with TBI in both the prehospital and the DMU, and guidelines for triaging patients with TBI for specific lesions are virtually absent. Thus, evidence is needed to support a trauma patient scoring system based on 24-hour outcomes.</p> <p>In our study, the Glasgow Coma Scale, Simplified Motor Score (SMS) and the Revised Trauma Score (RTS) were used to assess TBI severity at the pre-hospital stage. The results of our study showed that the GCS, SMS and RTS scores have a good predictive value, thus for the Glasgow Coma Scale (GCS) the area under the curve (AUC) value was 0.884 (CI 95%: 0.833 - 0.936, $p < 0.0001$); for the SMS Scale the AUC was 0.875 (CI 95%: 0.823 - 0.926; $p < 0.0001$), being only 0.009 lower than for the SGC; and for the Revised Trauma Score the AUC was 0.802 (CI 95%: 0.729 - 0.875, $p < 0.0001$). The results for the RTS are however weaker than for the SGC (AUC 0.884) and SMS (AUC 0.875).</p>

MD.59.**Title**

The method of assessing the risk factors of patients with traumatic brain injury at the pre-hospital stage and in the emergency medicine department in the Republic of Moldova. Clinical-evolutionary particularities and socio-demographic profile of patients with traumatic brain injury

Authors

MOCANU Natalia, ZAPUHLÎH Grigore, MANEA Diana, REZNEAC Larisa, CIOCANU Mihail

Institution

The Institute of Emergency Medicine, The State University of Medicine & Pharmacology "Nicolae TESTEMIȚANU"

Patent no.

Certificat SAIP AGEPI MD series OȘ nr. 7821 din 18.03.2024

Description

At the beginning of the 21st century, traumatic injuries, including traumatic brain injury, are a current medical problem with significant economic and social impact due to increased morbidity, disability and mortality from these conditions. Population studies on the epidemiological aspects of traumatic brain injury in several countries such as the USA, UK, China, Sweden, Finland and Finland have determined that the incidence of traumatic brain injury in the urban population ranges from 2.18 to 8.65 cases per 1000 population, including 2.74-9.71 cases in men and 1.0-5.0 cases in women. The level of hospitalisation of patients with traumatic brain injury averages 2 ‰. Among the causal factors of TBI, road traffic accidents, falls from the same plane and from a height, and assaults account for 80-90%.

The results of the study show a higher incidence of traumatic brain injury in men (62.96%) compared to women (37.04%). The share of men in the group of patients with mild traumatic brain injury was 58.14%, in the group with moderate traumatic brain injury - 83.33% and in the group with severe traumatic brain injury - 79.49%.

The mean age of patients with traumatic brain injury was 54 ± 18.34 years, including 60.5 ± 19.36 years in females and 54 ± 18.34 years in males.

According to the Glasgow Coma Scale, out of a total of 486 patients included in the study, 387 (79.63%) were with mild trauma, 60 (12.35%) - with medium (moderate) trauma and 39 (8.02%) - with severe trauma.

MD.60.

Title	<i>The importance of the time criterion in the management of patients with hypertension complicated with stroke at the pre-hospital stage and in the emergency medicine department in the Republic of Moldova</i>
Authors	CATANOI Natalia, GROPPA Stanislav, MANEA Diana, REZNEAC Larisa, CIOCANU Mihail
Institution	The Institute of Emergency Medicine, The State University of Medicine & Pharmacology "Nicolae TESTEMITANU"
Patent no.	SAIP AGEPI MD patent pending nr. 2709 din 2024.03.29
Description	<p>The scientific problem solved in this study consists in assessing the quality of serving patients with complicated HTA with stroke from the time of the call to 112 and until the patient is taken over by stroke teams. The action of the HTA on stroke occurrence as well as the intervention of the prehospital emergency service for these patients were elucidated based on these algorithms of triage, management of patients with acute stroke at the prehospital stage until the stroke team took over from the DMU.</p> <p>The study demonstrated the need to promote the emergency service, the implementation of the FAST scale in the automated Information System of the IP "unique national service for emergency calls 112" for 112 dispatchers and medical dispatchers with the use of the algorithm for receiving and managing medical emergency calls in hypertensive emergencies and stroke.</p> <p>Based on this study were implemented the algorithms of triage, diagnosis and emergency medical assistance to patients at the prehospital stage until the stroke team from DMU. The results of the research argue the need to develop the legal framework of a national program to promote the specifics of the organization and management of the emergency service at the prehospital stage.</p>

MD.61.**Title**

The method of complex evaluation of the development of risk factors of patients with hypertension complicated with stroke. Monitoring patients during transport to the pre-hospital stage and in the emergency medicine department in the Republic of Moldova

Authors

CATANOI Natalia, GROPPA Stanislav,

MANEA Diana, REZNEAC Larisa, CIOCANU Mihail

Institution

The Institute of Emergency Medicine, The State University of Medicine & Pharmacology "Nicolae TESTEMIȚANU"

Patent no.

SAIP AGEPI MD patent pending nr. 2710 din 2024.03.29

Description

The National Centre of Prehospital Emergency Medicine from Chisinau, Republic of Moldova in 2023 has given Emergency Medical Care to 48.103 major cardiovascular emergencies. Of these, Hypertensive Emergencies (ex-treme hypertensive emergencies) were 23.570, which is 49%. Grade II cardiovascular emergencies constituted 125.752 and 65.286 of these were Hypertensive Urgencies (common hypertensive emergencies), which constituted 51,9% and essential hypertension stage I and stage II were 33.732 or 26,8%.

As a result of the correlation analysis of 7 factors, 3 leading factors that significantly affect accidental ischemic stroke were identified. Correlation analysis made it possible to identify 3 significant factors influencing Ischemic Cerebral Vascular Accident:

- blood glucose level (rating 1)
- blood pressure on arrival at the hospital (rating 2)
- old age (rating 3).

The results of the study showed the significant correlation between high blood pressure and acute stroke. The results obtained and the analytical comparison allowed to reach the conclusion that arterial hypertension is a trigger of acute stroke.

Preventing hypertension complicated with stroke by ensuring early management at the prehospital stage should be a priority for all levels in health systems.

MD.62.

Title	<i>Identification, characterization and argumentation of new predictive parameters of negative postoperative results of patients with bronchopulmonary cancer with advanced anesthetic-surgical risk</i>
Authors	MAXIM Igor, ROJNOVEANU Gheorghe, BELÏI Adrian
Institution	The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMIȚANU”
Patent no.	SAIP AGEPI MD patent pending nr. 2707 din 2024.03.29
Description	<p>The detection of late-stage lung cancer is a medical problem due to the lack of alternatives for prolonging and maintaining the quality of life of patients.</p> <p>Research goal: optimization of diagnosis and surgical treatment by extending preoperative indications to patients with advanced PBC with major anesthetic and surgical risk.</p> <p>Have been identified several parameters relevant to preoperative evaluation that influence the decision on whether or not to operate on a particular patient, in particular if more than one patient is present at the same time in a single person. First of all, it is comorbidities, which reduce from the biological reserve of the patient, leave a functional, symptomatic and laboratory imprint, which may overlap the characteristics induced by bronchopulmonary cancer. It turned out that it is necessary to standardize the influence of comorbidities on immediate and remote postoperative results, and in this desideratum, the most useful was the Charlson comorbidities Index (ICC), cautious in the context of the paper, in the range of 0-12 points. Patients with severe CHF score (5-12 points) made up 36.7% of patients. Respectively, from the point of view of CHF, patients with bronchopulmonary cancer evaluated for surgical treatment should be divided into 3 categories: (a) no comorbidities (CHF=0); (b) with comorbidities with moderate impact on general condition (CCI=1-4 points) and (c) with comorbidities with significant impact on general condition (CCI=5-12 points). In his own opinion, an ICC of more than 12 points (D) does not make the surgical approach to lung cancer rational.</p> <p>After stratification of patients according to the ICC score in the 4 classes (a, b, c, d), it seems rational to merge them with the potentially operable lung cancer stages (Stage I-II and Stage IIIA) and non-operable ones (stage IIIB and IV).</p> <p>The listed parameters, framed in a decision tree, can more easily and objectively orient the final decision of the thoracic surgeon, in collaboration with the patient, to opt for a surgical treatment of bronchopulmonary cancer or not.</p>

MD.63.

Title	<i>Predictive models of the results of postoperative treatment and argumentation of extended operational criteria in patients with bronchology cancer with advanced anesthetic-surgical risk</i>
Authors	MAXIM Igor, ROJNOVEANU Gheorghe, BELÎ Adrian
Institution	The Institute of Emergency Medicine, The State University of Medicine & Pharmacology “Nicolae TESTEMITANU”
Patent no.	SAIP AGEPI MD patent pending nr. 2708 din 2024.03.29
Description	<p>The main result of the research carried out, but also of the proposed innovative method of approaching the surgical treatment and the patient's perioperative behavior consists in the fact that the surgical treatment based on the extended operability criteria is a feasible one (including for patients in stage IIIA and ICC 0- 4 points), with a statistically significant increase in survival time (up to 6 months longer, $p=0.0235$) and 2-year survival rate. It has not demonstrated the feasibility of surgical treatment for patients with stage IIIA and Th-RCRI class B score and/or ICC of $5 \leq$ points.</p> <p>The fundamentally new research results obtained were the demonstration of the fact that surgical treatment of bronchopulmonary cancer can be indicated in patients up to stage IIIA of the disease, provided that the identified and described inoperability criteria are met, as well as taking into account the factors found to be associated with reduced life expectancy postoperatively. Approaching the patient in the logic of ERAS, fulfilling a prehabilitation program, performing ultrasound-guided interfascial blocks and intraoperative administration of tranexamic acid expands the spectrum of patients potentially eligible for surgical treatment, but the exact clarification of these aspects requires additional, prospective research. Also, the effects of non-diabetic hyperglycemia, anemia, leukocytosis, and fibrinogen level (all preoperative) on life expectancy, through the lens of different covariates, also need to be further studied.</p>

“Ion Creangă” State Pedagogical University of Chisinau

MD.64.

Title

MDIR Constructor 3.00 - software for creating interactive e-textbooks

Authors

Balmuş Nicolae, Chiriac Tatiana

Institution

“Ion Creanga” State Pedagogical University of Chisinau

Patent no.

Certificate of Copyright and Related Rights, AGEPI Moldova (*registration date 27.03.2024*)0

MDIR Constructor 3.00 is an upgraded version of MDIR Constructor 2.00 software, which was created in the Delphi 11 (FMX) integrated development environment using TMS SOFTWARE and WinSOFT tools. This software allows users to create interactive digital textbooks of their own design for a variety of academic subjects based on a *.pdf file.

Description

Version 3.00 of the application includes new features like improved design, new learning and knowledge testing activities, multilingual interface translation options, an integrated robot for voice reading, a new algorithm for placing resources on textbook pages and fields, and a new algorithm for creating student textbooks that teachers can password protect. Version 3.00 of the student textbook allows for the addition of student-designed resources to the fields of the manual. These resources can include audio/video sequences, images, documents, notes, and programming activities created in a variety of programming languages, including Pascal, Delphi, C++, Python, and Scratch. They can also include exe applications, HTML5 files, and other materials.

Academy of Economic Studies of Moldova

MD.65.

Title

Analysis of determinants influencing tax behavior in SMEs

Authors

Iulian Dascalu, Svetlana Mihaila, Veronica Grosu

Institution

Academia de Studii Economice din Moldova

Patent no.

research project

Description

Through this research, the authors explore the factors that influence tax behavior among small and medium-sized enterprises (SMEs). The study relies on a questionnaire-based approach targeting SME managers to collect data. The study aims to identify the key determinants such as economic, social and regulatory factors that influence how these businesses approach their tax obligations. The results are expected to provide insights into the complexity of tax compliance behavior in SMEs and suggest ways to improve adherence to tax regulations through specific policies and interventions. In addition, the research considers the impact of technological advances on tax practices, examining how digital solutions could streamline tax processes and strengthen compliance among SMEs, plus outlines what are the significant factors that influence the decisions of entities, such as the degree of business risk, the entity's fiscal situation, etc.

MD.66.

Title

Optimizing integrated reporting quality by strengthening the ESG foundations/pillars

Authors

Cojocaru (Bărbieru) Ana-Carolina, Mihaila Svetlana, Grosu Veronica

Institution

Academy of Economic Studies of Moldova

Patent no.

research project

Description

In the context of the increasing importance of the sustainability in the evaluation of corporate performance, integrated reporting becomes essential for providing a holistic view of the organizational impact on the environment. This research project aims to analyze and improve the quality of integrated reporting by strengthening the environmental, social and governance (ESG) pillars. Our project will assess current reporting methods and identify

the gaps, focusing on how effective implementation of ESG indicators can contribute to greater transparency and more informed decision-making. The research results include a set of practical recommendations for companies to guide them in integrated reporting processes optimization, as well as contributions to the existing academic literature by exploring the link between ESG and integrated reporting. This research will not only support organizations in achieving their sustainability goals, but will also contribute to reputation and corporate responsibility in a global market increasingly focused on social and environmental impact.

MD.67.

Title	”Development of new economic tools for evaluating and stimulating the agricultural competitiveness of the Republic of Moldova for the period 2020-2023”
Authors	Stratan Alexandru, Bajura Tudor, Lucaşenco Eugenia, Iaţişin Tatiana, Ceban Alexandru, Tureţchi Viorel, Gandacova Svetlana, Baltag Grigore, Romanciuc Andrei
Institution	The National Institute for Economic Research, Academy of Economic Studies of Moldova
Patent no.	Research Project 20.80009.0807.16
Description	The main goal of the project is to provide scientific support to agricultural producers, producer associations, central and local public bodies, the academic environment, as well as other institutions, by developing new economic tools to evaluate and stimulate the competitiveness of the Republic of Moldova's agriculture. These include the annual development of updated cost tariffs, the annual determination of net income norms, as well as the modeling of model investment projects in the field of agricultural business. The project is an interdisciplinary one, aiming at the intersection of research between the agricultural field and the rural economy, natural and environmental resources, sociological and migration. Model investment projects can contribute to boosting small and medium-sized businesses, increasing the attraction of investments in rural areas, creating new jobs, stopping labor migration and developing rural areas. The socio-economic importance of the obtained results is represented by the direct familiarization of farmers with the most progressive agricultural business management scenarios, achievements of technical-scientific progress in

the agrarian field, highly productive plant varieties and/or animal breeds, techniques and methods of agricultural business evaluation.

MD.68.

Title	Innovative practices for improving the methodological support of cost accounting and income in the field of information technologies
Authors	Cojocaru Victor, Bădicu Galina, Socoliuc Marian
Institution	Academy of Economic Studies of Moldova
Patent no.	research project
Description	<p>The undeniable evolution of the IT field is accompanied by the abundance of new services and software products, characterized by uniqueness and intangibility, which generate deficiencies in the organization of accounting in the IT field. The reason is explained by the lack of a unique and specific concept of accounting, as well as methodological recommendations related to the accounting of income, costs and cost calculation for such services and software products. Therefore, analytical accounting and cost calculation methods are used in the entities in the researched field that do not correspond to the current conditions of cost management, and, consequently, influence the financial performance of the entity.</p> <p>The results of the research will express a clear picture by revealing the findings related to the accounting of costs and revenues in the IT field, by highlighting the context in which the correct organization of accounting, the recognition and evaluation of costs and revenues depend on the correlation of accounting elements with the particularities of the development of the IT field, the technological process providing services and developing software products. At the same time, reporting the results of the study on different issues of cost calculation, both conceptually and from a practical point of view by identifying the main limits of traditional calculation methods in relation to modern ones in order to obtain cost-type information over time useful also during the development of technological processes in order to improve deficiencies.</p>

MD.69.**Title****The coherent model of the audit of financial statements based on quality, performance and sustainability****Authors**

Stratan Alexandru, Șoimu Sergiu, Bădicu Galina, Grosu Veronica, Mihaila Svetlana, Cojocaru Victor

Institution**Academy of Economic Studies of Moldova****Patent no.**

Series OȘ Nr.7365 from 20.12.2022

Description

The world's numerous financial scandals have led to international animosity over audit quality. The intention of this research is to develop a coherent model of the audit of financial statements based on quality-performance-sustainability, which captures a better information of the audit process and can evaluate the performance in the audit and not only the quality of the results, such as the audit opinion.

The study aims to approach from a conceptual point of view the essence of the notion of "quality of audit services" as a growth factor and evaluation criterion of the "performance of audit entities". At the same time, it focuses on the systematization of the component elements and logical relationships of the audit, which will allow "sustainability of the audit activity". In order to record the priorities and challenges of this profession, as a result of a high interest in the best practices, an opinion poll was used on the situation of audit activity in the Republic of Moldova and Romania, among the auditors.

The research results provide an exhaustive analysis of the component elements and logical relationships of the audit, structured in a contextualized aspect, which allowed the development of the coherent model of the audit of financial statements based on quality-performance-sustainability and the pyramid of audit performance was built. However, the proposed Balanced Scorecard application model for evaluating audit performance would be beneficial not only to the audit profession, but also to all those interested in its effectiveness, including supervisory bodies.

MD.70.

Title	Measuring the economic resilience of the Republic of Moldova in the context of the accession process to the European Union
Authors	Popa Viorica, Ungur Cristina, Țirigan Sergiu, Ianioglo Alina, Popa Nicolae, Gutium Mircea, Șargu Lilia, Gumovschi Ana, Toacă Zinovia, Timuș Angela.
Institution	National Institute for Economic Research, AESM, Chisinau, Republic of Moldova
Patent no.	-
Description	<p>The presented research project focuses on measuring the economic resilience of the Republic of Moldova in the context of the European Union accession process. The purpose of the research is to conceptualize an integrated methodological framework for the formulation and measurement of economic resilience and competitiveness, taking into consideration the sustainable development. The main objective is to substantiate the concept of economic resilience by correlating macro and microeconomic indicators. In this sense, the project carried out several actions, including the development of a theoretical-methodological basis of the concept of economic resilience, the analysis of the European normative and institutional framework related to the economic resilience, and the study of international experience and good practices in the field. Moreover, the analyses of the relevant national legislative and institutional framework, as well as of the economic tools and methods related to the economic resilience were carried out. By systematizing national strategic macroeconomic indicators and analysing economic trends in the Republic of Moldova, the project aims to develop forecasts and identify measurement parameters according to best practices, in order to ensure a rigorous assessment of the country's economic resilience in the context of European integration.</p>

MD.71.

Title **Implementation of energy efficiency projects within public institutions in the Republic of Moldova.**
Case study: National Institute of Economic Research of the Academy of Economic Studies of Moldova

Authors Popa Viorica, Ungur Cristina, Țirigan Sergiu, Popa Nicolae.

Institution **National Institute for Economic Research, AESM, Chisinau, Republic of Moldova**

Patent no. -

Description The presented project proposes an analysis of the energy efficiency potential in the Republic of Moldova, based on the case study regarding the installation of photovoltaic panels in public institutions. The expected result of the study is the development of a methodological guide for the implementation of renewable projects within public institutions in the country. The novelty of the project derives from the absence of such a guide in the Republic of Moldova. And its necessity is given by the small number of projects implemented within public institutions by capitalizing on own resources. The methodology includes an integrated case study at the end of 2023, with data provided by Premier Energy SA and INCE, ASEM, and uses analysis, synthesis and comparison as research methods. At the second stage of the project, through questionnaires, the constraints and facilitating factors for the implementation of such projects within public institutions will be evaluated. The case study focuses on the implementation of a photovoltaic plant at INCE, ASEM, providing a practical example but also a source of data for the second stage of research and for the development of the guide. The project aims to make significant contributions to energy efficiency, reducing greenhouse gas emissions, promoting sustainable development in the Republic of Moldova. The project focuses on capacity analysis and guidance in the implementation of similar projects outside of support from development partners, based on their economic efficiency, to facilitate a progressive extension of the number of renewable energy production projects in within public institutions.

National Agency for Public Health, Republic of Moldova

MD.72.

Title	The method for boron intake estimation and its influence on the osteoarticular system
Authors	Maria-Victoria Racu, Iurie Pinzaru, Vladimir Bernic
Institution	The National Agency for Public Health
Patent no.	Decision no 7839 from 03.04.2024 of the State Agency on Intellectual Property of the Republic of Moldova
Description	<p>The method refers to the field of public health. It aims to study food and drinking water consumption habits to estimate boron intake and its influence on the osteoarticular system, more precisely the morbidity from osteoarthritis (OA) and rheumatoid arthritis (RA) of residents of areas of the country with different concentrations of boron in deep drinking water. Current scientific data suggests that a daily intake of at least 3 mg of boron can positively impact the health of the osteoarticular system. The method consists of an application of a questionnaire with 41 open and closed questions regarding the quality and drinking water consumption, eating habits, and osteoarticular morbidity. Using this tool will make it possible to accumulate the necessary data for developing preventive measures that aim to improve the health status of patients suffering from OA and RA by changing the intake of boron from the water and food products consumed.</p> <p>method can be used by research and innovation institutions, hospitals with departments of rheumatology and arthrology, and local and national-level public authorities for the adjustment of normative acts regarding drinking water quality.</p>

MD.73.

Title	The method for assessing working conditions and health status of medical workers in Pre-Hospital Emergency Medical Service
Authors	Kristina Stinca, Iurie Pinzaru,
Institution	National Agency for Public Health
Patent no.	No. 7697 of 2023.10.25
Description	The invention refers to human medicine, which aims to

evaluate the working conditions, the professional risk factors, the degree of satisfaction and the health status of medical workers of pre-hospital emergency medical service. The proposed method allows the application of the Questionnaire and the evaluation of the results following the determination of certain associations between the work of medical staff and the items of the questionnaire, which measure those factorial characteristics that describe the state of health, and its evaluation from the perspective of the working conditions declared by the respondents.

The method is applied within the Public Medical-Sanitary Institution National Center for Pre-Hospital Emergency Medical Assistance which includes a network of 41 substations and 96 emergency medical assistance points. An important functionality of this tool consists in the possibility of data collection, which serve as a basis for strengthening the management of the supervision of occupational risk factors and the development of preventive measures aimed at improving the quality of the professional life of medical workers. The method will facilitate the response capacities, if the state of health declared through the questionnaire expresses the perception of the presence or absence of the disease, of the occupational risk factors during the work, which is an indicator of complex self-assessment of the quality of life. The proposal stands out as being useful in increasing responsibility and reducing the paradigms for the complex of professional risk factors, which will not endanger the health and quality of life of the medical staff.

MD.74.

Title

The hygienic method of complex diagnosis of risk factors in the etiology of non-communicable diseases

Authors

Vladimir Bernic, Grigore Friptuleac, associate professor, Miron Inga

Institution

National Agency for Public Health;

„Nicolae Testemițanu” State University of Medicine and Pharmacy

Patent no.

Registered at AGEPI Series OȘ No 7699 from 2023.10.10.30

Description

The "Hygienic method for complex risk factors diagnosis in the etiology of non-communicable diseases" represents a valuable tool for a comprehensive risk factor assessment, enabling their ranking and prioritization based on their level of

aggressiveness. This instrument, presented through a questionnaire, allows simultaneous exposure levels evaluation to various risk factors: psychosocial, behavioral, dietary, environmental, occupational, biological, and hereditary. It also enables assessment of the knowledge level regarding the influence of risk factors.

Assessing and highlighting the non-communicable diseases risk factors will enable the population and the healthcare system to direct their efforts towards effective preventive measures. This is one of the strategic directions of action for reducing morbidity and mortality from this group of diseases. Better understanding of risk factors and cautionary signs can facilitate medical interventions aimed at reducing morbidity and mortality from non-communicable diseases. Mortality caused by these diseases could be reduced by over 75%, and their incidence could decrease by over 50%, with widespread implementation of prevention programs for these conditions.

A hygienic method for complex risk factor diagnosis in the etiology of non-communicable diseases is designed for public health specialists, family medicine specialists, and all key stakeholders with direct or indirect responsibility in preventing illnesses, protecting and promoting population health, and improving quality of life. The developed method holds significant theoretical significance for improving undergraduate and postgraduate training programs and preparing highly qualified personnel.

MD.75.

Title	Communication method for improving public awareness on impact of endocrine disruptors
Authors	Roman Coretchi, Iurie Pinzaru, associate professor, Vladimir Bernic, Kristina Stinca, Inga Miron
Institution	The National Agency for Public Health from the Republic of Moldova
Patent no.	Decision no 2714 from 2024.04.11 of the State Agency on Intellectual Property of the Republic of Moldova
Description	The communication original method for improving public awareness on impact of endocrine disruptors, focused on a complex approach, provide the elaboration of the practical guide „Endocrine disturbers: challenges and perspectives”. Endocrine disruptors comprise a large group of compounds capable of interacting with the hormonal system, affecting various body functions: metabolism, reproductive functions, the

nervous system, the immune system, etc. This method are particularly important, intended for used in practice of public health specialists involved in the supervision and management of chemicals, physicians in different medical and health areas, involved in the diagnosis and treatment of diseases caused by endocrine disruptors. It is also aimed at economic operators who manage chemical substances, the academic community, teaching staff, and the general population. The implementation of this method contributes to: raising awareness in specific interest groups and general public about the principal characteristics and the issue of endocrine disruptors; involvement of key actors responsible for hazardous chemical management in consolidation actions to reduce the population's exposure to endocrine disruptors; providing actionable and specific recommendations for national authorities and the general population regarding the prevention of risks associated with exposure to endocrine disruptors through the appropriate use of chemicals. At the national level, the issue of endocrine disruptors is underestimated, insufficiently addressed and practically unregulated. Despite the illusory goal of total elimination of endocrine disruptors from our living environment, it is still possible to act and cooperate with the relevant authorities to limit their presence and, therefore, harmful exposure.

MD.76.

Title	Treatment method of cellular immunity disorders caused by ionizing radiation
Authors	BAHNAREL Ion, SPÎNU Constantin, COREȚCHI Liuba,
Institution	Agency for Public Health of the Ministry of Health of the Republic of Moldova
Patent no.	27 Z
Description	A method of treatment of cellular immunity disorders caused by exposure to ionizing radiation it's being suggested, which consists in the fact that sol. of 5% Pyridoxine, 1 ml once a day, <i>per os</i> ; Essential, 2 capsules 3 times a day and Pacovirin-plus, 1 pill a day is administered intramuscularly. The treatment course consists 90 days. The Pacovirin-plus administered simultaneously with Pyridoxine and Essentials has a positive influence on the immune system and contributes to increasing the immunoregulatory index due to the antioxidant properties of the preparation, capable of reducing the free radicals formed in

the process of radiolysis of cells under the action of ionizing radiation.

MD.77.

Title	Proportional extrapolation of the data on the smokers number in the study of the radon x smoking interaction as a trigger factor in the onset of bronchopulmonary cancer in the Republic of Moldova
Authors	Corețchi, L., Overcenco, A., Ababii, A.
Institution	National Agency for Public Health Certificate of registration of the object of copyright or related rights Serial OȘ no. 7836 of 20.03.2024 issued by State Agency for Intellectual Property of the Republic of Moldova
Patent no.	
Description	<p>Radon exposure and tobacco smoking are the two most important risk factors for lung cancer, the second most common cancer in the Republic of Moldova. The number of smokers in the <i>radon x smoking x lung cancer</i> study is necessary, but difficult due to the different scale of the initial data and therefore requires the use of a special method of bringing them to values suitable for the study. The number of tobacco smokers of the National Population Study STEPS 2021 (4097 interviewees, age 18-69 y.o., both genders, urban/rural residence) and population data of the National Bureau of Statistics were used. Because of the STEPS 2021 data on number of smokers is available only for the whole country in order to fit these data with radon measurement data and the lung cancer morbidity rates a mathematical tool of proportional extrapolation of initial data on tobacco smokers has been developed. The mathematical ratio (proportion) between the total population number in each age group, gender and place of residence with the number of the population in the same categories by regions has been calculated, using the population data of the National Bureau of Statistics during 2021. Based on these links (rates), the number of smokers by region of the country has also been calculated. The data obtained by extrapolation by regions allowed us to develop a spatial distribution of tobacco smokers, to assess them by statistical sense as well as to use them in <i>radon x smoking x lung cancer</i> study.</p>

MD.78.**Title****Quantification of health risk associated with radon exposure****Authors****ABABII Aurelia, COREȚCHI Liuba****Institution**

National Agency for Public Health

Patent no.

Project

Description

Radon represents the most important source of natural radiation of the population, whose harmful effect has a cumulative character and synergism with other risk factors such as tobacco consumption. In the Republic of Moldova, based on a study measuring the radon concentration in a sample of 1,100 homes using passive detectors, the population exposure doses to radon were calculated. Following the statistical processing of the collected data, the following results were obtained for a uniform distribution of the data, thus maximum values of 1160 Bq/m³ was recorded for the Center area, 1260 Bq/m³ - for the North area and 950 Bq/m³ - for the South. The average concentration of radon in the indoor air was 211.67 Bq/m³; 240.55 Bq/m³ and 285.57 Bq/m³ for the Center, North and South Area respectively. The share of homes that exceeded the reference level of radon (300 Bq/m³) constituted 25.3% for the Center area, 31.06 - North and 38.58% - South. The cluster analysis study of the dependence of the radon concentration on the abiotic factors of the environment detected a close connection/correlation, demonstrated by the cluster formation with the large Euclidean distance, the linkage distance constituting 4250 for the radon concentration, the maximum air temperature and the temperature at the soil surface. At the same time, the case-control study on the influence of radon on the occurrence of lung cancer revealed the following results for the experimental group: the average value of the concentration of radon in the indoor air of 194.3 Bq/m³, and the maximum value 857.2 Bq/m³. Value average recorded for the control lot was 165.2 Bq/m³, and the maximum value 922.2 Bq/m³. The fundamental study through cluster analyzes of the „*radon x smoking*” interaction influence detected significant interactions between the researched factors manifesting *trigger* capabilities on the onset of lung cancer.

MD.79.	
Title	Biological dosimetry of exposed professional and accidental at ionizing radiation sources
Authors	COREȚCHI Liuba, GÎNCU Mariana, CAPAȚÎNA Angela, POPESCU Irina-Anca, ABABII Aurelia
Institution	National Agency for Public Health; INSP-CRSP, Iași, România
Patent no.	Certificate of registration of the object of copyright or related rights Serial OȘ no. 7242 of 24.03.2022 issued by State Agency for Intellectual Property of the Republic of Moldova.
Description	<p>evements: The paper presents methodological guidelines and methods useful in conducting studies of biological markers of ionizing radiation, and their use in the biodosimetry of occupational and accidental exposure to radiostressogenic factor. In order to perform the correct biological dosimetry, it is recommended to use simultaneously or separately the various technologies described in the paper. It is important to evaluate the biological response to an absorbed dose of ionizing radiation in order to predict the medical consequences. The absorbed dose and the exposed body fractions must be determined as accurately as possible. Biological dosimetry is recommended to support medical treatment decisions. Biological dosimetry is recommended to support medical treatment decisions and is a component part of the medical management of nuclear accidents and radiological incidents. Biological dosimetry is indicated to validate low dose exposures in occupational radiation protection. Chromosomal aberration analysis in peripheral blood lymphocytes can be widely used to assess radiation dose. Even in partial exposures of the body, chromosomal damage is an excellent indicator of the absorbed dose. At present, none of the biodosymmetry methods meets the ideal requirements, and "general biodosimetry", which includes various technologies, is proposed as a "gold standard".</p>
MD.80.	
Title	Method for identifying the anti-HEV IgG marker in the blood serum
Authors	Pinzaru Iurie, Sajin Octavian, Iziumov Nina, Guțu Veaceslav, Țurcanu Adela, Blaj Valentina
Institution	National Agency for Public Health

Patent no.	1258 Z 2019.02.28
Description	<p>The core of the invention involves analyzing blood serum using enzyme immunoassay on a microplate coated with adsorbed AgHEV. This process includes measuring the optical density values of the samples through photometric analysis within a wavelength range of 450 to 620 nm. Subsequently, the average optical density value of the samples with negative control is calculated using the formula: the average optical densities of the samples with negative control + 0.350.</p> <p>Next, the ratio between the average optical density value of the patient's serum and the average optical density value of the samples with negative control is computed. A ratio of up to 0.9 indicates a negative result, while a ratio exceeding 1.1 indicates a positive result. Samples with a ratio between 0.9 and 1.1 undergo treatment with a 20% slurry of kaolin ($\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$).</p> <p>After this treatment, the enzyme immunoassay is repeated, and the ratio of the average optical density value of the patient's serum to the average optical density values with negative control + 0.350 is determined. A ratio of up to 0.9 indicates a negative result, whereas a ratio exceeding 1.1 suggests a positive result.</p>

MD.81.

Title	Identifying method of the anti-HEV IgG marker in blood serum in people at high risk of infection
Authors	Pinzaru Iurie, Sajin Octavian, Iziumov Nina, Holban Tiberiu, Guțu Veaceslav, Blaj Valentina
Institution	National Agency for Public Health
Patent no.	1291 Z 2019.06.30
Description	<p>The essence of the invention lies in the analysis of blood serum using enzyme immunoassay conducted on a microplate featuring adsorbed AgHEV. Optical density values are determined within the wavelength range of 450 to 620 nm to identify serum samples as positive or negative for IgG anti-HEV, with thresholds set at over 1.000 and less than 0.100, respectively. In cases where samples yield undetermined results, the serum undergoes treatment at a temperature of 56°C for 30 minutes and is then mixed in equal volumes with a 0.05 M sodium periodate solution. Following a 2-hour incubation period, a 5% glucose solution is added in a 1:1 ratio.</p>

Subsequently, the enzyme immunoassay is repeated for the treated serum samples, which are diluted in a 1:4 ratio using a standard reagent check serum sample that tests negative for IgG anti-HEV (with an optical density of less than 0.100) and a neutralizing check serum sample that tests positive for IgG anti-HEV (with an optical density of more than 1.000). The optical density values are calculated using the formula: optical density of the reagent check sample divided by the optical density of the neutralizing check sample. If the resulting ratio is less than 2, the sample for IgG anti-HEV is deemed negative; if it exceeds 2, it is considered positive.

MD.82.

Title

Method for the identification of anti-HCV marker in human blood serum

Authors

Sajin Octavian, Holban Tiberiu, Paraschiv Angela, Turcanu Adela, Iziumov Nina, Blaj Valentina

Institution

National Agency for Public Health

Patent no.

1352 Z 2020.02.29

Description

The innovation involves a method for analyzing blood serum samples to detect the presence of specific antibodies using a bentonite-based treatment and an immune-enzyme test. Initially, blood serum samples are mixed with a 20% suspension of bentonite in equal proportions. This treatment likely serves to precipitate interfering substances or concentrate target antibodies.

Following the bentonite treatment, the serum samples undergo examination using an immune-enzyme test performed on a microplate coated with AgHCV (presumably the antigen of interest). Optical density values of the samples are measured at a wavelength of 450 nm using photometric analysis.

To interpret the results, the average optical density of negative control samples is calculated by taking the mean of their optical density values and adding 0.350 to this average. This step presumably adjusts for baseline noise or background levels.

Subsequently, the ratio of the average optical density value of the patient's serum samples to that of the negative control samples is determined. A ratio ≤ 0.9 is interpreted as a negative result, suggesting the absence of the targeted antibodies. Conversely, a ratio > 1.1 indicates a positive result, suggesting the presence of the targeted antibodies in the patient's serum.

This method likely aims to enhance the sensitivity and specificity of antibody detection by using bentonite treatment to modify sample properties and employing an immune-enzyme

test for specific antigen-antibody interactions. The optical density measurements and subsequent ratio calculations provide a quantitative assessment of antibody presence relative to baseline control levels, aiding in diagnostic decision-making.

MD.83.**Title**

Method for diagnosis of viral hepatitis B in persons with accidental exposure

Authors

Sajin Octavian, Iziumov Nina, Tcaciuc Eugen, Ţurcanu Adela, Blaj Valentina, Cebanu Ecaterina

Institution

National Agency for Public Health

Patent no.

1245 Z 2018.12.31

Description

The invention involves utilizing two strips, each containing wells, for detecting AgHBs antibodies. In the first strip, different types of sera are employed: human serum without AgHBs, negative human serum to AgHBs antibodies, serum with high-titer antibodies to AgHBs (>100 IU/ml), and serum from the individual being tested. The second strip includes human serum without AgHBs, fetal bovine serum for calibration, inactivated human serum with calibrated AgHBs, and serum from the individual being tested.

After a 30-minute incubation at 18-24°C, a diluted conjugate (1:20) of rabbit or mouse anti-species globulin with horseradish peroxidase is added to all samples, followed by further incubation at 37°C for 120 minutes. Then, a chromogen solution (0.02% hydrogen peroxide, 4% dimethyl sulfoxide, and 0.03% tetramethylbenzidine) is added and incubated at 18-24°C for 30 minutes.

Finally, optical density values are determined using photometric analysis at 450-620 nm. This method allows for the detection of AgHBs antibodies by evaluating the reactions within the wells of the strips, aided by specific sera types, conjugates, and chromogenic reactions. The optical density measurements provide quantitative data regarding antibody presence in the tested samples. This process offers a comprehensive approach to diagnosing AgHBs antibodies efficiently and accurately.

MD.84.

Title	Process for obtaining materials based on silver nanoparticles with antibacterial activity
Authors	Olga Burduniuc, Sergiu Coșeri, Mihai Mareș, Gabriela Biliuță, Valentin Năstasă, Andra-Cristina, Bostănaruliescu
Institution	National Agency for Public Health
Patent no.	Short-term invention patent no. s 2022 0054 of 12.08.2022
Description	invention relates to nanotechnology and medicine, in particular to a process for producing materials based on silver nano-particles stabilized with cellulose derivatives with antibacterial activity. Summary of the invention consists in that is prepared a silver nitrate solution with a concentration of 0.01 M by dissolving it in bidistilled water or dimethyl sulfoxide, it is also prepared a solution with a concentration of 1% of a cellulose derivative in bidistilled water or dimethyl sulfoxide, then to the solution with cellulose derivative is added silver nitrate solution in a volume ratio of 4:1, which is continuously stirred for 2 hours, at room temperature. As cellulose derivative is used hydroxypropylcellulose, methylcellulose, ethylcellulose or cellulose acetate.

Public Institution Scientific-Practical Institute of Horticulture and Food Technologies

MD.85.

Title	Process for obtaining dry white wines with an advanced content of bioactive substances
Authors	TARAN Nicolae, SOLTAN Ana, MORARI Boris, NEMȚEANU Silvia, ADAJUC Victoria, SOLDATENCO Olga, PONOMARIOVA Irina, URȚU Dionis, GLAVAN Pavel, SANDU Vasile
Institution	Public Institution Scientific-practical Institute of Horticulture and Food Technologies
Patent no.	Patent application No. s 2023 0082 date: 2023.10.05
Description	This innovation introduces a technological process for producing dry white wine with an increased content of bioactive substances (SBA). This process involves the use of white grapes of New selection varieties, harvested at technological maturity, as well as an extended maceration at specific temperatures and prolonged contact with the solid phase. This method leads to the production of white wines with an elevated SBA content, which varies depending on the maturity of the grapes.

MD.86.

Title	Process for obtaining the food product extruded from cereals
Authors	IUSAN Larisa; TERENCEVA Galina; MIGALATIEV Olga;
Institution	Public Institution Scientific-practical Institute of Horticulture and Food Technologies
Patent no.	Invention patent No. 4826 of 2023.05.31
Description	The invention relates to the food industry, in particular to the production of extruded products like as breakfast cereals. The problem solved in the present invention is the development of a new enriched extruded food product with nutritional value and content of vitamins and minerals increased, not complicating the technological process, as well as diversifying the range of extruded products from native raw materials: soris and corn. During the procedure, the mixture is prepared on the basis of

soris grains, to which corn grits and wheat germ are added. The mixture is moistened with water to 16-18%, after which it is extruded, where the processing is carried out at a temperature of the product in the matrix of 418-423 K and a pressure in which a pre-matrix zone of 5.5-6.0 MPa and cords with a thickness of 6-8 mm are obtained. The cords are cut and dried to 20 - 25 °C, then the product is packed in bags for 12 - 14 hours to balance the moisture in the product.

The mixture is prepared with the following ratio of components: soris 60-65%, corn grits 15-20%, wheat germ 15-25%. Extrusion process occurs in modes with low temperature and pressure parameters, which helps reduce the loss of nutrients (vitamins) from the raw materials.

The invention provides a new extruded product with increased nutritional and biological value. Increasing the nutritional value of the product is achieved through the use of unrefined soris and corn grains.

MD.87.

Title	Process for obtaining structured fruit snacks
Authors	ŞLEAGUN Galina; IUŞAN Larisa; CUPCEA Tatiana
Institution	Public Institution Scientific-practical Institute of Horticulture and Food Technologies
Patent no.	Invention patent No. 1660 Y of 2023.01.31
Description	<p>The invention relates to the food industry, in particular to a method for producing structured fruit snacks.</p> <p>The method according to the invention provides: preliminary preparation of raw materials, preparation of fruit mass by mixing of raw materials taken in a certain ratio, molding of fruit mass with a concentration of soluble dry substances (16 ... 38)% by pouring it onto sheets or pallets in a layer (2 ...8) mm, the structuring of the mass is carried out directly during the drying process at a temperature of (48... 62) ° C until water activity is reached (0.48... 0.60) and subsequent cooling to a temperature of (25... 30)°C; formation of the final product.</p> <p>At the same time, additional ingredients can be added to the finished fruit mass.</p> <p>The result of the invention is to obtain natural fruit snacks with a fruit content of at least 50%, including 100% fruit, well structured and easy to chew, with a pleasant, jelly-like,</p>

non-sticky texture, without the use of added sugars or food additives, without the use of structuring agents or with their use in reduced quantities, guaranteed quality when using raw materials of different qualities.

Thus, the structuring of natural fruits requires, first of all, the use of raw materials, the chemical composition of which is capable of providing the technological functional properties of the process and product. The new approach involves a combination of various fruit raw materials based on a preliminary assessment of certain indicators that reflect the quality of the final structured product.

MD.88.**Title**

Process for obtaining the grape and apple blend acidifier GOLUBI Roman, IORGA Eugen CRUCIRESCU Diana, ARNĂUT Svetlana, FIODOROV Stanislav, IORGA Lucian, VOITCO Elena, RABOTNICOVA Ludmila

Authors**Institution**

Public Institution Scientific-practical Institute of Horticulture and Food Technologies

Patent no.

Patent No 4757 / 2021.06.30

The blended grape and apple acidifier is a natural product and serves as a source of acidity in manufactured foods, replacing synthetic acids. The problem solved by the present invention is obtaining a combined acidifier from grapes and apples, which allows the tartaric stabilization of the finished product without cold treatment and improving sensory indices. An important aspect is use of enzyme preparations that increase juice yield and clarification.

Description

The grape acidifier is obtained according to the process described in patent MD 913 Z, and the apples acidifier – to the MD 1286 Y. The technical result of the invention consists in obtaining a coupled acidifier with increased tartaric stability through an easy-to-implement process, as well as reducing manufacturing costs, due to the moderate heat treatment regime. The raw material is unripe grapes and apples, cultivated according to ecological agricultural technologies. The acidifier obtained according to this procedure can be applied to a larger assortment of products compared to the drapes acidifier, because introduced the apple acidifier contributes to improving the taste, aroma and harmonizes with various vegetables and fruits intended for preservation. The finished product's quality indices depend on the raw material's quality and the technological peculiarities of obtaining the acidifier.

Institute of Mother and Child

MD.89.

Title

MOLECULAR-GENETIC DIAGNOSTIC METHOD OF SPINAL MUSCULAR ATROPHY BASED ON QPCR+HRM MOLECULAR GENETIC TECHNIQUE

Authors

COLIBAN Iulia, SACARĂ Victoria, UȘURELU Natalia, OPALCO Igor, GLADUN Sergiu

Institution

PUBLIC MEDICAL-SANITARY INSTITUTION INSTITUTE OF MOTHER AND CHILD

Patent no.

Innovation Act Nr. 562, according to art. 16 of Law no. 138-XV of 10.05.2001, Republic of Moldova

Description

Early, presymptomatic diagnosis, is crucial for patients with SMA. The objective of this innovation endeavor is to formulate a diagnostic methodology at the molecular-genetic level for the precocious detection of Spinal Muscular Atrophy (SMA) for DNA extracted from the dried blood samples of neonates. This diagnostic approach employs the 5' nuclease PCR technique to facilitate the real-time identification of the mutation responsible for SMA. Additionally, it leverages the analysis of melting curves of nucleotides. The critical focus is the detection of the deletion of exon 7 in the SMN1 gene, a pivotal factor in the diagnosis of SMA. The methodology encompasses the utilization of both commercial and custom reagents, thereby ensuring a balance between cost-efficiency and diagnostic sensitivity.

This method involves personalized design of primers with Primer-BLAST software and synthesizing them through BioAnalitica SRL to differentiate the SMN1 and SMN2 genes using qPCR+HRM (quantitative Polymerase Chain Reaction + High Resolution Melting). This approach merges real-time PCR amplification with high-resolution melt analysis for efficient detection of genetic variations and mutations, allowing both qualitative and quantitative DNA analysis.

Innovation leads to enhanced molecular-genetic diagnostics by customizing primers and controls, tailored to detect the SMN1 exon 7 deletion. The qPCR+HRM technique underlines the innovation's effectiveness through high sensitivity and specificity, rapid results, and applicability across all ages, including the neonatal period, for both presymptomatic and symptomatic diagnoses.

This condensed summary highlights the test's efficiency and importance in SMA early detection, showcasing the method's capability to improve diagnosis accuracy and speed, beneficial for patient management and treatment strategies.

Comrat State University

MD.90.

Title

Probiotic dairy product with high antioxidant activity
(**LACTANOX**)

Authors

Cartasev Anatoli, Neicovcena Iulia, Mahamat Yamtitina

Institution

Comrat State University

Patent no.

23.70105.5107.05T Project of young researchers

The aim of the project is the possibility to increase the nutritional values of the fermented milk product by adding bee honey and obtaining the probiotic product with a high content of antioxidants. The possibility of using honey as a stimulator for the native lactic acid bacteria cultures. The Project strategic direction of developing an innovative and competitive product with positive implications on consumer health will be developed.

Project objectives

- Isolation, selection and testing of new autochthonous lactic bacteria for milk fermentation;

- Development of yogurt production technology.

- Testing the functional potential of bee honey on the quality and shelf life of yogurt;

- Evaluation of quality characteristics of yogurt. Safety and harmlessness indices.

Description

Original ideas and elements

- The use of lactic bacteria with symbiotic characteristics from local natural sources;

- Creation of fermented dairy products from milk, beneficial to the consumer, with increased antioxidant properties.

The novelty and uniqueness of the methodological approach in the Project's activity will consist in the use of the achievements of different sciences (biotechnology, technological engineering, chemistry, microbiology) to obtain original data regarding the creation of the innovative milk product

Expected results of the project

Determination of the chemical composition and the functional potential of native bee honey.

Autochthonous symbiotic cultures of lactic acid bacteria. Scientifically argued procedures and recipes regarding the manufacture of the assortment of fermented dairy products.

The methodology for determining the shelf life of the fermented products developed.

Technological College of Chisinau, Moldova

MD.91.

Title	Small leather goods
Authors	Malcoci Marina, Malcoci Maria-Eudochia
Institution	Technological College of Chisinau
Patent no.	MD nr.1978
	The small leather goods collection includes: wallets, pen holders, purses, key holders and belts. These products are used to protect and transport various small objects. But they can be used to add beauty, style and personality to the wearer.
Description	Small leather goods are made by hand, applying the technique of embroidery decoration. Cross-stitching was used on all models, using 0.8-1.0 mm thick waxed thread. The closure system used allows quick access to the inside of the product. The presented products can be used with all the outfits in your wardrobe.

Junior Achievement Moldova

MD.92.

Title	Sabri-lup
Authors	Scorțescu Silvia, Lungu Sabrina
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	<p>Sabri –lup is a scarf that can be fixed around the neck. This product innovation has medicinal magnets that offer relaxation to the head and thyroid gland.</p> <p>Being in love with wolves I attached a logo with a wolf, which provides strength and health, this product is intended for everyone who has hormonal dysfunction or have headaches.</p> <p>I also recommend it as a product fixed around the neck without medicinal magnets. The wolves will always be loved and give you courage and strength and health.</p>

MD.93.

Title	R/M -Shopik
Authors	Scorțescu Silvia, Raileanu Marilena
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	<p>R/M -shopik is a sports suit, completely different, it is removable and full of health, our logo is protected by Agepi. It is of considerable innovation, at list is detached and thus becomes useful, also recommended for all ages, if necessary, the magnets can be fixed medicines for knees, elbows, back, are fixed especially for those who have pain or are elderly.</p> <p>I recommend this product –innovation to everyone.</p>

MD.94.

Title	FanaDorya
Authors	Scorțescu Silvia, Andreea Sinegur
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	<p>Fanadorya- is a cute white and purple ghost toy, it is a toy with copyright - very funny and sweet.</p> <p>We are created because it is very colorful and attractive. Children are bored with all the toys, that's why , we created a new one, cool and attractive. It is for all toy lovers. Logo also belongs to us, that's why we can produce a whole collection of small or large, dressed and colorful ghost toys.</p> <p>We recommend the up-to-date toy, I hope you will enjoy it.</p>

MD.95.

Title	Cecilyk
Authors	Scorțescu Silvia, Cecilia Musteață
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	<p>Cecilyk is a travel pillow, it is a uniquely created character that has its own author, the innovative pillow its good for all ages. It is very comfortable and useful .</p> <p>Very well to use both childrens and adults. This pillow also has a place for medicinal magnets for migraine relief.</p> <p>I recommend the unique character and innovative product to anyone.</p>

MD.96.

Title	Stelikaș
Authors	Scorțescu Silvia, Stelian Musteață
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	<p>Stelikas its a blue snake with the stars of the universe.</p> <p>It is copyrighted and is used as a treatment product, it is a back support and it is attractive, it looks like a pet, the logo and the name and the character are protected by Agepi.</p> <p>It is created for all ages.</p>

MD.97.

Title	Dum-slip
Authors	Scorțescu Silvia, Stroici Dumitrița
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	<p>Dum-slip its a hoodie-blanket, for camping and cold weather, that's why the blanket innovation will be used regardless of size. It is a wide model intended for anyone, it also has a mascot, an own creation that our customers will play with while traveling.</p> <p>I recommend the cool and warm product, it is attractive and easy to use and carry.</p> <p>The project is ongoing, both the mascot logo and the product will be protected by Agepi.</p>

MD.98.

Title	Dudu-Duda
Authors	Scorțescu Silvia, Scorțescu Marius-Silviu
Institution	JUNIOR ACHIEVEMENT MOLDOVA
Description	Dudu-Duda are two robots, one female the other male.

Their journey through the world continues with many events, each robot has a segment of colors and a logo, these innovative products are created both as a book character and as a user logo. I recommend the development of the following project - product with placement in comics. I hope all ages will like it. I recommend to be read and loved by all ages.

MD.99.

Title RUMF
Authors Scorțescu Silvia, Buca Felicia
Institution JUNIOR ACHIEVEMENT MOLDOVA
Description RUMF is a backpack for animals, it's funny. It is special for transporting animals, it has a backpack cap to be able to remove the head of the animals that must be transported safely. It has ventilation, it is transparent and the waterproof clip in front. Front of backpack it is a transparent eco-plastic. The character and logo are copyrighted. Recommended for all small animals, especially cats, dogs. This innovation are so usefull in our days.

MD.100.

Title Pipa-Pupa
Authors Scorțescu Silvia, Papu Junior Achievement Moldova
Institution Sebastian JUNIOR ACHIEVEMENT MOLDOVA
Description Pipa-Pupa are 2 uniquely created and invented poufs. I love poufs but these are unique blue color for both girl and the boy. The unique poufs have another big secret. The magic health envelope is inside, its an envelope made of plants, so it provides volume and can be easily changed. This product is created for children and those who love toys and small toys.

MD.101.

Title Epu-Kami
Authors Scorțescu Silvia, Bordan Kamelia
Institution JUNIOR ACHIEVEMENT MOLDOVA
Description Epu-Kami is a rabbit pillow, it is a unique and healthy project, because it has medical magnets, the small pillow is hard, it is for straightening the back, I created it for school,

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we get tired a lot in the sitting position and I fix it on the back during hours not to do scoliosis. I recommend the product for children in the process of growing up and as health during class. Epu-Kami is also cheerful with a magical and attractive design.

MD.102.

Title KAPI-TANI
Authors Scorțescu Silvia, Eșanu Tania
Institution JUNIOR ACHIEVEMENT MOLDOVA
KAPIBA-TANI - this innovative project, represents a tourist attraction in my country I love capybaras.
Description I will create small toys and in the our zoo area in the house where the capybaras live I will give them as gifts to children with disabilities, the logo and the product will have a social purpose of loving and protecting the capybaras from our zoo.

MD.103.

Title MAURA-PU
Authors Scorțescu Silvia, Colun Maura
Institution JUNIOR ACHIEVEMENT MOLDOVA
PA-MAURA is a social project, I love birds, I love building houses. With parents and colleagues, we build the houses so that they have a place to live when they come from other traveling countries. The logo is placed on the houses and those who wish can help with their construction. I love the song of spring with the chirping of birds.
Description

MD.104.

Title GAB-LEU
Authors Scorțescu Silvia, Zubco Gabriel
Institution JUNIOR ACHIEVEMENT MOLDOVA
GAB-LEU is a social project, to collect plastic, the logo is personal, I love to protect the environment and with my friends I created a group to collect garbage and plastic from the high school yard. This social project aims to preserve and protect our waters and lands.
Description

MD.105.

Title Spat-LERA
Authors Scorțescu Silvia, Gorincioi Laura
Institution JUNIOR ACHIEVEMENT MOLDOVA

Description Spat-LERA is a project created with the aim of straightening the back with a straight wooden support, the procedures are simple but long. Scoliosis, back diseases and incorrect position lead to enormous back pain, we created a target group where we show that at all ages have back problems. The logo is personalized, the procedures and exercises last 1, 3 months depending on the condition of the back. The healthy back project with Spat-LERA means healthy legs, a straight body and a flexible back. Recommended for all ages. We look forward to seeing you at the Spat-LERA online and offline group.

MD.106.

Title MOOFU NICA
Authors Scorțescu Silvia, Lazarica Nicoleta
Institution JUNIOR ACHIEVEMENT MOLDOVA
Description MOOFU NICA is a vegan ice cream, full of health, recommended to anyone. It is a dose of sweet vitamins from dried fruits. I recommend the product to anyone. For those with diabetic problems, it is recommended as a treatment, for those with diets and restrictions, the product only benefits them. It is indicated for all ages.

MD.107.

Title BRO-DRAGO-RAD
Authors Scorțescu Silvia, Bostan Dragoș, Bostan Radu
Institution JUNIOR ACHIEVEMENT MOLDOVA
Description BRO-DRAGO-RAD-The project is an innovative one, we are all subject to risk and every time we take 3-4 bags to school, work, a bag with books, a bag with sports utilities, a bag with food products, a bag with a change of shoes. We thought that we carry many things behind us every day, to create a modern product, which will be attached to the belt of the pants. It will be a magnet fixed to the belt of the pants that helps us with back pain. This belt will be a special treatment, it will relieve pain and the spine will feel more flexible and relaxed. We recommend this product to anyone, but especially to boys and mens.

Mongolia

MN.1.

Title **The Khalkh doll(s)**
Authors MYAGMARSUREN Tsanjid, Altantuya Purevsuren
Institution **Urangar urlal**

Description

The KHALKH doll A pair of KHALKH dolls are 21 centimeters tall. Its crafted usind the macrame art with colorful threads The dolls are crafted using a combination of the ancient and the modern style of KHALKH nation. The dolls are made out of metal, The decoration of the female doll's hat made using a piece of the silver. These products are lightweight, compact, and can be used by women who take care of children at home and anyone who likes handicrafts. It is cheap and can be washed and reused.

Morocco

MA.1.

Title	Invention of a pioneering smart scanner by radio frequency for the detection of breast cancer
Authors	AMMOR Hassan, ER-REGUIG Zakaria
Institution	Technological Innovation Center, Mohammadia School of Engineers, Mohammed V University of Rabat, Morocco MA38889B1 31/5/2018
Patent	MA57766 accepted 20/3/2023 WO/2017/155377
Description	<p>Breast cancer is the most common cancer in women, especially in developed countries. One in 8 women is at risk of developing breast cancer. Early detection of breast cancer is known to be a key factor in the successful treatment of the disease. Every year, early detection saves thousands of lives. Indeed, the earlier breast cancer is detected, the greater the chances of recovery. Our project involves the invention of an antenna array system in microstrip technology for radio frequency. It is intended for recent radiological systems allowing a study of internal organs without irradiation of the body for the detection of infra-millimeter tumors of breast cancer.</p> <p>This system realized in this project is unique in its operation and design. Besides, our antenna array system is cheaper, lighter, smaller and not harmful to health. It presents a saving of more than 80%. It will have great success in the medical fields. Indeed, current breast cancer detection methods such as X-ray mammography, MRI and ultrasound have certain limitations and sometimes their results seem unreliable for tumor detection.</p> <p>Early detection of breast cancer, when the latter is exposed to electromagnetic waves, the breast tumor has electrical properties that are different from those of healthy breast tissue. Indeed, the technique of microwave tomography of the breast uses the diffusion of signals by an object, when the latter is illuminated by an electromagnetic signal. The scattered signal depends on the electrical characteristics of the object, in particular the dielectric constant and the conductivity of the tumors.</p>

North Macedonia

MK.1.

Title

Aptex

Authors

Vlatko Stojkoski, Ana Mladenova

Institution

Yahya Kemal College

Description

Aptex emerges as a groundbreaking combination of Artificial Intelligence (AI) and healthcare, dedicated to reshaping pharmacy services and medical consultations, enhancing accessibility and efficiency. As healthcare infrastructures strain globally, innovative solutions like Aptex are imperative, bridging the gap for individuals seeking medical guidance and digital health resources.

Driven by the observation that many struggle to access timely healthcare, Aptex pioneers immediate, reliable, and personalized healthcare advice and medication recommendations, regardless of geographical or time constraints. At its core, Aptex harnesses sophisticated algorithms and large language models to interpret user inquiries, translating symptoms into actionable medical advice with pinpoint accuracy.

The cornerstone of Aptex lies in its intuitive AI chatbot, seamlessly guiding users through medication searches and providing personalized healthcare advice. Its comprehensive drug catalog empowers users to find the right medications effortlessly. Moreover, Aptex offers an online consulting service with a scheduling system, effortlessly connecting patients with healthcare professionals.

With a vast market potential amidst the rise of digital health solutions, Aptex promises convenience, efficiency, and personalization in healthcare access. Future plans include expanding its medication and condition database, enhancing multilingual AI capabilities, and fostering partnerships for a holistic continuum of care.

In essence, Aptex envisions becoming a global leader in AI-driven healthcare, revolutionizing medical advisory and service accessibility through its chatbot-centric approach and streamlined appointment scheduling feature.

Philippines

by

Toronto International Society of Innovation & Advanced Skills (TISIAS)

PH.1.

Title	SOLOMON: 160 Hz VIBRATION-BASED SOLEUS MUSCLE STIMULATION FOR POTENTIAL HEALTH BENEFITS
Authors	JANNA MARIE T. FLORENDO, ALLEXIS MARY GRACE Z. KALAUQUIAN, ELIJAH JAMES M. PUNSALAN, MA. CHAT DONNA V. OFILAS
Institution	Ramon Magsaysay High School, Philippines N/A
Description	<p>The soleus muscle, a pivotal component of the lower leg, influences essential aspects of mobility and posture. In this context, a preliminary study named "Solomon" is introduced, designed to target and massage four specific acupuncture points within the soleus muscle. These points are strategically chosen due to their significance in enhancing muscle function, improving circulation, and relieving tension. Solomon offers a novel approach to muscle therapy by employing precision and innovation. Through the gentle yet effective massage of these acupuncture points using 160 Hz of vibration, Solomon aims to optimize the health and performance of the soleus muscle. This innovation holds promise for individuals seeking relief from muscle-related discomfort and improved musculoskeletal well-being. Understanding the potential benefits of Solomon in the context of soleus muscle care opens new avenues for research and application in the field of holistic health and rehabilitation. Further exploration of Solomon's impact on muscle function and its therapeutic implications is essential to harness its full potential in enhancing overall health and well-being.</p>

PH.2.**Title**

ENHANCING SEED PLANTING EFFICIENCY AND WORKER COMFORT: IoT-ENABLED ROBOTIC SEED PLANTING TO MITIGATE EXTREME HEAT CONDITIONS

Authors

MILESTONE O CALDERON, TRIXIE ANN A. BALDOZA, MA. CHAT DONNA V. OFILAS

Institution

Ramon Magsaysay High School, Philippines
N/A

Description

As the competition in the commercialization of food and revenue rises, the investment in agriculture gadgets and robots to increase the output in a minimized process duration also surges. This is the main prerequisite of IoT-Enabled Robotic Seed Planting, covering phenotyping, crop detection, harvesting, seed planting, pruning automation, and weed management using its solar panels. In light of the high urban density, the robot focuses on providing services to rural areas of the country providing the robot with better access to a larger space and maintaining an equilibrium to maintain economic stability and less rural land scarcity. The IoT-Enabled Robotic Seed Planting is an Arduino-equipped robot, the first servo motor drives the plow and the blades that wrap around the seeds, while the second is responsible for driving the seeds planter hatch, powered by four gear motors controlled by an Arduino, the system's brain. The automatic seeder robot specializes in assessing the crucial duration of work and improving physical health in accordance with eliminating health hazards associated with sun exposure. Investing in the long-term result of the Internet of Things (IoT) assists in sowing seeds in the needed area to help farmers save time and limit excessive sun exposure. This solar-powered robot simultaneously executes digging, seed sowing, and seed covering tasks under the control of an Android application. It can also recognize obstacles and avoid them. Additionally, remote energy movement monitoring is possible from anywhere in the world.

Poland

Represented by **Eurobusiness-Haller**

PL.1.

Title	High quality white LED system with color rendering index (CRI) over 90
Authors	Dagmara Stefańska, Marek Adaszyński, Damian Szymański
Institution	Institute of Low Temperature and Structure Research Polish Academy of Sciences
Patent no.	Pending

Available LED emits light with an unpleasantly "cold" color. Excessive exposure to blue light disrupts the human circadian cycle, including the production of the sleep hormone melatonin.

We present an innovative method of producing white WLED light with a high color rendering index (CRI) above 90. This parameter determines how a given light source describes the color of illuminated objects, for sunlight the CRI is 100. In our solution, white light is generated by a composite containing two phosphors excited by violet light with CRI 92 and CCT 2550 K. The electroluminescence spectrum covers the entire visible range from 400 nm to 750 nm. The lack of dominance of the blue component and the presence of

Description

a band in the red spectral range make this light healthy for the human body. The color of the generated light, the CRI value, and the CCT color temperature can be modified by changing the proportions between the phosphors used. The obtained composites are stable and have successfully passed aging tests that lasted 10,000 hours. This invention has a high impact on the health and quality of life of the entire society. It can be used as lighting for home, public, and industrial spaces as well as high-quality specialist lighting, e.g. during surgical procedures. Light with a high CRI will allow surgeons to better assess the condition of internal organs and will allow for more precise identification of diseased tissues. People should realize that good quality light is as important as clean air or a healthy lifestyle.

PL.2.**Title** Toilet Insert FULL CONTROL**Authors** Piotr Sulecki**Patent no.** P. 436342**Description**

Innovative solution protects the user of the toilet against the possibility of contracting infectious diseases found, among others, in body fluids and faeces, mainly related to the COVID-19 virus, the plague of the 21st century. Hepatitis B, COLI, SALMONELLA and other viruses. The critical moment when using public toilets is flushing fecal matter with a stream of water from the cistern, that's when microscopic particles of water mixed with faeces "in the form of an aerosol" rise up to a distance of 1.5 meters, falling within about 2 minutes on everything in the radius about 1.5 meters. The use of the solution developed by me guarantees: 1. Protecting the person using the toilet against direct body contact with the toilet seat and toilet bowl. (mainly in public toilets) 2. Keeping toilet bowls and toilet seats clean (after use) without the need to use cleaning tools, e.g. brushes (especially important in times of pandemic); one rinse of water is enough. 3. Protection against direct contact with stagnant water in the siphon of the toilet bowl; the so-called "splash" As a result of applying the above solutions: 4. Reducing the amount of water used during flushing operations.

Movie about invention:

<https://www.youtube.com/watch?v=cbwWisxLRO0>

PL.3.**Title****Sea Rescue Station THE LIFE-SAVING PLATFORM****Authors****Piotr Sulecki****Description**

A floating life-saving platform that secures people in the deep waters. High buoyancy platform is equipped with ropes that allow it to hold on to it, there is also a SP buoy. In the equipment of the platform, you can find a switch-key alarm with sirens and alarm light. At night, a solar lamp lights up to provide the light for the entire platform.

In case of getting tired, the swimmer can swim up to the life-saving platform, and after grabbing the ropes, they can rest or, for their safety, may take a life buoy from the platform and swim to the shore with it. However, in case of strong currents not allowing them to return safely to the shore, the person who is on the platform, can call for help, using

a switch-key with alarm lights, that can be heard from several hundred meters away. In which, drawing attention that someone needs help. The platform is well visible at night, due to a solar lamp mounted on the top of the structure, that turns on at dusk.

The advantage of the life-saving platform is its location in the water, nearby people enjoying sea or inland swimming. So far, people who were drowning, were doomed to receive help, coming from the land, and more than once, people were drowning in silence, without calling for help. The life-saving platform, to a large extent, solves that problem, because the swimmer, who got tired and has that platform, can swim to it and call for help.

Poland

Represented by

Association of Polish Inventors and Rationalizers

Stowarzyszenie Polskich Wynalazców i Racjonalizatorów. SPWIR

PL.4.

Title **Modified cephalosporin antibiotic molecules and diagnostic radiopharmaceuticals based on these molecules for imaging bacterial infections, their preparation and use.**

Authors Przemyslaw KOZMINSKI, Ewa GNIAZDOWSKA, Pawel HALIK, Kinga ZELECHOWSKA-MATYSIAK

Institution **Institute of Nuclear Chemistry and Technology**

Patent Pat. 242808

Description The subject of the invention is modified antibiotic molecules from the cephalosporin group and diagnostic radiopharmaceuticals for imaging bacterial infections based on these molecules, as well as the method of their production and application. The modified antibiotic molecule from the cephalosporin group is combined with a selected macrocyclic or linear ligand (DOTA, DOTAGA, NOTA, NODAGA, TRAP, NOPO, TCMC, DTPA, THP, HBED, DFO) or its derivative. This compound forms complexes with transition metal cations (^{94m}Tc , ^{99m}Tc , ^{68}Ga , ^{111}In , ^{89}Zr , ^{43}Sc , ^{44}Sc) by attaching the ligand to the antibiotic molecule through an amide or thiourea bond (between the carboxylic or isothiocyanate group of the selected ligand and the primary amino group). The use of the linker and the diagnostic radionuclide labeling does not alter the biological properties of the antibiotic. Cephalosporins constitute a group of semi-synthetic β -lactam antibiotics with a broad spectrum of bactericidal activity against both Gram-positive and Gram-negative bacteria, acting by inhibiting bacterial cell wall synthesis. The radiopharmaceutical comprising the modified antibiotic molecule from this group is intended for imaging infections caused by Gram-positive and Gram-negative bacteria, especially for imaging and diagnosing infections associated with diabetic foot syndrome. X-ray imaging does not show inflammatory changes in bones during the first two weeks of infection, and magnetic resonance imaging may not differentiate between infection and aseptic inflammation. Scintigraphic studies using a labeled antibiotic from the cephalosporin group exhibit higher sensitivity and specificity than standard methods. The application of the antibiotic labeled with a diagnostic radionuclide innovatively leverages the known action of the antibiotic and does not require significantly high costs, thus enabling wide accessibility to this type of diagnostics.

PL.5.

Title	Delivery systems of active substances with anti-inflammatory and soothing properties intended for dermatological applications
Authors	Magdalena Bankosz, Katarzyna Sala, Wiktoria Wrzesinska, Claudia Garbowska, Magdalena Kedzierska, Bozena Tyliczszak
Institution	Cracow University of Technology
Patent	-
Description	This study presents an innovative delivery system for anti-inflammatory and soothing active substances for dermatological applications. The investigated invention in the form of a patch is characterized by a gel-like structure that exhibits the ability to retain a significant amount of water, which is an ideal basis for dermatological and cosmetic applications, especially in the context of skin hydration and care. The main objective of the project was to develop hydrogel materials that not only provide adequate hydration of the skin, but also exhibit anti-inflammatory effects. The innovativeness of the presented solution lies in the combination of modern technology with a wealth of natural plant components, using the advantages of hydrogels. The breakthrough nature of the invention is due to the possibility of tailoring the selection of specific plant extracts to specific dermatological needs. For example, chamomile extract and plantain extract have anti-inflammatory effects. In addition, the use of hydrogels allows for easy application and comfortable use, making the products more attractive to users. Thanks to the synergistic combination of modern technology, natural plant ingredients and the advantages of hydrogels, these products have the potential to become revolutionary solutions in the field of dermatology and cosmetology. The invention could be an effective therapeutic tool for treating and alleviating the symptoms of dermatological diseases.

PL.6.

Title	Polymeric capsules as drug carriers in anticancer therapies
Authors	Bozena Tyliczszak, Magdalena Bankosz, Katarzyna Sala, Oliwia Grzywacz, Magdalena Kedzierska
Institution	Cracow University of Technology
Patent	Pat. 242808
Description	Polymer capsules, as carriers for drugs in cancer therapies, represent an innovative approach to drug delivery based on advanced pharmaceutical technologies. The capsules consist of

polymeric materials characterized by controlled degradation, acting as a carrier for therapeutic substances, enabling their precise delivery to cancer cells. Alginates, natural polymers derived from marine algae, enable the formation of gel structures via calcium cross-linking, allowing for controlled drug release. This controlled release ensures that the drugs are protected from degradation in the gastrointestinal tract, which in turn increases their bioavailability. In addition, these capsules can be customized for different physical properties and for the content of different drugs at different doses, allowing them to be tailored to individual therapeutic needs. Thanks to their biodegradability and compatibility with the body, alginate capsules minimize the risk of side effects and eliminate the need to remove residual drugs from the body. In addition, there is room for further innovation by functionalizing the capsules, such as by adding carrier polymers or nanoparticles, which opens up new possibilities in the field of targeted therapy and nanotechnology applications. As a result, calcium-crosslinked alginate capsules represent a promising tool in modern therapeutic strategies.

PL.7.

Title	ROBOTIC STATION FOR ADDITIVE MANUFACTURING ELEMENTS OF DIFFERENT SIZES MADE OF ALUMINUM ALLOYS AND STEEL
Authors	Maciej Ceder, Wojciech Kiński, Michał Smater, Piotr Falkowski, Julia Wilk
Institution	Łukasiewicz Research Network - Industrial Research Institute for Automation and Measurements PIAP
Patent	-
Description	The design of a robotic station for the additive manufacturing of machine parts, involving the deposition of material directly in a pool of molten material, results from the need to increase the efficiency and profitability of individualized production of engineering structures with various geometries, dimensions and materials (steel, aluminum alloys). The station is based on the operation of a welding machine, the welding pipe of which is embedded in the cluster of a robotic arm of an industrial manipulator with 6 degrees of freedom, which ensures the implementation of a wide spectrum of programmed movements in the working space depending on the robotic arm used. This makes it possible to produce (additive manufacturing) machine parts, structural elements, as well as architectural elements, freely scaled. The research station was installed in a room specially adapted for this purpose, which also serves as the station's working chamber, equipped with appropriate infrastructure.

PL.8.

Title	PLA-based composite material, method of manufacturing PLA-based composite material, use of PLA-based composite material
Authors	Paulina Byczkowska, Emil Saryusz-Wolski, Mikael Skrifvars, Nawar Kadi, Marcin Barbarski
Institution	Lodz University of Technology
Patent	PCT/EP2024/052675

Description The object of the invention is a material containing in its composition PLA with the addition of wool in virgin or recycled version, and its method of manufacture. This material is produced in the form of a filament as well as pellets/pellets. 3D filaments are materials used in 3D printing technology. One of the most popular types of 3D filaments is PLA (polylactide), which is a biodegradable synthetic polymer with low density and high flexibility. PLA can be easily printed using a variety of 3D printing methods and can also be colored, giving it a wide variety of aesthetics. However, PLA also has some disadvantages, such as low resistance to heat, moisture and abrasion, which limits its use in some fields. Various additives can be added to PLA to improve its properties, such as natural or synthetic fibers, nanoparticles, fillers or plasticizers. These additives can affect the mechanical, thermal, chemical, biological or optical properties of PLA, increasing its strength, stability, biocompatibility or visual appeal. The additive proposed by the developers for PLA is wool, which is a natural fiber of animal origin, obtained from sheep or other animals. Wool has many advantages, such as high strength, abrasion resistance, thermal insulation, hygroscopicity, biodegradability and antibacterial properties. Wool can also be dyed in a variety of colors, giving it aesthetic value, and the use of recycled wool is an added benefit to the final material obtained. PLA filament with wool is a type of composite material that combines the advantages of both components.

Poland

*Represented by Association for the Promotion of Polish Science,
Technology and Innovation*

PL.9.

Title	Composition of cement slurry for sealing casing pipes in underground hydrogen storage
Authors	Marcin Rzepka, Miłosz Kędzierski, Ewa Kałna, Szczepan Filip
Institution	Oil and Gas Institute – National Research Institute Lubicz 25 A Str., 31-503 Kraków, POLAND
Patent	Registered no P. 443064 ; 06.12.2022

Description

The main determinant of the tightness of hardened cement slurry to The object of the invention is a composition of cement slurry with the addition of nano-SiO₂ intended for sealing casing pipes in underground hydrogen storage facilities. Cement slurries based on silicon nanoparticles (nano-SiO₂), tested by in Institute the last few years showed a high tightness of the cement matrix. Currently, in the era of energy transformation and introduction of so-called “green energy” principles, the necessity of producing and storing hydrogen in underground storage (e.g. in depleted hydrocarbon deposits) is increasingly emphasized. The tightness of the annulus between the borehole wall and casing pipes in such cases must be extremely high (so that hydrogen does not migrate to the surface of the ground or into other horizons in the borehole).

The invention developed a composition of cement slurry, made on the basis of water, modifying agents (mixtures of lignosulfonates, petroleum products, unsaturated fatty acid esters derivatives, organic polymers) and nanocomponent (silicon nanooxides), using Portland cement.

PL.10.

Title	<i>The method of assessing the stability of crude oils and their blends</i>
Authors	<i>Sławomir Szufliła, Wojciech Krasodowski Jerzy Kuśnierczyk, Mirosław Wojnicki, Marcin Warnecki</i>
Institution	<i>Oil and Gas Institute – National Research Institute Lubicz 25 A Str., 31-503 Kraków, POLAND</i>

Patent	<p><i>Patent Pending / Registered no P. 442166; 31.08.2022</i></p> <p>The patent focuses on evaluating the stability and compatibility of crude oils, which has become particularly crucial due to the current disruptions in the global crude oil supply. Refineries are compelled to diversify their crude oil sources to adapt to the changing situation. However, when different oils are mixed during the refining process, excessive deposition of deposits frequently transpires.</p> <p>The developed method of stability assessment sets itself apart from other existing methods by conducting evaluations under specific pressure and temperature conditions. This unique approach enables the determination of safe proportions of crude oils in blends, mitigating the risk of excessive precipitation and deposit formation. This advancement in assessing oil stability provides refineries with valuable insights to optimize their blending processes and ensure efficient and reliable operations.</p>
Description	<p>The invention focuses on a method for assessing the stability of crude oils and their blends using PVT apparatus. The mixing of incompatible oils causes the destabilization of asphaltenes, which can lead to severe technological issues such as the deposition of sludge on the internal walls of pipelines and exchangers. Consequently, this deposition limits the flow or even causes blockages. Therefore, leading oil companies have a keen interest in conducting research on oil stability and developing techniques to predict the flocculation and precipitation of asphaltenes.</p> <p>By utilizing the PVT apparatus, a method was devised that enables the assessment of crude oil and blend stability. This method facilitates measurements under pressures ranging from 1 to 250 bar and temperatures within the range of 20 to 200°C.</p>

PL.11.

Title	A surfactant composition designed to reduce water production in gas well
Authors	Śławomir Falkowicz, Winicjusz Stanik, Marcin Majkrzak, Renata Cicha-Szot
Institution	Oil and Gas Institute – National Research Institute Lubicz 25 A Str., 31-503 Kraków, POLAND
Description	<p>Patent Pending / Registered No P. 445682; 26.07.2023</p> <p>The innovation of the invention is the improved properties of the surfactant composition forming, in-situ with carrier oil, amphiphilic surfactants, and solvent, a thermodynamically stable Winsor type III microemulsion blocking the inflow of formation water and allowing</p>

increased gas recovery, which resolves problems related to production and the environment. The developed composition is less harmful to the environment than the commonly used compositions based on organic polymers and expensive organosilicone compounds or anionic surfactants used in oil extraction.

PL.12.**Title**

Quenching oil for the cold quenching of steel

Authors

Stefan Ptak, Agnieszka Skibińska, Wojciech Krasodomski, Artur Antosz, Zygmunt Burnus, Grażyna Żak, Jarosław Markowski, Iwona Rycaj, Kamil Pomykała, Wojciech Wilk

Institution

Oil and Gas Institute – National Research Institute

Patent

Lubicz 25 A Str., 31-503 Kraków, POLAND

Patent Pending / Registered No P. 447426; 31.12.2023.

Description

The invention is a quenching oil for the cold quenching of steel. Quenching is a type of regular thermal treatment of materials in which the workpiece is heated to the relevant temperature, and that temperature is maintained for the time required to alter the internal structure of the quenched material. It is then cooled down at an appropriate rate. When the material is heated and kept at a high temperature, its structure starts to change. The quenching rate is a very important factor in the quenching process. If the rate is too low, cementite will be released, preventing the martensitic transformation, and if the rate is too high, high quenching stresses will be produced, potentially causing permanent deformations or cracking in the quenched item, which can be prevented. The essence of the invention is a quenching oil for the cold quenching of steel products whose primary ingredient is a plant-based base oil: a wax – jojoba oil. Jojoba oil is produced from crushed seeds of an evergreen perennial desert shrub, jojoba, which grows in the southwestern USA and north Mexico. Approximately 50% (m/m) of Jojoba oil is an odorless, colorless, oily liquid that mostly consists of esters of monounsaturated fatty alcohols C20–C24 and monounsaturated fatty acids C18–C22, and is virtually free from glycerin. This makes jojoba oil fundamentally different from all known plant oils, as it is not an oil but liquid wax. The quenching oil, which contains a base oil with additives, has additives that are highly compatible with the base oil.

Poland + Ukraine (collaboration)**PL.13.****Title****Methods for the preservation and restoration of Dunhuang wall paintings: foreign experience****Authors****Shiru WANG, Ion SANDU, Yulia IVASHKO, Michal KRUPA, Anna KRUKOWIECKA-BRZEŃCZEK, Tetiana YEVDOKIMOVA, Serhii STAVROYANY, Oksana KRAVCHUK, Andrei Victor SANDU***Kyiv National University of Construction and Architecture, Ukraine**Academy of Romanian Scientists AOSR, Romania***Institution***Cracow University of Technology, Faculty of Architecture, Cracow, Poland**Gheorghe Asachi Technical University of Iasi, Romania***Description**

The fresco restoration methods used in China were defined and characterized: Frontier method for protection of wall coatings in China using poly acrylic acid-functional graphene Ca(OH)₂ Nanocomposites; the use of organic (acrylic polymers Parrot B-72 and AC33) and inorganic materials (lime water, barium hydroxide, alkaline earth silicate) as reinforcing materials for the protection and restoration of fresco wall paintings; a method of strengthening and protecting frescoes with nanomaterials based on graphene materials based on polyacrylic acid graphene / nano Ca(OH)₂, which are synthesized by the aqueous solution method; desalination and elimination of excessive moisture using a three-layer desalination pad and desalination plates with secondary desalination; modern diagnostic methods, such as X-ray fluorescence, X-ray diffraction, scanning electron microscopy, cross-section microscopy, laser microscopy, confocal spectroscopy, which determine the characteristics of the original materials and technologies of mural painting.

PL.14.

Title	Specific Issues of Conservation and Restoration of Libya Mosques
Authors	Mohammed SULAYMAN, Yulia IVASHKO, Somayeh AFSHARIAZAD, Andrii DMYTRENKO, Krystyna PAPRZYCA, Anna SAFRONOVA, Olena SAFRONOVA, Tetiana YEVDOKIMOVA
Institution	<i>Kyiv National University of Construction and Architecture, Ukraine</i> <i>Cracow University of Technology, Faculty of Architecture, Poland</i> <i>National University "Yuri Kondratyuk Poltava Polytechnic" Katowice, Poland</i> <i>Western University of Timișoara, Romania</i>
Description	The characteristics of mosques in each region of Libya are defined: a) Western Libya (Tripoli region) – characterized by multiculturalism due to continuous wars and several systems of government at the beginning of the introduction of Islam and Ottoman rule for four centuries. Arab, Maghreb, and Ottoman architectural traditions will be combined; b) Eastern Libya (Cyrenaica province) – characterized by multiculturalism as a result of numerous conquests and invasions. Ottoman, Andalusian (Azhdabia, Benghazi, Derna), and local traditions are combined; c) South (Fezzan province) – characterized by regional uniqueness due to isolation from external influences due to desert natural and climatic conditions (Ghadames, Sabha, Aujila). The main element that expresses the Libyan national identity is found to be the small, symmetrical domes that distinguish the Libyan traditional mosque roof style from other neighboring countries and other Islamic countries.

PL.15.

Title	Preserving authentic decoration in the entrance spaces of residential buildings in Eastern Galicia from the late 19th to the first third of the 20th century
Authors	Uliana SHCHEVIOVA, Karol WYSZNACKI, Aleksander SERAFIN
Institution	<i>Lviv National Academy of Arts 38 Kubiyovycha Street, Ukraine</i> <i>Lodz University of Technology, Institute of Architecture and Urban Planning, Poland</i>
Description	The vestibules and stairwell spaces of Secession-era buildings in Galicia are an important component of

Ukraine's architectural heritage. As a result of the conducted research, three main types of entrance spaces were identified based on their layout (inside the volume or section; offset to the right or left relative to the main axis of the building; corner placement), and four groups of entrance spaces based on the presence of decoration were established: entrance space with paintings and artistic metalwork on stairs; entrance space with sculpting and artistic metalwork on stairs; entrance space with paintings, sculpting, and artistic metalwork on stairs; entrance space with paintings, sculpting, stained glass windows, and artistic metalwork on stairs. Regarding the placement locations, four placement techniques of decoration on surfaces were determined: decoration on the floor and with artistic metalwork (the most common variant); decoration on walls, floor, and with artistic metalwork; decoration on the ceiling, floor, and with artistic metalwork; decoration on the ceiling, walls, floor, and with artistic metalwork.

PL.16.

Title	The innovative means of physical factors indoor normalization in reconstructed and restored buildings and structures
Authors	Valentyn GLYVA, Larysa LEVCHENKO, Nataliia BURDEINA, Tetiana TKACHENKO, Grzegorz TWARDOWSKI, Yana BIRUK, Serhii ZOZULIA, Larysa ZOZULIA
Institution	<i>Kyiv National University of Construction and Architecture, Ukraine National Technical University of Ukraine, Kyiv, Ukraine Cracow University of Technology, Faculty of Architecture, Poland National Aviation University, Kyiv, Ukraine</i>
Description	The problems of reconstruction and restoration of buildings and structures are relevant all over the world. It is especially important for Ukraine, where a large number of historical buildings and buildings of architectural value have been destroyed or damaged by military operations. The developed noise-protective composite materials based on foam latex and expanded polystyrene allow for high noise reduction indices in the entire sound range. A particularly important result is the reduction of low-frequency noise levels (by 12–30 dB), which is practically not absorbed by

building materials and structures. The addition of 5–10 % magnetite to the mixture allows for simultaneous shielding of acoustic and electromagnetic fields. Studies have shown that LED ultraviolet radiation sources can be used in the presence of people for at least 8 hours without reaching the maximum permissible exposure level of 30 J/m² according to SBM-2015. The use of LED ultraviolet radiation sources allows to increase the concentration of ions in deionized air to the standard concentration (500 cm⁻³) within 10 minutes according to SBM-2015.

PL.17.

Title	Aspects on preserving wall paintings (example of Ukraine and China)
Authors	Viktoriia ZAITSEVA, Andrei Victor SANDU, Vladyslav SMILKA, Bianca BOROS, Oleksandr IVASHKO, Tomasz KOZŁOWSKI, Yuliia KHARABORSKA, Lidiiia SHEVCHENKO
Institution	<i>National Preserve "Kyiv-Pechersk Lavra", Kyiv, Ukraine Romanian Inventors Forum, Romania Kyiv National University of Construction and Architecture, Ukraine "George Enescu" National University of Arts of Iasi, Romania Cracow University of Technology, Faculty of Architecture, Poland</i>
Description	The frescoes of the interior of the Trinity Gate Church were executed in the technique of oil painting (the main group of pigments: white lead, smalt, verdigris, orpiment, red lead, ochre, umber, ultramarine, indigo, cinnabar). A 2-3 cm thick plaster layer of the 16th–17th centuries was used as the basis for the painting, which contained identified lime with a filler and vegetable glue. The original painting, made with glue paints, can be dated to the beginning of the 17th century and needs additional research. Painting in the oil painting technique is done on a layer of oily soil containing red lead. As a result it was established that the fact of the lack of timely restoration, "natural aging" of materials, aggressive environment, anthropogenic and technogenic factors led to the occurrence of negative processes in the state of conservation of paintings (structural cracks, destruction and deformation of the base, loss, and peeling of the paint layer and soil, craquelure, degradation of pigments, biodamage, pollution).

PL.18.

Title	Questions on the Object's Authenticity In Ukraine's Restoration Sector
Authors	Nataliia KOVTIUKH, Marek PABICH, Vitaliy MOLOCHKO, Tomasz GRZELAKOWSKI, Joanna MATUSZEWSKA
Institution	<i>Kyiv Scientific Research Institute of Forensic Expertise, Ukraine Kyiv National University of Construction and Architecture, Ukraine Lodz University of Technology, Institute of Architecture and Urban Planning, Poland</i>
Description	The authors focused on an important aspect of the preservation and restoration industries – authentication of works of art, details and elements of architecture, as well as the importance of proving the dating of architectural objects and works of art. This issue has always been relevant for Ukraine, as well as for other countries, and it became even more relevant during the post-war reconstruction when 863 objects of cultural heritage were destroyed and damaged in the period from 24.02.2022 to 25.11.2023. The existing experience of the "Ukrrestavratsiia" corporation in the field of authentication and dating of architectural monuments, decorative elements, and works of art was analysed. The procedure for establishing the dating and authenticity of works of art is described in specific examples

PL.19.

Title	The destruction of the established urban environment of Borodianka and Irpen as a result of the Russian-Ukrainian war
Authors	Yulia IVASHKO1*, Andrii DMYTRENKO2, Oleksandr MOLODID1, Oleksandr IVASHKO1, Vitaliy MOLOCHKO1, Serhii BELINSKYI3, Przemysław BIGAJ4
Institution	<i>Kyiv National University of Construction and Architecture, Ukraine National University "Yuri Kondratyuk Poltava Polytechnic", Poltava, Ukraine Knights of the Winter Campaign 28th Separate Mechanized Brigade, Armed Forces of Ukraine Cracow University of Technology, Faculty of Architecture, Poland</i>

Description

Although the Russian-Ukrainian war is still going on, calculations of the losses of cultural heritage objects, historical environment, residential and industrial stock, etc. are already underway. It was established that the degree of damage directly depended on the type of weapon used (explosive projectile or aerial bomb). The events of the Russian-Ukrainian war exacerbated the need to collect information on the state of preservation of cultural heritage monuments of national and local importance, destruction, or damage (except for the destruction or damage of monuments due to the military aggression of the Russian Federation). The issue of the geo-informative resource of the State Register of Immovable Monuments of Cultural Heritage was also raised.

PL.20.

Title **Certain aspects of research work
In the restoration of the Kyiv velodrome**

Authors **Oleksandr MOLODID, Volodymyr SKOCHKO, Sergey BOGDAN, Marek PABICH, Karol WYSZNACKI, Joanna BOROWCZYK**

Institution 1 Kyiv National University of Construction and Architecture, Ukraine
2 LLC "Mapei Ukraine", Ukraine
3Lodz University of Technology, Poland

Description Kyiv Velodrome is the oldest sports facility in Ukraine and one of the oldest in Europe. In 2016-2017, the restoration of its track, administrative building, construction of an underground parking lot, and reorganization of the adjacent territory were carried out. As part of the scientific and technical support, an examination of the velodrome track was carried out to determine all existing defects and damages, and as a result, recommendations for their elimination were provided. In particular, solutions have been developed to repair cracks and recommended measures are aimed at preventing their appearance in the future. Also, within the scope of research work, some experimental studies were carried out with the designed constructions of the bicycle track for their compliance with the technical documentation and to establish durability (in laboratory conditions).

Saudi Arabia

By Highly Innovative Unique Foundation,

SA.1.	
Title	Sensory Car Seat
Authors	Madawi Hamad Awadh Alotaibi
Institution	<i>Princess Nourah Bint Abdul Rahman University</i>
Patent no.	SA 1020242258
Description	<p>The present invention relates to a sensory car seat in the field of child car seats, the purpose of which is to soothe children with sensory dysfunction. It is a children's chair that includes 1- air cushions, vibration sensors, 5- vital signs measuring sensors, 4- belts with sensory toys, and an umbrella attached. Linked to an application installed on smart devices. A car seat for children between 2-5 years old to develop motor skills, logical thinking, hand-eye coordination, visual perception, observation, and attention, thus helping the child to become stable and calm and to enjoy a new experience while sitting in the car.</p>
SA.2.	
Title	Harnessing the Beauty of Saudi Heritage to Inspire Sustainable Avant-Garde Fashion
Authors	Amjad Jameel Abdullah, Maha Adel Al Harbi, Thekrah Ahmed Al Rahaili, Bashayer Salem Al Sehamy
Institution	Taibah University - College of Design and Arts - Department of Fashion Design
Patent no.	-
Description	<p>Saudi fashion embraces innovation to celebrate heritage where Designers are fusing traditional aesthetics into contemporary and avant-garde pieces, and to promote sustainability, environmentally friendly materials and deconstructive design techniques are used to extend the life of the garments and reduce waste, and that is for Strengthening the global presence of Saudi fashion. This approach meets the needs of women attending prestigious international events while drawing inspiration from the Kingdom's rich heritage.</p>

SA.3.

Title **Interactive Nanotechnology Storybook**
Authors **Samia Fayes Al-Shehri, Abdulaziz Sultan Al-Shehri**
Institution Highly Innovative Unique Foundation (HiUF)
Patent no. Registration No. 4314378

This invention is an Interactive Nano-technology Storybook that relies on nanotechnology in its pages. It allows children to enjoy interactive illustrated stories based on nanotechnology to display dynamic and exciting images.

Description

The invention relies on children's interaction with the stories and images they see, as new stories are inspired by their reactions and responses to previous stories included in the book. What makes this book unique is the use of advanced nanotechnology and artificial intelligence to dynamically and inspiringly create new stories. Children can interact with the book either through voice recording or writing using the attached pen. Thanks to these innovative technologies, children can enjoy amazing and engaging reading experiences that blend reality and imagination in a new and innovative way.

SA.4.

Title Smart Amniotic Fluid Detector (SAFD)
Authors Qamar H. Naith, Yousef S. Alshafi,
 University of Jeddah, Jeddah, Saudi Arabia
Institution Highly Innovative Unique Foundation (HiUF)

Description

Changes in the quantity or characteristics of amniotic fluid can indicate serious health issues during pregnancy. We have invented a device called the Smart Amniotic Fluid Detector (SAFD) which pregnant women can use to monitor their fetus's well-being and the possibility of early birth from home. The SAFD detector is a device placed on the abdomen of pregnant women. It utilizes Advanced IoT technology (such as ultrasound IoT sensors) and AI technologies (image recognition algorithms and signal processing algorithms) to accurately measure and detect any changes in the level of amniotic fluid surrounding the fetus in real-time during pregnancy. The device has a real-time alert system that notifies the pregnant woman and her healthcare provider of any potential fluctuations and complications in the fluid level. With its easy-to-use interface and seamless integration with mobile apps, the SAFD enables healthcare professionals to remotely monitor their patients and provide prompt medical attention in case of any pointers related to potential increased risk of preterm birth in some cases, such as with the presence of infections or a decrease in amniotic fluid below the minimum acceptable value.

Sri Lanka

SR.1.

Title

S.O.S WRIST LIGHT (HUMAN SAFETY)

Authors

Wijayapala WELGAMA & K. Anton Chrishan Peiris

Description

The invention is a hi power light to be worn on the wrist left/right to use at any emergency like power cut, map-reading, use mobile phones or computers and send signals etc. Look like a watch. But fixed solar re chargeable (solar panel fixed) battery for long lasting. “No fear in the darkness”

Taiwan

Represented by WIIPA

TW.1.

Title **Electric welding gun with adjustable electric welding power**

Authors CHUNJIE, SHIH

Patent no. M648622

Description

This creation provides a type of welding gun with adjustable welding power. The welding gun is composed of a gun body, heater, solder tube, solder controller, handle, PCB, and voltage regulator controller. Its main feature lies in the installation of a PCB and a voltage regulator controller inside the gun body. The PCB is electrically connected to the voltage regulator controller, and the voltage regulator controller is electrically connected to the heater. By rotating the knob at one end of the voltage regulator controller, the user can infinitely adjust the welding power of the welding gun, thereby enhancing the efficiency of the welding gun

TW.2.

Title **Horizontal bar construction**

Authors GUAN-TING LIU, YUMING TSAO

Institution **Shih Chien University**

Patent no. M646992

Description

This creation introduces a single-bar structure composed of two pillars, a crossbeam, two telescopic rods, and a pull bar. Adjacent to each pillar, there is at least one support frame to stabilize the pillar. Inside the pillars, the telescopic rods are inserted, allowing the height of the single bar to be adjusted according to the child's height. The pull bar is threaded through the two telescopic rods. This single-bar structure is designed for easy portability and assembly."

TW.3.

Title **"Interactive New Toy"**

Authors Chung Yi Chen

Institution **National Taipei University of Technology**

Patent no. M651419

Description The creation offers an interactive new toy consisting of a

main body and a base unit. Multiple toy units can be arranged and combined to form a structure through which a rope can be threaded. Adjacent toy units are connected by interlocking protrusions on one end of the main body fitting into corresponding indentations on the other end. When users wish to rotate or change the position of adjacent toy units, they can do so quickly and with slight elasticity."

TW.4.

Title Luminescent fan structure
Authors YANG CHEN SHIH
Institution Tamkang University
Patent no. M649325

Description

"This creation presents a structure for an illuminated fan. It incorporates LED lighting devices on the rear cover of the fan and LED color-changing lights on the PCB inside the fan base. Additionally, a solar panel is installed on the top cover of the base to directly provide power to the fan. By using a switch, the illumination of the LEDs can be controlled, with the solar panel serving as a power source for the LEDs

TW.5.

Title Versatile Tray IV
Authors WU CHEN-NI, WU PEI-HSUN
Institution Hsinchu County American School
Patent no. M644260

Description

The versatile tray IV allows users to effortlessly dine and work in the car. Its unique design contains a heater, light, working and dining platforms...etc

TW.6.

Title Water holding device
Authors YANG LUNG SHIH, YANGSHENG WANG
Institution Tamkang University
Patent no. M647942

Description

This creation offers a water containment device consisting of a cup body and a cup lid. Inside the circular base at the bottom of the cup body, there is a central disk and multiple circular rings. When not filled with water, the multiple circular rings are folded into the circular groove of the base,

allowing for easy carrying and packaging when the cup lid is closed and the device is compacted. To contain liquid, the cup lid can be opened, and the multiple circular rings can be pulled upward to form a stable and waterproof container."

TW.7.

Title

WoodAlchemy: Transforming Cheap Wood with Traditional Chinese Medicine Dyes

Authors

CHANG CHUN-SHAN, CHANG DENG-JUN

Institution

Kang Chiao International School

Patent no.

Description

In our project, we utilized traditional Chinese medicine to dye inexpensive wood. This not only avoids the impact of chemical paint on the human body but also enhances the color and texture quality of the wood. This process increases the value of inexpensive wood and reduces the felling of slow-growing precious wood, contributing to environmental protection, love for the Earth, and carbon saving.

Our experimental material was pretreated with hydrogen peroxide and surfactant. After dyeing with different Chinese medicinal materials and soaking it in detergent for 15 minutes, the color difference value was less than 2, and the rubbing fastness was above grade 4. If treated with natural beeswax for waterproofing, the color fastness can reach grades 4-5. In the antibacterial experiment, it showed significant antibacterial effects, with no growth on the 20th day. In the anti-termite experiment, the mortality rate for turmeric was 100%, and for wolfberry it was 83.8%; other groups also had a total elimination effect.

While plastic products have a significant impact on the environment, the environmental value of wood dyed or modified with natural pigments far exceeds human visual perception.

TW.8.

Title

A Driver Dangerous Behavior Detection System and Method Based on Object Spatiotemporal Relationships

Authors

Chuan-Wang Chang, Dong-Yuan He, Hsun-Yu Li

Institution

National Chin-Yi University of Technology

Patent no.

1831524

Description

In recent years, numerous traffic accidents have been caused by driver distraction. Therefore, developing and deploying

safety-driving behavior monitoring systems have been increasingly emphasized. Although traditional driving monitoring camera has recording and playback functions, it cannot provide real-time warnings or reminders for sudden abnormal events. Therefore, this product proposes a driver dangerous behavior detection system based on object spatiotemporal relationships to identify dangerous driving behavior in the monitored screen and timely issue warnings to remind drivers to stop risky behavior to reduce the occurrence of accidents immediately.

TW.9.

Title

ACTIVE EPIDEMIC PREVENTION LANDSCAPE LIGHT DEVICE

Authors

Wen-Liang Chen, Hsin-Yu Chuang

Institution

SHU-TE UNIVERSITY

Patent no.

D225525, 112212017

Description

As severe Covid-19 outbreaks occur in countries around the world, the impact and threats of viral infectious diseases have been highlighted. A common environmental epidemic prevention measure is for cleaning personnel to spray at single points on the street. Although it has a suppressive effect, it still has the following shortcomings: (1) It is difficult to spray at fixed points at regular intervals: in existing epidemic prevention, spraying is only carried out in hot spots of the epidemic. For areas that have not been sprayed, it is very likely to become a gap in epidemic prevention. (2) Unable to be combined with lighting equipment: The existing street light system is not designed with equipment that can spray chemicals, resulting in spraying operations requiring a lot of manpower, time and consumption. (3) Unable to warn pedestrians: During spraying, it is impossible to effectively warn surrounding people.

Therefore, the present invention provides an active epidemic prevention landscape light device. The epidemic prevention unit is installed in the lighting unit, and the control module can spray pesticides regularly to prevent the surrounding area from becoming an epidemic prevention gap. The lampshade allows the lighting module to emit light to the surroundings, not only providing lighting at night. When the epidemic prevention unit is spraying chemicals, the lighting

module can emit warning lights and sounds to remind people around to leave and avoid harm to the human body caused by chemicals. Chemicals are stored in the storage tank, and multiple active anti-epidemic landscape light devices can be provided for spraying operations. This will make epidemic prevention more effective and safer, and achieve the goals of humanistic care and environmental care.

TW.10.**Title****AI multifunctional tennis machine****Authors****Chun-Hsiung Lee, Jheng Yong-Ren, Chen Bo-Xiang, Lu Yu Sheng****Institution****CHENG SHIU UNIVERSITY****Patent no.**

I762343

Description

The application of AI image recognition technology enables the AI automatic ball pickup to accurately locate the position of the tennis ball on the court and perform the picking action. The application of this technology enables the machine to accurately identify and capture the tennis ball, effectively reducing the burden of manual operation. At the same time, the efficiency of picking up is improved.

AI automatically picking up balls shows the urgent need for modern technology to be applied to sports field management. This can not only improve efficiency and save labor costs, but also bring new possibilities for technology to improve the application scenarios in daily life. It also represents a study of applying advanced technology to daily labor to improve efficiency and quality of life.

In addition, the serving function is also added to further improve the functionality and full automation of the machine. When no one can practice together, the machine can be moved to a designated position through the operation of the V5 controller to automatically serve without manual intervention to accompany the practice. This not only saves money It saves time and reduces the complexity of manual management.

TW.11.**Title****AI table tennis ball machine****Authors****Chen Ke-Chih, Sheng-Xiang Su, Chih-Liang Huang, En-Yu Liu, Yi-Hung Chou****Institution****CHENG SHIU UNIVERSITY**

Patent no.	M606726 【Creative motivation】 Most of the existing table tennis servers on the market are large in size, inconvenient to carry, have high requirements for the venue, and have a high sales price. They are a burden for novice table tennis players, and they only have fixed serving machines and basic functions. For fixed-point serving, topspin and backspin, most ball machines lack a movable structure and AI tracking function. In view of this, this research developed eight spin functions and an AI tracking serving mode. Pitching machine that can be operated removable via Bluetooth handle
Description	【Research purposes】 1. Propose the functions that existing table tennis machines lack and develop an AI smart table tennis server. 2. Determine the player's position through the AI object tracking system, and use mBlock to calculate the distance between the player and the machine. 3. Suitable for indoor gymnasiums or any table tennis venues. 4. Adjust the intensity by yourself to help professional players and enthusiasts improve their skills.

TW.12.

Title	AIoT Intelligent Dog House
Authors	Yuan-Hsiou Chang, Hsiao-Ling Lu, Jun-Kai Yang, Tzu-An Liao, You-En Zhong
Institution	National Taichung University of Science and Technology National Formosa University
Patent no.	M644445 This invention combines the Internet of Things (IoT) with various sensors and devices installed, which collect data through sensors and send it to the cloud for integration. The integrated data is then transmitted to a mobile application, allowing users to monitor their pets' status at any time and remotely control and interact with them. Functions include playing music through speakers, opening the door of the pet house for outdoor activities, and feeding the pet using a controller. Even when users are away for an extended period, they can still take care of their pets using this product. The main functionalities of this invention can be
Description	

summarized as follows:

- 1.Utilizing cloud records to track pets' daily activities.
- 2.Detecting and improving various aspects of pets' living environments based on collected data.
- 3.Remote control and interaction with pets.
- 4.Ensuring pets' safety even when users are away for an extended period.

TW.13.

Title AIOT remote pet automatic feeding machine
Authors Chung-Wen Liao, Zhan Kaijun, Xie Zhengxun, Lin Tsuyu, Chen Yong-Zih
Institution CHENG SHIU UNIVERSITY
Patent no. M554703

Description

As the phenomenon of declining birthrate continues to intensify, more and more people choose to keep pets. In the busy modern life, most pet owners have problems with the consistency of feeding their pets. We have developed an automatic pet feeding machine that uses cloud technology knowledge and practical Solutions are combined to improve the quality of life for pets and their owners and advance awareness of the use of technology to support pet care.

【Research purposes】

1. Remote remote control automatic feeding machine
2. Use ultrasonic sensors to measure whether there is food left
3. Add a temperature and humidity sensor to prevent food from being too moist and causing spoilage.
4. The cloud records each feeding situation to prevent diseases.
5. Remote monitoring to check whether the pet is normal at any time.

TW.14.

Title AIOT smart home pill box
Authors Li Chia En, Jhuang Yong-Yu, Chen Jia-Yi, Ai Pin-Xin, Pan Yu-Ying
Institution CHENG SHIU UNIVERSITY
Patent no. M623491

Description

This topic proposes "combination with cloud systems" and actually develops an "AIOT cloud smart pill box", which

can measure body temperature daily to facilitate observation of the elderly's physical condition, and add an emergency button to prevent crises, and Use the AI facial recognition function to confirm whether you are a medicine user, and automatically upload daily usage information to the cloud Google spreadsheet, so that it can instantly remind the elderly to take medicine and send it to their family members using LINE or SMS, or send it to Specific medical institutions to achieve the purpose of smart medical treatment and care.

TW.15.**Title**

An Internet of Things (IoT)-Based Master-Slave Regionalized Intelligent LED Lights Controlling System

Authors

Huan-Mei Chu, Yu-Ting Lin, Bonnie HM Chen, Nai-Yu Chen, Jian-An Huang

Institution

Cheng Shiu University

Patent no.

M602711

Description

this article presents an easy-to-install, low-cost, master-slave intelligent LED light-controlling system based on Internet of Things (IoT) techniques. The benefit of using the proposed system is that the brightness of the LED lights in the same zone can be changed simultaneously to save in energy consumption. Furthermore, the parameters of the LED lights can be directly set. Moreover, the related data are collected and uploaded to a cloud platform. In this article, we use 15 W T8 LED tubes (non-induction lamps) as a case study. When the proposed system is installed in a zone with few people, the energy-saving rate is as high as 90%. Furthermore, when 12 people pass by a zone within one hour, its energy-saving rate can reach 81%. Therefore, the advantages of using the proposed system include: (1) the original lamp holder can be retained; (2) no wiring is required; and (3) no server is set up. Moreover, the goal of energy saving can also be achieved. As a result, the proposed system changes the full-dark mode of the available sensor lamp to the low power low-light mode for standby. Further, it makes the sensor lamps in the same zone brighten or low-light way simultaneously, which can quickly complete large-scale energy-saving and convenient control functions of intelligent LED lighting controlling system.

TW.16.

Title Application of AI technique to the detection of internal misaligned screw nuts

Authors Huang-Kuang Kung, Pang-Chieh Lin, Yan-Chen Lin, Fang-Chen Yang, Jia-Xian Chen

Institution Cheng Shiu University

Patent no. I791174

Description This invention mainly uses AI deep learning method to develop the technology platform for the detection of internal misaligned screw nuts. The software of this platform system uses AI deep learning technique to determine and detect whether the internal fastener thread has flaws or misaligned defects. Fig.1 shows a typical internal fastener thread and a possible misaligned angle at 2 degrees.

TW.17.

Title Beverage cup for placing ingredients

Authors Chun-Te Lee, Huang-Kuang Kung, Huan-Mei Chu, Bonnie HM Chen, Jui-Ling Hsieh

Institution Cheng Shiu University

Patent no. M610162

Description The beverage cup of this creation that can place ingredients is provided with a drop hole at the center of the bottom of the container of the cup, and the hole is covered with a hole sheet, when the user wants to eat the ingredients in the cup At the same time, the straw is pulled out of the drop hole of the cup to release the blocking state of the drop hole, and then the straw is used to push the ingredients into the beverage through the drop hole, so as to achieve effective control of the ingredients by simplifying the structural design. Add the number of drinks, avoid adding all the ingredients into the drink at one time, as the ingredients will become hard or soft due to soaking in the drink for too long, which will affect the flavor and taste.

TW.18.

Title Charging device that can protect you from rain

Authors Chien Wei, Kang Tsai-Hua, Chiu Chien-Ching, Chen Po-Hsiang, Chang Yu-Cheng

Institution Lunghwa University of Science and Technology, HungKuo Delin University of Technology, Tamkang University,

Patent no. M644887
 This invention provides a charging device that can protect you from rain, which has the advantage of low cost and can avoid short circuit or open circuit due to water seepage during the charging process. It can not only avoid the occurrence of safety accidents, but also ensure the safety of the charging electric vehicle.

Description

TW.19.

Title Confidential document recycling methods
Authors Chen Tsung-Chia, Hsiao Tien-Chin, Zhang Yu-Teng, Wuchun-Hsien, Kan Chun-Wei
Institution National Chin-Yi University of Technology
Patent no. 111145908

Description

1. The purpose of this invention is to eliminate the need to send sensitive information by fire, shredder or environmental protection company when destroying it, thereby meeting the requirements of energy saving, environmental protection and confidentiality and security.
2. Paper materials can be soaked and melted in a short time using ordinary water. If natural enzymes or colors are added, confidentiality, safety, and dissolution speed and effect can be achieved.
3. It can be implemented immediately within the unit or under the supervision of users, which is safer than the current practice; it can also produce pulp for recycling, which is in line with the environmental protection and market needs of the circular economy.
4. Confidential documents will be destroyed immediately and quickly.
5. A large amount of paper can be put in at one time without destroying them one by one.
6. The destruction process is fast, greatly reducing time and eliminating the need to waste manpower.
7. After destruction, the shredded paper is compressed into paper bricks, reducing the volume of shredded paper and saving space.
8. Different molds can be replaced to create paper bricks and coasters of different shapes, making the paper shredding process more fun.
9. Let children learn about environmental protection and recycling classification by increasing their fun.

TW.20.

Title Device to prevent cables from falling off

Authors Chien Wei, Kang Tsai-Hua, Chiu Chien-Ching, Chen Po-Hsiang, Chang Yu-Cheng

Institution Lunghwa University of Science and Technology, HungKuo Delin University of Technology, Tamkang University

Patent no. M645261

Description This invention provides a device to prevent cables from falling off, which can facilitate the adjustment of the existing hook device, solves the problem that the existing hook devices on the market cannot facilitate the adjustment, and improves the safety of the staff. Work efficiency.

TW.21.

Title Doctor-Assisted Intelligent Diagnosis System and Method

Authors Sung-Tsun Shih, Hsieh Jen-Yang, Huang-His Huang, Chong-Wei Wu, Zhong Qi

Institution CHENG SHIU UNIVERSITY

Patent no. I773995

Description The present invention is an intelligent auxiliary diagnosis system and method for physicians with voice recognition and real-time prompting. According to the voice data of the consultation room, the characteristic information of doctor's orders and patients' self-reported information is generated to form medical sentence structure and sentence structure of patient's self-report. It is stored in the medical history database; at the same time, it can be compared with the patient's physiological information in the medical history database according to the content of the doctor's order, and an instant prompt message will be generated when there is an abnormality in the comparison. The purpose of this invention is to execute the judgment of Chinese and English audio files automatically, and through health status reminders and drug adaptability reminders, it can increase the doctor's consultation speed and reduce errors in judging the patient's disease and physiological status, and increase the tracking of the patient's health status.

TW.22.

Title Emotional Dinosaur- Sensory Integration and Development Toys for Children
Authors Lin Chyun-Chau, Liu Hui-Ru, Li Pin-Xuan, Xu Yin-Xuan
Institution SHU-TE UNIVERSITY
Patent no. M642669

In recent years, the rapid development of 3C products has led to early exposure of children to these devices, resulting in alienation in parent-child relationships, lack of companionship and care, thus affecting children's emotional expression and personality development. To address this issue, we propose a modular toy that can improve children's sensory integration and development through tactile stimulation.

Description The toy features a dinosaur-shaped body with multiple attachment unities on the back where tactile modules can be inserted. Through manual manipulation, tactile perception, visual recognition, color stimulation, and facial expression mimicry, children can interact with the toy and express emotions. The parents can also use the toy to guide children in expressing emotions, enhancing parent-child interaction, and promoting children's sensory integration and development.

TW.23.

Title Good Talk- communication device for hearing-impaired persons
Authors Lin Chyun-Chau, Cai Ya Yin
Institution SHU-TE UNIVERSITY
Patent no. 112141578

In Taiwan, there are approximately 1.2 million individuals with proof of disabilities, among whom 125,764 have auditory function impairments. This accounts for one in ten individuals with disabilities being hearing-impaired. Severe hearing-impaired individuals typically communicate using sign language but still face challenges in establishing effective communication channels with those who can hear. There is often ineffective interaction with the hearing-impaired, leading to communication avoidance and unfriendly social environments. This hinders the social

integration and employment opportunities for the hearing-impaired and deaf community.

The invention is a communication device enabling both sign language and oral communication for hearing-impaired individuals. It promotes seamless two-way communication without causing psychological burden. The device offers instant text and voice convenience. A feedback incentive service is proposed, rewarding non-hearing-impaired individuals with credits for participation, which can be redeemed for discounts. This encourages general persons to engage and communicate with the deaf and hearing-impaired community.

TW.24.

Title

Immersive mixed virtual reality tactical scenario training system

Authors

Fa-Shian Chang, Shang-Chi Su, Guan-Qun Lu, Jingzhe Yan, Chang-De Lin

Institution

CHENG SHIU UNIVERSITY, National Kaohsiung University of Science and Technology

Patent no.

M644889

Description

This invention is a system that utilizes immersive multimedia environments and technologies to integrate multi-user synchronous collaborative training. It enables instructors to monitor the learning status of trainees and provide guidance and simulate real-life battlefield event handling scenarios. This allows for mastering the reactions of the entire team and fostering mutual understanding in teamwork. The system departs from traditional one-way teaching methods by providing real-time physiological detection and situation feedback. It allows for understanding the cognitive status and learning progress of each trainee and the team regarding teaching procedures and content. Administrators can simultaneously set various obstacles such as enemies, tanks, enemy aircraft, bunkers, etc., at any point during the training. They can provide individual or unified guidance for trainees who are not operating commands properly within the course content to adjust the progress of multiple trainees in the course. This achieves the best training effect for trainees with limited manpower among administrators. Furthermore, as this invention integrates virtual reality technology, it can achieve

excellent scene restoration while saving costs, providing trainees with an immersive visual experience. The operating device provides trainees with vibration feedback corresponding to the operating commands, enhancing the realism of the training and avoiding motion sickness caused by the 3D perspective of virtual environments. Through real-time guidance and learning assistance provided by the system, the physiological sensing module detects the trainee's physiological data and condition during operation. The relevant data is analyzed by big data and artificial intelligence platforms to obtain teaching effectiveness and student learning status. This system effectively enhances the efficiency of technical and vocational education and can achieve excellent teaching benefits for precision technical training and remote teaching applications.

TW.25.

Title

IoT smart clothes drying rack

Authors

Paohsi Wang, Chen Bo-Xiang, Liu-Bo Liang, Lin Shan-Jie

Institution

CHENG SHIU UNIVERSITY

Patent no.

M568614

Description

Although there are washing machines, dehumidifiers with continuous drying function, and powerful antibacterial laundry detergents developed for climate conditions on the market today, some clothing materials cannot be washed with powerful antibacterial laundry detergents, or they cannot be washed with powerful antibacterial laundry detergents. The dryer dries clothes at high temperature, and when using the continuous drying function of the dehumidifier, it needs to be in a closed indoor space, which will cause the humidity in the indoor space to be too high, and will also affect people's activity space and time at home. However, if you want to dry your clothes outdoors or in a semi-outdoor space, you will be worried that it will suddenly rain when you are working or away from home, resulting in the freshly washed and dried clothes being damaged because there is no one to collect them. Rain splashes require rewashing.

TW.26.

Title LIFESAVING POLE DEVICE
Authors Wen-Liang Chen, Ying-Liang Yao, Miao-Syuan Zeng
Institution SHU-TE UNIVERSITY
Patent no. M646862, D229859

Description

It is common to hear of drowning incidents in which rescue efforts are unsuccessful, often causing great grief to the family members. Therefore, the present invention provides a lifesaving pole used for rescue at sea or in rivers. The lifesaving pole connection unit is used to extend the distance between the support unit and the floating unit, and allows shore personnel to pull people in the water back to the shore. The rescue lighting module and sound module can remind people in the water and let people in the water know the location of the floating unit. Features of the work: (1) It can remind the position of the floating body: If the floating body is too far away from the people in the water, the rescue lighting and sound module emits light and sound, which can let the people in the water know the position of the floating body and increase the chance of rescue. (2) Assist shore personnel to pull people in the water to the shore: The support body can throw the floating body near the people in the water by throwing it out, so that people on the shore can pull people in the water to the shore. (3) Can beautify the city appearance: When the lifesaving pole is not in use, the rescue lighting module can emit light externally and be used as a landscape light or lighting. It has the concept of public art and adds overall value.

TW.27.

Title Omnibearing Stun Rod
Authors Wu Chen-Ni, Wu Pei-Hsun
Institution Hsinchu County American School
Patent no. M650284

Description

The omnibearing stun rod is an all-encompassing electric device that combines features such as a mosquito swatter, mosquito zapper, mosquito repellent, light, and lighter to provide versatile convenience in daily life.

TW.28.

Title Parking Offset Warning System
Authors Che Jen Hsieh, Jun-He Yang, Shih Hung Lin, Jui-Ling Hsieh, Yu Shiu-an Lin
Institution Cheng Shiu University, Lichih Senior High School,
Patent no. I803894

Description

At present, most parking lots are open 24 hours a day. Since there is no one on site to monitor them, some car owners often do things on their own when parking. For example, they often occupy adjacent spaces, protrude too much or veer too far to one side, which means they often cover the parking grid without realizing it., resulting in other car owners not having enough space to park. The invention allows the car owner to know whether he or she is parked improperly after parking, so as to immediately correct the improper parking status.

TW.29.

Title Plastic recycling mechanism for 3D printer
Authors Hsieh Ming Chu
Institution NATIONAL CHIN-YI UNIVERSITY OF TECHNOLOGY
Patent no. M648096

Description

The present invention provides a plastic recycling system for a 3D printing machine, which includes a screw propeller, a fixed shaft sleeve and a heating unit; In the feeding element, the guide channel inside the fixed sleeve is heated by the heating unit and the body of the screw propeller, so that the heat of each section of the guide channel can reach a state of uniform concentration, which can The waste plastic can be uniformly melted into a high-temperature liquid state, and the base shaft of the screw propeller and the surface of the screw blade are made of Teflon material, so that the molten plastic in a high-temperature liquid state is not easy to stick to the surface of the screw blade, and Evenly flow and export to the wire diameter discharge hole without easy to cause blockage, and the exported molten plastic is extruded through the wire diameter discharge hole to become a plastic linear substrate that can be reused by 3D printers .

TW.30.

Title Range hood provided with an air wall channel
Authors Li Kuo-Yi, Zhuang Yu-Ting
Institution National Chin-Yi University of Technology
Patent no. 111146892

Description A range hood provided with an air wall channel mainly includes an air ring arranged around a burner base and an air exhaust device disposed on a top plate which is situated correspondingly to the burner base. The air ring is connected to an air supply device. The air exhaust device has a storage unit, a telescopic air hood penetrating the top plate, a drive motor capable of expanding and contracting the telescopic air hood, and an air suction and filtering device located opposite to the telescopic air hood. Thus, the air supply device supplies outside air upwards through the air ring to generate an air wall channel. Simultaneously, the telescopic air hood is extended downwards to connect with the air wall channel thereby surrounding oil fume effectively and reducing required horsepower and rotation speed greatly. Hence, the noise generated while the range hood operates is reduced. The effect of removing the oil fume is improved.

TW.31.

Title ROAD CONDITION REAL-TIME REPORTING SYSTEM
Authors Che Jen Hsieh, Jun-He Yang, Shih Hung Lin, Jui-Ling Hsieh, Yu Shiu Lin
Institution Cheng Shiu University, Lichih Senior High School
Patent no. M632352

Description When many drivers find traffic conditions on the road, they want to use a phone call to report to the radio station to inform them of the location, type and time of the traffic conditions or accident. However, the law stipulates that drivers are prohibited from holding mobile phones while driving. Even if drivers find traffic conditions on the road, they cannot report it immediately. It's easy to miss the perfect reminder time. The invention enables drivers to proactively report traffic conditions, location and time to the radio system in real time so as to broadcast traffic conditions information to other drivers.

TW.32.

Title Road section control light system
Authors Huan-Mei Chu, Ching-Yun Hsu, Bonnie HM Chen, Nai-Yu Chen, Jian-An Huang
Institution Cheng Shiu University
Patent no. I761947

Description This creation is about a road section control light system. When various road conditions require one-way traffic control, such as cleaning and maintenance due to landslides on mountain slopes, when only one-way traffic is possible, it is generally necessary to have traffic control personnel at both ends of the road section. The traffic control personnel at both ends communicate by radio or telephone. When the first end is released, entry is restricted at the second end. When the release time expires, the first end is controlled and restricted, and the contact is informed the traffic control officer at the second end of the characteristics of the last vehicle entering the road section. After the traffic control officer at the second end confirms that the last vehicle entering the road section has exited, the traffic control officer at the second end will be allowed to pass through, and the vehicles will be controlled repeatedly. Passage is achieved to achieve the purpose of traffic control; however, this method of traffic control is extremely labor-intensive and causes great inconvenience in implementation. In view of this, this creation is to set up a road section control light system, which uses mobile control devices to be installed at both ends of the controlled road section, uses lights and control fences to control vehicle traffic, and uses an image processing unit to identify the license plate numbers of passing vehicles., to achieve automatic control of one-way traffic of vehicles, which can significantly reduce labor costs and increase practical effects in overall implementation and use.

TW.33.

Title SEAT TYPE TRASH CAN
Authors Wen-Liang Chen, Cian-Yun Jun, Yu-Ching Fan, Hui-En Tseng, Ying-Ru Wu
Institution SHU-TE UNIVERSITY
Patent no. M647815, D229114, 112121722
Description Generally, offices are equipped with trash cans and seats,

but they are designed to be placed separately, which not only takes up a lot of indoor space but also makes it difficult for vulnerable groups with limited mobility to use. Therefore, the present invention provides a seat type trash can, which can be used as an article storage tank. The storage tank can be placed in a recessed space, and the supporting side walls and movable walls can seal the recessed space, hiding and sealing the garbage or articles in the storage tank. The detection module can output the capacity status of the storage tank and notify the user to come and clean up the garbage when the storage tank is full. The card structure in the track can be detached to allow the storage slot to detach from the recessed space, making it easier for users to dump garbage or retrieve articles. Features of the work: (1) Can reduce space occupation: The storage is integrated into the seat, allowing users to have exclusive storage slots, which is convenient to use and can reduce space occupation. (2) Garbage or articles can be sealed: When the storage main body is in a hidden position, the storage tank is enclosed in a recessed space, and garbage can be sealed and isolated from the outside world to avoid the generation of odor. (3) Convenient garbage removal: When the storage main body is moved outward, the storage trough can be separated from the seat main body, and the user can easily clear the contents of the storage trough or even clean it. This result is achieved by users centric design goals.

TW.34.**Title****SMALL PIPELINE CLEANING ROBOT****Authors****Fa-Shian Chang, Guan-Qun Lu, Jing-Zhe Yan, Jun-Xiang Wu, Yi-Cheng Tsai****Institution****CHENG SHIU UNIVERSITY****Patent no.**

113600694

Description

This invention relates to a miniature pipeline cleaning robot, comprising an articulated shock-absorbing walking unit and a surrounding telescopic cleaning unit. The aforementioned articulated shock-absorbing walking unit is a four-bar linkage adjustable mechanism, which is a single body structure and can smoothly and steadily walk in pipelines of various sizes through shock-absorbing buffer mechanisms, and can climb inside curved pipelines. The surrounding telescopic cleaning unit is installed on the aforementioned

articulated shock-absorbing walking unit and is equipped with a rotating mechanism and a two-stage telescopic cleaning mechanism. The rotating mechanism can rotate around the articulated shock-absorbing walking unit, and the two-stage telescopic cleaning mechanism can manually adjust and automatically adjust the position of the vacuum cleaner to achieve the optimal vacuuming distance for cleaning and suctioning debris in pipelines. Additionally, this invention adopts a modular design, fully exploiting the advantages of versatility, reducing construction costs, and the complexity of subsequent repair and maintenance, possessing a competitive advantage in the international market. The machine is designed with waterproof and dustproof IP67, suitable for household sewer sampling, inspection, and maintenance engineering applications.

TW.35.

Title

Smart Care Devices

Authors

Yau Wei-Hung, Lien Chien-Hua

Institution

National Chin-Yi University of Technology

Department of Mechanical Engineering

Patent no.

M637807

Description

The invention is a smart sheath for users to wear on their hands or feet. It uses a Raspberry Pi as the main control board and integrates heating elements and sensors. Through system judgment and control, it detect the temperature of the smart sheath currently worn on the hands or feet. Does it need to be heated ? A product that integrate the Internet of Things and wearable devices have automatic sensing and control system functions. They can instantly detect blood oxygen concentration and pulse frequency values through the blood oxygen sensor on the smart sheath display, and can be used in advance through nursing and health care. Improve physical health, allowing users to be reminded and make improvements before harm occurs, and solve dangerous problems caused by poor blood circulation when users encounter cold snaps in winter, go out to work or exercise. This product has a universal design and is suitable for all age groups and genders. It is currently negotiating cooperation with the Pharmacists Association and blood oxygen sensor manufacturers, and it has great potential for industrial application and commercialization.

TW.36.**Title**

Spindle Thermal Deformation Measuring Equipment for Machine Tools

Authors

Shao-Hsien Chen, Yi-Jyun Li

Institution

National Chin-Yi University of Technology

Patent no.

I814648

Description

this study develops a strain gauge based smart tool holder that can capture spindle operation data, static and dynamic spindle pull-in force changes, and convert the force to displacement by modeling device. The thermal temperature rise sensing module and the equipment developed in this study were used to perform the thermal temperature rise test at 5000rpm, static pull-in force test, and dynamic test. The experimental results showed that the maximum temperature rise deformation was reached at about 4000 seconds at this speed, and the deformation of Z-axis was 28% larger than that of Y-axis and 71% larger than that of X-axis because of the symmetric design of X-axis and C-shaped structure of the machine. The BPNN method was used to build a prediction model and the accuracy of the model was calculated with the actual values, and the prediction ability of MAPE in each of the three axes was 3.2%, 3.4% and 2.5%, which are all highly accurate. In addition, the puller force decreases by about 7% during the temperature rise of the spindle when the spindle starts to rotate due to the effect of the centrifugal force on the disc spring, and then increases with the temperature rise.

TW.37.**Title**

The fermentation product of *Lactobacillus Plantarum* GKM3 that promotes wound healing.

Authors

**Chen Chin-Chu, Chen Yen-Lien, Lin Shin-Wei,
Chen Yen-Po**

Institution

GRAPE KING BIO

Patent no.

I825362

Description

The present invention relates to an external composition for wound healing containing *Lactobacillus* fermentation product and a use thereof. The *Lactobacillus* fermentation product serves as an effective component, which is a bacteria-free concentrated filtrate fermented by *Lactobacillus plantarum* and loaded onto an absorbent

carrier or a carrying agent. The external composition for wound healing is subjected directly onto an skin wound, facilitating the effects of anti-inflammation and enhanced healing of the skin wound.

TW.38.

Title Upper Reaching Teaching Resource III
Authors Liu Jun-Lin, Liu Yi-Shuo, Liu Yi-Zhen
Institution Lilin Elementary School, New Taipei City
Patent no. M651283

Description This product is a teaching resource based on the principle of energy conversion involving the transformation of magnetic energy, kinetic energy, and potential energy. The motion amongst the small steel balls on the path in the set position is designed to show the series of energy conversions.

TW.39.

Title Use of *Lactobacillus fermentum* GKF3 for improving depression
Authors Chen Chin-Chu, Chen Yen-Lien, Lin Shin-Wei, Chen Yen-Po, Wu Szu-Yin
Institution GRAPE KING BIO
Patent no. US 11,253,556 B2

Description The probiotic GKF3 can be used to improve depression. In an animal depression model, it can be seen that the serotonin in the brains of depressed rats is reduced by more than 200% after immobilization. However, GKF3 could restore serotonin and dopamine levels as well as reduce blood inflammatory factors after administration. This study provided that active modulation of the intestinal microbiota, through GKF3 supplementation, can produce serotonin and dopamine to help alleviate stress, anxiety and depression via bidirectional gut-brain connection.

TW.40.

Title Waste lithium batteries enzyme degradation and decomposition technology
Authors Chen Wen-Hsien
Institution WISHES TECHNOLOGY CORPORATION
Patent no. Haven't applied yet

Description In view of the fact that the use of batteries in various industries has become more and more extensive

EUROINVENT 2024

Therefore, “Wishes Technology” invested in the development of waste lithium battery recycling technology 10 years ago

Provide environmentally friendly and non-toxic recycling methods to decompose waste lithium batteries

The recycling efficiency as high as 90% can inject new strength into the recycling industry and contribute to environmental protection

Thailand

By ATIP

TH.1.

Title Conveyor-belt-based Water Hyacinth Storage Vessel

Authors Vidhaya Kasitinon

Institution Subwaree Construction Co., Ltd.

Patent no. 2102001646 / 2024

Description Water hyacinth (*Eichhornia crassipes*) is a rapid growing aquatic weed that thrives densely in rivers and wetlands. It leads to various problems such as obstruction of water flow, hindrance to aquatic transportation, and serving as a breeding ground for mosquitoes. Traditional manual harvesting of water hyacinth typically requires a crew of three individuals, consisting of one boat operator and two workers responsible for gathering the plant. Within the span of one hour, this labor-intensive process yields an average quantity of approximately 747.5 kilograms of harvested water hyacinth. Conveyor-belt water hyacinth vessel is an innovation for efficient water hyacinth removal, measuring 2.3m in width, 5.7m in length, and 0.72m in height, with a 0.38m draft. Powered by a 4,000cc diesel engine (60hp at 2,200rpm), it complies with EPA Tier 2 emissions standards. The circular cutting blade, rice cutting blade, paddle wheel, and sweeping feeding system efficiently manage water hyacinth infestations. The vessel's exceptional maneuverability allows it to navigate through floating weeds, continuously harvesting at an average rate of 854kg in 26.6 minutes. It can clear 170 sqm in one hour, yielding approximately 2 tons of harvested water hyacinths. Notably, a single operator can manage its efficient operations.

TH.2.**Title****AKRA™ : Thai Herb Aroma Inhaler****Authors**

Sudawan Somjai, Natnaporn Aeknarajindawat, Akramanee Somjai, Phattaraporn Thongnopkun, Chonlada Somjai

Institution

Suan Sunandha Rajabhat University

Patent no.

2403001059

Description

Migraines are severe headaches that can strike people of all ages, causing intense pain and disrupting daily activities. While medications can offer relief, they often come with unwanted side effects. AKRATM Thai herb aroma inhaler provides a natural, side-effect-free alternative for managing migraines. This innovative product utilizes a unique blend of essential oils extracted from five fragrant Thai herbs: Jasminum Sambac (L.), Mimusops elengi Linn., Mesua ferrea L., Mammea siamensis Kosterm., and Nelumbo nucifera Gaertn. etc.

A double-blind clinical trial was investigated the effectiveness of AKRATM Thai herb aroma inhaler in reducing migraine pain. The study is divided into 40 healthy participants for two groups. One group received the inhaler, while the other received a placebo, over a four-week period. The results showed a significant reduction in migraine pain intensity ($p < 0.001$) and migraine frequency ($p < 0.001$) in the group using the inhaler compared to the placebo group.

TH.3.**Title****Dr. JEL™ Dual Softgel****Authors**

Pannawit Chottechathammanee, Runchaya Chottechathammanee, Natnaporn Aeknarajindawat, Nattachai Aeknarajindawat

Institution

Organics Innovations Co., Ltd.

Patent no.

Pending

Description

The invention introduces a novel supplement form called Dr.JEL Dual Softgel, which utilizes a unique dual-layer mechanism to enhance drug delivery efficacy. This innovative approach incorporates various forms of medication, such as tablets, softgels, capsules, and pellets, within an outer softgel layer. The outer layer of the softgel is designed to release active ingredients in the stomach, while the inner layer, consisting of enteric-coated forms like

tablets, softgels, capsules, or pellets, is intended for release in the upper small intestine. This ensures that substances, which may be unstable or easily degraded in acidic conditions of the stomach, are absorbed, and activated in the small intestine, optimizing their efficacy and absorption. The two-stage release process of Dual Softgel ensures comprehensive and efficient delivery of medication or supplements, with the first layer acting in the stomach and the second layer targeting the small intestine.

The Dual Softgel has undergone various tests, including disintegration tests in accordance with CHP 2020 Volume IV General Rule 0921. Results demonstrated a disintegration time of 28 minutes in water, 24 minutes in a test solution, and 18 minutes in simulated intestinal fluid, showcasing the product's effective design for targeted release and absorption.

TH.4.

Title

LAB FARM™ : Immunity Boosting Herbal Supplement Capsule

Authors

Akkapol Yokyingyong, Natnaporn Aeknarajindawat, Nattachai Aeknarajindawat

Institution

Hopeful Co., Ltd.

Patent no.

2403001012

Description

LAB FARM™ immunity boosting herbal supplement capsule is formulated with a unique blend of plants and herbs designed to support immune system function, provide antioxidant benefits, and offer anti-carcinogenic properties.

This supplement capsule comprises a carefully measured mix of active ingredients, including Beta-1,3/1,6-glucans, sea buckthorn, maqui berry, quercetin, ginger, aegle, black pepper, and ginkgo, specifically selected for their known health benefits. The critical innovation of this supplement lies in its enteric-coated capsule with special fine polymer, ensuring that these beneficial compounds are protected until they reach the small intestine, the ideal place for absorption. Disintegration tests were conducted in accordance with CHP 2020 Volume IV General Rule 0921, results demonstrated a disintegration time of 3 minutes in simulated intestinal fluid at pH 7.4 and a temperature of 37 degrees Celsius, with the capsule completely dissolving within a period of 21 minutes

Turkey

TR.1.

Title

Dietary powder fortified with processed grains to enhance bodily systems

Authors

Aref Khalkhali, Mehrdad Mosadegh

Institution

Arya Toloue Aseman

Patent

99173

Nutrition Bio-Shield (NBS) is a uniquely formulated plant-based dietary supplement powder, rich in micronutrients such as vitamins, minerals, and bioactive compounds.

It is designed to regulate cellular metabolism and promote cellular detoxification, consequently enhancing overall health. Unlike other similar products, NBS contains no additives or chemicals. Furthermore, due to its plant-based nature, it is associated with minimal to no known side effects.

Description

Registered under number 99173 in Iran by Aref Khalkhali in the National Organization for Registration of Deeds and Properties, NBS has demonstrated its efficacy in various dimensions, particularly in strengthening the host immune system and significantly reducing mortality rates, as evidenced in reputable international journals.

Authors of these studies, Aref Khalkhali and Mehrdad Mosadegh, have been granted honorary membership in the American Society for Nutrition (ASN) due to their scientific contributions to the field of nutrition. Recently, a study conducted on acute COVID-19 patients has been aligned with the third United Nations Sustainable Development Goals.

Ukraine

UA.1.

Title
Analysis of the cat purring influence on humans
Authors

Diana Burova

Institution
Junior Academy of Sciences of Ukraine
Patent

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Description

It was defined that frames of the cat purring signal are similar to the human ECG and the human breathing period is similar to the periodicity of the purring signal frames. It suggests that purring adjusts the human heart rhythm. The principle of using the purring for rehabilitation was developed.

UA.2.

Title
Hardware and software complex for studying satellite television broadcasting signals
Authors

Anhelina Dromova

Institution
Junior Academy of Sciences of Ukraine
Patent

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Description

The relevance of the project lies in the need for operational control of the quality of television channel reception when setting up a satellite dish by measuring the parameters of satellite television broadcasting signals. The purpose of the work of the work: to create a hardware and software complex for studying the parameters of satellite television broadcasting signals. It was hypothesised that maximum measurement accuracy can be achieved by combining hardware and software measurement methods. The object of the project is satellite TV broadcasting systems of DVB-S and DVB-S2 standards. The subject of the study of the study is hardware and software for measuring the parameters of satellite TV broadcasting of DVB-S and DVB-S2 standards. According to the results of the study confirmed the hypothesis that it is possible to combine hardware and software methods for studying the parameters of satellite TV broadcasting signal and detected interference in the spectrum of the received signal during the experiments. The developed device supports the achievement of the ninth UN Sustainable Development Goal - industry, innovation and infrastructure, one of the components of which is stable

communication.

UA.3.

Title **Budget EMG Sensors**
Authors Andrii Haiduk
Institution **Junior Academy of Sciences of Ukraine**
Patent none

Description During my research I have made schematic and PCB designs of EMG sensors, soldered, conducted tests, and looked into digital filters that can greatly improve signal quality: filter out noise, smooth out signal, or convert it into different domains.

UA.4.

Title **The Fluxify mobile application**
Authors Oleksandra Krotova
Institution **Junior Academy of Science of Ukraine**
Patent No patent

Description Fluxify is a travel app that provides virtual tours with audio and text options. It caters to visitors who want to explore at their own pace and those with hearing impairments. Users can post photos from their visits, scan buildings to learn about them, and even virtually travel through time using 3D models.

UA.5.

Title **An environmentally safe method of obtaining a fibrous semi-finished product from Ambrosia Artemisiifolia**
Authors Anna Lahus
Institution **Junior Academy of Sciences of Ukraine**
Patent

Description Ragweed is a quarantine weed that causes a negative reaction in humans, but this is not its only drawback. It grows in crops of spring and winter crops, and during the growing season it dries out the soil. Therefore, we should find a way to dispose of it. This is a goal of my project to make a semi-finished product from it

UA.6.

Title Child resistant-caps
Authors Kateryna Peleshchynshyn
Institution Junior Academy of Sciences of Ukraine
Patent -

Description This project resolves the problem of children's access to first aid kits. I placed a labyrinth on the cap of a first aid kit, in the end of the labyrinth there is a button, which you have to press to open the kit. A child's finger isn't long enough to get to the end of the maze. My prototype was tested on children and the hypothesis was successfully confirmed.

UA.7.

Title Method of diagnostic non-contrasts fragments in the human body
Authors Bohdan Salenko
Institution Junior Academy of Sciences of Ukraine
Patent -

Description Research scientific work was devoted to the search and development of a new method of diagnosing the presence of non-contrast foreign objects (fragments) in a patient's wound by means of direct contact.

A study of controlled signals depending on the type of foreign object in the wound channel was conducted. As a result, the functional conditioning of the controlled signals from the shape and type of the foreign object was revealed.

The practical significance lies in the development of a fundamentally new tool for inspecting wound canals. consisting of a flexible probe for individual use and a holder handle with a microphone capsule, the membrane of which is directly connected to the probe and reacts to mechanical contact with an obstacle, and the capsule itself is directly connected to the oscilloscope through a signal amplifier. which has spectral signal processing chains.

This work can be used in military field surgery and surgery in general. This method can be used to diagnose fragments from any materials.

UA.8.**Title****Green Guard: a system for recognising diseased plants using a neural network****Authors**

Ivan Savchynskyi

Institution**Junior Academy of Sciences of Ukraine****Patent**

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Description

My project aims at improving crop management and increasing yields using advanced neural network technology. Green Guard is an innovative system based on artificial intelligence and microcontrollers that can autonomously determine whether a plant is healthy or not. The challenge was to create a system that could detect the health of a plant at any given time to predict yield losses and simplify the work of farmers.

South Korea & U.S.A.

by
AI-JAM US

US.1.

Title **Arduino-based DIY Eco-friendly Smart Farm Production**

Authors Juhyun Sung

Institution **BHA Jeju High School**

Description The purpose of this project is to create a smart farm using advanced technologies and automation to optimize plant growth and provide convenience to users. The key components used in this DIY smart farm include soil moisture sensors, light sensors, temperature and humidity sensors, cooling fans, and servo motors. By integrating these components, the smart farm, also known as the "Plant Incubator," can autonomously regulate and provide optimal conditions for plant growth.

US.2.

Title **Development of Efficient Operational Strategies for Cattle Farms through Smart Agriculture**

Authors Hohyeong Kim

Institution **SJA Jeju**

Description This paper explores the enhancement of cattle farming operations through smart agriculture techniques, aiming to contribute to the sustainability of agricultural production. With the agricultural sector heavily relying on cattle farming, the necessity for operational optimization is paramount. The study initiates by collecting a comprehensive dataset from cattle farms, encompassing cattle health indicators, productivity metrics, environmental conditions like temperature and humidity, and feed consumption data. Through exploratory data analysis (EDA), the research identifies critical factors affecting cattle farm operations, such as the relationship between cattle health and productivity and the influence of environmental conditions on output. Subsequent data preprocessing efforts ensure the data's readiness for model training by addressing missing values and applying normalization or scaling techniques to improve model accuracy.

US.3.

Title **AI- powered Intelligent Elevator Control System using Computer Vision(Version 1)**
Authors Hyunjin Nam
Institution **Saint Paul Academy Daechi**

Description The adoption of AIECS by major elevator manufacturers worldwide could yield significant benefits. For the users of elevators, the system promises substantial time savings and enhanced convenience. The system's advanced detection capabilities could minimize delays and improve the overall user experience by streamlining the operation of the elevators. It would ensure that elevators are dispatched more efficiently, reducing wait times and making the transportation process smoother and more pleasant for all users.

US.4.

Title **Superiority of Time Series Analysis and Machine Learning Prediction Models over Traditional Technical Analysis Methods in Financial Markets**
Authors Chaeun Lee
Institution **Asheville School**

Description This research paper presents a comprehensive comparative study between traditional technical analysis methods and modern analytical approaches that leverage time series analysis and machine learning (ML) prediction models. Through quantitative analysis and empirical research, this study assesses the flexibility, accuracy, complexity, learning curve, and data requirements of each method. The findings suggest that ML-based time series analysis offers superior predictive power, adaptability to diverse market conditions, and the ability to process and analyze vast datasets efficiently. The paper also explores the integration of traditional and modern methods to form hybrid models, offering enhanced predictive accuracy and insights for investors and market analysts.

US.5.**Title**

A study on Communication Interface for Speech-Impaired Individuals using AI Smartphone Solution

Authors

Seyoung Lee

Description

Can a smartphone-based communication interface using touch inputs, inspired by “hangul” which is the Korean alphabet, effectively facilitate communication for speech-impaired individuals?” there was still no service on the market that implemented a direct text messaging system. This makes communication between patients and caregivers difficult and sometimes leads to important needs being missed, which can delay emergency response in medical situations.

US.6.**Title**

Chemical Structures and Characteristics of natural and synthetic opioid for psychological disorders

Authors

Sijun Shin

Description

Neurotransmitters have been found to be highly effective in treating a range of human diseases, from traditional ones such as dementia and Parkinson's to modern ones such as depression and insomnia. In this study, the researchers aim to help medicine utilize these neurotransmitters by examining their characteristics and selecting some of the many that currently exist.

US.7.**Title**

Study on the correlation between schizophrenia and various brain waves and the ratio of waves

Authors

Yeseong Kim

Institution

Sage Hill School

Description

EEG sleep studies with individuals at high-risk for developing schizophrenia can provide valuable information about the neurobiology of the disorder and identify potential biomarkers of schizophrenia. Further research is necessary to establish whether reduced delta wave EEG could be a diagnostic biomarker for schizophrenia. While limitations exist, sleep EEG studies remain a promising area of research that can inform the neurobiological mechanisms that predict the transition to schizophrenia.

US.8

Title	Enhancing Decision-Making in Retail: Leveraging Time Series Analysis for Forecasting Sales Trends in a Global Superstore
Authors	Jinu Kang
Description	In the rapidly evolving world of retail, the ability to make informed decisions is crucial for staying ahead of the competition and meeting consumer demands. With the advent of digital technologies and the widespread availability of data analytics tools, retailers have unprecedented access to valuable insights that can drive strategic decision-making. This study explores the utilization of time series analysis to enhance decision-making processes within the retail sector, with a specific focus on forecasting sales trends for a global superstore. By leveraging advanced analytical techniques, retailers can gain deeper insights into consumer behavior, optimize inventory management, and maximize revenue opportunities.

US.9.

Title	Harnessing Art and AI to Promote Sustainable Energy Solutions through Environmental Data Analysis
Authors	Sieon Lee
Institution	Libertas Scholars College Prep
Description	In the face of escalating global environmental challenges, the quest for sustainable energy solutions has become more critical than ever. Addressing these concerns requires not only technological innovation but also effective strategies to engage the public and encourage widespread adoption of eco-friendly practices. This research paper delves into a novel interdisciplinary approach that combines the analytical prowess of environmental and energy data analysis with the compelling communicative power of art and artificial intelligence (AI). Through an extensive exploratory data analysis (EDA) of current environmental datasets and energy consumption patterns, we uncover pivotal trends and insights that underscore the pressing need for a shift towards renewable energy sources and the reduction of carbon footprints. Our study leverages AI-driven techniques to transform these data-driven insights into engaging and informative visual narratives, interactive art installations, and digital media pieces.

US.10.**Title**

A Study on the concept of flow state and its potential impact on attention

Authors

SEUNGWOO LEE

Description

this study contributes to our understanding of the relationship between flow state and attention in high school male students. It calls for further research and interventions to improve the attention and concentration levels of high school students. The findings of this study have practical implications for educators, parents, and researchers interested in understanding and improving the attention and concentration levels of high school students.

US.11.**Title**

A study on Mangrove Forest Carbon Sequestration

Authors

Junoh Bae

Institution

Asia Pacific International School Seoul

Description

Mangrove trees, which are typically found in tropical and subtropical regions around the world, play a significant role in carbon sequestration, a natural process that captures and stores atmospheric carbon dioxide. These trees have adapted to thrive in their unique habitats, such as coastlines, estuaries, and river mouths, through features like specialized root systems known as pneumatophores or prop roots. These adaptations allow them to obtain oxygen even when submerged in waterlogged soil.

US.12.**Title**

Device for Removing Fine Dust Using the Principle of Fractal

Authors

Jongmin Choi

Description

The experimental results presented in the document provide valuable insights into the effectiveness of different fine dust removal mechanisms within the device. The findings indicate that the device's various fine dust removal mechanisms work together to achieve a high level of effectiveness in removing fine dust particles from the air. One crucial finding is that the electrostatic-type fine dust removal mechanism is particularly efficient in removing fine dust particles. The table and figure demonstrate a consistent

reduction in the amount of fine dust in the air coming out of the device over time, indicating that the electrostatic mechanism is capable of removing fine dust particles in a sustained manner.

US.13.

Title

AI's Effect on the Pursuit of Knowledge and its Impact on Human Progress

Authors

Songjung Kim

Institution

Lake Forest Academy

Description

the future of AI holds both advantages and disadvantages. AI has the potential to improve various industries and aspects of life, but we must address the potential risks and ensure that AI systems are developed and deployed in an ethical and responsible manner. By doing so, we can harness the power of AI to improve the lives of individuals and communities around the world, and create a better future for all. The pursuit of knowledge and scientific exploration contribute to human progress. However, a balanced and holistic approach is vital. "The Birthmark" and Matthew Huston's article provide insights into the dangers of excessive knowledge focus. By considering the consequences of our actions, we can ensure human progress in the future. Neglecting these aspects can have negative consequences for society, potentially causing harm to individuals or the environment. Therefore, it is crucial to explore the consequences further in order to ensure a balanced approach to scientific research where knowledge can be acquired while taking morals and everyone's well-being into account.

US.14.

Title

Research on Personality Traits Differences between Dog Owners and Cat Owners

Authors

Seoyoung Lee

Institution

Hankuk Academy of Foreign Studies

Description

Owning a dog or a cat is often associated with different personality traits. Numerous studies have explored the variations in personality traits between dog owners and cat owners. These studies aim to understand the unique characteristics and preferences of individuals who choose to own dogs or cats as pets. One area of focus in this research is the Big Five personality traits:

openness, conscientiousness, extraversion, agreeableness, and neuroticism. These traits can provide insights into the psychological differences between dog owners and cat owners. For example, studies have found that dog owners tend to score higher in extraversion and agreeableness compared to cat owners. Dog owners are often described as more outgoing, sociable, and friendly. They are also perceived as more dependable, cooperative, and empathetic.

On the other hand, cat owners tend to score higher in neuroticism and openness. Cat owners are often characterized as more introverted, independent, and creative. They are also perceived as more sensitive, imaginative, and open to new experiences.

US.15.

Title

Proposal for Hydrogen Production Utilizing Efficient Electrolysis of Seawater with Lactobacillus

Authors

Wooju Do

Institution

BC Collegiate

Description

Hydrogen, which can be obtained through electrolysis from seawater or freshwater, is a future clean energy source. However, seawater requires a purification process to remove salinity, and freshwater also has the disadvantage of requiring electrical energy. In this study, it was confirmed through a nitrate-copper reaction that Lactobacillus numbers 8, 14, and 25, cultivated from 30 types of kimchi, emit electrons to the outside through a process called 'extracellular electron transfer chain'. By culturing these Lactobacillus strains that are confirmed to release electrons outside the cell through the 'extracellular electron transfer chain' process, removing foreign substances from the culture media they have grown in, mixing with triple-distilled water, and performing electrolysis, the amount of H₂ gas generated greatly increased at the same voltage. This confirmed that a relatively large amount of H₂ gas can be produced with small power. Also, in the case of seawater, it was confirmed through research that the production of H₂ gas can be promoted by diluting seawater with freshwater without going through a purification process, and adding the culture medium where Lactobacillus has been cultured. This can be the beginning of providing an environmentally friendly option for producing economical hydrogen, as it uses less energy in the electrolysis process of seawater and does not require a purification process to remove salinity or other impurities in seawater.

US.16.	
Title	Analyzing Appropriate Shelters for Southeast Asian Refugee Camps:Comparative Look at the Hex House versus Bamboo Structures
Authors	Soobin Chun In the analysis of appropriate shelters for Southeast Asian refugee camps, two innovative designs have emerged as noteworthy contenders: the Hex House by Architects for Society and the bamboo structures by Agora Architects. Both designs offer unique solutions to the pressing need for emergency housing, but they approach the challenge from different perspectives and with different resources, making a comparison both relevant and insightful.
Description	
US.17.	
Title	Research on the fundamental principle of GPT, which is Transformer modeling, is being conducted
Authors	Jooye Lee
Institution	SAINT PAUL PREPARATORY SEOUL GPT demonstrates excellent performance in natural language processing based on this Transformer modeling. GPT pre-trains on massive amounts of text data and can perform various natural language processing tasks based on this pre-training. As a result, GPT excels in tasks such as natural language generation, machine translation, and question-answering, and ongoing research is being conducted on GPT modeling. Therefore, research on the fundamental principle of GPT, which is Transformer modeling, receives significant attention in the field of natural language processing, and we can expect the emergence of more advanced models and techniques in the future.
Description	
US.18.	
Title	Investigating the Potential of Harnessing Smart Farm Technology for Domestic Biofuel Production
Authors	Minseong Kim many scientists conduct research about it. However, their fuel is made in industrial ways. I will conduct an experiment to make a biofuel in algae which can be grown at home. It can be used both to decorate the home and make a fuel. Also, there are many microalgae in river. Fuel can also be made in that area. There are many advantages to disposing of algae in the river - to purify water and to get fuel. In this way, biofuel is obtained in a natural way.
Description	

US.19.	<p data-bbox="314 233 953 320">Exploring the use of plants and gardening as a means to produce sustainable materials and contribute to urban revitalization</p> <p data-bbox="150 325 538 352">Authors Evelyn Joonhee Koo</p> <p data-bbox="150 520 281 547">Description We are delving into the potential of plants and gardening as an innovative sustainability solution. This investigation goes beyond viewing plants as merely aesthetic elements, but rather as resources that can be harnessed to create sustainable materials. These materials can then be used in various sectors, contributing significantly to urban revitalization. The aim is to transform our urban environments into green, sustainable, and liveable spaces. This approach provides a dual benefit: it not only enhances the beauty and usability of urban areas but also contributes to environmental conservation by promoting the use of biodegradable and renewable resources. This exploration presents an exciting opportunity to redefine urban living, making it more aligned with environmental sustainability goals.</p>
US.20.	<p data-bbox="314 788 938 842">Formulating a Relief Lotion for Acute Symptoms from Atopic Dermatitis</p> <p data-bbox="150 847 418 874">Authors Jihye Lee</p> <p data-bbox="150 879 594 906">Institution Cushing Academy, MA</p> <p data-bbox="150 975 281 1002">Description Our data demonstrated that our main formulation and its derived groups showed more favorable properties for AD in relative stability, moisturization, and sensitivity than a commercial product. Further, its antibacterial strength was better than the eczema therapeutic cream. More clinical studies might be needed for further confirmation of the lotion quality.</p>
US.21.	<p data-bbox="314 1147 833 1201">Expression, purification, and confirmation of recombinant protein of Taq DNA polymerase</p> <p data-bbox="150 1206 465 1233">Authors Minjune Choi</p> <p data-bbox="150 1334 281 1361">Description the successful expression and purification of Taq DNA polymerase from E. coli in the experiment demonstrated the importance of protein purification and quality control in ensuring the accuracy and reliability of experimental results. Taq DNA polymerase is an essential enzyme in PCR and is frequently used in genetic research. This experiment provides valuable insights into the process of Taq DNA polymerase purification and the use of E. coli as a host organism for protein expression.</p>

US.22.	<p data-bbox="314 231 934 320">Promoting healthier dietary habits across diverse populations through pattern analysis of eating healthy food</p> <p data-bbox="150 325 432 352">Authors Sejun Kim</p> <p data-bbox="150 448 284 475">Description</p> <p data-bbox="314 357 969 576">In this project, our objectives are twofold. Firstly, we aspire to maximize the availability and accessibility of health information for consumers. We believe that having access to accurate and comprehensive nutritional information is crucial for individuals to maintain a healthy and balanced diet. Secondly, we aim to optimize the nutritional components of food products, ensuring that they not only meet the taste preferences of consumers but also contribute positively to their nutritional intake.</p>
US.23.	<p data-bbox="314 639 925 699">Simulation of Spinal Cord Compression from Cancer Using the Action Potentials from <i>L. Terrestris</i></p> <p data-bbox="150 703 437 730">Authors Aiden Kim</p> <p data-bbox="150 788 284 815">Description</p> <p data-bbox="314 730 969 868">This study investigated the impact on evoked action potential (AP) parameters such as response duration (RD), peak potential (PP), action potential width (APW), and nadir potential (NP) to examine any functional relationship for the standard weights placed on <i>Lumbricus terrestris</i>' body.</p>
US.24.	<p data-bbox="314 948 925 1007">Harvesting Energy via Piezoelectricity for Embedded Systems</p> <p data-bbox="150 1011 415 1038">Authors Ella Kim</p> <p data-bbox="150 1176 284 1203">Description</p> <p data-bbox="314 1043 969 1339">This paper presents a proposal to study how piezoelectric materials can be used to more efficiently generate power for embedded systems. By taking advantage of the properties of dielectric materials that develop polarization under mechanical strain, an electric field can be generated. Converting this mechanical energy through the deformation of the material into electric energy, piezoelectric energy harvesting techniques will be focused on powering low-power electronics in the ranges of microwatts to milliwatts of power. Under the right conditions with persistent ambient vibration, sufficient amounts of power can be provided to power electronics in embedded systems.</p>

US.25.	<p>Title ThermoGuard: Keeping You in the Comfort Zone</p> <p>Authors Taehyun Kim</p> <p>Institution Seoul Scholars International</p> <p>Description Engineered for constant comfort, this innovative garment combines an electronic heating element with advanced ventilation systems. Whether it's keeping you warm on chilly days or cool during activities, the Smart Jacket adjusts to maintain your ideal temperature, ensuring comfort in any weather. Ideal for the active and style-conscious individual, experience the perfect blend of technology and fashion.</p>
US.26.	<p>Title Development of Nutramen With healthier nutrients</p> <p>Authors Seeun Jang</p> <p>Institution Busan Foreign School</p> <p>Description Introducing a healthier, more sustainable ramen option: our low-sodium ramen combines nutrient-rich vegetables and protein with a savory stock, offering a deliciously guilt-free meal. Our noodles are air-baked for a healthier, tastier alternative to traditional dried noodles. Packaged in environmentally friendly, recyclable materials, we also offer vegan options to cater to diverse dietary preferences. Enjoy a modern twist on classic comfort food that's better for you and the planet.</p>
US.27.	<p>Title CityField provides the joy of sports, one field at a time</p> <p>Authors Chaeyoon Lee</p> <p>Institution Wilbraham & Monson Academy</p> <p>Description This project transforms unused rooftop spaces into vibrant community hubs, offering a safe and engaging environment for soccer enthusiasts and fostering social interaction in a metropolitan setting. By integrating state-of-the-art design features such as artificial turf, efficient drainage systems, and safety barriers, our rooftop soccer fields are not just functional but also environmentally conscious and visually appealing. This introduction to rooftop soccer fields outlines the benefits, necessary features, and design considerations that make these spaces both sustainable and enjoyable. Join us in reimagining urban landscapes and promoting an active lifestyle through this exciting initiative.</p>

US.28.**Title** **Smart Tooth Brush Design Using AI and IoT Technology****Authors** Seungmin Bae**Institution** **Pennfoster highschool****Description**

This paper presents an innovative smart toothbrush design that integrates Artificial Intelligence (AI) and Internet of Things (IoT) technologies to enhance oral hygiene. The smart toothbrush is equipped with sensors that collect real-time data on brushing habits and oral health parameters. Utilizing AI algorithms, the toothbrush analyzes this data to provide personalized feedback and recommendations for improving brushing techniques and overall dental care. IoT connectivity allows the toothbrush to sync with mobile applications, enabling users to track their oral hygiene progress and receive alerts for dental appointments or reminders to replace brush heads. This advanced design aims to promote better oral health by offering a more engaging, informative, and efficient brushing experience.

US.29.**Title** **Bayesian Decision Theory for Data Science and Business****Authors** Cheyounng Kim**Description**

The application of Bayesian Decision Theory in data science and business, highlighting its potential to improve decision-making processes under uncertainty. Bayesian Decision Theory provides a probabilistic framework that combines prior knowledge with new evidence to update beliefs and make informed decisions. In data science, this approach is utilized for predictive modeling, anomaly detection, and risk assessment, enhancing the accuracy and robustness of analytical models. In business, Bayesian methods support strategic planning, marketing, and financial forecasting by incorporating uncertainty and variability into decision-making processes. By integrating Bayesian Decision Theory, organizations can leverage data-driven insights to optimize outcomes, reduce risks, and achieve more effective and resilient decision-making in dynamic environments. This paper discusses practical implementations, benefits, and case studies demonstrating the impact of Bayesian Decision Theory on data science and business operations.

US.30.**Title** **Device for fatigue and drowsiness detection using IoT and AI****Authors** Eugene Lee Rho**Description** A novel device designed to detect fatigue and drowsiness in real-

time using the combined power of Internet of Things (IoT) and Artificial Intelligence (AI) technologies. The device is equipped with sensors to monitor physiological signals such as heart rate, eye movement, and brain activity. Leveraging IoT, these sensors continuously transmit data to a cloud-based system where AI algorithms analyze the data to identify patterns indicative of fatigue and drowsiness. The AI models are trained to recognize subtle changes in physiological signals, enabling early detection and timely alerts. The device can be integrated with various applications, including transportation, workplace safety, and healthcare, to enhance safety and productivity. By providing real-time monitoring and alerts, this device aims to prevent accidents and improve overall well-being. The paper discusses the device's design, implementation, and potential impact on reducing fatigue-related incidents through intelligent monitoring and intervention.

US.31.

Title

The Truth about Labor and Artificial Intelligence

Authors

Hyeonggi Park

Description

This paper investigates the complex relationship between labor and Artificial Intelligence (AI), examining both the opportunities and challenges presented by AI integration in the workforce. AI has the potential to revolutionize industries by automating repetitive tasks, enhancing productivity, and driving innovation. However, it also raises concerns about job displacement, workforce inequality, and the need for new skill sets. The study explores how AI is transforming various sectors, the types of jobs most vulnerable to automation, and the emerging roles that AI technology is creating. It also addresses the socio-economic implications of AI on labor markets, including potential shifts in employment patterns and the demand for reskilling and upskilling. By providing a balanced perspective, this paper aims to offer insights into how businesses, policymakers, and workers can navigate the evolving landscape of labor and AI, ensuring that the benefits of AI are maximized while mitigating its adverse effects on employment.

United States of America

By *TISIAS*

US.32.

Title

Automatic tropical fruits harvesting and tending robot

Authors

Nguyen Minh Son

Institution

Lake Forest Academy, Chicago, IL, USA

Patent no.

N/A

Description

Tropical fruits boast high profits and robust export potential, yet their varied shapes, sizes, and delicate features pose challenges for automated harvesting. This study seeks to build an automatic harvesting and monitoring solution, mirroring human actions to support farmers and unlock new export avenues. Through meticulous research, we devised an optimal operational framework for programming the recognition application, which formed the foundation for designing both the recognition and control systems. Leveraging image acquisition and TensorFlow algorithms, our machine adeptly discerns fruit features and detects irregularities or diseases. A flexible mechanical arm with five axes, crafted from 3D printed components and controlled by an Arduino Mega 2560 board, was tailored to navigate diverse terrains and execute caregiving and harvesting tasks. Fruit coordinates are relayed via Bluetooth to the Arduino board, directing the system's actions. Integration of hardware and software preceded rigorous real-world testing, validating the machine's prowess. Results showcased its ability to accurately identify and harvest 25 tropical fruits within 70 seconds, boasting superior operational efficiency and recognition accuracy.

Class no.

Vietnam

By SANVIC

VN.1.

Title

SYSTEM TO INVESTIGATE THE PROPERTIES OF CARDIOMYOCYTE CELLS BASED ON COMPUTER VISION

Authors

Le Trong Gia Duc, HUS High School for Gifted Students, VNU University of Science, 182 Luong The Vinh, Thanh Xuan, Hanoi, Vietnam

Institution

HUS High School for Gifted Students, Hanoi City, Vietnam

Patent

Patent pending

Description

Cardiovascular diseases (CVDs) remain the leading cause of global mortality, responsible for approximately 17.9 million deaths annually, such as myocarditis, arrhythmia, dilated cardiomyopathy, etc. Currently, to facilitate disease treatment, cardiomyocytes grown from autologous stem cells are of research interest. These cells could be used to test drugs to detect drug reactions to each patient's heart cells. The electrocardiogram method is commonly used to detect heart abnormalities, and it uses electric current to measure heart rate. When the heart contracts, it will emit variations in electric current. However, because the heart muscle cells are tiny with a diameter of less than 1 mm, using an electrocardiogram will make it difficult to contact the electrode and may cause the cells to die. To solve this problem, we devised an idea for measuring the rhythm of small cardiomyocyte cells without direct contact with them. We created a microscope system to record the activity of cardiomyocyte cells and then save it to video as an mp4 file. Then, we used image processing technology to count the number of cardiomyocyte cell beats under different environmental conditions and time. Image processing technology is the processing of 2D images into digital form, providing important and useful information for research practice. Specifically, we used computer vision to obtain the properties of cardiomyocytes. Computer vision is a technology that enhances images and enlarges and analyzes images in detail. Thanks to that, we can easily count the beats of cardiomyocyte cells and apply this method for drug testing in the future.

NATIONAL EXHIBITORS

Universities
Research Institutes
Companies
Individuals

**THE NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
POLITEHNICA BUCHAREST**

RO.1.

Title EN	HIGH ENTROPY ALLOY COATINGS PRODUCED BY ELECTRO SPARK DEPOSITION WITH SUPERIOR PROPERTIES
Authors	Geambazu Elena Laura, Manea Ciprian Alexandru, Semenescu Augustin
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>
Patent no.	Patent application No. A 00408-2022
Description EN	<p>The current invention refers to high entropy alloys deposited by electro spark deposition technique, with the goal of obtaining coatings with superior properties for aggressive media as the geothermal environment, specifically the leading edge of the geothermal turbine blades.</p> <p>The process of obtaining the metallic coatings started from the homogenization of very high purity of Co, Cr, Fe, Ni and Mo powder materials, followed by a wet mechanical alloying in Ar atmosphere. After an alloying time of 30 hours, the CoCrFeNiMo_{0.85} high entropy alloy was microstructurally and chemically analyzed showing a high degree of alloying and a good homogenization throughout the mass. There were no contaminations present in the material and the oxygen content was minimal. After mechanical alloying, the samples were consolidated by pressing and sintering, after which they were cut in order to obtain the electrodes for the electro spark deposition. The coating was deposited on a stainless steel substrate and the microstructural results on the surface of the deposited layer, but also cross section, presented a uniform layer, without major defects and with good homogeneity.</p>

RO.2.

Title EN	Hf-Nb-Ta-Ti-Zr BASED HIGH ENTROPY ALLOY COATINGS OBTAINED USING THE ELECTROSPARK DEPOSITION METHOD
Authors	Manea Ciprian Alexandru, Geambazu Elena Laura, Semenescu Augustin
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>

Patent no.	Patent application No. A 00406-2022
	The present invention refers to the HfNbTaTiZr high entropy alloy coatings obtained using the electrospark deposition technique, a coating that exhibits superior properties in corrosive environments. The process of obtaining high entropy alloy coatings starts from high purity (>99%) metallic powders of hafnium, niobium, tantalum, titanium and zirconium in equiatomic ratio. The metallic materials were homogenized in a planetary ball mill and then alloyed for 60 h with the aim of obtaining a higher alloying degree according to the microstructural results. The milling parameters included: 10:1 ball to powder ratio and a speed of 300 RPM. For the homogenization and alloying process, stainless steel vials and balls and an argon atmosphere were used to have a minimal degree of oxidation. In order to obtain a bulk material, the HfNbTaTiZr high entropy alloy powder was consolidated by Spark Plasma Sintering (SPS) technique, the best results being obtained in vacuum at a temperature of 1000°C and a pressure of 50 MPa, from which the electrodes for deposition were mechanically processed. The deposition was carried out under an argon atmosphere to reduce oxidation during the process, by depositing successive thin layers obtaining a uniform coating with good homogeneity, reduced porosity and minimal defects. The corrosion rate resulted from the saline solution corrosion test had a very low value (0.00024 mm/year) demonstrating the performance of the coating.
Description EN	

RO.3.

Title EN	PROCEDURE FOR OBTAINING A COMPOSITE COATING WITH INCREASED DURABILITY ON A METAL SURFACE
Authors	Vili Pasare, Dan Florin Nitoi, Augustin Semenescu, Mihnea Cosmin Costoiu, Oana Roxana Chivu, Dragos-Florin Marcu, Radu Claudiu Fierascu, Irina Fierascu, Raluca Somoghi
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>
Patent no.	Patent application No. A-00150/2023
Description EN	The invention refers to a procedure for obtaining a composite coating with increased durability on a metal surface, especially on a brake roller, by successively depositing of

layers of liquid epoxy resin mixed with sand granules on a metal surface, supported and rotated by using some bearings assembled in a casing which in turn is mounted on a support plate.

RO.4.

Title EN	Composite Coating Material With Anticorrosive And Anti Scratching Properties
Authors	Radu Claudiu Fierascu, Vili Pasare, Augustin Semenescu, Mihnea Cosmin Costoiu, Dan Florin Nitoi, Oana Roxana Chivu, Dragos-Florin Marcu, Irina Fierascu, Raluca Somoghi
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>
Patent no.	Patent application No. A-00151/2023
Description EN	The present invention refers to a composite coating material, which simultaneously presents high cohesion and a high degree of scratch resistance, dedicated to the steel-carbon type support materials, offering at the same time anti-corrosion protection.

RO.5.

Title EN	3D PRINTED LOWER LIMB PROSTHETIC CUP WITH SKIN PROTECTION COMPONENT
Authors	ALEXANDRESCU Dragos-Vivi, ANTONIAC Vasile Iulian, SEMENESCU Augustin
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>
Patent no.	Patent application No. A-00151/2023
Description EN	The invention refers to an innovative 3D printed lower limb prosthetic cup with skin protection component, attached to limbs that have undergone amputations, a component that connects the complex, organic geometry of the anatomical structure, with a component with a simple geometry that takes over the functional role of the limb, covered at interior with a composite material with a polymer base (polydimethylsiloxane) reinforced with copper nanoparticles (10%) to have antimicrobial properties, developed due to the need to make customized components in a fast, efficient way, with a low consumption of material and with a sales. The components of the protective cup are obtained from a composite (polylactic acid (PLA), poly-acrylic-butadiene-

styrene (ABS) or thermoplastic polyurethane (TPU)), using two filaments with added nanoparticles: one with added silver and one with addition of copper, both with an antibacterial role.

RO.6.

Title EN	System and method for collecting, analyzing and classifying incidents that occur in an operational area, based on Artificial Intelligence algorithms for the processing and analysis of aerial information acquired with LIDAR and video cameras in the visible and thermal spectrum, for the protection of Critical Infrastructures
Authors	DUMITRESCU Cătălin Marian, CHIVA Ionuț-Cosmin, SEMENESCU Augustin, NECULA Horia, FLOREA Bogdan
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>
Patent no.	Patent application No. A 00719/2023
Description EN	The invention relates to a method and a hardware system for the collection, analysis and classification of incidents occurring in an operational area, based on Artificial Intelligence algorithms for the simultaneous processing and analysis of information acquired from LIDAR and video streams and still images aerial from the visible and thermal spectrum, for the protection of Critical Infrastructures.

RO.7.

Title EN	Procedure for Surface Saturation with Carbon and Nitrogen of Metal Surfaces Using the Electro-Spark Deposition
Authors	Mihai Ovidiu Cojocaru, Mihai Brânzei, Cosmin Cotruț
Institution	National University of Science and Technology POLITEHNICA of Bucharest
Patent no.	OSIM :A/0045/11aug-2023
Description EN	The process of superficial saturation with Carbon and Nitrogen of metal surfaces using the effect of anodic erosion and polar transfer on the surface of the cathode (the product subjected to processing) uses carbamide powder (technical urea) - $[\text{CO}(\text{NH}_2)_2]$ as a supplier of the elements of interest, mixed with an electro-conductive component, usually a self-curing acrylic resin injected into a pipe made of pure

technical iron foil (Fe-ARMCO). By initiating the electric discharge, the elements of interest are electro-deposited on the surface of the cathode. The coating thickness strictly dependent on the discharge parameters and the time (number of passes) allocated to the process.

Using such a process and source of C and N, on an HS18-0-1 alloy tool steel substrate, a coating thickness of about 25 μm was obtained. In certain microvolumes, 7.63 wt% C and 13.01 wt% N were measured. The values of the process parameters were: the discharge energy of about 1.0 J/pulse, the current intensity of about 1.5 A, the frequency of the pulses being 100 s^{-1} , and the processing time of 1.5 min/cm^2 .

RO.8.

Title EN	Hydroxyapatite Deposition Process by the Electro-Erosion Method and Polar Transfer (Electro-Spark Alloying)
Authors	Mihai Ovidiu Cojocaru, Mihai Brânzei, Cosmin Cotruț, Ștefan Alexandru Lăptoiu
Institution	National University of Science and Technology POLITEHNICA of Bucharest
Patent no.	OSIM: A/100455/11aug-2023
Description EN	<p>The hydroxyapatite deposition process by the electro-erosion method and polar transfer (electro-spark alloying) uses a mixture of hydroxyapatite powder as the agent providing the elements of interest, and an electro-conductive component, usually a self-polymerizing acrylic resin, injected into a pipe of pure tantalum foil (or another bioinert metal). By initiating the electric discharge, the elements of interest, Calcium, Phosphorus, but also Tantalum in a certain proportion, are electro-deposited on the surface of the cathode. The coating thickness is strictly dependent on the discharge parameters and the time (number of passes) allocated to the process.</p> <p>Using such a process and source of Ca and P, on an Ti6Al4V alloy substrate, a coating thickness of about 50-60 μm was obtained. In certain microvolumes, 2.96 wt% Ca and 1.39 wt% P were measured. The percentage of Ta in the coating was about 11.4%. The values of the process parameters were: the discharge energy of about 0.75-1.0 J/pulse, the current intensity of about 1.0-1.5 A, the frequency of the pulses being 100 s^{-1}, and the processing time of 1.5 min/cm^2.</p>

RO.9.

Title EN	Photocatalysis and device implementing same
Authors	Cristian Predescu, Ruxandra Vidu, Ecaterina Matei, Andra Mihaela Predescu, Mirela Gabriela Sohaciu, Andrei Constantin Berbecaru, Grigore Vlad
Institution	National University of Science and Technology POLITEHNICA Bucharest
Patent no.	Patent application no. US2021/0261443 A1 / 26.08.2021
Description EN	<p>The present invention relates to a process providing a photocatalytic treatment of water in a baffled wastewater purification tank. Specifically, the invention relates to a method for controlling the fluid flow using photocatalytic baffles, resulting in improves surface area for the photocatalytic reaction photon efficiency.</p> <p>Photocatalytic baffles are pads coated with a photocatalytic material or pads that have attached a photocatalytic film. In both cases, the surface of the photocatalytic baffles can be regenerated or replaced. The present invention also includes an improved photoreactor design which allows controlled circulation of the fluid under illumination, in which the pollutants present in water constantly move towards and attached to the deflecting baffle surface where the reaction takes place. The method of the present invention further allows the calculation of the time required to increase photocatalytic efficiency under conditions of continuous illumination for certain pollutants</p> <p>The present invention is useful in the removal of organic contaminants from liquid phases, including aqueous and organic liquids, gas phases, and in the purification of pharmaceutical and industrial waste waters.</p>

RO.10.

Title EN	Collagen Nanofibers from Fish Scale and Procedure for Obtaining
Authors	Gaidau Carmen Cornelia, Rapa Maria, Stanca Maria, Predescu Cristian, Alexe Cosmin-Andrei
Institution	<i>National University of Science and Technology POLITEHNICA Bucharest, RO</i>
Patent no.	Patent application No. A 2022 00782/29.11.2022
Description EN	The invention presents a process for obtaining collagen extracted from fish scales with spinable properties, and

obtaining collagen nanofibers, which consists in crushing the fish scales, successive washing with solutions of sodium chloride, sodium hydroxide, n-butanol and distilled water, treatment with EDTA, in one version and without EDTA, in the second version, heating at 60°C for 12 hours, filtering and drying. The obtained collagen is dissolved in acetic acid solution and electrospun with a flow rate of 1-2 mL/hour, at a voltage of 22.19-23.24 kV, at a distance of 13 cm, at 26.0-26.5 °C and 10% RH, when a matrix of collagen nanowires with dimensions of 176.9 nm and 110 nm is obtained, with the potential to be used to make non-active dressings, to treat wounds and other medical applications.

RO.11.**Title EN**

Collagen and Collagen-Keratin Nanofibers from Donkey BY-PRODUCTS. PROCESS FOR THEIR OBTAINING

Authors

Maria Râpă, Carmen Gaidau, Ecaterina Matei, Maria Stanca, Daniela Mariana Berechet

Institution

National University of Science and Technology POLITEHNICA Bucharest, RO

Patent no.

Patent application No. A 2022 00770

**Description
EN**

The invention refers to a composition for making nanofibers based on collagen and keratin obtained from hides and hair of donkey and to a method of obtaining them. The nanofibers obtained could be utilized for non-active medical dressings. The composition according to the invention comprises the following elements expressed as a percentage by weight: 12% collagen or collagen-keratin mixture and 88% acetic acid solution in water, with a volume ratio of 9:1 for acetic acid and water. The process according to the invention involves obtaining a working solution from the above elements. The resulting solution is then introduced into a syringe fixed in a pump and electrospun with a flow rate between 0.6 to 0.8 mL/h. The needle used for electrospinning has an inner diameter of 0.168 mm and is connected to a high voltage source ranging from 22.71 to 25.59 kV. The distance between the end of the needle and the collector is set between 9 to 14 cm, resulting in nanofibers with a variable diameter between 73 to 133 nm.

RO.12.**Title EN****The process of obtaining materials based on alkali-activated glass with intumescent properties****Authors****Adrian Ionut NICOARA, Alina Ioana BADANOIU****Institution**

National University for Science and Technology Politehnica Bucharest

Patent no.

A/00463/29.06.2022

**Description
EN**

The invention refers to a process for obtaining alkali activated materials with intumescent properties which consists in mixing a solid component, represented by a glass powder and CaCO_3 , in percentages between 5...30% from the glass weight, with a liquid component represented by an alkaline activator solution consisting of a 70-30% mixture of NaOH and Ca(OH)_2 .

According to this production process, the silico-calco-sodium glass waste are ground to a specific Blaine surface between 2000-3000 cm^2/g . The powder obtained is mixed with CaCO_3 and after homogenization for 10 min at 100 RPM, a mixture of NaOH and Ca(OH)_2 is added (the mass ratio between the activator solution and the glass powder is between 0.15 and 0.21 depending of the degree of substitution of the glass with CaCO_3 powder) under continuous stirring at the speed of 500 RPM for 10 min. After homogenization, the pasta is poured into molds and subjected to a maturation treatment at a temperature of 60°C for 48 hours, then it is removed from the mold and stored in the air (normal storage conditions). The obtained material is characterized by a mechanical strength at 28 days between 22.99...27.50 MPa, respectively by a swelling degree of up to 77% at a temperature of 900°C .

RO.13.**Title EN****Method for obtaining nanostructured $\text{Cu}_2\text{ZnSnS}_4$ thin layers with a continuous concentration gradient for photovoltaic applications****Authors****Iulian BOERASU, Bogdan Stefan VASILE, Otilia Ruxandra VASILE, Roxana Doina TRUSCA, Adrian Vasile SURDU, Valentin CRACIUN****Institution**

National University for Science and Technology Politehnica Bucharest

Patent no.

A/00034/06.02.2024

Description
EN

The present invention refers to a method of obtaining of high quality thin nanostructured layers of photo-absorbing $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) with a continuous compositional gradient in the volume of the layer, obtained by varying the $\text{Cu}/(\text{Zn}+\text{Sn})$ ratio from 0.80 to 0.90, thus varying the Zn/Sn ratio from 1.1 to 1.3, while kept the Cu/Sn ratio fixed at the value of 1.6. The method is based on the growth of thin nanostructured layers of $\text{Cu}_2\text{ZnSnS}_4$ on soda glass substrates coated with semitransparent molybdenum by solutions deposition technique (Sol-Gel/Spin Coating), a cheap reproducible technique and perfectly integrated into existing industrial technological processes. The process, according to the invention, allows the growth in a single step of a thin layer of CZTS with a composition gradient, through the continuous variation of the Cu concentration, starting from a Cu poor composition at the substrate surface to a rich Cu composition at the layer surface, with the aim of implementing these layers as photo-absorbers in solar cells with high conversion efficiency.

RO.14.

Title EN **Method for obtaining nanoparticles using a multifunctional microfluidic platform**

Authors **Cristina UNCU (CHIRCOV), Alexandra Cătălina BÎRCĂ, Bogdan Stefan VASILE, Alexandru Mihai GRUMEZESCU**

Institution National University for Science and Technology Politehnica Bucharest

Patent no. A/00476/04.08.2022

Description
EN

The present invention refers to the use of a multifunctional microfluidic configuration for nanoparticle synthesis. The configuration involves the use of five overlaid and screw-fastened plates that can be fabricated from various materials. Each plate contains components specific for each step required for the obtaining of the nanoparticles. Within the first plate, there are four orifices for the insertion of Teflon tubes which can be adjusted according to their diameter (between 0.5-3.5 mm). On the second plate, there are intermediate orifices with reduced diameter (between 0.25-2.5 mm) to reduce the pressure when introducing the solutions. Within the third plate, there are channels through

which the reagent solutions required for synthesis will flow, channels or chambers for mixing, and a junction channel, where the actual nanoparticle synthesis reaction takes place. The nanoparticles once synthesized will be collected in the specific collection chamber within plates two, three, and four, where they can be washed by replacing the reagent solutions with water. Finally, the nanoparticles will be collected through a channel and outlet orifice within plates four and five, respectively.

RO.15.**Title EN**

Process for regenerating end-of-life products for reuse in mortars/concrete

Authors

Adrian Ionut NICOARA, Ionela Andreea NEACSU, Bogdan Andrei ILIE, Bogdan Stefan VASILE, Otilia Ruxandra VASILE, Andrada-Elena NICOARA, Mirijam VRABEC, Saso STRUM, Sorour Semsari PARAPA

Institution

National University for Science and Technology Politehnica Bucharest

Patent no.

A/00506/15.09.2023

**Description
EN**

Alternative process for obtaining concrete, which consists in the use as an alternative raw material to ordinary Portland cement (OPC) of waste from historical dumps in Romania (thermal power plant deposits), in various proportions between 40±20% thermally activated ash. Power plant ash is collected directly from the dump located near the Turceni power plant, Gorj county. After collection, it is dried at a temperature of 60°C for 2 days in order to eliminate moisture, then it is ground with the help of a mill to the required fineness and completely passed through a 63µm sieve. After grinding, it is thermally treated at a temperature of 700°C for 2 hours, it is dosed so that the compositions fall within the mentioned ratios, it is mixed with ordinary Portland cement powder and sand (in a mass ratio of 1:3) and later mix with water under stirring, as described in the SR EN 197-1:2011 standard. After 24 hours, the samples are kept in water at a temperature of 20±2°C and tested at intervals of 1, 7, 28 and 90 days respectively, according to SR EN 196-1:2016. Portland cement obtained by mixing CEM I cement and thermally activated ash is characterized by an initial setting time between 266.21 and 283.44 minutes and final setting time between 606.49 and 671.13 minutes, compressive strength at 1 day between 11.78 and 17.64 MPa and at 28 days between 49.98 and 58.22 MPa depending on the percentage of ash added.

RO.16.**Title EN****DEMONSTRATOR - ELECTRO-METALLURGICAL METALOTHERMAL CONVERTER****Authors****COMAN TUDOR-ADRIAN****Institution****National University of Science and Technology POLITEHNICA Bucharest – Faculty of Materials Science and Engineering****Patent no.****PCTRO2023000010**

The invention refers to a process and an installation used for obtaining thermal-electric energy cleaner and more efficiently, complementary to obtaining metallurgical products such as processed alloys and abrasive and/or heat-resistant materials. The process proposes the metallothermic release of the potential chemical energy existing at the atomic level in metallothermic mixtures and its use for simultaneously obtaining thermal-electric energy and metallurgical products. The metallothermic mixtures used consist of oxide powders derived from iron ores (without pyrites and without siderites) and/or steel smelting wastes, mixed and homogenized with both metallothermic reducing agent powders (e.g., aluminum) and reaction inhibitors, alloying materials, and fluxes, conditioned granulometrically.

**Description
EN**

The process utilizes the oxide-reduction of metallothermic mixtures. This takes place at temperatures around 2300°C and generates alloys, slag, reaction gases (containing minimal amounts of CO₂, NO_x, H₂S, SO₂, or SO₃), complemented by the release of convertible heat energy (minimum 22%) into thermal-electric energy. The corresponding installation is shown in figure 3. It consists of both a Raw Materials Preparation Plant and a technological assembly for their valorization. The technological assembly has as its main sub-assembly a refractory crucible (e.g., graphite), partially evacuated, with double walls between which a cooling and heat transfer fluid is circulated (a thermostatic melt of tin or copper). Thus, the crucible generates the metallurgical products and the heat energy necessary for obtaining steam that drives a turbine-generator electric sub-assembly. Obviously, the installation does not use coke ovens, furnaces, or pig iron-steel converters.

RO.16.a

Title EN **Installation for the treatment of wastewater through biological and photocatalysis hybrid processes**

Authors Cristina-Ileana Covaliu-Mierlă, Corina Ioana Moga, Mihai Niță Lazăr, Petrescu Gabriel, Gigel Paraschiv

Institution National University of Science and Technology POLITEHNICA Bucharest

Patent no. Patent application No. a 202200248/2022

Description EN The invention refers to a wastewater treatment plant by combining two processes, the biological one with mobile artificial support (SAM) and the photocatalyzed one. The purpose of the invention is to improve/increase the efficiency of the removal of organic pollutants from wastewater up to CO₂ and H₂O by introducing two degradation steps with a synergistic effect, as follows: - biological step - which is based on the degradation of organic pollutants with the help of microorganisms and fixed biofilm technology - mobile artificial support (SAM). - photocatalytic stage - which is based on the degradation of organic pollutants through photocatalysis carried out by TiO₂ semiconductor nanoparticles under the action of radiation UV.

RO.16.b

Title EN **System for treatment of wastewater containing heavy metals using Typha angustifolia plant**

Authors Cristina-Ileana Covaliu-Mierlă, Loredana Diaconu, Gigel Paraschiv

Institution National University of Science and Technology POLITEHNICA Bucharest

Patent no. Innovation in Phd thesis

Description EN The innovation consists in creating a system in which wastewater containing heavy metals such as copper, nickel, lead and manganese is treated using Typha angustifolia plant. The purpose of the invention was to obtain a high efficiency of the removal of heavy metals from wastewater through an ecological and economical technology. The experimental research system carried out using Typha angustifolia plants was formed by the following components: container with wastewater, Typha angustifolia plant, support and mechanical stirrer. 100.00% wastewater treatment yields of heavy metals from wastewater were obtained in the case of Pb²⁺ ions when three and five plants were used, for wastewater containing a concentration of 0.65 mg/L, as well as in the case of Cu²⁺ ions for wastewater containing a concentration of 0.60 mg/L.

Technical University of Cluj-Napoca, România

RO.17.

Title EN

Innovative use of sheep wool and polyurethane foam for obtaining materials with sound-absorbing properties

Authors

Nemeş Ovidiu, Borlea (Mureşan) Simona Ioana, Tiuc Ancuţa-Elena, Deak Gyorgy

Institution

Technical University of Cluj-Napoca

Patent no.

Patent OSIM no.: RO136050- B1/30.05.2024

Description EN

The aim of this work was to obtain materials with sound-absorbing properties using sheep wool and rigid bicomponent polyurethane foam. Were obtained four materials composed of three layers, a layer of sheep wool previously processed by hot pressing at 80°C and 5 MPa, with final thicknesses of 2, 4, 6 and 12 mm; a layer of rigid bi-component polyurethane foam, with a thickness of 8...37 mm and a transition layer, 1...20 mm thick, resulting from the migration of polyurethane foam during the multilayer panel manufacturing process into the wool layer and/or the migration of wool into the polyurethane foam layer. Wool and polyurethane foam are the combination of sound insulation and sound absorption - wool absorbs sound and reduces it, and due to the rigid structure of polyurethane foam (closed pore structure), it does not allow sound to travel further, resulting in sound insulation. The obtained materials have very good sound absorption properties with acoustic absorption coefficient values over 0.7 for the frequency range 800 ÷ 3150 Hz; the results prove that the sheep wool has a comparable sound absorption performance to that of mineral wool.

RO.18.

Title EN

Method for correcting plane surfaces in images from cameras equipped with time-of-flight (tof) sensors, using convolutional neural networks

Authors

Pop Marian-Leontin, Tamas Levente

Institution

Technical University of Cluj-Napoca

Patent no.

Patent OSIM no.: RO135782- B1/30.08.2023

Description EN

A system and method for automatically eliminating the multi-path interference on planar surfaces caused artifacts for the pulse based Time-of-Flight (ToF) cameras is provided. Moreover, the system comprises a component which is using convolutional neural network (CNN) for the elimination of

the artifacts sensed and returned from the ToF camera depth images. The CNN is based on the 3 channel composition of information which is trained on a large real and synthetic dataset, for which an automatic 3D point processing chain is extracting and marking the correct ground planar information. During the evaluation mode, the CNN is able to correct in a seamless manner the artifacts on the planar patches from the ToF camera, ensuring a reduced MPI.

RO.19.

Title EN **Method for automatically calculating normals from surfaces on three-dimensional (3d) scans, involves using convolutional neural networks**

Authors Molnar Szilard, Tamas Levente

Institution **Technical University of Cluj-Napoca**

Patent no. Patent OSIM no.: RO135781- B1/30.08.2023

**Description
EN**

A system and method for automatically computing spatial surface normals in 3D data from the pulse based Time-of-Flight (ToF) cameras is provided. Moreover, the system comprises a component which is using convolutional neural network (CNN) for computing the normals of a 3D pointcloud sensed and returned from the ToF camera depth images. The CNN is based on the 3 channel composition of information which is trained on a large real and synthetic dataset, for which an automatic 3D point processing chain is used to determine the normals. During the evaluation mode, the CNN is able to compute the normals of the pointcloud from the ToF camera, ensuring a fast and robust normal estimation for the pointclouds.

RO.20.

Title EN **Ex-situ bioremediation system and process of hydrocarbon polluted soils using pseudomonas and bacillus microorganisms**

Authors Micle Valer, Sur Ioana Monica, Mitrea Mihai

Institution **Technical University of Cluj-Napoca**

Patent no. Patent OSIM no.: RO132554- B1/30.08.2023

**Description
EN**

The ex-situ bioremediation system of hydrocarbon-polluted soils using Pseudomonas and Bacillus microorganisms is composed of the concrete platform, the plastic foil on which a draining layer of gravel and the polluted soil is deposited, an aeration system consisting of a blower and a network of

air distribution provided with five perforated PVC pipes, three being placed horizontally in the gravel layer at the base of the pile and two in the middle of the pile and a system for introducing water and the solution with nutrients and microorganisms consisting of a tank, hydraulic pump and corrugated suction and discharge hoses. By using the soil treatment system at a temperature of 24–26°C, pH 7.5–8, humidity of 28–30%, and an increase in the total number of microorganisms from 151×10^5 to 213×10^7 CFU/gram of soil, after 12 weeks of treatment the achieved depollution yield is 83%.

RO.21.**Title EN**

Device for performing artery puncture with view to sampling blood from radial artery

Authors

Mocan Bogdan, Universitatea Tehnică din Cluj-Napoca

Institution

Mocan Mihaela, Universitatea de Medicină și Farmacie „Iuliu Hațieganu” Cluj-Napoca

Patent no.

Technical University of Cluj-Napoca

Patent OSIM no.: RO133031- B1/30.06.2023

Description EN

The invention relates to a device for effectively performing arterial puncture to collect a blood sample from the radial artery. The device for performing the arterial puncture in order to collect a blood sample from the radial artery allows proper immobilisation of the patient's forearm, facilitates precise identification of the radial artery position even in the case of a reduced peripheral pulse, allows visualization of the subcutaneous area of the vein plane from the area under consideration to avoid their puncture, and maintain the needle orientation at a precise angle to the central horizontal plane of the patient's forearm.

RO.22.**Title EN**

Method for making supports to be used in selective laser melting by differential scanning

Authors

Cosma Sorin Cosmin, Bâlc Nicolae Octavian, Popan Alina Ioana, Hendea Radu Emil

Institution

Technical University of Cluj-Napoca

Patent no.

Patent OSIM no.: RO134105- B1/ 30.06.2023

Description EN

The invention relates to a method for making supports to be used in selective laser melting (SLM) by differential scanning, more exactly to anchor the parts during the SLM process. The purpose is to improve the quality of support

structures by having better adhesion with SLM platform and fabricated parts. According to the invention, the method comprises the stages of initialization of process parameters corresponding to the scanning of the lower zone of the supports, material deposition layer-by-layer and laser scanning of 2D sections of the support for consolidation purposes, the support being divided into a lower zone which is the contact zone with a working platform, an upper zone on which the piece is fixed and a medial zone, where the scanning of the support is differentiated on the three zones.

RO.23.**Title EN** **Reconfigurable gearbox****Authors** Ciupan Cornel, Steopan Mihai, Pop Emanuela**Institution** **Technical University of Cluj-Napoca****Patent no.** Patent OSIM no.: RO132365- B1/ 30.06.2023**Description**
EN

The invention presents a reconfigurable gearbox designed for the skills development of students in the field of mechanical engineering. The solution offers students the opportunity to build over 20 different types of gearboxes, depending on the structure and the speeds selected by the workload of the machine tool. Reconfigurability of the box is provided by a modularized concept, by using interchangeable shafts and gears and by creating an optimized set of gears. The invention will help the students to understand important aspects related to the design, construction and operation of the gearbox and, in addition, contributes to the development of their creative abilities.

RO.24.**Title EN** **Device and method for precise remote synchronization of systems for astronomical observation****Authors** Dănescu Radu Gabriel**Institution** **Technical University of Cluj-Napoca****Patent no.** Patent OSIM no.: RO131751- B1/ 28.04.2023**Description**
EN

The invention describes a system and method for remote synchronization of optical systems for sky observation, used for detecting objects in low, medium, or high Earth orbits. According to the invention, the system comprises a triggering device, which consists of a GPS receiver with two channels, one for reading global time and a very high-precision Pulse Per Second (1PPS) synchronization signal, a

microcontroller board, a matrix keyboard for user input, and an LCD screen for display. A telescope equipped with a camera is connected to this device, which will be triggered by the device according to a preloaded exposure program.

RO.25.**Title EN****Hybrid funicular with energy recovery****Authors**

Oprea Claudiu-Alexandru, Breban Ștefan, Lateș Daniel

Institution**Technical University of Cluj-Napoca****Patent no.**

Patent application OSIM no.: A/00858/21.12.2023

**Description
EN**

Hybrid funicular, with energy recovery, that has a hydraulic system (motor/pump) to drive the carrier drum, driven by two other hydraulic machines which are connected to the shafts of an electric machine or diesel engine. The hydraulic machine is mechanically linked to the electric one and reversible, to allow the recovery of the potential energy available during the upstream to downstream transport of the material, so that the electric machine will operate in motor mode when lifting the transported material under the trolley and at returning the trolley to the material pick-up area and in generator mode when the material is transported downhill.

RO.26.**Title EN****Electric funicular with energy recovery****Authors**

Breban Ștefan, Oprea Claudiu-Alexandru, Lateș Daniel

Institution**Technical University of Cluj-Napoca****Patent no.**

Patent application OSIM no.: A/00859/21.12.2023

**Description
EN**

Electric funicular, with energy recovery, in which the drive of the carrier drum is done by one or two electric machines, which operate in motor mode when lifting the transported material under the trolley, when returning the trolley to the pick-up area and when transferring it from downstream to upstream (if applicable) and in generator mode when transporting the load from upstream to downstream. In this way, the potential energy of the descending transported load is converted into electrical energy and stored in the battery, being later consumed for the return, on the way up, of the anchoring elements related to the transported loads.

RO.27.

Title EN	Thermal management device of a catalytic system to reduce pollution caused by internal combustion engines
Authors	Mariaşiu Florin Emil
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM no.: A/00831/13.12.2023
Description EN	The invention refers to a thermal management device of a catalytic system to reduce pollution caused by internal combustion engines, which achieves, through construction and operation, bringing the catalytic system to the temperatures required by the operation of the internal combustion engine that equips a vehicle in a time very short, at stratified mixture operation, at cold start and operation. The problem that the invention solves is to reach an internal temperature of the catalytic pollution reduction system in a short time, which makes it possible to operate in the optimal pollution reduction parameters during the cold start of internal combustion engines.

RO.28.

Title EN	Pva fiber reinforced cementitious composite with fly ash as a replacement for natural aggregate and process of obtaining
Authors	Negruţiu Camelia Maria, Şoşa Pavel Ioan, Câmpian Cristina Mihaela, Pop Maria Ileana
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM no.: A/00832/13.12.2023
Description EN	This invention relates to the composition and process of obtaining a fiber reinforced cementitious composite with 2% Polyvinyl Alcohol (PVA) fibers and fly ash as a substitute for natural aggregates. The innovation involves the complete replacement of aggregates specific to conventional concrete with thermal power plants waste, such as fly ash, to obtain a new eco-friendly material with compressive and tensile strengths comparable to those of traditional concrete but with significant improvements in deformability properties.

RO.29.

Title EN	Energy management method in smart microgrids, based on prediction, optimization, and correction algorithms
Authors	Petreuş Dorin, Pătărău Toma, Szilagyí Eniko, Paulescu Marius, Stroia Nicoleta

Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM no.: A/10011/09.03.2023
Description EN	The invention relates to a method of controlling an intelligent microgrid for supplying the loads using several types of renewable energy generators, by combining prediction algorithms with correction algorithms that use real-time data and optimization algorithms, to reduce the cost of electricity. The method involves going through the following steps: measuring the irradiance and temperature from a pyranometer mounted in the proximity of the photovoltaic panels and saving them in a first local file; estimating the next day's irradiance and temperature based on a prediction algorithm using data from the file above or using satellite data and writing the resulting data to a second file; determination of generator operation data (of the type: power, time) and cost optimization with an optimization algorithm; correcting generator operating data with a correction algorithm running on the external computing system or cloud.

RO.30.

Title EN	Composite magnetic cores based on ferromagnetic fibers and process for preparing the same
Authors	Neamțu Bogdan Viorel, Marinca Traian Florin, Chicinaș Ionel
Institution	Technical University of Cluj-Napoca
Patent no.	Patent application OSIM no.: A/00052/07.02.2023
Description EN	The invention relates to composite magnetic cores based on ferromagnetic fibers and to the method of obtaining these cores. The proposed process can be applied to obtain magnetic composite cores from a varied range of ferromagnetic fibers. The proposed process is a process with increased productivity compared to the classic processes of pressing fibers in a mold. It facilitates the obtaining of composites compact with superior magnetic characteristics because it allows a better preservation of the integrity of the dielectric layer and does not induce mechanical stresses and crystallographic defects in ferromagnetic fibers. Also, the innovative cold sintering method proposed in the patent brings a significant improvement in terms of the productivity of the conventional cold sintering operation.

RO.31.**Title EN**

Automatic line and thermoforming process of the parts from thermoplastic composite material

Authors

Ciupan Cornel, Ciupan Mihai, Filip Ioan, Ciupan Emilia

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM no.: A/00574/18.10.2023

The invention refers to an automatic thermoforming line for parts made of thermoplastic composite materials reinforced with plant fibers.

The line consists of a heating system formed by a conduction heating zone where two strips of composite material are heated in parallel by pressing between the plates of a hot press and a roller heating zone.

Description**EN**

The material is kept in the hot press for a time t_1 , after which it passes through the hot rollers in the second zone forming a single strip which is further heated by conduction and convection for a time t_2 , until the thermoplastic matrix melts. The strip of plasticized material passes from the heating zone to the forming zone with cold rollers, resulting in a profiled board.

RO.32.**Title EN**

Continuous thermoforming line for profiled boards

Authors

Ciupan Cornel, Ciupan Mihai, Filip Ioan, Ciupan Emilia

Institution

Technical University of Cluj-Napoca

Patent no.

Patent application OSIM no.: A/00575/18.10.2023

The invention refers to an automatic thermoforming line for parts made of thermoplastic composite materials consisting of a reinforcing element (hemp fibers, flax, willow, poplar etc.) and a thermoplastic matrix (polypropylene).

Description**EN**

The line consists of a material feeding system in the form of two strips of fibrous layer, a heating furnace with two successions of rollers that lead the strips of material in separate zig-zag paths, and finally, at the terminal part of the furnace, the strips come together in a single strip with the help of two pairs of rollers and pass into the forming system with rollers in order to obtain a profiled board.

“Gheorghe Asachi” Technical University of Iasi

RO.33.	
Title EN	Procedure for Making Geopolymers Based on Red Mud, Fly Ash and Power Plant Desulphuration Product for Applications in the Field of Construction
Authors	BURDUHOS-NERGIS Dumitru-Doru, SANDU Andrei Victor, BĂLȚATU Mădălina Simona, ACHITEI Dragos-Cristian, PERJU Manuela-Cristina, BURDUHOS-NERGIS Diana Petronela, SURLEVA Andriana, VIZUREANU Petrica
Institution	“Gheorghe Asachi” Technical University of Iasi
Patent no.	Patent application A00156/04.04.2024
Description EN	The invention refers to a Process for making geopolymers based on red mud, fly ash and power plant desulfurization product by alkaline activation that have the ability to harden quickly at room temperature. The process according to the invention for making the ecological geopolymer consists of mixing two components, one solid and one liquid, whose composition is as follows: the solid component consists of 30-35% class F fly ash, 10-15% thermal power plant desulfurization product, 45-50% red mud, and the liquid component consists of Na ₂ SiO ₃ solution and NaOH solution in a mass ratio between 1.25 and 1.5; the mass ratio between the liquid and solid components is between 0.65 and 0.75, and the concentration of the NaOH solution is 10M or 3M. In the case of the 10M concentration, the final setting time is about 30 minutes, and in the case of the 3M concentration it is about 100 minutes, which makes it also suitable for 3D printing.

RO.34.	
Title EN	SHOEGAME. Developing Key Competences in VET for the Footwear Industry through Serious Games
Authors	Project reference n° 2021-1-RO01-KA220-VET-000028078 Aura Mihai, Adriana Chirilă, Arina Seul, Raluca Lupu, Mariana Costea
Institution	„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management
Patent no.	-

EUROINVENT 2024

One of the biggest challenges the footwear industry is currently facing is the attraction of young people. The manufacturing industry in general and the footwear industry, in particular, have to present themselves as a real alternative for young students and focus on digitalization, automatization, education, innovation, research, sustainability.

The ShoeGame project arises in the context of a need for renovation and change in the footwear sector. Within the challenges it faces, two main ones should be highlighted: first, the fact that the industry suffers from an aging workforce, which is not being replaced due to the lack of attractiveness of the sector to the new generations and second, the gap between the training and education offered and the industry demands. ShoeGame intends to address these needs by developing a VET solution, based on digital tools, aimed at students who are either deciding if they should enroll in a VET course or already enrolled.

The main objectives of the ShoeGame project are attract younger generations to the sector; prevent school drop-out and maintain students' interest and motivation; develop an innovative training approach and learning tools to be applied in VET contexts; promote synergies and cooperation among businesses, universities, research centers and other relevant stakeholders operating in the footwear sector, contributing to the attractiveness and competitiveness of the sector; contribute, on a larger scale, to the renovation and modernisation of the footwear sector, maintaining its value and competitiveness.

Description EN

RO.35.

METASKILLS. Alliance for Cooperation on Digital and Circular Economy Skills for the TCLF sector across Europe

Title EN

Project reference n° 101111842 ERASMUS-EDU-2022-PI-ALL-INNO-BLUEPRINT

Authors

Aura Mihai, Mariana Costea, Arina Seul, Raluca Lupu, Adriana Chirilă

Institution

„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management

Patent no.

-

Description

The METASKILLS4TCLF project aims to address all the

EN objectives of the Alliances for Sectoral Cooperation on Skills (“E+ Blueprint”), intersecting the pillars of the EU PACT4SKILLS TCLF Charter launched in December 2021.

Outcomes

At strategic level

- 1 Reinforced EU network of TCLF training providers (+ members, + related sectors)
- 1 Network of European regions promoting the modernisation of VET in TCLF extended (+ members, + actions).
- 1 updated European strategy, and 7 updated national skills strategies.
- 3 new national skills strategies
- Regional TCLF Pact for Skills.
- Dissemination and promotion events

At educational level

- Training schemes on circular economy and digitalisation of companies.
- 2 courses level EQF 3-4.
- 2 courses level EQF 4-5.
- 2 courses level EQF 6+.
- Innovative curriculum content on circular economy and digitalisation.
- 2 modular eBooks, compatible with APPs augmented reality.
- Online courses where real work environments will be reproduced available in.
- eLearning platform (non-immersive experience).
- Metaverse Labs (immersive experience).

At social level

- 1 Manifesto for Diversity and Inclusion in TCLF industries.
- 1 Guidelines on how to promote the attractiveness of TCLF industries among young people for companies.
- 2 international design competitions.
- 1 for VET.
- 1 for Higher Education, with 2 categories per competition: footwear and clothing.
- Events promoting the attractiveness of TCLF industries for young people.

Open days in companies

RO.36.**Title EN****THE FOOTWEAR. RECONSIDERED****Authors**

Raluca Lupu, Adriana Chirilă, Mariana Costea, Arina Seul, Aura Mihai

Institution

„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management

Patent no.

-

**Description
EN**

Keywords: sustainability; ergonomic design; 3D printing; footwear; leftover leather; design for disassembly

Considering the challenges that society is facing nowadays, sustainability is a focus point in each field of study. This is reflected clearly in areas such as engineering and design. Bearing this idea in mind, the developed concept of footwear was structured with a **limited number of components** in order to facilitate the assembly process. The models incorporate **3D printed elements made from biodegradable materials** – PLA, the pieces were made from leftover leather to minimize the waste, and last but not least, the product was conceived for afterlife repurpose by disassembling the parts.

The whole process started from an historical inspiration, an ancient pair of shoes from palm leaf fibres that dated from 1550 BC in Egypt. The concept wants to deliver an **innovative** component, represented by the closing system. It consists of 3D printed buttons with channels for laces to go through them with the aim of fixing the foot and to keep the components close to the leg. The products were made in a factory environment and the components were repurposed from their manufacturing processes. The leathers and the intermediary components, even the soles were acquired from previous collections, thus **reducing the economic impact**.

RO.37.**Title EN****3D4U. 3D CONCEPTS FOR FASHION EDUCATION IN UKRAINE**

Project reference n° 101128856 ERASMUS-EDU-2023-CBHE

Authors

Mariana Costea, Aura Mihai, Arina Seul, Raluca Lupu, Adriana Chirilă

Institution

„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management

Patent no.	-
	3D4U addresses the lack of skilled talent in 3D Concepts for fashion education in Ukraine by the establishment of 3 hubs in 3D concepts, in the 3 Ukraine HEIs. This project has been funded by the Erasmus+ Programme of the European Union The 3D4U project will focus on the development and setting up of the 3 hubs in 3D Concepts for Fashion. The specific objectives are:
Description EN	<ul style="list-style-type: none"> - Improve the quality of education in clothing, textile and fashion in Ukraine - To enhance collaboration and future business opportunities for the local enterprises, and to foster cooperation across different approaches of teaching 3D technologies around clothing, textile, fashion and footwear through joint initiatives. <p>Including Ukrainian HEI staff and students in 3D4U project's Hubs will enhance the teaching and assessment mechanisms but also the quality assurance and management and of course their digital and entrepreneurial capacities.</p>

RO.38.

Title EN	SHOEDES. New footwear designer qualifications for sustainable products that comply with the emerging demands of circular economy
Authors	Project reference n° 2021-1-TR01-KA220-VET-28186 Mariana Costea, Aura Mihai, Arina Seul, Adriana Chirilă, Raluca Lupu
Institution	„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management
Patent no.	-
Description EN	<p>SHOEDES project aims at enhancing the skills of the professional designers through a cross-disciplinary training program, combining professional and transversal skills associated with creativeness, innovation, and sustainability, both technological and non-technological.</p> <p>In this context, the SHOEDES objectives are:</p> <ul style="list-style-type: none"> - To anticipate the job-related requirements of the future footwear designers more effectively and explore new and innovative business. 111 - To develop new framework career guidelines and paths for sustainable footwear design by exploiting

existing European instruments and initiatives like Europass, “Economy that works for people”, “European Green Deal”, that will result in better-qualified footwear design professionals and better services and in the EU and Turkish footwear industry.

To develop new methodologies and learning tools based on MOOCs for re-engineering the training process targeted to the existing and future designers of the footwear industry.

RO.39.	
Title EN	Shoe 5.0. Reshaping and bringing new competencies to European footwear managers and workers
Authors	Project reference n° 2022-1-PT01-KA220-VET-000088122 Arina Seul, Aura Mihai, Mariana Costea, Adriana Chirilă, Raluca Lupu
Institution	„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management
Patent no.	-
Description EN	<p>Shoe 5.0 Proposes an ICT (Digital) multilevel tailor-made upskilling scheme and correspondent content wise tools, (based on a self-awareness skills scanning), to implement the presuppositions of i5.0, towards a greener and digital transition, making footwear factories a place where creative and talented people can come and work and live a human and personalized experience.</p> <p>The Shoe 5.0 focus on:</p> <ul style="list-style-type: none"> - Human-centric approaches. Promotion of talent, diversity and empowerment of workers. - Business resilience. Development and implementation of new technologies and digital tools that allow companies to be agile and resilient. - Sustainability. The transfer of knowledge to workers so they can lead actions on sustainability and the respect of planetary boundaries. <p>The project main goal is to prepare the EU footwear sector with the necessary skills to embrace the challenge of the transition towards a sustainable, human-centric and resilient industry, transcending efficiency and productivity objectives.</p>

RO.40.	
Title EN	Digi4Wearables. Digital Tools for Wearable Products for the Shoe Industry Project reference n° 101092436 — ERASMUS-EDU-2022-CB-VET
Authors	Arina Seul, Aura Mihai, Mariana Costea, Adriana Chirilă, Raluca Lupu
Institution	„Gheorghe Asachi” Technical University of Iași, Faculty of Industrial Design and Business Management
Patent no.	-
Description EN	<p>The Digi4Wearables project has developed and pilot an innovative training methodology on digital manufacturing using emerging and inclusive practices and digital tools to improve the knowledge of workers in footwear companies in Albania.</p> <p>Objectives:</p> <ul style="list-style-type: none"> - Improving staff working skills in using advanced technologies in footwear manufacturing. - Integrating digital tools for footwear design to help companies to improve product quality, raise productivity and at the same time reduce time to market. <p>Sustain companies to be competitive in the globalized business by offering products for every consumer.</p>
RO.41.	
Title EN	ACTIVE SELF-ADAPTIVE PROSTHESIS FOR LOWER LIMB
Authors	Dimitrie-Cristian FODOR, Neculai-Eugen SEGHEDIN
Institution	<i>Gheorghe Asachi Technical University of Iasi</i>
Patent no.	<i>Patent application No. a 00747/2022</i>
Description EN	<p>The invention refers to an active self-adaptive prosthesis for the lower limb, used in the case of growing patients, with applicability in the field of recuperative medicine and prosthetics, intended to replace the limb or a missing part of a limb amputated following trauma, causes pathological or congenital. The problem that the invention solves is to create a self-adaptive active prosthesis for the lower limb which, based on the information measured on the user's body, can self-adapt the length of the rod and the prosthetic leg, until it reaches a length equal to that of the contralateral biological limb and of self-adjusting the size of the prosthetic cup for a personalized fit on the patient's abutment and which monitors the patient's condition and continuously self-adapts during and according to the amputee's growth rate.</p>

RO.42.**Title EN****Dendrometer with magnetic amorphous wires****Authors**

Cristian Fosalau, Doru Cornei

Institution

„Gheorghe Asachi” Technical University of Iasi

Patent no.

Patent application No. A00192/2023

Description**EN**

The invention consists of a device called *dendrometer* dedicated to measuring very small variations, of the order of tens of microns, of the diameter of tree trunks, variations occurring during day-night and seasonal cycles and due especially to the lack or excess of humidity for the plant. The operation of the device is based on the variation of the impedance of the sensing elements in form of magnetic amorphous wires under the stress-impedance effect, which are subject to the action of forces produced by the stress exerted by the tree trunk upon some calibrated springs that transform the movement of the moving parts into force. The dendrometer provides a very high sensitivity, low price and good precision, being also robust to the action of external disturbing factors such as temperature, humidity or physical-mechanical actions.

The utility of the device consists in the possibility of including it as a measurement node in Internet of Things monitoring networks in precision agriculture and informing the farmer about the health status of the fruit trees in an orchard with the aim of taking appropriate measures.

RO.43.**Title EN*****OBTAINING OF NEW SEMISYNTHETIC PENICILLINS*****Authors**

Oniscu Corneliu, Ștefanache Alina, Mocanu Anca Mihaela, Cernătescu Corina

Institution

“Gheorghe Asachi” Technical University of Iasi, Faculty of “Cristofor Simionescu” Chemical Engineering and Environmental Protection

Patent no.

“Grigore T.Popa” University of Medicine and Pharmacy of Iasi, Faculty of Pharmacy

RO132076/2023

Description**EN**

The patent refers to a process for obtaining semisynthetic penicillins that contain a bis-beta-chloroethyl-aminosulfonyl group in position 6 of the bicyclic thioazolidine-beta-lactam system that is characteristic of penicillins. The technical problem that the invention solves consists in obtaining,

through a simple and effective process, penicillins with increased stability in acidic and basic environments in order to avoid their inactivation and the improved effects of inhibiting the proliferation of cancer cells.

The semisynthetic penicillins obtained have in position 6 of the bicyclic system a phenoxyacetyl chain substituted in the para position with bis-beta-chloroethyl-aminosulfonyl and in the ortho position with a chlorine atom, a methyl group or a methoxy group. These groups give the new penicillins, in addition to the antimicrobial activity due to the bicyclic thioazolidine-beta-lactam system, resistance in acidic and basic environments and effects of inhibiting the proliferation process of cancer cells (due to the alkylating properties of the bis-beta-chloro- ethyl).

RO.44.	
Title EN	Method for Obtaining Sulphur-free Lignin from agri-wastes
Authors	Elena Ungureanu ¹ , Maria-Emiliana Fortună ² , Ovidiu Ungureanu ³ , Bogdan-Marian Tofănică ^{4*} , Adrian-Cătălin Puițel ⁴
Institution	<ol style="list-style-type: none"> 1. “Ion Ionescu de la Brad” Iasi University of Life Sciences, 3 Mihail Sadoveanu Alley, 700490 Iasi, Romania 2. “Petru Poni” Institute of Macromolecular Chemistry, Grigore Ghica Voda Alley 41A, 700487 Iasi, Romania 3. “Vasile Goldis” Western University of Arad, 94 The Boulevard of the Revolution, 310025 Arad, Romania 4. “Gheorghe Asachi” Technical University of Iasi, 73 Prof. Dr. Docent Dimitrie Mangeron Boulevard, Iasi 700050, Romania
Patent no.	Pending
Description EN	The present invention provides an innovative method for the extraction of lignin utilizing environmentally friendly techniques from byproducts of the agricultural processes: wheat straw, corn stalks, and rapeseed stalks. The proposed method employs sulfur-free conditions, ensuring minimal environmental impact and reducing the need for harsh chemicals. By optimizing mild conditions and short retention times, the aim is to enhance the efficiency of lignin extraction while minimizing energy consumption and processing time. The extracted lignin has the potential to be utilized in a variety of industrial

applications, including the production of bio-based polymers, adhesives, and composites. This innovative approach contributes to the sustainable utilization of agricultural waste and promotes the development of eco-friendly materials. The method not only offers a practical solution for lignin extraction but also underscores the importance of integrating eco-friendly practices into industrial processes. Through the development of novel approaches such as biorefinery steps, we pave the way for the widespread adoption of sustainable materials.

This work was supported by a grant from the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI; project number **PN-III-P2-2.1-PED-2021-3384** (Sustainable Technology for Lignocellulosic Crop Residues Processing Towards Circular Economy Integration), within PNCDI III.

RO.45.	
Title EN	Process for integral valorization of lignocellulosic residues sourced in agricultural crop harvesting
Authors	Puițel Adrian Cătălin, Bârjoveanu George, Drăgoi Niculina Elena, Nechita Mircea Teodor, Bălan Cătălin Dumitreț, Custură Adina Elena
Institution	“Gheorghe Asachi” Technical University of Iasi
Patent no.	Pending
Description EN	<p>The object of the present invention is represented by a process for integral valorization of agricultural harvesting residue to obtain papermaking fibers and recovery of co-products such as lignin and hemicelluloses. According to the present invention, the process consists of the following stages: 1) Reduction of the dimensions of the considered corn stalk vegetal raw material to 1-3 cm sizes of length; 2) preliminary treatment at mild temperature alkaline conditions (NaOH) to partially remove lignin, hemicelluloses and reduce mineral content; 3) subsequent treatment at higher temperature (120-140°C) to complete the delignification and fiber liberation; 4) washing and screening of the obtained fibers yielding 40-50% of raw material; 5) treatment of residual liquids (extraction liquor and pulping liquor) for the separation of lignin and hemicellulosic polysaccharides.</p> <p>This work was supported by a grant from the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI; project number PN-III-P2-2.1-PED-2021-3384, within PNCDI III.</p>

RO.46.	
Title EN	New Approach to Obtaining Vegetal Extracts from Romanian Native Spontaneous Flora Species – Galium verum, as Active Ingredient Source with Antioxidant Properties
Authors	Delia Turcov¹, Claudia Maxim², Ana Simona Barna², Daniela Suteu²
Institution	1 University of Medicine and Pharmacy “Grigore T. Popa”, Faculty of Medical Bioengineering, Iasi, 11-13 Kogalniceanu Str., 700454, Iasi, Romania 2 “Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection “Cristofor Simionescu”, Department of Environmental Engineering and Management, 73 Prof. Dr. Docent D. Mangeron Str., 700050 Iasi, Romania Corresponding
Description EN	<p>There are a variety of molecules that offer protection from oxidative stress and its induced diseases, so antioxidants are one of the most studied and tested classes of pharmacological ingredients with wide application in the pharmaceutical and dermocosmetics industry [1], [2]. These ingredients are selected on the basis of strict criteria imposed by certain standards, medical therapeutic guides and pharmacopoeia, for patient safety.</p> <p>Isolated bioactive compounds of the Galium verum species belong to the following classes: phenolic compounds, iridoid glycosides, anthraquinones, triterpenes, tannins, saponins, essential oils. The quantity and diversity of bioactive compounds suggest good applicability with promising therapeutic results in pharmaceutic formulas.</p>
RO.47.	
Title EN	An advanced sensory apparatus designed to assess the strength of pelvic floor muscles
Authors	Alina Roxana Miron, Marian-Silviu Poboroniuc
Institution	Gheorghe Asachi” Technical University of Iași
Patent no.	Patent application No. A/00594 20.10.2023
Description EN	Evaluating muscle strength is pivotal in physical therapy, yet it poses particular difficulties when it comes to the pelvic floor muscles (PFM) owing to their positioning and restricted mobility. The assessment of these muscles yields

valuable information about the patient's capacity to engage and uphold the pelvic organs (bladder, bowel, uterus) and abdominal structures, thereby sustaining sphincter function, stability during locomotion, and blood flow. Furthermore, it aids in monitoring alterations in PFM functionality and robustness throughout the rehabilitation journey.

Different assessment methods like palpation, visual inspection, electromyography (EMG), ultrasound, or magnetic resonance imaging (MRI) can capture distinct facets of PFM activity. Nevertheless, these approaches demand specialized facilities, equipment, skilled personnel, and may cause discomfort for the patient. The unique feature of the innovative sensory system will be to alleviate these limitations. The proposed sensory device will consist of a Foley urinary catheter integrated with a fluid-activated sensor. This sensory system will be linked to the balloon port lumen of the Foley catheter. This design enables easy attachment and detachment of the sensory device from the urinary probe, rendering it suitable only for patients who require it.

The advantages of this innovative sensory device are manifold: the Foley catheter is suitable for both genders, cost-effective, and widely employed. It can serve as a point of reference for locating and engaging the pelvic floor muscles, managed by medical professionals, comfortable for extended wear and home use, reduces the need for additional equipment and assessment space, and can assist patients in performing exercises while documenting potential treatment progress.)

RO.48.	
Title EN	Preliminary evaluation of aerial parts of <i>Acmella Oleracea</i> as an innovative resource for the development of high quality dermatocosmetics
Authors	Claudia Maxim¹, Simona Barna¹, Adriana Trifan², Delia Turcov³, Daniela Şuteu¹
Institution	¹ "Gheorghe Asachi" Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection, Iași, România ² "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Faculty of Pharmacy, Department of Pharmacognosy-

Phytotherapy, Iasi, Romania

³ "Grigore T. Popa" University of Medicine and Pharmacy
Iasi, Faculty of Medical Bioengineering, Iasi, Romania

Patent no.

NO

Plants are an important source of biologically active molecules relevant to dermatocosmetic formulations.

Spilanthol, the main component of interest from *Acmella Oleracea*, has a wide range of biological properties such as anti-inflammatory, antioxidant, analgesic, anaesthetic, antifungal, anticancer and bacteriostatic effects. Although the *Acmella oleracea* plant has been intensively studied for its spilanthol content, there is limited information on the total content of polyphenols and flavonoids and on the synergistic action between spilanthol and these components with antioxidant activity that could bring new beneficial contributions to dermatocosmetic preparations to combat stress oxidative or other skin pathologies resulting from this oxidative stress. Furthermore, most research has focused on studying the extraction of spilanthol from the plant's flowers, neglecting the potential benefits of using the whole plant.

Description
EN

This study focuses on the use of *Acmella oleracea* extracts as a source of polyphenols and flavonoids for new dermato-cosmetic formulations to prevent the effects of oxidative stress on the skin. Hydroalcoholic plant extracts obtained by: thermal reflux extraction (HRE), room temperature extraction (maceration –M) as conventional techniques and ultrasound assisted extraction (US) as an unconventional 'green' method.

The hydroethanolic extracts were characterised by polyphenol and flavonoids content-using spectrophotometric methods and by the evaluation the antioxidant activity (using DPPH and ABTS methods).

The obtained results show that the extraction method that generated the highest amounts of extracted bioactive compounds was the reflux extraction (HRE in conditions of Solid/Liquid ratio of 1:15, 30% extraction solvent concentration and 120 min time of extraction) followed by maceration (M in conditions of Solid/Liquid ratio of 1:5, 60% extraction solvent concentration and 30 dys time of extraction). In order to evaluate the antioxidant and/or anti-inflammatory effects on the skin, the study will continue with the preparation of green dermatofomulation containing one of these extracts.

RO.49.	
Title EN	Customer Engagement And Sensory Brand Experience in the Confectionery Sector: A Gamified Journey Through Aroma, Taste and 3D Printed Models.
Authors	Ilinca-Maria Baltariu, Florin-Alexandru Luca, George-Călin Baltariu
Institution	Gheorghe Asachi Technical University of Iași Alexandru Ioan Cuza University of Iași Transilvania University of Brașov
Description EN	The aim of this paper is to develop a comprehensive model of do's and don't's for implementing sensory and interactive marketing strategies, tailored to the unique dynamics of the cake industry. It offers a blueprint for enhancing customer engagement and brand awareness through innovative, multi-sensory experiences. It also seeks to evaluate the impact of gamified marketing techniques, exemplified by cultural city-hunts, on customer engagement.
RO.50.	
Title EN	Integrated Spatial Analysis and Visualization Platform for Advanced Soil Mapping and Land Management
Authors	George-Călin Baltariu, Florin-Alexandru Luca, Ilinca-Maria Baltariu
Institution	Gheorghe Asachi Technical University of Iași Alexandru Ioan Cuza University of Iași Transilvania University of Brașov
Description EN	ASLAM is a cutting-edge web-based platform designed to revolutionize soil mapping and land management practices by integrating advanced spatial analysis and visualization tools. By harnessing the power of GIS, GPS location tracking, and immersive VR technology in a mixed reality environment. ASLAM offers users a comprehensive solution for exploring, analyzing, and managing land and soil data. The product aims to create a significant advancement in soil mapping and land management, offering a sophisticated yet user-friendly platform for analyzing, visualizing, and managing spatial data. By leveraging the latest advancements in GIS, GPS, and VR/AR technologies, ASLAM empowers users to make informed decisions and optimize land utilization for agricultural productivity and environmental sustainability.

RO.51.

Title EN	Integration of Augmented Reality Overlays with Real-Time Unmanned Aerial Vehicle Data for Comprehensive 3D Modeling and Advanced Diagnostics of Building Exteriors
Authors	George-Călin Baltariu, Ilinca-Maria Baltariu, Florin-Alexandru Luca, Ion Serbanoiu
Institution	Gheorghe Asachi Technical University of Iași Alexandru Ioan Cuza University of Iași Transilvania University of Brașov
Description EN	Traditional building exterior inspections often rely on scaffolding, rope access, or visual assessments from the ground, presenting safety hazards and limitations in data acquisition. This paper proposes a novel approach that leverages the combined strengths of Unmanned Aerial Vehicles (UAVs) and Augmented Reality (AR) to revolutionize the field of building exterior condition assessment. This study investigates the in-situ integration of real-time UAV data with AR overlays, enabling the creation of comprehensive 3D models and facilitating advanced diagnostics of building exteriors. The integration offers significant advantages over traditional methods, including improved safety, enhanced data acquisition capabilities, and the potential for real-time decision-making during inspections.

RO.52.

Title EN	Dynamic Web Platform for Next-Gen Qualitative Interviews
Authors	Ilinca-Maria Baltariu, George-Călin Baltariu, Florin-Alexandru Luca
Institution	Gheorghe Asachi Technical University of Iași Alexandru Ioan Cuza University of Iași Transilvania University of Brașov
Description EN	This platform is specifically crafted to facilitate qualitative interviews like ZMET and Elicitation interviews, pivotal for academic and market research endeavors. Customized to suit the autonomous, independent, and fast-paced tendencies of Generation Z and Alpha – the digital-native cohorts, it eliminates direct human interaction. This design choice caters to these generations, often characterized by anxiety and a preference to avoid prolonged contact with unfamiliar individuals. By sidestepping these social barriers, our platform ensures the gathering of valuable, pertinent responses untainted by factors like respondent anxiety or disinterest provoked by lengthy interview durations.

„Lucian Blaga” University of Sibiu

RO.53.	
Title EN	ANTI-SEDENTARY ERGONOMIC ASSEMBLY FOR THE HOME OFFICE
Authors	ȚÎȚU Aurel Mihail, MĂRGINEAN Ion, ȚÎȚU Ștefan, BOGORIN PREDESCU Oana, BOGORIN PREDESCU Adrian, MOLDOVAN Alexandru Marcel, OPREAN Constantin
Institution	”Lucian Blaga” University of Sibiu
Patent no.	Patent Request A-2023-00089
Description EN	The invention relates to a piece of furniture which replaces persons' long motionless sitting while watching TV and working at the computer, with a sitting providing a continuous mobility of the human body skeletal structure. According to the invention, the piece consists of a chair having an ergonomic seat placed above a base plate fixed to a telescopic leg which rolls on some swinging rollers, between the seat and the base plate, there being an electro-mechanical oscillating assembly provided with a linear electric actuator, which imparts two simultaneous continuous oscillating movements to the seat, one of left-right inclination by 4° related to the horizontal and the other of rotation in the horizontal plane by an angle of 10° related to a median position, the repeated linear movement of the actuator being converted into two angular movements of the seat by means of a central hub.
RO.54.	
Title EN	Autonomous mobile platform with UV ray disinfection system, a modular and affordable solution for virus elimination
Authors	Aurel Mihail ȚÎȚU, Daniel BÂLC, Emanuel BÂLC
Institution	”Lucian Blaga” University of Sibiu
Patent no.	Student Research Project
Description EN	In the post-COVID era, there has been a growing emphasis on the significance of disinfecting objects individuals come into contact with. Mobile disinfection robots have emerged as a definitive solution to meet this demand. This scientific endeavor aims to outline the primary challenges associated with conventional mobile disinfection robots and introduce a solution through the implementation of an Autonomous

Mobile Platform equipped with a UV Ray Disinfection System. A critical issue identified in conventional mobile disinfection robots pertains to their inability to ensure maximum efficiency in preventing the spread of viruses. This limitation is often linked to their static structure and the incapacity to efficiently cover the entire space. Furthermore, the risk of continuous at the introduction of an Autonomous Mobile Platform integrated with a UV Ray Disinfection System. This innovative approach effectively addresses existing limitations in conventional robots. The autonomous mobile platform enables comprehensive spatial coverage, eliminating the risk of blind spots and ensuring uniform disinfection. The UV Ray Disinfection System adds an additional layer of efficacy by molecularly destroying viruses and bacteria, thereby reducing the risk of contamination. The integration of an Autonomous Mobile Platform with a UV Ray Disinfection System opens opportunities for more efficient and secure disinfection of spaces, contributing to the mitigation of the risk of virus spread in the post-COVID period.

RO.55.

Title EN	Mechatronic system for withdrawal and arrangement of microphone cables in the context of audio system optimization
Authors	Aurel Mihail ȚÎȚU, Daniel BÂLC, Emanuel BÂLC
Institution	”Lucian Blaga” University of Sibiu
Patent no.	Student Research Project
Description EN	In the context of continuous technological advancement, efficient management of microphone cables becomes a crucial component for improving the quality and functionality of audio systems. The proposed system goes beyond the physical withdrawal of cables, incorporating strategic organization to maximize the performance and overall efficiency of the system. The primary function of this mechatronic system lies in facilitating the installation and maintenance of audio equipment, eliminating cable chaos, and reducing the risk of electromagnetic interference. Moreover, the system provides enhanced flexibility and mobility, facilitating the manipulation and adjustment of audio equipment according to the specific needs of the user. As the optimization of audio systems becomes increasingly

important, this mechatronic system represents an innovative and efficient solution. The benefits include reducing the risk of failure due to disorganized cables, minimizing the time required for cable installation and maintenance, and increasing flexibility in managing audio equipment. The study thus highlights the importance of implementing this mechatronic system in the design and use of audio systems, significantly contributing to technological evolution and the overall performance of the audio industry.

RO.56.**Title EN****Advancements in Drone Technology for Enhanced Surveillance Capabilities****Authors****Robert-Marian Bleotu, Cosmin Preda****Institution**

Lucian Blaga University of Sibiu

Patent no.

Ph.D. Student Scientific Research Project

**Description
EN**

The proliferation of unmanned aerial vehicles (UAVs) has revolutionized various fields, including surveillance. In this paper, we present the design, implementation, and performance analysis of an advanced surveilling drone system. Our system leverages state-of-the-art technologies in drone hardware, sensor integration, communication protocols, and data processing algorithms to achieve efficient and effective surveillance capabilities. We presented the key components of the drone system, including the hardware architecture, sensor suite, communication infrastructure, and software algorithms. The end of the research is based on the performance of our system in real-world surveillance scenarios.

RO.57.**Title EN****Analyzing Thermoelectric Brake Disc Heat Recovery through Finite Element Analysis****Authors****Cosmin Preda, Robert-Marian Bleotu****Institution**

Lucian Blaga University of Sibiu

Patent no.

Ph.D. Student Scientific Research Project

**Description
EN**

The project presents the development of a calculation model for the braking system equipped with a thermoelectric generator to correlate the temperature of the brake disc with the performance of the generator. The variant with solid or ventilated brake disc is compared. The thermal analysis of the system temperature using finite elements was used to evaluate the potential energy that can be reused in the form

of heat after braking. This research focused on the analysis of the conversion of thermal energy lost during the braking process into electrical energy, necessary for the operation of many auxiliary components of motor vehicles. The conversion of the heat generated in the braking process by means of thermoelectric generators was explored. The resulting electrical energy is fed back into the system to assist the electric motor or other auxiliary components fed directly from the heat engine. The potential benefit of using this electrical energy recovery system for vehicles is an important step in the automotive industry.

RO.58.
Title EN

Rack and pinion jack system to help lower the coffin into the grave

Authors

Bunescu Bianca, Pănăzan Andreea

Institution

”Lucian Blaga” University of Sibiu

Patent no.

Student Research Project

**Description
EN**

The rack and pinion coffin lowering system is a technical and human innovation that redefines the solemn moment of coffin lowering during funeral ceremonies. Designed to ensure safety, precision and elegance in every movement, this system provides essential support for mourners. With its elegant and discreet design, it blends harmoniously into any funeral environment, completing the moment of mourning with subtlety and refinement. Each smooth and controlled descent of the crematorium is an expression of human respect and compassion, offering a fitting last tribute to those departed in peace and tranquillity.

RO.59.
Title EN

Automatic protection system in the windshield

Authors

Spircu Alexandru-Ionel, Szoke Laurentiu-Ilie

Institution

”Lucian Blaga” University of Sibiu

Patent no.

Student Research Project

**Description
EN**

This system is designed for the safety of car passengers. Therefore, in the event of a frontal impact, the aim is to prevent hard objects from penetrating from the outside environment into the car cabin, as well as to prevent passengers who are not wearing seat belts from being thrown through the windshield. This project will be implemented by fully covering the windshield with an airbag system within the first second of the impact.

RO.60.	
Title EN	The saving of shoes
Authors	Benchea Iulia Maria, Blanga Nicoleta Andreea, Mutiu Robert Florin, Poplacean Bogdan Pavel
Institution	"Lucian Blaga" University of Sibiu
Patent no.	Student Research Project
Description EN	<p>This invention has the purpose to protect the washing machine tube from the shocks produced by the shoes, furthermore it helps maintain the integrity of the shoes during washing. The module will be demontable, easy to get inside the tube and made from an inoxidable alloy. This support allows a more efficient drying process by keeping the shoes fix after the washing process is finalised.</p>
RO.61.	
Title EN	Mechanical pencil with hub for pencil leads
Authors	Todor Vlad Vasile, Chitoiu Darius
Institution	"Lucian Blaga" University of Sibiu
Patent no.	Student Research Project
Description EN	<p>A new and simpler way to insert lead into the mechanical pencil and for a longer duration of its use. This project presents an improvement on mechanical pencils. This improvement refers to a hub inside the mechanical pencil where we will insert the pencil leads, to be used when the previous lead runs out. The mines are inserted through a hole in the upper part of the pencil, placing one after the other in a semi-circle shape, guided by a groove to indicate the direction in which they must slide to reach the center of the pencil, the slide will be made with the help of a simple hand gesture. An advantage of this improvement is the fact that we no longer have to worry about the moment when we unexpectedly run out of lead and the fact that we no longer have to carry additional leads, they are inserted directly inside the pencil immediately after their purchase. Another advantage would be that we have a writing instrument that is easier to use in the sense that once the pen is filled it would have a longer use ,provided the pencil is refilled periodically, it also eliminates the time to insert the leads into the pencil.</p>

RO.62.	<p>Title EN The demultiplier with fuse</p> <p>Authors Belei Gabriel, Bolintineanu Gheorghe, Cloțan Antonio</p> <p>Institution "Lucian Blaga" University of Sibiu</p> <p>Patent no. Student Research Project</p> <p>The role of this mechanic fuse is to replace the sliding gearbox mechanism. The fuse consists of a spring, which, by storing heat, achieves the ratio change. The spring expands causing the axial displacement of the sliding gear. The components of the demultiplier are mainly made of Fe-Mn alloy, and the spring is made of aluminium. During the operation, when the first gear reaches a certain temperature, the transmission ratio is automatically changed.</p>
Description EN	
RO.63.	<p>Title EN Power plant sand</p> <p>Authors Cloțan Antonio</p> <p>Institution "Lucian Blaga" University of Sibiu</p> <p>Patent no. Student Research Project</p> <p>This type of Power plant sand is intended for use in dry areas of the Earth. The water in a hydropower plant is replaced with sand, the operating principle remaining the same. From an ecological point of view, it is very sustainable, the same amount of sand can be reintroduced into the circuit a large number of time, almost infinitely, because sand does not evaporate like water.</p>
Description EN	
RO.64.	<p>Title EN Intelligent waste sorting system</p> <p>Authors Costea Marius-Ionuț, Doară Mihai Alexandru, Popa Ioan Alin</p> <p>Institution "Lucian Blaga" University of Sibiu</p> <p>Patent no. Student Research Project</p> <p>Our project is about an intelligent waste sorting system. Through this system, we aim to assist people who have difficulties in disposing and correctly sorting waste. This system is equipped with cameras and AI algorithms to automatically identify the types of waste being thrown into a container. The algorithm can be trained to recognize various materials such as plastic, metal, paper, glass, biodegradable waste, and many more. The system is equipped with two small-sized cameras and four waste compartments for</p>
Description EN	

various materials. This system can be implemented in homes, restaurants, cafes, and even on the streets.

RO.65.	
Title EN	Wireless parking sensor system
Authors	Flisc Adelina-Maria, Dumitru Alexandru-Nicolae, Florea Ionut-Alexandru
Institution	"Lucian Blaga" University of Sibiu
Patent no.	Student Research Project
Description EN	The Wireless parking sensor system is meant to ease the process of installing an aftermarket parking sensor kit to a car that is not equipped with it from the factory. It does not require any cable or a long period of time to install it on the car, facilitating the user. The main advantage is the portability and the compatibility with any kind of vehicle, the system consisting of two sets of four sensors that have to be stucked to the car bumper and the main control unit that displays the signal from the sensors. The mounting bracket facilitates the removal of the sensors when the battery is running low, this being another great advantage, backing up the simplicity of use.
RO.66.	
Title EN	Vital Flow Tracker
Authors	Leon Gabriel-Ilie, Mihăilescu Flavia-Maria, Popa Marian-Cristian
Institution	"Lucian Blaga" University of Sibiu
Patent no.	Student Research Project
Description EN	The Vital Flow Tracker monitors real-time health by measuring hormones and chemicals from the body. Precise data, accessible through a simple interface, provides users with an immediate understanding of their physiological balance. A perfect combination of advanced technology and practical utility for personal health care.
RO.67.	
Title EN	Smart pot for moisture analysis and light exposure of the plant
Authors	Ivan Razvan Alexandru, Popenta Raul Alexandru, Radu Raul Mihai, Tereblecea Ioan
Institution	"Lucian Blaga" University of Sibiu
Patent no.	Student Research Project
Description	In this project, it is about a smart pot in which a probe is

EN mounted, the purpose of which is to measure humidity, soil nutrients, as well as the light exposure of the plant, depending on the data received from the sensors mounted in this probe. This invention already exists, but we came up with an improvement to it. The probe analyzes these characteristics and depending on the type of plant. Based on the data read by the sensors, the client finds out the water requirement for the plant, the nutrients and the exposure to the sun. The data is provided in an application on the phone. The system is aimed at people who do not stay at home very much. Providing this information to a phone helps so that even a child can take care of a plant.

RO.68.

Title EN **Electric car with solar energy**
Authors **Dan Teodora, Zidaru Patricia**
Institution "Lucian Blaga" University of Sibiu
Patent no. Student Research Project

Description
EN We want to make a little car that uses solar energy and in case of anything the car will be incorporated with a battery. The car will be able to move front-back and sideways because of the special wheels. It will be driven by a special remote control, which will actually be every phone that has download de car app and has the chassis number of the car. So that means you can control the car from not only one but multiple remotes.

Stefan cel Mare University of Suceava

RO.69.	
Title EN	METHOD AND SYSTEM FOR LIMITING THE LOAD CURVE
Authors	Bejenar Ciprian, Bejenar Marian, Milici Laurențiu-Dan, Pentiu Radu-Dumitru, Atănăsoae Pavel, Popa Cezar-Dumitru, Pop Teodor, Ifrim Visarion
Institution	Stefan cel Mare University of Suceava
Patent no.	Patent Application no. A 2023 00022
Description EN	The invention involves a specific communication and adjustment system in relation to controllable electrical sources (e.g. charging and/or power supply systems) with which adjustable electrical consumers are equipped and/or flexibly supplied (e.g. electric propulsion vehicles or hybrid), simultaneously connected to an electrical network with limited energy capacity, so that it limits and/or regulates one or more electrical parameters (e.g. electrical voltage, electrical current, etc.).
RO.70.	
Title EN	HYBRID SYSTEM FOR IMPROVING THE ENERGY EFFICIENCY OF PHOTOVOLTAIC PANELS
Authors	Milici Laurențiu-Dan, Pavăl Mihaela, Atănăsoae Pavel, Nițan Ilie, Ungureanu Constantin, Iavorschi Eugen, Alisavetei Irina, Tuduriu Constantin Cornel
Institution	Stefan cel Mare University of Suceava
Patent no.	Patent Application no. A 2023 00576
Description EN	The solution involves a panel placed on the back of the photovoltaic panel and which has a system of channels, of variable section through which the cooling fluid circulates, which can be water for the preparation of hot water or air for heating a room.

RO.71.	
Title EN	SYSTEM FOR INCREASING THE QUALITY OF SLEEP
Authors	Popa Valentin, Bejenar Ciprian, Milici Laurențiu-Dan, Dimian Mihai, Ungureanu Constantin, Pavăl Mihaela
Institution	Stefan cel Mare University of Suceava
Patent no.	Patent Application no. A 2023 00488
Description EN	System for sleep quality enhancement, according to the invention, it assumes a unitary body composed of an elastic rectangular structure of thermo-sensitive elements that react to the local temperature variation, depending on which it adapts the shape of the rest mattresses between the layers of which it is embedded, that it modifies according to the shape of each user's body and returns to its original shape after each use, so that it represents an appropriate solution for the role it fulfills.
RO.72.	
Title EN	METHOD FOR ACTUATING SPRINGS MADE OF SHAPE MEMORY MATERIALS
Authors	Bejenar Ciprian, Bejenar Marian, Popa Valentin, Dimian Mihai, Milici Laurențiu Dan, Rață Mihai, Afanasov Ciprian, Ungureanu Constantin
Institution	Stefan cel Mare University of Suceava
Patent no.	Patent Application A 2023 00079
Description EN	The method for actuating shape memory material springs according to the invention features a distinctive three-phase, implementable and parameterizable power supply sequence that can be modeled, integrated, adjusted and generated by programmable electronic systems as needed, so as to cause a reaction of additional speed and force, both by thermal and electromagnetic effect, simultaneously developed on the actuation spring coils within an actuator.

**„Grigore T. Popa” University of Medicine and Pharmacy
Iasi, Romania**

RO.73.**Title EN** Virtual Medical Assistant Interface**Authors** Vicol Victor, Manoliu Artemie, Andrițoi Doru**Institution** "Grigore T. Popa" University of Medicine and Pharmacy
Iasi, Faculty of Medical Bioengineering**Patent no.****Description
EN**

Virtual assistants can be a useful resource, facilitating access to information and support without the need for human intervention. They can manage repetitive tasks and routine work much faster than humans, freeing up time for employees, are available 24/7, and can provide consistent and accurate responses. The project's objectives include implementing a virtual assistant in the medical field consisting of a hologram that will guide patients and clarify certain common questions related to hospital services, clinics, or medical offices. The chosen technical solution leverages existing technology already on the market, aiming to integrate holographic fans, motion sensors, and voice recognition. By using modern technologies such as voice recognition and motion sensors, the virtual assistant is able to provide consistent and personalized answers to patients' questions and effectively guide them to the medical services they need.

RO.74.**Title EN** Monitoring the exposure to X-Radiation of medical staff and patients**Authors** Băeșu Andra Cristiana, Fuior Robert, Corciovă Călin**Institution** "Grigore T. Popa" University of Medicine and Pharmacy
Iasi, Faculty of Medical Bioengineering**Patent no.** -**Description
EN**

Providing a clear perspective on the structure and functioning of the human body involves the use of advanced technologies in medical imaging. The increased precision of medical staff and equipment software reduces the risk of radiation exposure, enhancing the safety and effectiveness of procedures. Minimizing radiation exposure in X-rays, computed tomography (CT) and osteodensitometry is achieved using appropriate protective equipment, and radiology personnel are trained to use it properly to protect

both patients and relatives. Users can adapt and adjust strategies for identifying and localizing areas of interest for each patient, continuously monitoring and evaluating risks during procedures. Dose monitoring for operators is done using dosimeters, while for patients, skin absorbed dose (DAP) and field of focus are recorded. These data are imported for storage and analysis to identify exceeding the accepted dose according to radiation protection competencies, with responsibility lying with the national authority. In this regard, a graphical user interface (GUI) has been implemented using MATLAB software to support the internal quality management of a medical unit.

RO.75.

Title EN **New devices used in the recovery of hand functionality**
Authors Iustina CONDURACHE, Cătălin IONIȚE, Andrei GHEORGHITĂ, Marius TURNEA, Cezar Mucileanu, Marina ROTARIU
Institution "Grigore T. Popa" University of Medicine and Pharmacy Iași, Faculty of Medical Bioengineering
Patent no. -

**Description
EN**

The hand is an indispensable tool for work, so only work can restore hand functionality following a deficit. In both professional and non-professional daily activities, the hand is required for strength and endurance, speed of execution, precision, and combinations of these qualities. Specific hand training is achieved through Occupational Therapy (OT), which includes both work therapy and recreational activities and games. Occupational Therapy (OT) is the method that bridges medical recovery and socio-professional reintegration. In medical recovery, techniques that best achieve the re-education of compromised motor functions will prevail, while in socio-professional rehabilitation, those that lead to work retraining and professionalization or re-professionalization will prevail. Practical activities constitute the essence of occupational therapy.

From the therapist's standpoint, we strive to assist our patients by devising and implementing a series of activities and devices aimed at facilitating the recovery process they undergo. As such, we have created a series of occupational therapy boards intended to be used in the rehabilitation of coordination and fine and gross motor skills

in patients diagnosed with various chronic or acute hand pathologies. The centerpiece is represented by a Canadian board equipped with a light signaling device. The patient must follow paths of various shapes using their healthy hand first, then the affected hand. The paths are made of copper rods, and their shapes range from simple to complex. When the patient follows the path, errors are signaled by lights and tallied. The board is intended primarily to train coordination, fine and gross hand functions, as well as muscle strength.

RO.76.

Title EN	Motor and cognitive rehabilitation system supported by virtual reality
Authors	Corciovă Călin, Onu Ilie, Băeșu Andra, Luca Cătălina, Fuior Robert
Institution	„Grigore T. Popa” University of Medicine and Pharmacy Iasi, Romania, Faculty of Medical Bioengineering
Patent no.	-
Description EN	In the rehabilitation field of healthcare, the use of virtual reality (VR) is becoming increasingly popular for the treatment of neurological and cognitive conditions as well as physical therapy. According to the statistics so far, VR improves rehabilitation results, patient, and physiotherapist satisfaction rates. The aim of this research was to create a wearable device and provide an engaging and interactive virtual environment to perform everyday activities aimed at medical rehabilitation. In this way, virtual reality has been used to support the performance of activities such as functional mobility (by stationary walking) and maintenance of personal items. The monitoring of some physiological parameters gives the possibility of rapid analysis of the patient's status.

RO.77.

Title EN	The Novel IIC, beside other Inflammation Indexes, reveals the Influence of Climate on Critically Ill Pregnant COVID-19 Patients, in Spring versus Autumn 2021 Infection
Authors	Roxana Covali, Tudor Butureanu, Mona Akad, Razvan Socolov
Institution	"Grigore T. Popa" University of Medicine and Pharmacy Iași, Faculty of Medical Bioengineering
Patent no.	-

Description
EN

Background: Seasonality is an important environmental factor that influences immune responses. Methods: In a retrospective study, we included all pregnant patients admitted to the Elena Doamna Obstetrics and Gynecology Hospital with a critical form of COVID-19 infection between 1 January and 1 December 2021. The blood counts collected on the specific A, H and E Brixia score- collection days, or the ones collected closest to those days, were considered in our study. We also studied the differences between the two groups regarding the inflammation indexes exhibited on those specific days: A (admittance), H (highest Brixia score), and E (end of hospitalization). Results: The values of NLR, dNLR, SII, and AISI are significantly higher and IIC is significantly lower for the spring group versus the autumn group, especially on the H and E Brixia score-collection days. Conclusions: These results suggest that severe-COVID-19 inflammation was significantly higher in the spring of 2021 in Romania than in autumn 2021, in regard to pregnant patients.

RO.78.

Title EN **Innovative Device Development for Enhancing Neuromotor Recovery in Lower Limb Rehabilitation**

Authors Deaconu Denisa, Buzenche Emanuela, Băeșu Andra Cristiana

Institution “Grigore T. Popa”University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering

Patent no. -

Description
EN

Modern rehabilitation practices rely on advanced devices to track patient progress during therapy sessions. A growing global trend involves the development of wearable systems, ensuring safety and comfort, applicable in diverse environments such as medical facilities or patients' homes. This study aims to design and construct a device tailored for monitoring lower limb rehabilitation movements. Leveraging an ADXL345 accelerometer module and FSR406 force sensors, the system captures real-time foot movements. Data processing occurs through the Arduino IDE platform, integrated into Processing for implementation within medical rehabilitation applications. Consequently, ankle joint movements translate into commands facilitating therapeutic gaming experiences. With both hardware and software

components in place, the system offers a personalized rehabilitation journey, adaptable to various conditions. This broad applicability, coupled with therapy customization, fosters heightened motivation and engagement, enhancing the efficacy of the rehabilitation program.

RO.79.	
Title EN	New Green Way for Muconic Acid Separation Process using Ionic Liquids
Authors	Dan Cascaval, Alexandra Cristina Blaga, Alexandra Tucaliuc, Lenuta Kloetzer, Anca Irina Galaction “Grigore T. Popa” University of Medicine and Pharmacy
Institution	Iași Gheorghe Asachi Technical University of Iași
Patent no.	Patent application No. 00022/24.01.2024
Description EN	Muconic acid (MA), 2,4-hexadienedioic acid, is an important ingredient in the manufacturing of adipic acid, which serves as a starting point for the synthesis of many other polymers, including bio plastics, coatings, pharmaceuticals, new resins, agrochemicals, nylons and food additives. The method described in the patent involves a novel extraction system for MA separation with a hydrophobic ionic liquid, tri-hexyl-tetra-decyl-phosphonium decanoate, [P _{6,6,6,14}][Dec], as an effective extractant. A mixture between heptane, a physical solvent and 120 g/L [P _{6,6,6,14}][Dec], as extractant was analyzed for improving the separation performance, obtaining an extraction yield of 99.56%. The organic phase is regenerated at 50°C with sodium hydroxide, allowing muconic acid recovery from the organic phase and its simultaneous regeneration.
RO.80.	
Title EN	New Alternative Culture Medium Design for Biomass Production
Authors	Mădălina POȘTARU ¹ , Delia Turcov ¹ , Alexandra TUCALIUC ² , Alexandra BLAGA ² , Lenuța KLOETZER ² , Dan CAȘCAVAL ² , Anca-Irina GALACTION ¹ , ¹ “Grigore T. Popa” University of Medicine and Pharmacy of Iasi, Faculty of Medical Bioengineering, Departament of Biomedical Sciences, M. Kogălniceanu 11-13, 700454, Iași, România. ² “Gheorghe Asachi” Technical University of Iasi, “Cristofor

Simionescu” Faculty of Chemical Engineering and Environmental Protection, D. Mangeron 71, 700050, Iași, România.

Patent no.

Known as the most used microorganisms in biotechnology for bioethanol and biofuel production, the yeast *Saccharomyces cerevisiae* has the ability to develop in both aerobic and anaerobic conditions. Due to this remarkable potential, *S. cerevisiae* became a viable model to study the transformations and the way in which cellular metabolism is directed to face the stress conditions due to environmental changes, such as oxidative, ethanol, saline or osmotic stress.

**Description
EN**

This study followed the transformations undergone by the yeast due to changes in the concentration of salts in the fermentation medium, through optical and fluorescence microscopy methods. The study of the behavior of yeast cultures to osmotic stress assessed their reaction in the presence of microelement solutions of different concentrations. To analyze the resistance to osmotic stress, the yeast cultures were subjected to saline concentrations between 1 and 10%, and it was observed that *S. cerevisiae* can withstand a maximum salt content in the medium of 5%.

RO.81.**Title EN**

New Insight in the Management of Topic Antioxidants – Combinations of Resveratrol in Dermatocosmetic Products

Authors

Delia TURCOV, Mădălina POȘTARU, Anca ZBRANCA-TOPORAȘ, Anca-Irina GALACTION

Institution

“Grigore T. Popa” University of Medicine and Pharmacy of Iasi, Faculty of Medical Bioengineering, Department of Biomedical Sciences, M. Kogălniceanu 11-13, 700454, Iași, România.

Patent no.

The development of the dermatocosmetic industry has a remarkable momentum in the last few years and antioxidants are among the most popular active ingredients. They have a double role: exerting significant protective activity against oxidative stress and also improving the signs of photoaging. Standardised methods for benchmarking the protective properties and capacity of antioxidants, in vitro and in vivo, as well as for quantifying their benefits in skin tissue are constantly being developed. In this regard, a number of

**Description
EN**

studies have shown the importance of associating antioxidants to increase protective activities in the cells and tissues, with strong evidence for preventing and relieving important diseases, whether systemic or skin. The additional benefits are related to higher bioavailability and preservation of the active ingredients.

The major advantage of combining specific bioactive compounds can be to increase the basic action, with better therapeutic results and better satisfaction for patients and specialists, thereby improving the attributes of the product and also replacing synthetic chemical compounds.

In a thorough study of the products already marketed there is a discrepancy between the large number of products containing antioxidant associations and the lack of detailed studies related to the concentration and ratio of the associated antioxidants.

The research aims to highlight the most popular associations and to bring additional data on concentration and ratio in mixtures of resveratrol and ferulic acid, antioxidant ingredients recognized for combating oxidative stress and its effects.

RO.82.
Title EN

**DEVICE FOR TRAINING EYE-HAND
COORDINATION AND UPPER LIMB
REHABILITATION**

Authors

Gatman Robert, Păcuraru Gabriel-Lucian, Teacu Mihail-Sebastian

Institution

**“Grigore T. Popa” University of Medicine and Pharmacy
Iasi, Faculty of Medical Bioengineering**

Patent no.

-

**Description
EN**

This paper presents an innovative medical device for the recovery and improvement of upper limb mobility, which uses infrared sensors and electroluminescent diodes to create tactile buttons with sensory feedback. Equipped with an Arduino MEGA microcontroller and an LCD screen, it provides real-time information and allows custom settings to be configured. Used in interactive therapy, the device improves coordination and agility. Integrating moderate physical exercises represents and innovative methodology for mobility recovery. The study highlights the importance of continued research in this area. Prototyping was the method used for development, and following feedback from users

and testers we will optimize the device and improve its capabilities by creating a library of interactive games.

RO.83.**Title EN****Hand Motion Video Recognition System for Cursor Control in Healthcare Applications****Authors**

Marius TURNEA, Mariana ROTARIU, Andrei GHEORGHITA, Iustina CONDURACHE, Taiki-Constantin BABA, Ingrid-Elena MACOVEI, Fima STORIȘTEANU

Institution

"Grigore T. Popa" University of Medicine and Pharmacy Iași, Faculty of Medical Bioengineering

Patent no.**Description EN**

In recent years, the field of computer vision has witnessed remarkable progress in the domain of hand motion video recognition. The developed solution introduces an innovative hand motion video recognition system tailored for medical use, offering precise cursor control without the need for conventional input devices like a mouse or touchpad. Leveraging advanced motion recognition and image analysis technologies, the system tracks and interprets hand gestures in real-time. Its algorithm accurately detects a range of gestures, including up-down and left-right movements, as well as clicking gestures, without necessitating specialized hardware or intricate calibrations. By translating hand motions into cursor commands, the system enables clinicians to navigate medical software and interfaces with exceptional accuracy directly from the patient's bedside or workstation. This technology is enhancing workflow efficiency and is reducing contamination risks, as it minimizes the need for physical contact with input devices. Using this input method enhances hygiene practices by minimizing physical contact with computer peripherals, thereby reducing the transmission of pathogens in healthcare settings.

RO.84.**Title EN****Virtual Reality and 3D Printing: Innovative Solutions in Advanced Surgical Interventions Planning****Authors**

GHEORGHITĂ Andrei, CONDURACHE Iustina, Mariana ROTARIU, ILEA Mihai, AROTĂRIȚEI Dragoș, MANEA Florian-Cosmin, POPA Florin-Bogdan

Institution

"Grigore T. Popa" University of Medicine and Pharmacy Iași, Faculty of Medical Bioengineering, Romania

Patent no.

In modern medicine, the utilization of cutting-edge technologies such as virtual reality (VR) and 3D printing has emerged as a revolutionary approach in the planning and execution of advanced surgical interventions.

Virtual reality offers surgeons an immersive platform to visualize intricate anatomical structures in three-dimensional space. Through VR-based surgical simulations, surgeons can refine their skills, anticipate potential challenges, and devise optimal surgical strategies, thereby reducing intraoperative complications. Surgeons can utilize patient-specific 3D-printed anatomical models generated from medical imaging data (such as CT scans or MRI) to gain a deeper understanding of complex anatomical structures and pathologies. These physical models allow for hands-on preoperative planning, facilitating more accurate surgical approaches and reducing the risk of complications. These modalities provide clinicians with detailed insights into patient anatomy, pathology, and physiological processes, serving as the foundation for personalized surgical interventions.

Description
EN

By integrating virtual reality and 3D printing into the surgical workflow, healthcare providers can achieve unparalleled levels of precision, efficiency, and personalized care in the realm of advanced surgical interventions. The integration of 3D printing and virtual reality (VR) technologies in surgical procedures represents a significant advancement in modern medicine, offering transformative benefits to both surgeons and patients.

RO.85.

Title EN

Chest compression device for cardiac massage

Authors

Daria-Georgiana Opria, Daniela Viorelia Matei, Florin Munteanu

Institution

“Grigore T. Popa” University of Medicine and Pharmacy from Iași, Faculty of Medical Bioengineering

Patent no.

Description
EN

Emergency response services are often faced with unique challenges, with chest compressions being a fundamental procedure in most interventions. This study focuses on a medical device dedicated to performing cardiac massage,

specifically designed to meet the requirements of emergency medical services. With a sturdy structure and a small number of components, the device can be adjusted to fit each patient's dimensions using two servo motors and linear guidance mechanisms. The crank-handle mechanism, operated by a third servo motor, constitutes the module that performs the cardiac massage. The medical device presents a promising, reliable, cost-effective solution that can be easily implemented in the intervention vehicles of the emergency response services throughout the country

RO.86.**Title EN****Line Recovery Device****Authors****Giumali Senol, Daniela Viorelia Matei
Florin Munteanu****Institution**"Grigore T. Popa" University of Medicine and Pharmacy
from Iași, Faculty of Medical Bioengineering**Patent no.**

The daily amount of time spent on the phone is on a clear, and worrisome, uptrend.

A healthy and ergonomic posture is one where the spine is vertical and upright, the anatomical curvatures are well defined, and the weight bears down directly in line with the spine's mechanical axis. Usually, the phone's screen ends up positioned well below eye level, and so we adopt a kyphotic posture and sustain it for long periods of time.

Line opposes the many activities included in the modern lifestyle which impose a kyphotic posture through complementary movement patterns that counteract the negative effects on the human body.

Description**EN**

Line induces postures that are both directionally and functionally opposed to the aforementioned, thus reducing the negative effect, and preventing the onset of pathological conditions. The motions are natural, inspired from man's instinctive rest posture, but, also, well aligned with the principles of biomechanics.

The device is a mechatronics system consisting of a robotic arm that can be further enhanced with sensors according to the patient's specific needs and the treatment plan.

Line uses the patient's intrinsic motivation of focusing on entertainment in order to attain relaxation and postural reeducation.

Thus, the relief of a pain-free and unrestricted spine is directly linked to the pleasure offered by watching the preferred type of virtual content. This makes the system very easy to use, and as such, efficient, in a context where the users have ever less time and mental space for self-care.

RO.87.

Title EN	Exploring the effect of atmospheric pressure plasma on the young wines
Authors	Andrei Vasile Nastuta ¹ , Ramona Huzum ² , I. Topala ² , C. B. Nechita ³ , M. Niculaua ³ , V. Cotea ³
Institution	¹ “Grigore T. Popa” University of Medicine and Pharmacy Iasi, Faculty of Medical Bioengineering, ² “Alexandru Ioan Cuza” University of Iasi, ³ Romanian Academy – Iasi Branch, Oenological Research Center, Iasi, Romania
Patent no.	0
Description EN	<p>Plasma discharges at atmospheric pressure (appj) have a wide range of applications in a variety of fields, including agriculture, medicine, and industry. As a result, it is of utmost significance to characterize plasma sources from both an electrical and optical perspective, in order to meet the requirements of the appropriate applications.</p> <p>In order to enhance the storage capacity and quality of wine, we make use of an appj that is designed to handle liquid media, namely fresh must (grape juice).</p> <p>Electro-optical techniques were utilized in order to characterize the plasma source, and UV-Vis spectroscopy, ATR-FTIR, and pH and volatile components measurements were collected in order to analyze the plasma-treated liquid medium. From the findings, it appears that plasma discharge is the most effective method for activating the medium and conserving the wine.</p>

R. Huzum, A.V. Nastuta, Helium Atmospheric Pressure Plasma Jet Source Treatment of White Grapes Juice for Winemaking, Applied Sciences, 11 (18), (2021), 8498

RO.88.**Title EN****Advancements in AI-Enhanced Body Posture Detection: A Next-Generation Monitoring System****Authors**Betina-Mihaela Melinte¹, Mihai Aron², Teofil Ilie Ursache^{1,2}, Ioana-Raluca Adochiei³, Cristian Rotariu¹, Gabriela-Gladiola Petroiu¹¹Grigore T. Popa University of Medicine and Pharmacy of Iasi, Faculty of Medical Bioengineering, M. Kogălniceanu 9-13, Iași, România**Institution**²Gheorghe Asachi Technical University, Faculty of Automatic Control and Computer Engineering, Str. Prof. dr. doc. Dimitrie Mangeron, nr. 27, Iași, România.³Technical Military Academy "Ferdinand I" & Emil Palade Center of Excellence for Young Researchers, Bucharest, Romania.**Patent no.****Description
EN**

The fusion of Artificial Intelligence (AI) and Machine Learning (ML) has catalyzed remarkable progress in body posture detection. This study introduces an upgraded version of our existing posture detection framework, fortified with cutting-edge AI techniques for heightened accuracy and real-time functionality. By integrating advanced sensor data fusion, deep learning models, and real-time analysis, the enhanced system achieves superior precision and resilience in posture monitoring. Through machine learning algorithms, it efficiently processes sensor data, adapting dynamically to individual postural behaviors, thus offering personalized feedback and interventions. This adaptability is particularly valuable in clinical and ergonomic contexts, aiding in early detection of minor postural irregularities to prevent long-term musculoskeletal issues. Furthermore, the system's versatility is expanded with additional sensors and an intuitive interface, facilitating seamless integration into various environments. Portable and cost-efficient, our updated solution enables continuous posture monitoring, transcending existing technological limitations and setting a new industry benchmark. In essence, this paper delineates the evolution of our AI-driven body posture detection system, representing a significant advancement with implications for health, ergonomics, and personal well-being.

RO.89.	
Title EN	AUTOMATIC SYSTEM FOR MONITORING DRIVER'S PHYSIOLOGICAL PARAMETERS
Authors	Iulian Claudiu LAZĂR ¹ , Mihai ARON ² , Teofil Ilie URSACHE ¹ , Gladiola PETROIU ¹ , Cristian ROTARIU ¹
Institution	¹ Grigore T. Popa University of Medicine and Pharmacy of Iasi, Faculty of Medical Bioengineering, Dept. of Biomedical Sciences, M. Kogălniceanu 9-13, 700454 Iași, Romania
Patent no.	² Gheorghe Asachi Technical University, Faculty of Automatic Control and Computer Engineering, Dept. of Automatic Control and Applied Informatics, Iași, Romania, Str. Prof. dr. doc. Dimitrie Mangeron, nr. 27, Iași, 700050
Description EN	<p>A significant contributor to road accidents stems from driver's inability to make timely and clear decisions in critical moments. Continuous monitoring of driver's vital signs becomes imperative to assess their health status and judgment capability while driving. The proposed system is designed to monitor physiological parameters using an array of sensors integrated into a steering wheel. This system alerts drivers if their pulse, oxygen saturation (SpO2) and heart rate (HR) are not in the normal intervals and if the galvanic skin response (GSR) is decreasing rapidly. These physiological signs are constantly measured using three acquisition modules. The first module, the MAX30100, measures the driver's pulse and SpO2 values. The ECG acquisition board extracts the ECG Lead I signal via the two copper electrodes placed on the steering wheel and the CJMCU-6701 module, with other two electrodes placed on the driver's fingers, detects the GSR. The data collected by the acquisition modules is processed by the ATmega328P, an 8-bit microcontroller operating at a clock frequency of 16MHz from an Arduino Uno board. Processed data is then transmitted to the driver's smartphone via Bluetooth communication using the HC-05 module. If physiological conditions such as heart rate arrhythmias, hypoxemia or acute stress reactions are detected, the system triggers visual and auditory alerts to notify the driver.</p> <p>This system represents a significant advancement in road safety and accident prevention by continuously monitoring blood oxygen saturation, pulse rate, heart rate, and GSR, ultimately increasing driver health and decreasing the number of potential road accidents.</p>

RO.90.	
Title EN	NON-INVASIVE DEVICE FOR HEARING REHABILITATION
Authors	Daniela GOLDAN ¹ , Mihai ARON ² , Teofil Ilie URSACHE ¹ , Gladiola PETROIU ¹ , Cristian ROTARIU ¹
Institution	¹ GRIGORE T. POPA University of Medicine and Pharmacy of Iasi, Faculty of Medical Bioengineering, Dept. of Biomedical Sciences, M. Kogălniceanu 9-13, 700454, Iași, România
Patent no.	² GHEORGHE ASACHI Technical University, Faculty of Automatic Control and Computer Engineering, Dept. of Automatic Control and Applied Informatics, Str. Prof. dr. doc. Dimitrie Mangeron 27, 700050, Iași, România
Description EN	<p>INTRODUCTION:</p> <p>According to international statistics, it is estimated that more than 466 million people suffer from some form of hearing loss globally. This number includes both adults and children, and is increasing due to factors such as an aging population, exposure to loud noise, untreated otitis media, associated chronic diseases, genetic factors, and other causes.</p> <p>METHOD:</p> <p>Our non-invasive hearing rehabilitation device is designed to provide an innovative and effective solution for people with hearing problems and ear conditions that do not allow the use of classic hearing prostheses, such as: congenital malformations, chronic infections, recurrent otitis, etc.</p> <p>The essential components of this device include headphones equipped with Bluetooth technology and a smartphone. The smartphone is used to capture sounds from the environment using its built-in microphone. These sounds are processed in real time by a dedicated application on the phone, which uses advanced algorithms to adjust and improve the sound quality according to the individual needs of the user.</p> <p>The processed sounds are transmitted to the wireless headphones via Bluetooth technology. These headphones are equipped with bone vibration transducers, which transmit sounds directly to the user's inner ear via bone conduction.</p> <p>The application installed on the smartphone allows the user to adjust the volume and other settings of the sounds captured and transmitted by the device. The app can also</p>

provide additional features, such as equalization presets and sound direction control, to customize the user's listening experience.

CONCLUSIONS:

We believe that this system offers an effective and affordable solution for the presented risk group. The benefits of this system are: the sounds are transmitted in real time to the inner ear without interacting with the external auditory canal, the user has the possibility to adjust the sounds he perceives according to his hearing deficit through an application with an easy interface, it is non - invasive, it is cheap compared to ITE, BTE and RIE type hearing prostheses and is easy to use.

RO.91.	
Title EN	NEW METHOD OF TREATMENT BY ROBOTIC-ASSISTED PELVIC SURGERY
Authors	Dragos Viorel Scripcariu, Razvan Vieriu, Mihaela-Madalina Gavrilescu, Ioana Florescu, Viorel Scripcariu
Institution	¹GRIGORE T. POPA University of Medicine and Pharmacy of Iasi, Faculty of Medicine, Universităţii 16, Iaşi, România
Patent no.	
Description EN	<p>The feasibility of the robotic-assisted surgery was assessed by measuring the conversion rate to laparotomy.</p> <p>The safety of the surgery was evaluated by recording the incidence of intraoperative and postoperative complications.</p> <p>Results: Fifty robotic surgeries were performed over 6 months, including 21 interventions for digestive neoplasia, 14 gynaecologic cases, and 15 prostatic cancers.</p> <p>The study found that robotic-assisted pelvic surgery is safe and has a low rate of transfer to open surgery, making it a suitable addition to conventional laparoscopy.</p>

**“Carol Davila” University of Medicine and Pharmacy,
Bucharest, Romania**

RO.92.	
Title EN	Gels with naproxen for skin application and method for obtaining them
Authors	Ghica Mihaela Violeta, Dinu-Pîrvu Cristina-Elena, Popa Lăcrămioara, Anuța Valentina, Prisada Răzvan Mihai, Velescu Bruno Ștefan, Tudoroiu Elena-Emilia
Institution	“Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania, Dionisie Lupu Str., no. 37, 020021, Bucharest, Romania, e-mail:
Patent no.	Patent application no. A / 00639 / 31.10.2023
Description EN	<p>The invention relates to a gel based on hydroxyethylcellulose and various penetration promoters to ensure the release of a non-steroidal anti-inflammatory drug, intended for skin application in the treatment of acute soft tissue injuries, and to a method of obtaining it.</p> <p>The technical problem that the invention solves consists in: (i) designing a gel for skin application based on hydroxyethylcellulose (semisynthetic biopolymer) and a mixture of penetration promoters (Transcutol, polyethylene glycol 200, ethyl alcohol and isopropyl alcohol) combined in different proportions, (ii) selecting a non-steroidal anti-inflammatory drug, naproxen, loaded in different concentrations in the gel base, to obtain an appropriate drug delivery system, which provides an analgesic and anti-inflammatory effect on acute soft tissue injuries.</p> <p>The application of the invention leads to the following advantages:</p> <ul style="list-style-type: none"> - topical use of a gel based on a biocompatible and biodegradable polymer and a mixture of various penetration promoters that ensure the drug penetration through the layers of the skin and its release at the action site, achieving an efficient analgesic and anti-inflammatory effect on an acute soft tissue injury; - obtaining a gel that presents adequate rheological profiles that allow proper conditioning and spreading on the skin surface, improving the patient compliance to the treatment; - obtaining a gel that exhibits a sustained release of naproxen over several hours, providing pain relief associated with soft tissue injury, followed by a gradual release to relieve inflammation; - avoiding systemic toxicity at the gastrointestinal, hepatic, renal or cardiovascular level.

RO.93.

Title EN	Microemulsions with miconazole for buccal application and method for obtaining thereof
Authors	Popa Lăcrămioara, Dinu-Pîrvu Cristina Elena, Ghica Mihaela Violeta, Anuța Valentina, Prisada Răzvan Mihai, Talianu Marina-Theodora
Institution	“Carol Davila” University of Medicine and Pharmacy, Bucharest, 37 Dionisie Lupu Str., 020021, Bucharest, Romania, e-mail: rectorat@umfcd.ro
Patent no.	Patent application No. A / 00638 / 31.10.2023 The invention refers to a coarse dispersion designed as microemulsion for miconazole delivery, intended for oromucosal application to treat oral candidiasis and a method for obtaining thereof. The technical issue solved by the invention consists of (i) designing a topical oromucosal system as oil in water microemulsion, (ii) selection of two phases, an aqueous and an oil phase, a stabilizer mixture formed by a surfactant and a cosurfactant, (iii) selection of a sweetener agent, combined in various ratios to obtain a stable system characterized by adequate physicochemical parameters, ensuring the topical application on the buccal mucosa with a superior release of miconazole. The following advantages result from the invention:
Description EN	<ul style="list-style-type: none"> - the topical application of an O/W microemulsion which may incorporate (i) an antifungal agent, namely miconazole base 2%, using an oil and a stabilizer mixture; - solving solubility and bioavailability challenges of miconazole through (ii) the use of oleic acid as a lipophilic phase and the stabilizers; - the stabilizer mixture defined by the association of (iii) Tween 20 as the non-ionic surfactant with PEG 400 as cosurfactant assures droplet size reduction and a good displaying at the mucosal area likewise; - the selection of xylitol as a sweetener from the polyol class is affordable to reduce the unpleasant taste of the invented system; - the abovementioned properties are significant for the miconazole release from the microemulsion; - based on the proposed invention, a microemulsion with adequate properties can be obtained, through a simple processing method with reduced energy input.

RO.94.

Title EN **I.D.E.A.L – Innovation, Digitalization, Education, Entrepreneurship, Leadership. Successful Doctor and Entrepreneur!**

Authors **Marina IMRE**

Institution **University of Medicine and Pharmacy "Carol Davila" Bucharest**

Patent no.

Description EN

This project builds upon previous projects and aims to create, consolidate, and promote at the university level an entrepreneurial culture capable of accelerating the generation of successful businesses, as well as developing the intrapreneurial dimension through the integration of digital innovations into the training process of UMFCD students and graduates.

Following the impact analysis of the UMFCD SAS activity carried out through the FDI 2023 project (questionnaire applied to participants), students emphasized the need for active involvement of mentors, tutors, or lecturers to simulate real entrepreneurial situations, indicating a considerable interest in entrepreneurship among students.

Also, we apply entrepreneurial skills development tools for the students of the "Carol Davila" University of Medicine and Pharmacy (UMFCD), which represent an essential process aimed at providing students with knowledge and skills specific to the entrepreneurial environment, in order to prepare them for the challenges and opportunities in the medical and pharmaceutical fields. This development effort focuses on providing the necessary framework for understanding entrepreneurial concepts, stimulating creativity and innovation, fostering initiative, and promoting risk management capacity in a continuously changing medical and pharmaceutical context.

RO.95.

Title EN	Supporting the institutional mechanisms for correlating the educational offer of UMFCD with the requirements of the labor market
Authors	Bruno Velescu
Institution	University of Medicine and Pharmacy "Carol Davila" Bucharest
Patent no.	CNFIS-FDI-2024-F-0584
Description EN	<p>The aim of the project is to support UMFCD Strategic Development Plan and strengthen the Institutional capacity to generate highly competent human resources by optimizing the institutional mechanisms to correlate the educational offer with the labour market. The specific endpoints of the project:</p> <ol style="list-style-type: none"> 1. Skillset identified by healthcare professional organisations/employers/employees and harmonised with European and national regulations 2. Consensus report on the competencies considered to be introduced in the short-term training programs 3. Curricula are designed to reflect the identified competencies, including the Digital Health sector 4. Collaboration agreements <p>Methodology for selecting partners from the socio-economic environment who may be involved in the educational offer</p>

**University of Medicine and Pharmacy
„Iuliu Hatieganu” Cluj-Napoca**

RO.96.	
Title EN	CREAM WITH PHOTOCHEMOPROTECTIVE EFFECT AND THE PROCEDURE FOR THEIR OBTAINING
Authors	Gabriela Adriana Filip, Marcela Achim, Simona Clichici, Postescu Ion Dan, Maria Perde-Schrepler,
Institution	University of Medicine and Pharmacy „Iuliu Hatieganu” Cluj-Napoca; Oncologic Institute "Prof. Dr. Ion Chiricuța" Cluj-Napoca
Patent no.	127719/30.03.2016 The inventions refer to the content of a cream, oil-in water emulsion for topical application with photochemoprotective properties, in the cosmetic field, designed to protect the skin against the noxious effects of ultraviolet radiation and also to two procedures of their obtaining. The inventions combine a natural extract obtained from Vitis Vinifera grape seeds, the Burgund Mare variety, and simple and cheap ingredients for the cream, which assure a good penetration of the extract in the skin and also improve the texture of dry/normal skin, are noncomedogenic and maintain their moisturisation.
Description EN	
RO.97.	
Title EN	Process for obtaining functionalized GNP-Chit-EGF nanostructures.
Authors	Matea Cristian, Mocan Teodora, Iancu Cornel, Mocan Lucian
Institution	„Iuliu Hatieganu” University of Medicine and Pharmacy Cluj-Napoca, Romania Regional Institute of Gastroenterology and Hepatology “Prof. Dr. O. Fodor”, Cluj-Napoca, Romania
Patent no.	133479/2022 The invention refers to a process for preparing a product applicable for the photothermal treatment of antibiotic-resistant Klebsiella pneumoniae infections. According to the invention, the process consists in synthesizing Au nanoparticles stabilized with chitosan (GNP), after which they are functionalized by covalent binding with EGF - epidermal growth factor protein, the nanoparticles thus
Description EN	

functionalized are subjected to successive steps of centrifugation and redispersion through ultrasound treatment in double-distilled water to remove reaction by-products.

RO.98.	
Title EN	Process for obtaining functionalized nanostructures type GNP-HSA-PBP2a
Authors	Mocan Lucian, Matea Cristian, Pop Teodora, Mosteanu Ofelia, Mocan Teodora.
Institution	„Iuliu Hatieganu”University of Medicine and Pharmacy , Cluj-Napoca, Romania
Patent no.	Regional Institute of Gastroenterology and Hepatology „Prof. Dr. O. Fodor”, Cluj-Napoca, Romania 131844 / 2020
Description EN	The invention refers to a process for preparing a product to be applied in the antibacterial photo-thermal laser treatment. According to the invention, the process consists in the preparation, in the first step, of gold nanoparticles stabilized with citrate, which are then replaced by mercaptosuccinic acid, after which they are functionalized by covalent binding with the anti-PBP2a antibody, then the nanoparticles thus functionalized, are subjected to successive stages of centrifugation and redispersion through ultrasonic treatment in double-distilled water, for the removal of reaction byproducts.
RO.99.	
Title EN	Composition of photopolymerizable giomer
Authors	Cristina Prejmorean, Marioara Moldovan, Doina Prodan, Tinca Buruiana, Laura Silaghi-Dumitrescu, Sarosi Codruta, Vlasa Mihaela, Colceriu Burtea Loredana, Hodisan Ioana, Boboia Stanca, Dorin Dadarlat, Mihaela Streza, Camelia Agapescu
Institution	Iuliu Hatieganu University of Medicine and Pharmacy Cluj-Napoca
Patent no.	Patent application No. 132534/30.09.2019
Description EN	Giomer technology is a new concept of adhesive dental biomaterial based on pre-reacted glass. The pre-reacted glass is able to release fluoride ions over time that penetrates the polymer matrix reaching the material enamel interface. This happens when the pH of the environment drops to values lower than 4.5-5.5 during the bacterial attack

on the enamel The fluoride ions released by giomer lead to the formation of fluorapatite in the presence of calcium and phosphate ions resulted after enamel demineralization. Through the formation of fluorapatite the demineralization process is stopped and the caries remineralization process begins.

The advantages deriving from the use of giomer as a restoration and sealing material are: aesthetics, high wear resistance, hydrolytic stability.

RO.100.
Title EN

Nanomaterials based on multi-substituted hydroxyapatite and their production process

Authors

Tomoaia-Cotisel Maria, Mocanu Aurora

Institution

UMF Iuliu Hatieganu Cluj Napoca

Patent no.

RO 133124 B1/30.08.2021

**Description
EN**

The invention aims to develop a new class of nanomaterials based on PAH/multisubstituted PAH with increased biological activity, used for biomedical purposes in dentistry for remineralization of dental enamel, bone remineralization in case of endodontic perforations and prevention of periodontal inflammation.

Technical problems solved by innovation

- the development of new kinds of nanomaterials based on PAH, and multi-substituted PAH in which the calcium ions are partially replaced by Magnesium, Zinc, Strontium.

- advanced methods of their preparation

The advantages brought by the invention

- the possibility of using patented PAHs to obtain toothpastes with a remineralizing effect. All prototype pastes containing multi-substituted PAH tested in this study produced enamel remineralization effect.

- the possibility of using the patented HAP to obtain endodontic cements and sealants that produce bone remineralization in the case of endodontic perforations and the prevention of periodontal inflammation.

RO.101.
Title EN

Chewable tablets with pollen and natural vitamin C

Authors

Tomuța Ioan, Hales Dana

Institution

University of Medicine and Pharmacy „Iuliu Hatieganu” Cluj-Napoca

Patent no.	RO 135449 A2 / Patent application No. A/00362/2020 The invention relates to a process for obtaining chewable tablets which contain a combination of natural components, namely pollen, honey, glucose and standardized extracts in the content of vitamin C and/or β -carotene. The process, according to the invention, consists in the steps of grinding bee pollen, preparing dried extracts of rosehip, sea buckthorn, acerola, cranberries or currants and standardizing them in the content of ascorbic acid, or ascorbic acid and beta-carotene respectively, followed by the preparation of chewable tablets by mixing 100...500 parts pollen, 45...100 parts standardized extract, 25...50 parts honey as binder and 75...150 parts glucose, possibly a flavoring, and finalizing with the wet and dry calibration of the granulate and its compression. Bee pollen is valued for its excellent nutritional and therapeutic properties, and is currently consumed as a food supplement. In the chewable tablets, the pollen is associated with other natural components, namely honey, glucose and standardized extracts in the content of vitamin C and/or β -carotene, in order to obtain a natural product containing high amounts of minerals, vitamins, amino acids, enzymes, organic acids, flavonoids, but mostly carbohydrates, which contribute to the antioxidant, antimicrobial and nutritional properties. These tablets can be used to supplement the diet of the general population, but also in the case of special categories of patients, such as children and the elderly, due to the benefit brought to these categories who have swallowing difficulties, or in the case of cachectic patients, who need a rapid supply of easily assimilable monosaccharides.
Description EN	

RO.102.

Title EN	Procedure for obtaining an extract of <i>Melissa officinalis</i> L. Enriched in phytotherapeutic compounds by gamma irradiation
Authors	Radomir Ana-Maria, Guță Ionela-Cătălina, Neagu Constantin Daniel, Moldovan Radu-Cristian, Iuga Cristina-Adela
Institution	Iuliu Hațieganu University of Medicine and Pharmacy Cluj-Napoca
Patent no.	Patent application A/00420/22.07.2021
Description EN	This invention refers to a procedure for obtaining an extract of <i>Melissa Officinalis</i> L. (lemon balm) enriched in phytotherapeutical compounds, for the pharmaceutical

industry. The procedure, according to the invention, consists in the following steps: in vitro cultures initiation using explants taken from healthy mature plants of lemon balm by inoculation on sterile culture medium without growing regulators, explant subcultivation, irradiation of vitro-plants using gamma rays after 3-4 weeks after inoculation on multiplication medium, microwave extraction at 40-50°C after the same time interval after gamma irradiation stimulation treatment, using 200-300 W microwave power, under magnetic stirring at 200 rpm, for 10-15 min, resulting in a plant extract enriched in bioactive compounds.

RO.103.**Title EN****Enzyme-based Gel for Tooth Whitening and Enamel Regeneration****Authors**

Moldovan Marioara, Saroși Codruța, Prodan Doina, Cuc Stanca, Popescu Violeta, Moldovan (Mazilu) Ionela Amalia, Agapescu Camelia, Gasparik Cristina, Dudea Diana

Institution

Iuliu Hatieganu University of Medicine and Pharmacy

Patent no.

Patent application No. A/00453/28.07.2022

**Description
EN**

The present invention consists in the development of a gel composition with enzymes (bromelain), for the minimally invasive treatment of localized dental discolorations. Bromelain is used for numerous clinical applications due to its therapeutic effects in the treatment of inflammation, soft tissue injuries.

The thematic problem, which the present invention solves, refers to obtaining whitening gel formulas with superior properties, on the one hand by using natural gels based on enzymes (bromelain, papain), and on the other hand by developing an optimal composition of gels in which the enzymes are contained in nanocapsules to ensure their controlled release.

The main characteristic of this type of enzymes is the ability to improve the reduction of hydrogen peroxide-dependent oxidation and to reduce the toxicity of electron-donating compounds such as peroxides and some aromatic compounds. The proposed gels containing plant-derived enzymes may hold significant clinical potential for the preparation of hydrogen peroxide/carbamide-free gels.

RO.104.	
Title EN	A Multivariate Analysis method combined with Surface Enhanced Raman Spectroscopy on filtered and unfiltered plasma samples for clinical applications
Authors	Ioana Pavel, Valentin Toma, Mihai Constantin Lucaciu, Rareş Ionuţ Ştiufiuc
Institution	MedFUTURE Research Center for Advanced Medicine/"Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca
Patent no.	Patent application No. A/00532/24.08.2020
Description EN	The patent introduces a novel method that uses a Multivariate Analysis of Surface Enhanced Raman Spectroscopy (SERS) data obtained from filtered and unfiltered plasma, and could have a clinical application. Solid substrates for SERS investigations have been used. These substrates are capable of providing high intensity SERS (Raman) signals from low molecular weight molecules found in biological liquids such as: plasma, serum, saliva, cellular lysates, without the need for a preliminary deproteinization step and at high reproducibility rates. Purification and concentration of the samples was performed by running the colloid through a tangential flow filtration device equipped with different porous filters (10-100 kDa). The efficiency of the substrate was analyzed by performing measurements on reference molecules that possess good Raman cross-sections such as methylene blue and rhodamine 6G, and also on biological liquids such as plasma, serum, saliva, etc. The SER spectra recorded using these substrates have been employed for cancer detection by means of Multivariate Analysis of the spectra collected on blood samples. The method is characterized by robustness, a low cost per sample, and last but not least an easy-to-operate and translate workflow.
RO.105.	
Title EN	TOOTHPASTE CONTAINING AN EXTRACT ENRICHED WITH ACTIVE INGREDIENTS OBTAINED FROM GRAPE POMACE AND VITIS VINIFERA LEAVES
Authors	Mirela-Liliana Moldovan, Cătălina Bogdan, Daniela Benedec, Sonia Meda Iurian
Institution	Faculty of Pharmacy, "Iuliu Hațieganu" University of

Patent no.	Medicine and Pharmacy Cluj-Napoca, Romania Patent application No. A/00730/16.11.2020
Description EN	The invention relates to a toothpaste with extract enriched in actives obtained from pomace and vine leaves. The extract used is enriched in antioxidant, antimicrobial and anti-inflammatory substances from white pomace, red pomace and vine leaves (<i>Vitis vinifera</i> L.), to which a combination of ingredients with increased tolerance in the oral cavity has been added: natural abrasive ingredients of rice powder and bamboo sap extract, a surfactant of natural origin - lauryl glucoside and allantoin. The toothpaste is intended to maintain the health of the oral cavity and improve the early symptoms of periodontal disease. Applications: cosmetic industry, oral care cosmetics.

RO.106.

Title EN	Nanotargeting prototype for anti-cancer curative applications
Authors	Ștefan Țițu, Lucian Mocan, Romelia Pop, Teodora Mocan, Flaviu-Alexandru Tabaran, Iancu Cornel, Alexandru Irimie
Institution	Iuliu Hatieganu”University of Medicine and Pharmacy, Cluj-Napoca, Romania; Regional Institute of Gastroenterology and Hepatology „Prof. Dr. O. Fodor”, Cluj-Napoca, Romania
Patent no.	Ph.D Student Research Project – PhD Thesis Matrix metalloproteinase -1 has been demonstrated to interfere with cell migration, invasiveness and collagen destruction in cancer patients. In particular, the hemopexin domain of MMP-1 regulates cell behaviour and the concentration upregulation has been known to increase rate of tumor local and metastatic growth.
Description EN	Also, gold nanoparticles represent FDA-approved solutions for cancer imaging and treatment, due to their high level of biocompatibility. We hereby propose an experimental model that starts with the synthesis of gold nanoparticles (modified Turkevich method). The next step of our concept is represented by binding of the anti-MMP1 hemopexin domain antibody onto the surface of nanoparticles. The newly designed construct has a significant potential for targeting applications (photothermal treatment, tumor imaging) in cancer field.

“Alexandru Ioan Cuza” University of Iasi

RO.107.	
Title EN	Fraud Risk Assessment Using Artificial Neural Network
Authors	Georgiana BURLACU ¹ , Ioan-Bogdan ROBU ¹ , Ionuț Viorel HERGHILIGIU ²
Institution	¹ Alexandru Ioan Cuza University of Iasi ² Gheorhe Asachi Technical University of Iași
Description EN	Financial fraud is a phenomenon that created problems in the business environment and brought numerous losses to the economy. Based on the increasement of financial fraud cases, the competent profesional bodies and numerous researchers tried to find the best methods of detection and prevention of this illegal acts. This action has created and continues to bring great challenges as a result of increasingly complex fraud cases. The academic environment continues to discover new advanced methods that allow easier detection of financial fraud. The purpose of this study is to test the artificial neural network method, one of the most discussed techniques, in the detection of financial fraud at the level of listed Romanian companies. Iin this study, a sample was analyzed that includes a number of 62 entities listed on the Bucharest Stock Exchange. The analyzed period is comprised between the years 2018-2022, thus resulting in a number of 248 observations. The results of study highlight an increased efficiency of the artificial neural network in the detection of financial fraud in the case of listed Romanian companies.
RO.108.	
Title EN	Exploratory Study on the Influence of Audit Opinion on the Share Prices of Companies Listed on the Bucharest Stock Exchange
Authors	Andreea MOCANU ¹ , Ioan-Bogdan ROBU ¹ , Ionuț Viorel HERGHILIGIU ²
Institution	¹ Alexandru Ioan Cuza University of Iasi ² Gheorhe Asachi Technical University of Iași
Description EN	True foundations of capitalism, stocks began to be used as capitalization tools and profit-making instruments since the 17th century. Independent and objective opinions issued by financial auditors are essential to investors for the trust they provide in the financial statements of companies,

illuminating the path through the financial labyrinth of capital markets. Considering the essential role of financial auditing in ensuring the transparency and credibility of financial information, the purpose of this study is to test the influence of audit opinions on the share price of companies listed on the Bucharest Stock Exchange. In conducting this study, we analyzed a sample of 30 companies listed on the main market, representing the hospitality, pharmaceutical, extraction industries, the electric power industry, as well as firms in the construction sector. Data were collected from the annual reports of the companies for the period 2018-2022.

RO.109.

Title EN **Interdisciplinary analysis and the role of experiments in identifying the raw material and technology of prehistoric pottery from the Bistrița River Basin**

Authors Ana DROB

Institution Arheoinvest Center, Department of Exact and Natural Sciences, Institute of Interdisciplinary Research, “Alexandru Ioan Cuza” University of Iași,

Description EN

This research represents an interdisciplinary approach based on an experimental model for investigating clay sources. The study proposes a combination of archaeological, physico-chemical, and experimental data, with the main objective of identifying the clay sources used by the Bronze Age communities in the Bistrița River Basin from the Eastern Romania. The results obtained following this study contribute significantly to the knowledge of prehistoric behaviours related to the exploitation of the resources necessary for pottery manufacture. Were selected several case studies for the proposed models, representing Middle Bronze Age settlements from the studied area. Finally, according to the scientific arguments that resulted, the model according to which the source of clay used by prehistoric communities would be the closest and easiest is not applicable in all cases, as many contextualizations are needed to generate a possible behavioural model. Thus, the development of this type of investigation for as many sites as possible, from different periods, can provide a more comprehensive picture regarding the exploitation of the environment by prehistoric communities.

RO.110.

Title EN	Interdisciplinary Investigations in Researching the Noua settlements with ashmounds. Practical values or ritualic connotations?
Authors	Casandra BRAȘOVEANU
Institution	Center Arheoinvest, Department of Exact and Natural Sciences, Institute of Interdisciplinary Research, “Alexandru Ioan Cuza” University of Iași
Description EN	<p>The research conducted aimed to perform interdisciplinary research on the ashmounds specific to Noua culture’s settlements, by using methods belonging to multiple scientific domains (physics, geography, chemistry, biology, etc.). The main objective was represented by obtaining new sets of information, essential in documenting the taphonomic processes that led to the forming of the ashmounds. For this, various case studies within the area of Jijioara’s catchment (Iași County) were selected, for which, subsequently, were used non-invasive investigation techniques (aerial photographs, LiDAR – Light Detection and Ranging, geophysical surveys). This methodological approach, complemented by archaeological test-trenches, offered the possibility of soil sampling (in order to carry out pedological, physico-chemical and phyto-pollinic analyses), in order to highlight important features regarding the Noua settlements with ashmounds, contributing significantly to a better understanding of the behavior of the Late Bronze Age communities.</p>

University Politehnica of Timișoara

RO.111.	
Title EN	PROCEDURE AND DEVICE FOR CAPTURE, RECOVERY, INVERSION, FILTRATION AND TREATMENT OF FLUIDS
Authors	Corneliu BIRTOK-BANEASA, Vlad-Mircea MIHAESCU, Adina BUDIUL-BERGHIAN, Ana Virginia SOCALICI, Roxana SIRBU, Petru NEGREA, Daniel-Horatiu URSU, Gabriel Petre GORECKI
Institution	Politehnica University of Timisoara, CITT Politehnica 2020
Patent no.	A/00087/ 23.02.2023
Description EN	The invention relates to a process and device for capturing, recovering, inverting, filtering and treating fluids. The process, according to the invention, consists in coupling the device with the suction path, then the fluid is captured by the external diffuser, then the direction of the fluid is changed in the direction reverser, the fluid on the outside of the external diffuser is taken up by the double recovery diffuser and then directed towards the element of filtration, then fine filtration is carried out simultaneously with the treatment. The device for applying the process, according to the invention, is provided with an external diffuser, reversing direction, filter element, aerodynamic element for directing and treating, internal diffuser, a double recovery diffuser and a recovery.
RO.112.	
Title EN	CORPORATE PERFORMANCE ASSESSMENT BASED ON FUZZY LOGIC (COPER)
Authors	Florin DRĂGAN, Larisa IVAȘCU, Marius PÎSLARU
Institution	Politehnica University of Timisoara, Gheorghe Asachi Technical University of Iași
Patent no.	Project BC 57/21.10.2021
Description EN	The research is focused to develop an integrated neuro-fuzzy based framework in order to generate and evaluate ecological scenarios based on data provided by environmental institutions, proposing concerted actions for improving ecological resilience at local, regional or national level and maximizing the benefits provided by the

environmental policies to society and economy, respecting the ecological limits of the ecosystem. As a consequence, the goal of this research is to develop an integrated framework for using fuzzy logic and neural networks with the purpose of determining the specific integrated system design parameters, and also of ensuring an increased adaptability of the environmental policies to the continuously changing environment.

In this field, the neuro-fuzzy modelling approach is very new and involves defining, delineating, and analysing the system which will perform the pre-defined functions. These functions will result from the architecture of the proposed system of design support variant indicators.

The research originality consists in developing an integrated intelligent system that combines the advantages provided by different computational techniques (fuzzy techniques and neural networks) to develop specific solutions to support innovative policies for environmental sustainability assessment.

The proposed research theme represents a premiere at national level and it's addressing an up-to-date issue for the scientific community worldwide. The digital model (COPER) is the result of a collective effort of multiple interdisciplinary research activities which will encompass the systematization, association, analysis and adaptation of existing knowledge applied in various scientific areas such as computational science, chemistry, engineering, environmental economics, and environmental management.

RO.113.

Title EN

MULTISPECTRAL MODULE AND EQUIPMENT FOR PHYSICAL NON-DESTRUCTIVE CONTROL

Authors

Șaptebani Neta Ionelia, Jurcutiu Corina Elena, Luca Flavia

Mentors: Marian Liviu Mocan, Larisa Victoria Ivașcu, Alin Emanuel Artene

Institution

Politehnica University of Timisoara, CITT Politehnica 2020

Patent no.

PCT/RO2024/000003/14.02.2024 - Doctoral Research project

Description EN

It is a device designed for non-destructive physical customs control that can also be utilized in other areas of interest. Its

major methods of operation include electromagnetic spectrum analyses in multiple bands and information gathering from other sensors. The module has the ability to interface with a special computer network, which enables it to carry out prompt comparison analyses to find any potential attempts to avoid customs clearance. This equipment's claimed goals are to enhance physical customs control, prevent human trafficking, economic crime, and other legal violations. By transmitting the pertinent data on a specialized computer network, the device can be utilized both singly and in groups.

RO.114.**Title EN****AUTONOMOUS HEATING SYSTEM FOR RESIDENTIAL SPACES****Authors**

Pavel Ștefan, Ungureanu Daniel-Viorel, Stan Daniel-Voicu

Institution**Politehnica University of Timisoara, CITT Politehnica 2020****Patent no.**

A/000356/06.07.2023

**Description
EN**

The invention relates to an autonomous heating system for residential spaces consisting of a water heating system as a heat transfer agent and at least one induction heating recipient, an electric power generation system, and a management and distribution system for electric energy composed of a current generator for powering the induction coil of the heating system's recipient, an inverter with an accumulator, a group of photovoltaic panels, and an electric panel with a microprocessor.

RO.115.**Title EN****RECIPIENT FOR INDUCTION HEATING ELECTRIC CENTRAL HEATING SYSTEM AND CONTROL SYSTEM FOR OPTIMIZING ITS OPERATION****Authors**

Pavel Ștefan, Ungureanu Daniel-Viorel, Stan Daniel-Voicu

Institution**Politehnica University of Timisoara, CITT Politehnica 2020****Patent no.**

A/000234/10.07.2023

Description

The recipient for induction heating central heating systems, as per the invention, consists of a metallic body open at both ends, electrically connected to the grounding system, with mounting flanges and four to six baffles, in the form of steel bands, welded inside the body along its internal surface. Ceramic material with reinforced glass fiber fabric is poured on the exterior of the metallic body, and a coil of induction is placed inside the space formed by it through winding

RO.116.**Title EN****TECHNOLOGIES FOR PROCESSING
ROAD VEHICLE RIMS**

Doru Ioan SAPTA

Authors

Mentors: Ana SOCALICI, Vasile PUTAN, Corneliu BIRTOK BANEASA

Institution**Politehnica University of Timisoara, CITT Politehnica
2020****Patent no.**

PhD Thesis / Ph.D. Student Research Project

One of the current trends is the increasing demand for large diameter rims, which can be difficult due to their weight, which leads to increased weight on the car's suspension, compromising comfort and safety behind the wheel, however, this problem has been solved by introducing flow technology forming.

**Description
EN**

"Flow Forming" is a procedure for increasing the width of the rim, which uses 3 hydraulic rollers and very high speeds and forces, which lead to very low weights and high resistances. Through this process, hydraulic rollers force the cast material to follow the profile given by the solid steel tools. During the process the entire diameter of the rim is created.

RO.117.**Title EN****RECYCLING OF AUTOMOTIVE LITHIUM ION
BATTERIES**

Ioan Alexandru RUS

Authors

Mentors: Eugen-Viorel NICOLAE, Corneliu BIRTOK-BANEASA

Institution**National University of Science and Technology
Politehnica Bucharest, Pitesti University Center;
Politehnica University of Timisoara, Faculty of**

	Engineering Hunedoara
Patent no.	PhD Thesis / Ph.D. Student Research Project
	The recycling of used Li-ion batteries must be carried out in accordance with the 4R principle (recycle, reuse, reduce and recover). Battery recycling has two objectives: reducing the negative impact of waste on the environment and reusing the materials that make up the batteries to promote both sustainable production and the circular economy. Materials from battery recycling can also be a valuable resource. The recycling process can be defined as the process, which starts after the collection and possible sorting and/or preparation for recycling of waste batteries and accumulators obtained by a recycling facility and which is completed when the output fractions are produced for use in their original purpose or for other purposes, without being subjected to further treatment and which have ceased to be waste.
Description EN	

RO.118.

Title EN	METALLURGICAL ANALYSIS OF PHOSPHOROUS CAST IRON BRAKE SHOES
Authors	Flavius BUCUR, Ana SOCALICI, Corneliu BIRTOK-BANEASA
Institution	Politehnica University of Timisoara, CITT Politehnica 2020
Patent no.	PhD Thesis / Ph.D. Student Research Project
	The researches were carried out in a specialized factory for casting brake blocks. The study focused on metallurgical characterisation of phosphorous cast iron and consisted of a study of microstructural analysis of samples taken from phosphorous cast iron intended for the manufacture of brake blocks.
Description EN	Microscopic analysis was performed by determinations made with and without attack with reagents of the samples: <ul style="list-style-type: none"> • graphite highlighting for both samples (form of graphite separations, graphite distribution, length of graphite separations and area occupied by it) was obtained on unattacked samples; • Highlighting the basic metal mass, perlite and phosphorous eutectic was obtained by determinations on samples attacked with 5% nital.

Transilvania University of Brasov

RO.119.
Title EN

Title: Branding Creative Cities: Navigating Modern Challenges

Authors

Ciuculescu (Pătrașcu) Elena-Lavinia, Florin-Alexandru Luca

Institution

Transilvania University of Brasov

Patent no.

This poster is based on studying literature review articles concerning creative cities, as well as on research conducted by the authors on document analysis (European Capital of Culture Bidbooks).

Description**EN**

Creative cities thrive on harnessing creativity, innovation, and cultural expression. UNESCO Creative Cities Network (UCCN) was established in 2004 to foster collaboration among creative urban centers. Currently, the network encompasses 350 cities spanning over 100 countries, with member cities included for their association with one of these seven creative fields: film, literature, music, crafts and folk arts, design, gastronomy, and media arts. This thematization brings an official twist to their city brand. Annually, cities bid for the title of European Capital of Culture, a significant milestone on the path to establishing themselves as creative hubs and add a cultural dimension to their brand. Challenges behind the process of creative city branding include negative perceptions associated with the current city image, as well as in-depth problems the cities face that influence the perception of their image (economic difficulties, demographic ageing, intolerance and widened opinion divide, among others).

University "Valahia" from Târgoviște

RO.120.	
Title EN	Emollient cream for dry skin with grapes skin/seed extract (organic culture of <i>Vitis vinifera</i> L., Fetească Neagră variety)
Authors	Cristiana Radulescu, Cristina Mihaela Nicolescu, Marius Bumbac, Radu Lucian Olteanu, Claudia Lavinia Buruleanu, Laura Monica Gorghiu, Carmen Georgeta Holban
Institution	Valahia University of Targoviste
Patent no.	SC Hyperici Farm SRL Targoviste RO 135101 B1
Description EN	The invention relates to an emollient cream for dry skin and to a process for preparing it, with applicability in the cosmetic or dermatological field, mainly for anti-wrinkle purposes. According to the invention, the cream consists of 7% (volume/ mass) hydroalcoholic extract from grape skin/seeds of ecologically cultivated <i>Vitis vinifera</i> L., Feteasca Neagra variety, in a cream base as a mixture of lanolin, cetyl alcohol and sodium lauryl sulphate. According to the invention, the process consists of the steps of: 1. extraction of the active compounds from the grape skin/seed from fresh fruit or biomass, in ethanol-water extraction solvent, by maceration at room temperature for 24 h, of which the first 3 h under mechanical stirring, followed by filtration, the resulting extract having a content of 2.5 to 3.5 mg EAG/ml (skin) and 4.5 to 7.5 mg EAG/ml (seeds), respectively, polyphenolic compounds, 3...4.5 mg EQt/ml (skin), and 4.2...7.7 mg EQt/ml (seed) flavonoids, antioxidant activity in the range of 0.8...1.5 mg EAA/ml (skin), and 10...12.5 mg EAA (seed), respectively, antibacterial and antifungal activity, 2. preparation of the cream base by mixing, at 50°C, 15% cetyl alcohol, 20% lanolin, 1% sodium lauryl sulphate and for the rest, distilled water, with continuous homogenization up to cooling, 3. incorporation of the liquid extract into the cream base, resulting in a moisturizing revitalizing anti-wrinkle cream product for a wide range of dry skin types.

RO.121.	
Title EN	Rapid method for isolation of microplastics from milk, yogurt, sour cream and butter
Authors	Cristiana Radulescu, Ioana Daniela Dulama, Andreea Laura Banica, Ioan Alin Bucurica, Raluca Maria Stirbescu, Laura Monica Gorghiu
Institution	Valahia University of Targoviste
Patent no.	RO 137927 A0 & PCT/RO2024/000010
Description EN	The invention relates to a method of isolating microplastics (MPs) from milk and processed milk-based products (yogurt, sour cream and butter), to be applied in the food safety field. According to the invention, the method consists of the following stages: A - pretreatment of raw material (milk and processed milk-based products with high fat content) with reactivities of advanced purity in the following mass ratios: 10 : 1 for milk : hydrogen peroxide, 1 : 0.2 : 100 for yoghurt : NaOH : distilled water, 1 : 0.1 : 0.12 : 100 for sour cream : sodium dodecylsulphate : NaOH : distilled water, 1:0.5:0.125 : 62.5 for butter : sodium dodecylsulphate : NaOH : distilled water, for the digestion of the complex organic matrix and the homogenization by stirring at 150 rpm, for 20 min, B - digestion proper by ultrasound treatment at 30°C, for 20 min, C - vacuum filtration on filters with a porosity of 12...15 µm and keeping the mixture on water bath at 60°C up to the complete filtration; eventually, the isolated MPs are quantified and characterized by complex analytical techniques.

RO.122.	
Title EN	Recovery of PV cells from mechanically destroyed PV modules before final recycling
Authors	Dorin-Dacian Let, Ioana-Daniela Dulama, Ion Valentin Gurgu, Andreea-Mihaela Let, Ioan-Alin Bucurica, Giorgian-Marius Ionita, Andrei Ceclan
Institution	Valahia University of Targoviste Technical University of Cluj Napoca
Patent no.	Horizon Europe GA 101103450
Description EN	In order to retain the value of PV cells (e.g., above production cost, the China mainland transport value) and minimize the embodied CO ₂ before reaching landfills or recycling plants, we propose a 2-step process. Initial

EUROINVENT 2024

inspection of PV modules collected for recycling (typically done through shredding) using electroluminescence and computer processing for identification and ranking of usable cells, followed by thermo-mechanical and chemical processing for delaminating parts of modules that can be reused. Considering the entire process can be economically competitive to the EU market price value, and accounting for the electronic waste incentives for recycling PV modules, the recovered cells can thus be reclaimed into new re-purposed products, retaining part of the embodied carbon footprint and their economic value.

Dunarea de Jos University of Galati

RO.123.

Title EN

Procedure of obtaining an optimized feed for the growth of common carp (*Cyprinus carpio*), by fortifying the fish diet with the PM-2 complex, based on trace elements: iron and cobalt, introduced into the feed in the form of complex nanoparticles.

Authors
Institution
Patent no.

MUNTEANU PILA, Mihaela; STANCIU, Silvius
"Dunărea de Jos" University of Galați, Romania
Patent application No. A/00273/ 20.05.2020.

Description
EN

The invention refers to a method of obtaining an optimized feed for the growth of common carp (*Cyprinus carpio*), by fortifying the fish diet with the PM-2 complex, based on trace elements (iron and cobalt), introduced into the feed in the form of complex nanoparticles. A method for producing fish feed involves mixing fishmeal (3%), sunflower meal (21%), soybean meal (20%), vegetable oil (2%), wheat flour (16%), and Premix PM-2 with nanoparticles of the iron-cobalt complex (70:30), introduced at a dose of 30 mg/kg of feed. The complementary effect obtained as a result of the interaction of cobalt and iron significantly affects the balance of these metals in the organs and tissues of the fish. Cobalt, interacting with iron, causes a synergistic effect, contributing to the incorporation of the iron atom into the hemoglobin molecule, improving the ionization and absorption of iron, and accelerating the maturation of red blood cells.

By applying the invention, a series of advantages can be obtained:

- the introduction of nanoparticles of the iron-cobalt complex contributes to the intensive accumulation of weight in the specimens, due to the positive effect on the absorption of proteins, carbohydrates, and essential trace elements.

- the nanoparticles activate the fish organism's enzymatic system, contributing to increased metabolism and the degree of nutrient assimilation from the diet.

- improvement of the mineral content in fish meat: calcium, potassium, magnesium, sodium, phosphorus, chromium, iron, zinc.

"In vivo" tests have led to excellent results

RO.124.**Title EN****Ecological solution of oral hygiene****Authors****Kamel Earar, Oleg Solomon, Alina-Ramona Dimofte, Marius Vacaru Carnaru, Maria Magdalena Vica, Roxana Drăgan, Meda-Lavinia Negruțiu, Cosmin Sinescu, Andrei Victor Sandu****Institution**Dunarea de Jos University of Galati
State University of Medicine and Pharmacy „Nicolae Testemițanu” Republic of Moldova
Victor Babes University of Medicine and Pharmacy Timișoara
"Gheorghe Asachi" Technical University of Iași**Patent no.**

Pending 2024

**Description
EN**

This product refers to an ecological solution designed to maintain the health of the oral cavity. In all dental treatments, the first stage of treatment is cleaning the oral cavity. In most toothpastes and mouthwashes, chemical products are found in fairly large proportions. This ecological solution for sanitizing the oral cavity (mouthwash), being composed of natural compounds such as ginger, sage, chamomile tea, salt, sterile water, strawberries or pomegranate (dried and ground or fresh), does not cause adverse effects, but multiple benefits. As for example, an accidental swallowing of the solution by the child patient does not create problems from the point of view of the general state of health.

RO.125.**Title EN****Ecological aqueous solution for the prevention and treatment of canker sores and pregnancy gingivitis****Authors****Kamel Earar, Oleg Solomon, Andrei Victor Sandu, Cosmin Sinescu, Mada-Lavinia Negrutiu, Ion Sandu, Gheorghe G. Balan, Ioan Gabriel Sandu****Institution**

Dunarea de Jos University of Galati

Patent no.

Pending

**Description
EN**

The invention relates to an ecological aqueous solution, which is used as a mouthwash for the prevention and treatment of oral thrush and pregnancy gingivitis and to improve oral hygiene, the aesthetic appearance of the teeth and to prevent conditions due to the action of dental plaque, biofilms, bacteria and food debris from the oral cavity, based on aqueous nanodispersions of supernatants obtained by separate centrifugation of white pomegranate, pineapple, aloe vera and ginger juices, in which aqueous concentrates obtained with the help of a rotavapor from teas in the form of infusion of aromatic plants (chamomile, mint and echinacea), after which the obtained system is stabilized with disodium glycerol phosphate and a natural emulsifier (preferably acacia honey, lecithin, xylitol or sorbitol), and finally fine powder is dispersed in this mixture of sodium bicarbonate by mechanical agitation.

**University of Agronomic Sciences and
Veterinary Medicine of Bucharest**

RO.126.	
Title EN	Process for obtaining a functional drink with high bioavailability based on the fermentation of Kombucha culture
Authors	Alexiu Teodora-Otilia, Vamanu Emanuel
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent no.	Patent application No. A/00076/2024
Description EN	Probiotic beverage with heightened bioavailability, developed via an innovative fermentation technique leveraging Kombucha culture in conjunction with flavored apple juice substrate. In contrast to conventional counterparts reliant solely on tea substrate, this iteration presents a more palatable taste and aroma to consumers, alongside fortified antioxidant properties.
RO.127.	
Title EN	Bacillus velezensis strain with endophytic potential and plants biostimulatory activity
Authors	Boiu-Sicuia Oana-Alina, Diguță Filofteia Camelia, Toma Radu Cristian, Băbeanu Narcisa Elena, Cornea Călina Petruța
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Biotechnologies
Patent no.	Patent application no. a2023 00364/10.07.2023
Description EN	The present invention refers to a new bacterial strain of <i>Bacillus velezensis</i> with endophytic potential and biostimulatory activity for bean plants. According to the invention, <i>Bacillus velezensis</i> BPVs2 strain used as agroinoculant stimulates the growth of bean plants, if applied as seed treatment. The strain is also ensuring plant protection against biotic and abiotic stress factors. This bacterial strain is deposited in the National Collection of Agricultural and Industrial Microorganisms, in Budapest, Hungary, under the code NCAIM (P) B 001510.

RO.128.

Title EN	Microbial cultivation process for upcycling food and agro-industrial wastes to obtain biofertilizers
Authors	Toma Radu Cristian, Boiu-Sicua Oana-Alina, Diguță Filofteia Camelia
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Biotechnologies
Patent no.	Patent application no. a2023 00365/10.07.2023
Description EN	The present invention refers to a process for bacterial-based biofertilizer production, using residual by-products from the food industry and agro-industrial wastes for microbial multiplication of plant growth promoting bacteria. The bacterial growth substrate contains residual by-products from the food industry, such as molasses (used as carbon source), milk whey (used as a protein source) and egg shells (to provide the mineral sources), as well as agro-industrial waste, such as pomace from red grapes (which is rich in cellulose, polyphenolic antioxidants and polyunsaturated fatty acids). According to the invention these are used for the submerged cultivation of <i>Bacillus velezensis</i> BPVs2 strain, under the following conditions: 150 rpm shaking, 30°C incubation temperature, for 3 days. The process revealed by the invention can be used to better solve the recycling problem of various food and agro-industrial wastes, while obtaining a biofertilizer inoculant based on <i>Bacillus velezensis</i> , involved in plant protection and growth promotion, when applied as soil, seed or vegetal mulch treatment.

RO.129.

Title EN	Integrated methods for cultivation and improvement of lettuce plant growth in the Nutrient Film Technology system
Authors	Nițu Oana Alina, Jerca Emanuela, Tronac Augustina Sandina, Draghici Elena Maria, Arshad Adnan, Ivan Elena Stefania
Institution	Faculty of Land Reclamation and Environmental Engineering/ University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent no.	Research projects no. 848/30.06.2023
Description EN	The project aims at the significant development of scientific and technological knowledge focused on improving the yield

of plants both quantitatively and qualitatively (nutritional value), with an analysis of water and energy resources embedded in the product, featuring a case study on the cultivation of lettuce plants through integrated methods in the NFT system.

The first innovative aspect of this proposal includes a technical solution that consists of an active bubbling system adapted to the NFT hydroponic system which can provide adequate oxygenation of the nutrient solution with a significant impact on plant yield. Up-to-date documentation will be conducted on how to identify the growth needs of the plants; a work scheme will be developed. Seedlings (age of seedlings- 25 days) will be produced for a growing cycle; lettuce cultivation will be established in the greenhouse. The experimental variants will be: Factor A: two varieties of green lettuce (green and red leaves); Factor B - system with additional oxygenation and without additional oxygenation; Factor C with two variants, natural lighting and additional LED lighting. With the existing equipment in the greenhouse, plant growth parameters will be monitored: temperature, light, atmospheric humidity, CO₂, O₂, pH, photosynthetic activity content, chlorophyll content; measurements regarding plant growth in diameter, number of leaves, and weighing of the plants to determine their weight will be made. Plants will be analyzed in terms of germination, growth, biomass production, leaf area, water balance, chlorophyll fluorescence (performed with S11Fl fluorometer, ADC Science, chlorophyll AC200 and gravimetric methods). Enzymatic activity will be determined by spectrophotometric methods.

RO.130.

Title EN	Project ResBerry - Resilient organic berry cropping systems through enhanced biodiversity and innovative management strategies
Authors	Oana-Crina Bujor-Nenița ³ , Roxana Ciceoi ³ , Liliana Aurelia Bădulescu ³ , Annette Reineke ¹ , Daniel Pleissner ² , Lene Sigsgaard ⁴ , Rachid Lahlali ⁵ , Abdelali Blenzar ⁶ , Grzegorz Doruchowski ⁷ , Bogdan Mihalcea ⁸
Institution	¹ Hochschule Geisenheim University, Von-Lade-Str. 1, Geisenheim, D-65366 ² Institute for Food and Environmental Research, Papendorfer

Weg 3, Bad Belzig, 14802

³University of Agronomic Sciences and Veterinary Medicine of Bucharest, Research Center for Studies of Food Quality and Agricultural Products, , 59 Mărăști Boulevard, District 1, Bucharest, 011464

⁴University of Copenhagen, Thorvaldsensvej 40, Frederiksberg C, 1871

⁵National School of Agriculture in Meknès, National School of Agriculture in Meknès BP S/40 - 50000

Meknès (Morocco)

⁶Faculty of Sciences Moulay Ismail University, B.P. 11201 Zitoune Meknès, Meknes, 50000

⁷Research Institute of Horticulture - National Research Institute (Instytut Ogrodnictwa - Państwowy Instytut Badawczy), Konstytucji 3 Maja 1/3, Skierniewice, 96-100.

⁸Cooperativa agricola Rodagria produce, Sat Ogoru, str. Islazului nr. 9, Constructia C1, Calarasi, 917059

Patent no. Research project no: ERANET-COREORGANIC-ResBerry-1
Period of implementation : 01.11.2021 – 31.10.2024

In Europe, berry production, sales and demands had an amazing ascending trend in the last decades. At the same time, there is a growing demand of consumers for pesticide-residue-free fruits and thus for organically produced berries. Within the EU project ResBerry research activities were carried out on conservation biological control which implies setting up an improved habitat management to increase resilience of berries against major pests and diseases. Experimental sites of the project, located in Denmark, Poland, Germany, Romania and Morocco, were established for the implementation of new biological control techniques on organic berry production. New espalier and cutting techniques in berry cultivation which can be used to achieve more narrow rows of bushes with better air and light penetration were evaluated. This reduces diseases and supports the development of flowers and fruit, leading to large, high-quality berries. Also, there were tested companion plants in the form of flower strips or trap plants in intercropping with berry crops to provide food, habitat and overwintering sites for increased biodiversity. Furthermore, cover crops were used to assess its influence on the composition of the soil microbiome. Moreover, alternative strategies to control specific pests were evaluated. For management of SWD *D. suzukii* was assessed the efficacy of entomopathogenic nematodes, which could be used as a biocontrol agent. Finally, all new methods to be implemented in organic berry cultivation were thoroughly evaluated for quality parameters of fruits. The methods are ecologically sustainable and can be an important help in conversion to organic production.

Description
EN

RO.131.**Title EN****Technology for identifying biotypes of *Lycium chinense* resistant to the attack of the gall mite on goji plants****Authors**

Roxana Ciceoi, Oana Venat, Mihaela Iordăchescu, Cătălina Nicolae, Ana Butcaru, Vasilica Luchian, Minodora Tudose, Mala-Maria Stavrescu-Bedivan, Dan Popescu, Adrian Asanică, Florin Stănică

Institution**Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest****Patent no.**

Patent application No. a2022 00767/2022

Description**EN**

The invention relates to a preliminary selection process assisted by molecular markers for goji biotypes in terms of resistance to the attack of the gall mite, *Aceria kuko*. The invention is intended for use in breeding activities and includes methods and compositions for evaluating plant resistance, representing a sequence of steps applied to plant tissue resulting from seedlings obtained in vitro from seeds of valuable biotypes. Additionally, the final stages of the invention, represented by the identification using ISSR and SSR molecular markers, can be directly applied to plant tissue from the planting material used for planting, in the establishment of new plantations or testing plants already existing in culture. The method for producing plant material for rapid identification of resistant biotypes includes a disinfection step with sodium hypochlorite at concentrations of 10-15% tested progressively and cultivation on Gamborg B5(-) culture medium without growth hormones. Resistant biotypes can be differentiated using an SSR molecular marker and two ISSR molecular markers, with the help of 10 bands, of which 6 bands give a positive indication of resistance and 4 bands indicate the same trait by their presence only in sensitive biotypes.

This patent application was carried out with the support of a grant of the University of Agronomic Science and Veterinary Medicine of Bucharest, project number 1268/30.07.2021, acronym ProtectGoji, within IPC 2021.

RO.132.	
Title EN	Research on the use of plasma technologies for the control of pests and diseases affecting stored agricultural products and the evaluation of its effect on seeds and plants, for a sustainable and quality production
Authors	Roxana Ciceoi, Oana Venat, Mihaela Iordăchescu, Ioana Cătălina Nicolae, Ana Butcaru, Elena Ștefania Ivan, Bujor-Nenița Oana-Crina, Liliana Bădulescu
Institution	Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent no.	Research project no 2.1.7./14.07.2023
Description EN	The main objective of the project is to evaluate the effects of plasma treatments on cereal seeds and plants by developing experimental models and working procedures for studying the effects of plasma technologies. The plants involved in this research are wheat and corn. The specificity of the project lies in finding solutions for applying these models in combating diseases and pests on cereal seeds and plants under controlled laboratory conditions and field as well. The project will develop starting with the experimental model results that will be followed in the project phases, experimental models, and evaluation of plasma technology effects under controlled conditions and in the field at the end of experiment.
RO.133.	
Title EN	Sustainable utilization of MARIne resources to foster GREEN plant production in Europe
Authors	Violeta Alexandra Ion, Oana Cristina Pârvulescu, Anne-Kristin Løes, Joshua Cabell, Thanos Salifoglou, Carlos Octavio Letelier-Gordo, Max Nielsen, Sigbjørn Tveteras, Ailin Moloșag, Oana Bujor-Nenița, Liliana Bădulescu, Alexandra Mocanu, Cristina Orbeci, Tănase Dobre, Cristian Răducanu
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent no.	Reasearch project no. 244/2021
Description EN	The MARIGREEN project aims to valorize residual materials from the blue sector by treating them with appropriate technologies and applying them in green agriculture. Significant amounts of fertilizers applicable in

organic growing are required to achieve 25% organic farmland in the EU by 2030, as proposed in the Farm to Fork (F2F) strategy. Residual materials available from fish capture, the brown algae industry, the mussel industry, and organic aquaculture, provided by five Scandinavian industry partners, will be studied within the project. The materials will be chemically characterized, and compounds with potential biostimulant effects on crop plants will be investigated, while concurrently checking for possible biotoxicity. The effects of these materials (untreated or treated using appropriate treatments, e.g., extraction, composting) on plant growth will be assessed. The project also includes an innovative treatment of organic fish waste from aquaculture and a study on biochar impregnation technology. Biochar, which is itself useful for soil amendment, will be used, after impregnation with extracts of blue materials, as a carrier of nutrients and other valuable compounds in agricultural soil. The most suitable materials (selected after chemical characterization) will be tested in real growing conditions in the greenhouse and field. The logistics and related costs required to establish a relevant value chain for producing fertilizers and/or biostimulants will be assessed by interviewing collaborating industry partners and surveying potential customers.

RO.134.

Title EN	EnterGreenFood – Ecological approach for the prophylactic and curative treatment of enteric diseases in the poultry sector
Authors	Alina Ortan, Petronela Rosu, Simona Marcu-Spinu
Institution	University of Agronomic Sciences and Veterinary Medicine of Bucharest
Patent no.	Project no 846/30.06.2023
Description EN	Animal health has always been a concern for all European citizens, regardless of their area of activity. This concern is based on public health, food security and safety, aspects related to animal health, but also to the economic costs of epidemics caused by animal diseases. Enteric diseases in domestic poultry species are present both in the industrial rearing system and in the domestic one, producing significant damage to poultry flocks. Usually, the treatment of enteric diseases includes antibiotics administered in the feed or by injection, which increases the risk of antibiotic

residues in meat and eggs and the risk of increasing the resistance of bacteria to them.

In this context, the main objective of the project is the design of alternative solutions with prophylactic and curative action on enteric diseases in the poultry sector, through the development of an innovative technology by obtaining a phyto-genic additive from indigenous flora with a multistage effect. The project will lead to obtaining bio products that can be easily mixed with other feed ingredients, without tissue residues, that improve feed intake, feed conversion rate, bird immunity, digestion, increase nutrient availability, as well as absorbability, have antimicrobial effects, do not affect carcass traits, reduce antibiotic use, act as antioxidants, compete for stressors, and provide healthy organic products for human consumption.

Acknowledgement: This research was funded by the University of Agronomic Sciences and Veterinary Medicine of Bucharest—Romania, Research Project 846/30.06.2023, acronym EnterGreenFood in the Competition IPC 2023.

RO.135.
Title EN

Selection process for consortia of microorganisms for biorefining plant material with high phyto-silicon content

Authors

Cornea Petruța, Oancea Florin, Israel-Romîng Florentina, Răut Iuliana, Voaideş Cătălina Mihaela, Burlacu Aglaia

Institution

University of Agronomic Sciences and Veterinary Medicine of Bucharest

Patent no.

Patent no 132587/30.08.2021

**Description
EN**

The following invention describes a process for selecting consortia of microorganisms that produce mixtures of enzymes and/or (poly)peptides that enhance the activity of enzymes used in the initial stages of biorefining plant material with high phyto-silicon content. This process has applications in biotechnology. The capacity of the respective consortia to produce mixtures of enzymes (cellulases, xylanases, silicases, and feruloyl-esterases) that act on lignocellulosic plant material rich in phyto-silicon is quickly highlighted, as well as action-enhancing (poly)peptides cellulases.

RO.136.

Title EN	ColonX: new generation prebiotic for microbiota modulation
Authors	Razvan Roşca, Emanuel Vamanu
Institution	Anoom Laboratories SRL
Patent no.	<i>Research project number: 662/2023</i>
Description EN	<p>An innovative product line, GreenBiom (www.greenbiom.ro), has been created for the human microbiome modulation in chronic diseases. This was accomplished by using an original process of extraction developed from mushrooms. The main product will be ColonX, produced from <i>Boletus edulis</i> mushrooms harvested in Romania. ColonX is an effective alternative to probiotic supplements and is particularly designed to restore balance to the disbiotic microbiota caused by antibiotic therapy. ColonX is an innovative prebiotic (metabiotic), which contains polysaccharides and other natural compounds reduced by the microorganisms in the intestines. This product enhances the production of short-chain fatty acids necessary for maintaining a healthy colon.</p>

Iasi University of Life Sciences
”Ion Ionescu de la Brad”, Romania

RO.137.**Title EN**

**CraKET— AN INNOVATIVE CRACKER WITH
 FLAXEED AND BEETROOT POWDER**

Authors

**FOTEA LENUȚA, PERUC GEORGIANA, RÎMBU
 CRISTINA MIHAELA, HORHOGEA CRISTINA-
 ELENA, PALANCIANU ARMAND**

Institution

“Ion Ionescu de la Brad” Iași University of Life Sciences.

**Description
 EN**

Consumers are increasingly concerned about their health and are looking for natural food options closer to nature, namely organic products and using sub-products obtained from the processing of raw materials, especially plant-based ones. "CraKET" with crushed flax and beetroot powder is a functional, ecological, and beneficial product for consumers, unique product on both the Romanian and international markets due to the organic ingredients used, the fermentation method and baking on a stone oven. The innovation of the product comes from the use of a natural ferment, namely sourdough, fed with two types of organic flour and apple residues from their industrialization. In this way, an innovative product with ingredients that offer the consumer numerous nutritional benefits has been created. Flax seeds are rich in ω -3 fatty acids and fibre, sourdough containing *Saccharomyces cerevisiae* and lactic acid bacteria contribute to the fermentation process and thanks to acetic acid the gluten network is stiffer, so the final product has a crunchy texture, beetroot powder is rich in nutrients with antioxidant effect and the inactivation of phytic acid allows the absorption of minerals, all of which are benefits for the human body and a product that can offer consumers a distinct psycho-sensorial experience compared to other pastry products available on the market.

RO.138.

Title EN	Food Residue Analysis and Essential Solutions in the Food Industry by Developing a Functional Adjuvant Obtained from Bone By-products.
Authors	Ioana GUCIANU, Marius-Mihai CIOBANU, Florin-Daniel LIPȘA, Catalin-Mihai CIUBOTARU, Diana-Remina MANOLIU, Bianca-Georgiana ANCHIDIN, Elena-Iuliana FLOCEA, Paul-Corneliu BOIȘTEANU
Institution	Iasi University of Life Sciences "Ion Ionescu de la Brad", Romania (IULS)
Patent no.	Research project included in the PhD school, IULS
Description EN	Food waste is now one of the most alarming problems worldwide, requiring concrete solutions involving coordinated global efforts. In the literature, there is a growing trend towards clean labelling, reflecting the growing awareness of the problem. Researchers have demonstrated the potential of extracts from animal by-products such as bones and cartilage, especially those considered waste in meat processing, to produce products with strong antioxidant capacity and low antigenicity. After consulting several researches around the world, our research team has committed to focus on the valorisation of bone by-products. These can be used to obtain various materials such as collagen or functional adjuvants for the food industry. Our objectives focus on replacing artificial binding additives with collagen extracted from bone tissue, given the circularity of the product. We want to increase the palatability and nutritional value of the products, creating a range of healthy meat foods to meet a variety of needs, from children and the elderly to people with joint or cardiovascular diseases.

University of Life Science
”King Mihai I” from Timisoara

RO.139.**Title EN**

Metabolic Food Waste as Food Insecurity Factor – Causes and Preventions

Authors

Balan Ioana Mihaela, Emanuela Diana Gherman, Ioan Brad, Remus Gherman, Adina Horablaga, and Teodor Ioan Trasca

Institution

University of Life Sciences "King Mihai I" from Timisoara

Patent no.

Research project

The concept of Metabolic Food Waste (MFW) refers to food consumed in excess of nutritional needs, highlighting the unsustainable nature of overconsumption and its impact on the environment. MFW quantifies the environmental footprint of excess food consumption in terms of carbon, water, and land use. This paper explores the underlying causes of MFW and suggests measures for its reduction, emphasizing the importance of consumer education and behavior change towards more sustainable diets.

Description EN

The research investigates the factors contributing to overconsumption and its environmental repercussions. Key drivers include a lack of nutritional education, poor access to healthy foods, and a general misunderstanding of dietary needs across various demographics. The analysis indicates that addressing these issues requires a multi-faceted approach focusing on improving nutritional knowledge, accessibility to nutritious food, and encouraging dietary shifts towards less resource-intensive foods.

The conclusions underline that to mitigate the negative impacts of MFW on health and the environment, concerted efforts are needed to raise awareness of healthy and sustainable eating practices. This involves a global strategy for distributing nutritious food more uniformly and encouraging individuals to adopt diets that are both healthful for them and less harmful to the planet. Through education and better food system management, the aim is to reduce overconsumption, thereby enhancing food security and sustainability.

RO.140.

Title EN	Sustainable Nutrition for Increased Food Security Related to Romanian Consumers' Behavior
Authors	Balan, Ioana Mihaela, Emanuela Diana Gherman, Remus Gherman, Ioan Brad, Raul Pascalau, Gabriela Popescu, and Teodor Ioan Trasca
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Research project
Description EN	<p>Food security is a matter of global concern, as the supply of food is one of the basic needs, ensuring the survival of the species. The trend of globalization and development of the global economy has shifted the responsible, local consumption patterns towards an increased homogeneity of diets, with food products being disconnected from their source, leading to two major results: (1) increased global consumption and (2) increased uncertainty in the supply chain. A survey with 1053 respondents from Romania, from both urban and rural areas, was conducted in 2021 and 2022 to understand consumption patterns. The results show a predominant consumption of animal products, starchy vegetables, and bread, which indicates a nutritional pattern high in animal protein and low in diversity, contributing to unsustainability and potential health risks. Despite global food production being sufficient to meet nutritional needs, malnutrition persists, with Romania experiencing a discrepancy between agricultural capacity and food insecurity. The traditional Romanian diet, heavy on meat and carbohydrates, leads to overconsumption and health issues like obesity. Sustainable consumption is vital for health and environmental impact, requiring a shift towards plant-based diets, reduced meat intake, and mindful resource use. The study concludes that the Romanian diet is unsustainable, emphasizing the need for dietary changes to ensure health and environmental sustainability.</p>

RO.141.	
Title EN	The study of the variation of the textural elements in relation to the depth on the soil profile
Authors	Radu Bertici, Cosmin Alin Popescu, Mihai Valentin Herbei, Daniel Dicu1, Florin Sala
Institution	University of Life Sciences "King Mihai I" From Timisoara
Patent no.	Research project
Description EN	<p>The study analyzed and described the variation of textural elements in relation to the horizons and depth of a soil profile, gleic phaeoziom. Five horizons were identified and analyzed, on the depth 0 - 100 cm of the soil profile. The distribution of the textured elements coarse sand (Cs), fine sand (Fs), dust (Dust), colloidal clay (Coll-C) and physycall clay (Phys-C) was analyzed. The variation of the textural elements in relation to the depth on the soil profile was described by linear equations (Coll-C) and polynomial equations of degree 2 (Cs, Fs, Dust, Phys-C), in different conditions of statistical safety (eg $R^2 = 0.952$, $p = 0.048$, Dust in relation to Depth). The interdependence relations between the textural elements were described by polynomial equations of degree 2, in conditions of statistical safety ($R^2 = 0.811$ to $R^2 = 0.993$). The Coll-C variation in relation to Cs and Fs (as singular influence, and interaction), was described in statistical safety conditions ($R^2 = 0.999$, $p < 0.001$) and expressed graphically in 3D model and in the form of isoquants</p>
RO.142.	
Title EN	The bioactivity of the cyanobacterium Anabaena 22 with possibilities for pharmaceutical and medical exploitation
Authors	Borozan Aurica Breica, Trofim Alina, Popescu Sorina, Moldovan Camelia, Dumbrava Delia Gabriela, Misca Corina-Dana, Moigradean Diana, Poiana Mariana Atena, Popa Mirela, Raba Diana Nicoleta, Bordean Despina Maria
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Research Project
Description EN	Cyanobacteria were considered irrelevant because of the toxins that some species produce. But it has been

demonstrated that cyanobacteria are an inexhaustible source of active natural compounds that can be exploited in medical and pharmaceutical fields. They can be an important source of neurocompounds with potential in the therapy of increasingly common diseases worldwide. For the exploitation of phytochemicals from cyanobacteria in the fields of medicine, biotechnology and pharmacology, it is essential to evaluate their bioactivity. The present study follows some biochemical characteristics and the antimicrobial activity of the cyanobacterium *Anabaena* 22. The strain comes from the State University of the Republic of Moldova. The four concentrations of the alcoholic extract of cyanobacteria were tested microbiologically on Gram positive (*Staphylococcus aureus*, *Staphylococcus epidermidis*, *Bacillus subtilis*) and Gram negative (*Escherichia coli*, *Pseudomonas aeruginosa*) bacterial cultures. Among the filamentous fungi, the species *Aspergillus niger* was tested. Ethyl alcohol (45%), ampicillin 10 µg and nystatin 10 µg were used as controls. The tests were performed using standardized methods. Microbial cultures were chosen according to their relevance in the medical, pharmaceutical and biotechnological fields. The results highlighted an antioxidant activity and a high content of polyphenols compared to other strains of cyanobacteria. The analyzed extract had no antifungal effect, but it was proven to have a promising antibacterial effect at the highest concentration, on the other hand, at low concentrations the biological activity was reduced. Complementary studies are needed because the tested strain is relevant for antimicrobial therapies and the development of pharmaceutical formulas

RO.143.

Title EN	RIS Consumer Engagement Labs [IMP-RIS-2325-19153-01] - EIT Food CEL-2024-15
Authors	Cocan Ileana, Alexa Ersilia, Raba Diana, Negrea Monica
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Project number: IMP-RIS-2325-19153-01
Description EN	The EIT Food RIS Consumer Engagement Labs 2024 project, number IMP-RIS-2325-19153-01, coordinated by the University of Life Sciences "Regele Mihai I" of Timisoara, in partnership with The Family Butchers SRL,

aims to implement a Consumer Lab for the co-creation of hybrid meat products, based on the consultation and preferences of consumers interested in healthy eating. The need for this focus group is due to studies on the impact of consumption of high fat animal foods on human health in the world and in Romania. As part of the partnership between The Family Butchers SRL and the University of Life Sciences "Regele Mihai I" in Timisoara, the objective of the Co-creation Labs involves working sessions, creative meetings with consumers, interviews, focus groups, consumer panels, social labs, co-creation workshops, creative sessions with consumers to promote healthy eating, low fat hybrid meat products that will be obtained through this project.

RO.144.
Title EN

Workflow for the identification of changes produced in grassland surfaces through Open Source solutions

Authors

Luminița Cojocariu, Loredana Copăcean, Marinela Horablaga, Veronica Sărățeanu, Ionel Samfira, Mihai Simon

Institution

University of Life Sciences „King Mihai I” from Timisoara

Patent no.

Research project

Description EN

Grasslands, some of the most important resources of the Globe; they are subject to changes, both in time and in space, under the action of natural and/or anthropogenic factors. The proposed workflow, to identify the changes produced in the grassland surfaces, is based on Open Source data (Corine Land Cover), analyzed by GIS techniques. Through this algorithm, it is possible to identify and quantify the areas of grasslands and, in the next stage, analyze the changes produced. Surface losses (through the transition of grasslands to other land use categories) and surface gains (through the transition of lands from other categories to grasslands) are identified. In the final part, the general direction of changes, at the regional level, in a thirty-year interval, is established. There are important differences in the territorial profile, of great importance for local communities and the economy of the rural area. Monitoring changes in grassland areas is also particularly important in terms of management strategies or sustainable development of rural areas.

RO.145.	
Title EN	Working algorithm for the analysis of vegetation coverage of grasslands, based on NDVI values
Authors	Loredana Copăcean, Cosmin Popescu, Livia Bârliba, Mihai Simon, Luminița Cojocariu
Institution	University of Life Sciences „King Mihai I” from Timisoara
Patent no.	Research project
Description EN	The distribution of the vegetation of the grasslands is different, depending on the phenophases, implicitly the observation period, during the growing season. In this context, we propose a work algorithm through which the analysis of the vegetation coverage of grasslands is carried out, based on satellite images, by applying the Normalized Difference Vegetation Index (NDVI). Through this algorithm, on the one hand, the areas of grasslands are represented, and on the other hand, the changes produced in time and space, in terms of the vegetation cover of the grasslands, are calculated, under a quantitative aspect. The proposed model, for the analysis of the distribution of grassland vegetation based on NDVI values, has several advantages: it completes the "classic" measurements in the field; the results are expressed in the form of thematic maps that can be integrated with other geospatial data; based on the maps obtained, it is possible to locate "problematic" or risky areas, from the point of view of vegetation cover; through successive images, changes produced over long periods of time can be identified; it can be applied with Open Source software, on freely available satellite images.
RO.146.	
Title EN	The Study of the Impact of Complex Foliar Fertilization on the Yield and Quality of Sunflower Seeds (<i>Helianthus annuus</i> L.) by Principal Component Analysis
Authors	Florin Crista, Isidora Radulov, Florinel Imbrea Dan Nicolae Manea, Marius Boldea, Iosif Gergen , Anisoara Aurelia Ienciu, Ioan Bănățean Dunea
Institution	Faculty of Agriculture / University of Life Sciences “ King Mihai I ” from Timisoara
Patent no.	Research project
Description	

EN The aim of the paper is to assess by the principal components analysis (PCA) the foliar fertilizations (FF) impact on yield and quality of sunflower seeds. This chemometric technique allowed us to select the best model for determining the most effective foliar treatment on the production of sunflower seeds, both quantitatively and qualitatively. Results were discussed in terms of principal component analysis. PCA was valuable for selecting the FF recipe which present the highest effect on the production and quality of sunflower seeds. The research was carried out in the agricultural years 2019-2021 in the experimental field of the university. The experimental variants were: Control, V1 – FF 10:10:10+ME, V2 –FF 8:10:0+8B+ME, V3 – FF 15:0:0+2S+1B+ME, V4 – FF 15:0:0+4B+ME and V5 – FF 8:8:8+ME. Two FF were carried out in the vegetation phases specific to the sunflower crop. These varied from 2-6 L ha⁻¹, depending on the chemical composition of the product. The method of planting in the field was in subdivided plots with 3 repetitions and 6 fertilization options. The application of treatments with FF to the sunflower culture positively influenced both production and its quality ex-pressed by specific quality indices, namely the content of proteins, lipids, carbohy-drates, fibers and minerals.

RO.147.**Title EN**

Cross-Border Network For Education And Research Of Natural Resources RORS-279

Authors

Crista Florin,Zaric Nenad, Radulov Isidora, Gaspar Sorin, Imbrea Ilinca , Ljubisa Stanisavljevic, Crista Laura, Milana Zaric,Igor Knezevic Berbecea Adina, Nita Lucian, Banatean Dunea Ioan , Latoa Alina, Hotea Ionela , Batrina Stefan, Chet Cornelia, Radulov Sorin, Srecko Curcic , Botos Lucian

Institution

Faculty of Agriculture / University of Life Sciences “ King Mihai I ” from Timisoara

Patent no.

Project Number: RORS-279

**Description
EN**

Project main overall objective is establishing cross-border networks for education and monitoring of environmental pollution (Heavy metals, pesticides, herbicides, insecticides) with an aim of using data collected through monitoring for education of students, farmers and members of competent bodies and authorities, and general public about environmental protection and sustainable use of natural

resources, mainly agricultural land and water.

This project is dealing with the common challenges in protection and sustainable use of main natural resources, agricultural land and water, in the cross-border region of South Banat district and Timis county. In these two regions pollution is not systematically monitored. The lack of data causes the lack of actions from direct users, authorities and resident population regarding the protection and sustainable use of natural resources.

The main outputs we will produce in the project are established monitoring systems, that will be used for gathering of data on pollution (Heavy metals, pesticides, herbicides and insecticides) in the environment, a guideline book on sustainable use of natural resources, made based on the gathered data, workshops on obtained data and guidelines with users of natural resources, as well as authorities in charge of these resources, seminars on informing resident population and other target groups about obtained data and how to use the guideline book for sustainable use of environmental resources. The resident population in the regions will benefit from this joint cross-border action, since we will obtain data on the condition of agricultural land and water bodies and consequently the food produced in the region. This will have a positive effect on the quality of food produced and consumed in the programme area.

RO.148.

Title EN

Relationships of Agrochemical Indices Interdependence in the Characterization of Some Soil Samples

Authors

Daniel Dicu, Cosmin Alin Popescu, Mihai Valentin Herbei, Radu Bertici, Florin Sala

Institution

UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM TIMISOARA

Patent no.

Research project

Description EN

The study evaluated the interdependence between agrochemical indices relevant for the characterization of some soil samples. They were considered, soil reaction (pH), humus content (H,%), phosphorus content (P, ppm), potassium content (K, ppm), degree of saturation in basic cations (V,%), index nitrogen (NI,%) and the sum of basic cations (BCS, m.e./100 g soil). Very strong correlations were recorded between P and pH ($r = 0.949^{***}$), between P and

BCS ($r = 0.915^{***}$), between NI and V ($r = 0.987^{***}$), between BCS and V ($r = 0.980^{***}$) and between NI and BCS ($r = 0.960^{***}$). Strong correlations were recorded between P and V ($r = 0.853^{**}$), between P and NI ($r = 0.844^{**}$), and moderate correlations were recorded between V and pH ($r = 0.755^{*}$), between NI and pH ($r = 0.758^{*}$). The P variation in relation to pH was described by a polynomial equation of degree 3 ($R^2 = 0.959$, $p < 0.001$), and the variation NI in relation to V was described by a polynomial equation of degree 2 ($R^2 = 0.979$, $p < 0.001$). According to the PCA, PC1 described 81.731% of the variance, and PC2 described 13.216% of the variance.

RO.149.**Title EN****JELL-BEET-ESSO by AKADEMIKAFOOD****Authors**

Dumbravă Delia-Gabriela, Bordean Despina Maria, Borozan Aurica-Breica, Cocan Ileana, Drugă Mărioara, Mișcă Corina Dana, Moldovan Camelia, Poiana Mariana-Atena, Popa Viorica Mirela, Raba Diana-Nicoleta, Radoi Petru Bogdan, Ștef Ducu Sandu

Institution**University of Life Sciences "King Mihai I" from Timisoara****Patent no.**

M2024/003330

**Description
EN**

Making sugar-free jellies is a way to diversify and meet the demands of the consumer market, which is increasingly looking for quality products, especially with a high nutrient content and lower caloric value, whether for aesthetic, physiological reasons or health restrictions. The invention relates to natural, vegan jellies, without added sugar, based on red beet juice with various additions of other juices: apple, pear, lemon, ginger root and essential oils, in different assortments according to the manufacturing recipe. Thanks to the combination of natural juices rich in carbohydrates and the essential oils used, the jellies in this invention did not require any added sweeteners. The production technology is simple, environmentally friendly and the gelling agent used is agar agar. The jellies of the present invention are distinguished by a high content of polyphenolic compounds, have a strong antioxidant activity, are low in calories and have superior sensory properties.

RO.150.	
Title EN	An innovative alternative to meat products: cashew pariser
Authors	Dumbrava Delia-Gabriela, Diana-Nicoleta Raba, Camelia Moldovan, Mirela-Viorica Popa, Corina Dana Miscă, Mariana-Atena Poiana, Marioara Druga, Borozan Aurica-Breica, Carmen Daniela Petcu
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Research project
Description EN	As more and more consumers want or are forced, for medical or other reasons, to reduce or even give up eating meat and meat products, there is a growing need on the market for plant-based products that can replace meat and should be both nutritionally and organoleptically adequate. The research project aimed to develop and characterize the physicochemical, nutritional and sensory properties of a vegan alternative to meat products, namely: cashew pariser, in two varieties: one with added beetroot juice and the second with added turmeric and sweet paprika as natural colouring agents. The products are 100% natural, have a very good antioxidant capacity and fewer calories than similar meat products, but are cholesterol-free and provide a high intake of dietary fibre. This innovative plant-based pariser assortments were highly appreciated in terms of sensory characteristics. The production technology is simple and environmentally friendly.
RO.151.	
Title EN	Biofunctional premixes (PMXBF) based on spelt wheat with application in the flour food industry
Authors	Alexa Ersilia, Radulov Isidora, Popecu Cosmin Alin, Raba Diana Nicoleta, Poiana Mariana-Atena, Cocan Ileana, Negrea Monica, Misca Corina, Obiștioiu Diana, Dragomir Christine, Dossa Sylvestre, Suster Gabriel
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Patent application OSIM: A 00408/27.07.2023
Description EN	The present invention concerns to the development of premixes based on Triticum spelta wheat flour (PMXBF)

with applications in the flour based food industry (bread, pasta, biscuits, pastry), with 5...25% meal ratio added flour from fruits of sea buckthorn (*Hippophaë Rhamnoides L.*), and/or lingonberries (*Vaccinium vitis-idaea L.*) and/or pomace resulting as a by-product of winemaking. The results obtained on the nutritional properties, phytonutrient content of premixes, as well as the rheological suitability of the dough, highlighted the possibility of implementing the technologies to obtain PMXBF-based products in the farinaceous food industry.

RO.152.
ESTIMATION OF SUNFLOWER CROP
Title EN PRODUCTION BASED ON REMOTE SENSING TECHNIQUES
Authors

Mihai Valentin HERBEI, Cosmin Alin POPESCU, Radu BERTICI, Florin SALA

Institution
UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM TIMISOARA
Patent no.

Research project

Description EN

The study used the remote sensing method (Sentinel 2) to analyze the sunflower crop and to estimate the production. The study area was within the DES, ULS "King Michael I" from Timisoara, Romania. Eight series of images were taken (April 06 – August 07, 2022). Based on the spectral information, the NDMI, NDVI, NPCRI and NBR indexes were calculated. Spline models best described the variation of index values in relation to time (t , days) during the study period, $\bar{\varepsilon} = -0.04286$ for NDMI, $\bar{\varepsilon} = 0.01172$ for NDVI, $\bar{\varepsilon} = 0.00537$ for NPCRI, respectively $\bar{\varepsilon} = -0.08481$ for NBR. Very strong correlations were found between NDVI and NDMI ($r=0.975$), between NBR and NDMI ($r=0.997$), and between NBR and NDVI ($r=0.967$), $p<0.001$. Strong correlation was recorded between NDVI and NPCRI ($r=-0.881$), $p<0.01$. Moderate correlations were found between NDMI and t ($r=0.729$), between NBR and t ($r=0.752$), between NPCRI and NDMI ($r=-0.776$), and between NBR and NPCRI ($r=-0.762$), $p<0.05$. The regression analysis facilitated the estimation of the production based on calculated indices, under conditions of statistical safety.

RO.153.	
Title EN	Models of variation of some indices in the analysis of an area based on remote sensing
Authors	Mihai Valentin Herbei, Cosmin Alin Popescu, Adina Horablaga, Radu Bertici, Daniel Dicu, Florin Sala
Institution	UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM TIMISOARA
Patent no.	Research project
Description EN	The study used remote sensing-based techniques to analyze and characterize a terrestrial area. For this, satellite images (Landsat 8) were used, taken at five different times, between January and October 2021. MNDWI, MSAVI2, NDVI and NBR indices were calculated based on spectral information. Very strong correlations ($r = 0.968$ to $r = 0.994$) were identified at the indices, and between indices and temperature, except for NBR which had strong correlations with precipitation. The regression analysis facilitated the obtaining of models in the form of polynomial equations of degree 2, which described the variation of the indices MSAVI2 ($R^2 = 0.998$, $p = 0.0012$) and NDVI ($R^2 = 0.966$, $p = 0.0334$) in relation to the time over the period of study. Equations were obtained, as well as 3D and isoquants graphical models, which described the variation of the NDVI index in relation to climatic factors (temperature, precipitation) and the NBR index in relation to MNDWI and MSAVI2 in statistical safety conditions ($R^2 = 0.999$, $p < 0.001$).
RO.154.	
Title EN	Antiparasitic hydrogel based on collagen and active principles from plants and its production process
Authors	Mederle Narcisa Geanina, Albu Kaya Mădălina Georgiana, Ghica Mihaela Violeta, Kaya Durmus Alpaslan, Mederle Ovidiu Alexandru, Radulov Isidora, Iancu Tiberiu, Dinu-Pîrvu Cristina-Elena, Ghilean Bianca Mădălina
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	A 2023 00409
Description EN	The hydrogel based on collagen hydrolyzate, carboxymethyl cellulose, and active plant principles with appropriate rheological properties was made as a treatment for skin parasites, especially for canine demodicosis. The hydrogel has the property of destroying mites and protecting or regenerating the skin and is recommended for veterinary use.

RO.155.

Title EN	Molecular research regarding the identification of Trichinella new species in wild carnivores from Romania and evaluation of the human infection risk
Authors	Ana-Maria Marin, Narcisa Mederle, Tudor Rareş Olariu, Ovidiu-Alexandru Mederle, Dan-Cornel Popovici, Gianluca Marucci, Simona Cherchi, Maria Monica Florina Moraru
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Research project
Description EN	<p>Trichinella spp. are etiological agents of a zoonosis affecting humans, caused by consuming raw or undercooked meat from animals infested with the larvae of these zoonotic nematodes. The European reservoir for Trichinella species is wildlife, with wild animals being the most important source of infection for domestic pigs, which are the main source of infection for other animals (e.g. horses), especially for humans. In Romania, there are no reports that support the possible consumption of meat from wild carnivores, but they appear as invasive species and suitable hosts for Trichinella species.</p> <p>The present project aimed to identify Trichinella spp. larvae in muscle from 10 wild carnivores in Romania by artificial digestion and to characterize the molecular isolates obtained. There are some species of the genus Trichinella which present zoonotic potential. Some of them could be identified by PCR. In our project, Trichinella spiralis in wild boar, Trichinella britovi in eight wild hosts, and Trichinella pseudospiralis in jackal have been identified. The present study reports the first identification of T. pseudospiralis in Romania. Infection with T. britovi in the raccoon dog and European pine marten was reported for the first time in Romania.</p>

RO.156.

Title EN	Engineering Resistance to Orobanche cumana in Wild Plant Varieties via Automated Rizotron Technology
Authors	Onisan Emilian, Sarac Ioan, Petrescu Irina, Popescu Sorina, Petolescu Cerasela
Institution	University of Life Sciences "King Mihai I" from Timisoara

Patent no. Research Project

Orobanche cumana, a parasitic plant with a significant impact on sunflower cultivation, is a major obstacle to agricultural productivity. In efforts to reduce this threat, breeding programmes have focused on developing resistance, using wild species that have shown promising results in controlling and limiting the spread of Orobanche cumana. In this context, an innovative method of genotype monitoring and evaluation, using automated rhizotron technology, has been introduced to achieve the objective. This integrated approach provides for the analysis of biological material together with the use of monitoring systems, allowing breeding programmes to examine the complex interaction between plants and Orobanche cumana in real time. This comprehensive assessment of genetic resistance in commercial inbred lines facilitates the identification and selection of genotypes with high resistance potential. In the demonstration study, the following activities were carried out: (i) creation of genotypes resistant to Orobanche cumana, (ii) monitoring the evolution and mode of action of the parasite over different time periods, and (iii) enumeration of morphological phenomena characteristic of susceptibility.

Description
EN

RO.157.

Title EN **Advancing Agriculture: Thornless blackberry production through in vitro culture for economic efficiency and genetic stability**

Authors Cerasela Petolescu, Ioan Sarac, Sorina Popescu, Irina Petrescu, Emilian Onisan, Violeta Hepp, Andreea Nistor

Institution **University of Life Sciences "King Mihai I" from Timisoara**

Patent no. Research Project

Thornless blackberry plants are a cultivated variety of blackberry that have been bred to produce fruit without the sharp thorns commonly found on wild blackberry bushes. The thornless blackberry plants are favoured by gardeners and commercial growers alike for their ease of cultivation, harvesting, and consumption. Our research aimed to assess the genetic stability of thornless blackberry regenerants produced through in vitro culture. We also want to highlight the benefits and economic advantages of in vitro

Description
EN

multiplication. Compared to traditional propagation methods, in vitro culture allows rapid multiplication of plants at an accelerated rate; it works in the laboratory where cultures can be started throughout the year, obtaining planting material independently of the season; it creates significant economies of workforce and production space compared to traditional propagation; micropropagation is an improved method of working, the work being carried out under maximum hygiene conditions. The evaluation using ISSR markers provides valuable information for plant breeders and researchers, ensuring that the regenerated plants maintain the desired genetic traits and the tissue culture process is reliable for the clonal propagation of blackberry plants.

The superior advantages of micropropagation include a significantly higher multiplication rate, leading to a faster and more efficient production of new plants. The multiplication rate is 4.0, meaning that each initial plant has produced, on average, four new plants over a period of three months. Genetic stability assessed with ISSR molecular markers was identified in all individuals included in the study.

RO.158.**Title EN**

**OXI STABLE OIL with Tomato By-product by
AKADEMIKAFOOD**

Authors

Mariana-Atena Poiana, Diana Moigradean, Diana-Nicoleta Raba, Camelia Moldovan, Viorica-Mirela Popa, Delia-Gabriela Dumbrava, Daniela Stoin, Despina-Maria Bordean, Cristina-Georgiana Torjoc, Aurica-Breica Borozan, Corina Dana Misca, Ariana-Bianca Velciov, Florina-Adriana Radu, Luminita Pirvulescu, Adrian Ravis

Institution

**University of Life Sciences "King Mihai I" from
Timisoara**

Patent no.

Trademark registered to OSIM (M2024/002547)

**Description
EN**

The invention relates to a novel application of tomato processing by-product, resulting from juice production, for the development of value-added sunflower oil (SFO) formulations with improved thermo-oxidative stability. SFO samples, supplemented with different doses of dried tomato by-product powder (TBP) to ensure a total phenolic content (TPC) of 200, 300, 400 and 500 ppm GAE (gallic acid equivalents), were subjected to convective heating at 185°C

up to 12 hours. The thermo-oxidative degradation process of the TBP-supplemented oil was monitored by specific chemical indices in comparison with an oil sample with 200 ppm butylated hydroxytoluene (BHT) and a control sample without any addition. An inhibitory effect close to that of BHT was obtained by incorporating TBP at a level ensuring 300 ppm GAE, while higher doses of TBP provided greater protection against thermo-oxidative degradation. Our results support the use of TBP as a natural additive to limit thermo-oxidative degradation of SFO.

RO.159.

Title EN	Supervised and unsupervised classification based on remote sensing for study of an area
Authors	Cosmin Alin Popescu, Adina Horablagă, Mihai Valentin Herbei, Radu Bertici, Daniel Dicu, Florin Sala
Institution	UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM TIMISOARA
Patent no.	Research project
Description EN	Supervised and unsupervised classification, based on remote sensing, was used to study a territorial perimeter. NDWI, NDVI and NDBI indices were calculated based on satellite imagery. The NDVI variation relative to NDWI was described by a polynomial equation of degree 2, in statistical safety conditions ($R^2 = 0.910$, $p < 0.001$). Unsupervised classification (U-class), based on the Iso Cluster algorithm (iterative process, which assigns each cell to a cluster based on Euclidean distances) and supervised classification (S-class), based on the Maximum likelihood algorithm (allocate each pixel to a class based on of maximum probability), led to the detection of three categories in the studied territory, with close values; water, vegetation, constructions ($p < 0.001$ (95%). Remote sensing provides useful spectral information for the analysis of an area, and the operator can decide on one method or another of classification in relation to the additional information held in the territory under consideration

RO.160.**Title EN****THE DEVELOPMENT OF IDENTIFICATION AND EVALUATION PROCEDURE FOR ANTIMICROBIAL COMPOUND-PRODUCING ACTINOMYCETES****Authors**

Popescu Sorina, Borozan Aurica Breica, Petolescu Cerasela, Sarac Ioan, Petrescu Irina, Onisan Emilian, Huiban Florin

Institution**University of Life Sciences "King Mihai I" from Timisoara****Patent no.**

Research Project

**Description
EN**

Actinomycetes, a diverse group of microorganisms, are known for their ability to produce antibiotics and their involvement in the breakdown of organic material in soil. They form symbiotic associations with plants and inhabit both terrestrial and marine environments. Because of their promising applications in pharmaceuticals, biotechnology, and agriculture, actinomycetes are extensively studied, serving as a constant source of innovation.

Our study utilized the barcoding method, involving sequencing the 16S rRNA gene, to identify actinomycetes isolated from soil. Molecular analysis was carried out due to the similarity in traits among these species, overcoming the challenges of morphological identification. Soil samples from various locations, including fertile agricultural areas, areas polluted with animal waste, or mountainous regions, were used for the isolation and purification of actinomycetes. The 16S rRNA gene primers were then used to amplify the extracted DNA, followed by sequencing of the resulting amplification products. Through comparison with NCBI (National Center for Biotechnology Information) databases, high accuracy was achieved in identifying several species. Additionally, the molecular identification of species was correlated with the evaluation of their antibacterial activity, using the bacterium *E. coli* as a model microorganism. Further testing will be expanded to study other microbial species. This study demonstrates the effectiveness of molecular investigations in accurately identifying actinomycete species present in analyzed soil samples.

RO.161.	
Title EN	Development and introduction on the market of a range of innovative food supplements with superior bioavailability based on bee products and essential oils
Authors	Raba Diana Nicoleta, Dumbrava Delia Gabriela, Alexa Ersilia Calina, Poiana Mariana Atena, Cocan Ileana, Obistioiu Diana Monica, Iancu Tiberiu, Ciucur Radu Ioan, Stoia Sorin, Popa Viorica-Mirela, Moldovan Camelia
Institution	University of Life Science "King Michael I" from Timisoara/Technology Transfer Centre
Patent no.	Patent application A00406/27.07.2023
Description EN	The project aims to develop and introduce on the market a range of innovative food supplements with superior bioavailability based on bee products and essential oils. Through collaboration with the USVT Technology Transfer Centre, a new range of honey-based foods will be developed and the technical skills for their production will be created. A technology will also be developed with optimized operating conditions and preparation mode of the basic matrix, ensuring functionality and bioavailability of the active principles in the ingredients used and long shelf life of the product without requiring chemical or physical preservation processes.
RO.162.	
Title EN	Three-dimensional analysis model of grasslands based on data obtained through UAV solutions
Authors	Mihai Simon, Loredana Copăcean, Cosmin Popescu, Luminița Cojocariu
Institution	University of Life Sciences „King Mihai I” from Timisoara
Patent no.	Research project
Description EN	The data acquired through UAV (Unmanned Aerial Vehicle) technology are particularly important in the analysis of the geographical space, implicitly in the analysis of grasslands. In this sense, different products obtained from photogrammetric flights can be used, such as: aerial images, three-dimensional models of the surface or orthophoto planes. In this context, we propose a complete workflow, based on UAV solutions, to result in 3D models that can be used in grassland analysis. The workflow involves: planning

the flight mission and flying over the area of interest; processing aerial images and point clouds; generation of 3D models; extraction of data of interest in the analysis of grasslands. The advantages of applying the workflow and spatial models offer a number of advantages: they reduce the workload in the field; covers large areas and continuous images and data are generated; the data sets obtained can be integrated with other geospatial data; for grasslands, information can be extracted regarding the conformation of the land, which influences the distribution of the vegetation; surface or volume measurements can be made.

RO.163.

Title EN	Geospatial Technologies Used in the Management of Water Resources in West of Romania
Authors	Adrian Şmuleac, Laura Şmuleac, Cosmin Alin Popescu, Sorin Herban, Teodor Eugen Man, Florin Imbrea, Adina Horablağa, Simon Mihai, Raul Paşcalău, Tamas Safar
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Research project
Description EN	Stability in time of major and important objectives is vital and can be achieved by 3D scanners which follow changes in time with construction, respective of the natural or artificial hydro-technical dams and the obtaining of 3D data in real time with the possibility of evaluating and making quick decisions. This scientific paper approaches a research topic of great importance and actuality in the field of Civil Engineering, Hydrotechnics, and Geomatics using the 3D scanning technologies for the hydrotechnical arrangements (Topolovăţu Mic, Coşteiu and Sânmartinu Maghiar) and hydroameliorative (Cruceni Pumping Station). In Romania, data collection was carried out for the first time using the mobile scanning technology (MMS), "Backpack" type, namely, Leica Pegasus Backpack. Data collection using terrestrial laser scanning technology (Terrestrial Laser Scanning) was carried out with the Leica C10 equipment. The processing of point clouds was carried out using the Inertial Explorer program, and the processing of point clouds was carried out with the Cyclone program. The collection of ground checkpoints used for checking, correcting, and

analyzing point clouds was carried out using the GPS Leica GS08 equipment. Compared with traditional methods using classical measuring instruments, precise data was obtained (with an error of 2–4 cm) through 3D laser scanning technology in a short time and with multiple possibilities of processing and visualizing point clouds.

RO.164.**Title EN****Use of Modern Technologies for the Conservation of Historical Heritage in Water Management****Authors**

Adrian Șmuleac, Laura Șmuleac, Teodor Eugen Man, Cosmin Alin Popescu, Florin Imbrea, Isidora Radulov, Tabita Adamov, Raul Pașcalău

Institution

University of Life Sciences "King Mihai I" from Timisoara

Patent no.

Research project

**Description
EN**

Historical monuments represent a cultural heritage that humanity has a duty to preserve and conserve. Lately all over the world, scanning these heritage objectives has become a priority, in order to preserve in the smallest details, the used architecture. The work aims to complete the cultural heritage for Sânmihaiu Român hydro technical development built between 1912 and 1915, located on the Bega River in Western Romania, through modern mobile scanning technology, Leica Pegasus Backpack, necessary for the creation of a three-dimensional (3D) documentation, for the completion of the cultural heritage, and for the creation of a 3D database. The purpose of the scientific paper is restoring Sanmihaiu Roman Hidro technical Node, subject to degradation, in order to achieve the project “The navigable Bega”, waterway connection to Serbia. Collecting method of LiDAR data is Fused Slam, the acquisition of RINNEX data being made by placing a Leica GS08 Master Station. Visualization of quality graphics has been performed in Quality Control (QC) Tools. The scanning accuracy is between 2 and 3 cm and the 3D data processing were performed with the Cyclone Model version program, with SmartPick Point and Virtual Surveyor functions. The obtained point clouds will be of a great help in order to follow in time the construction which can be used whenever it will be needed by the designers and specialists in the field of hydrotechnics.

RO.165.

Title EN	European Universities designing the horizons of sustainability
Authors	ȘMULEAC Laura, IANCU Tiberiu, RADULOV Isidora, STANCIU Sorin, IMBREA Florin, POPESCU Gabriela, PAȘCALĂU Raul, SĂLĂȘAN Cosmin
Institution	University of Life Sciences „King Mihai I” from Timisoara, Romania
Patent no.	Research project SHEs - Sustainable Horizon in European HEI's Project contribute to an inclusive society, supporting researchers/academics deeply thinking, respecting nature, practical problem-solving professionals, adapting to new challenges. There are six young HEIs, open to innovation, from South Extreme (Faro-Pt, Huelva-Es), Central (Zlin-Cz, Ludwigshafen-De), Eastern (Timisoara-Ro) to North (Lahti-Fi) carried out activities of co-production with relevant economic regional impact. The complementary strength in sustainability scientific fields aiming at inclusive institutional transformation and providing a platform as preferential partners collaborating with surrounding ecosystems. The goals are to support the institutional change in especially the Widening Countries HEIs (UAlg, ULST, UTB) to, within the network and with the best practices, define road maps to effectively implement inclusive approaches to open science policies, gender balance plans, sustainability reports, researcher's societal links. The project's sustainability research approaches anchors on traditional sciences (environmental, socioeconomics) but with strong interdisciplinarity innovation based on Artificial Intelligence, allowing Entrepreneurship and Employability to impact regional ecosystems. The project aims to project SUSTAINABLE HORINZONS outside Europe offering Distance learning PhD supporting locally at global level sustainability and a Healthy Planet.
Description EN	

RO.166.

Title EN	Impact of Climate Change in the Banat Plain, Western Romania, on the Accessibility of Water for Crop Production in Agriculture
Authors	Șmuleac Laura, Rujescu C., Șmuleac A., Imbrea F, Radulov Isidora, Manea D., Ienciu Anișoara, Adamov Tabita, Pașcalău R
Institution	University of Life Sciences „King Mihai I” from Timisoara, Romania
Patent no.	Research project
Description EN	<p>Global warming is an unanimously accepted phenomenon by the international scientific community, being already highlighted by the analysis of observational data over long periods of time, with an increase in temperature of over one degree C. Climate change in Romania is part of the global context. While the link between high temperatures, climate change and rainfall has been modeled in detail, the situation is not the same for plant water accessibility. The period of time between 1898 and the present, corresponding to the annual records of precipitation and evapotranspiration, overlapped with important political and administrative changes in the studied area, and with extensive hydro-melioration works. The aim of the paper is to statistically follow the evolution over time of precipitation, namely of evapotranspiration measured in Western Romania, which would allow the expression of conclusions regarding the improvement directions of the water regime. In order to follow the evolution in time of these data, the interval of 1898-2019 was divided into three periods: 1898-1950, 1951-1989 and 1990-now respectively. The increase in temperature, especially during the vegetation period and the large number of years in which evapotranspiration exceeds quantitatively the precipitation indicate the need for effective measures to regulate the water balance. Performing the ratio between precipitation and evapotranspiration for each year, for the entire time period studied, 1898-now, the P / ETP series (IV-IX) and P / ETP (year) were determined. Statistical calculations were performed using SPSS. SPSS, Microsoft Excel and Past4 were used for graphical representations</p>

RO.167.	
Title EN	Feed Supplement for Dairy Cows Aimed at Improving the Quantity and Quality of Milk
Authors	Ștef Lavinia, Julean Călin, Pet Ioan, Ștef Ducu Sandu, Marcu Adela, Simiz Eliza, Corcionivoschi Nicolae, Carabă Valer, Morariu Florica, Balta Igori
Institution	University of Life Sciences "King Mihai I" from Timisoara
Patent no.	Patent application No.CBI a 2023 00048/06/02/2023
Description EN	The invention purpose is to obtain a feed supplement designed for dairy cows to improve the quantity and quality of milk. The feed supplement according to the invention is a homogeneous mixture consisting of the following components expressed in percentages: rapeseed meal 40-60%, sunflower meal 20-40%, wheat bran 20-40%, protected vegetable fat 4-12%, calcium carbonate 4-6%, monocalcium phosphate 2-4%, sodium bicarbonate 2-4%, CLA (Conjugated Linoleic Acid sources) 2-4%, live feed yeast 0.4-0.8%, and a vitamin-mineral premix 0.8-2%. A quantity of 2.5 kg of this feed supplement is incorporated at a ratio of 25-35% into the structure of a concentrated mix. The nutritional value of the feed supplement is as follows: 0.95 UFL, 105-155 g PDIN, and 75-95 g PDIE. It results in an increase in milk production by up to 25% while simultaneously improving the quality of the milk, as evidenced by changes in the amount and profile of unsaturated fatty acids. Applications in Animal husbandry, Zoo-veterinary field
RO.168.	
Title EN	CaroTeff-Brio by AKADEMIKAFOOD
Authors	Daniela Stoin, Ionel-Calin Jianu, Mariana-Atena Poiana, Ersilia-Calina Alexa, Adrian Ravis, Teodor-Ioan Trasca, Ileana Cocan, Monica-Viorica Negrea, Ariana-Bianca Velciov, Ducu-Sandu Ștef, Diana Moigradean, Florina-Adriana Radu
Institution	University of Life Sciences "King Michael I" from Timisoara, Faculty of Food Engineering
Patent no.	Trademark registered to OSIM (M2023/09848)
Description	The present invention concerns the creation of gluten-free

EN muffins that are enriched with bioactive compounds, proteins, fiber, and minerals. This is achieved through the addition of varying proportions of teff flour (TF) and carob powder (CP). Specifically, rice flour (RF) was substituted with 10%, 15%, and 20% TF and 5% CP, respectively. Standard methods were used to examine the proximate composition, physical and sensory characteristics, total polyphenol content (TPC), total flavonoid content (TFC), and antioxidant capacity (AA) of the developed muffin formulas. Sensory analysis showed that muffins with added TF and CP had a pleasant, rich aroma and sweet taste, leading to increased overall acceptability. Data obtained from proximate composition analysis reveals the superior nutritional profile of TF and CP added muffin samples compared to the control sample, reflected by higher ash, fiber, protein and fat content, as well as lower carbohydrate level. It was also observed that the addition of TF and CP in the muffin recipe resulted in significantly higher levels of TPC, TFC and AA compared to the control. The results provide strong evidence for the use of TF and CP as a partial replacement for RF to obtain fortified muffin formulations, and these findings are useful in the development of new food products with improved functionality.

**University „Constantin Brâncuși,
of Târgu-Jiu**

RO.169.	
Title EN	Construction brick manufacturing process using industrial waste
Authors	Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Diaconu Bogdan Marian, Dițescu Corneliu Laviniu, Dondoe Valentin, Anghelescu Lucica
Institution	University „Constantin Brâncuși,, of Târgu-Jiu
Patent no.	13077/30.10.2020
Description EN	The invention refers to a process for the manufacture of heat-insulating concrete, using as light granular The invention refers to a process for manufacturing construction bricks using industrial waste, in which raw materials are exclusively used materials considered waste in the energy and extractive industries: heavy ash from thermal power plants, clay from lignite mining quarries in the area Carboniferous Gorj, drilling mud. The advantages of this process are represented by the fact that power plant ash successfully replaces the sand used as an additive to correct the plasticity of the Rovinari clay, under conditions of reducing the density of the finished products by (8-12) %, increasing the thermal insulation capacity by (10-15)% and the reduction of the sintering temperature by (30-50)% in the final stage of heat treatment.
RO.170.	
Title EN	Process for obtaining heat-insulating concrete based on heavy ash of power plant
Authors	Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Popescu Cristinel, Diaconu Bogdan Marian, Ciofu Florin Cristian, Cazalbașu Ramona, Anghelescu Lucica
Institution	University „Constantin Brâncuși,, of Târgu-Jiu
Patent no.	129872/27.04.2018
Description EN	The invention refers to a process for the manufacture of heat-insulating concrete, using as light granular aggregate the hearth ash resulting from the burning of coal in thermoelectric power plants. It is known that for the

manufacture of heat-insulating concrete with maximum usage temperatures of up to (1000-1100)0C, light aggregates are currently used, such as calcined diatomite and granulated blast furnace slag, raw materials that are currently in short supply in Romania. The technical problem that the invention solves consists in obtaining concrete with thermal power plant ash, through a cheap, economical and easy to apply process in production. The process of obtaining heat-insulating concretes, based on thermal power plant heavy ash and cement, assumes that in the composition of these concretes, ash represents (25-80)%, either as a single granular aggregate or in combination with other types of heat-resistant, lightweight granular aggregates, usual, such as, for example, expanded perlite. Heat-insulating concretes based on thermal power plant ash, obtained according to the invention patent, can be put into operation by known technical processes, of casting-vibration or shotcrete.

RO.171.
Title EN

Process for obtaining compaction masses with reinforcement based on hydraulic binder

Authors

Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Popescu Cristinel, Diaconu Bogdan Marian, Ciofu Florin Cristian, Cazalbașu Ramona, Anghelescu Lucica

Institution Patent no.

University „Constantin Brâncuși,, of Târgu-Jiu
129783/30.03.2018

Description EN

The invention refers to a process for obtaining quick-hardening masses, based on hydraulic binder, used in the execution of reinforced form, leveling or filling layers, in construction works. The process according to the invention capitalizes on the specificity of the oxidic and mineralogical chemical composition of the secondary steel treatment slag, in that, after grinding to an appropriate fineness for a rest of a maximum of 10% on the sieve with the meshes of 0.09mm , is used as a hydraulic binder in the composition of the compacting masses. The process according to the invention uses industrial waste with a relatively low degree of recovery as granular aggregates, to obtain the compaction masses with rapid hydraulic hardening: steel making slag in an electric furnace and ash of power plant.

George Emil Palade
University of Medicine, Sciences and Technology,
Târgu Mureș

RO.172.
Title EN

The doctor-parent communication – the basis of effective therapeutic management

Authors

Adumitrăchioaiei Heidrun, Adumitrăchioaiei Daniel

Institution

George Emil Palade University of Medicine, Sciences and Technology, Târgu Mureș, Romania

**Description
EN**

Doctor-patient communication is one of the essential pillars for effective therapeutic management.

Anamnesis is the way in which the doctor finds out essential information about the patient's personal physiological and pathological history, as well as about the cause that brought him to the doctor.

In pediatrics, doctor-parent communication is perhaps the most important, due to the different stages of development that pediatric patients go through, therefore, in front of a child aged between 0-3 years, the efficiency of the anamnesis is based on the effectiveness of doctor-parent communication.

We conducted a study based on an online questionnaire, after applying the exclusion criteria, we analyzed a number of 88 questionnaires and we identified the fact that parents associate communication with the degree of professionalism of the doctor, relate information in the anamnesis depending on the way the doctor communicates verbally or non-verbally with them and in depending on the degree of empathy they receive.

We also found that parents build their trust in medical recommendations depending on the way the doctor communicates.

These aspects draw our attention to the major impact that communication has in front of an efficient therapeutic management.

Similar opinions have been identified in other specialized studies, so we consider doctor-patient communication an essential pillar on the road to healing, and for this, the constant teaching of communication and empathy courses in medical units and the constant feed-back of their effect through the analysis of satisfaction questionnaires are necessary.

**National Research and Development Institute for Laser,
Plasma and Radiation Physics – INFLPR**

RO.173.

Title EN **Industrial-scale vacuum plasma coating equipment for thin film deposition at low temperature with sub-nanometric uniformity and roughness**

Authors Cristina Surdu-Bob, Marius Badulescu

Institution National Institute for Laser, Plasma and Radiation Physics

Patent no.

The invention consists on a large-scale plasma source, 60 cm in height, capable of coating large areas with film uniformity and roughness at sub-nanometer level. The plasma parameters are constant over several tens of hours, thus allowing for industrial scale deposition of thin films. Typical deposition rates obtained fall in the range of 0.5 to 1.5 nm/min.

Description The high-tech equipment is able to produce high quality films from gas precursors at room temperature and could therefore be used to coat flexible substrates and also in microfabrication processes involving photoresist. Due to the high thickness uniformity and roughness of films produced, the system could be involved in coating of large optical components of Space telescopes or high-power laser facilities.

RO.174.

Title EN **Equipment for the fabrication of sub-millimeter highly spherical metal particles**

Authors Cristina Surdu-Bob, Marius Badulescu

Institution National Institute for Laser, Plasma and Radiation Physics

Patent no.

The invention consists on high-throughput synthesis of metal spherical particles with diameters ranging from a few tens of micrometers to one millimeter. These are remarkable materials that could lead to advanced developments in science and technology. Any solid material in the Periodic Table can be made into high quality spheres.

Description Among the possible applications of the spheres, the following could be mentioned: high precision additive manufacturing, miniature ball bearings, research, industrial processes (magnetic separation), jewelry etc.

RO.175.	Biocompatible non-stick surgical devices capable of preventing tearing of fragile tissue
Title EN	Authors Cristina Surdu-Bob, Marius Badulescu
Authors	Institution National Institute for Laser, Plasma and Radiation Physics
Institution	Patent no.
Patent no.	<p data-bbox="308 375 974 670">During surgery, medical devices such as surgical suture pins, wires and blades retain on their surface some of the tissue. This is the result of inherent adhesion and tear phenomena of live tissue on shearing against device surface. When such events occur during surgical intervention on very fragile tissue such as that of internal organs or eyes, the impact is even higher. Knowing that part of the success of a surgical intervention depends on the least damage that can be achieved, improved non-stick devices are a good solution to the problem.</p> <p data-bbox="308 678 974 762">Biocompatible non-stick devices preventing sticking and tearing of live tissue on surgical devices encountered during surgery are presented.</p>
Description	
RO.176.	Nanotechnology large-scale equipment for metal coating of wooden objects
Title EN	Authors Cristina Surdu-Bob, Marius Badulescu
Authors	Institution National Institute for Laser, Plasma and Radiation Physics
Institution	Patent no.
Patent no.	<p data-bbox="308 986 974 1249">Wood is a lightweight material with several uses. Improvement of this material to resist against weather conditions or for aesthetical purposes is made by conditioning the surface using wet techniques. Coating of wood with thin metal films changes its properties and offers an enlarged window of applications. Apart from offering aesthetic coatings on wood, our invention opens new opportunities for using wood in less usual applications which remain to be imagined.</p> <p data-bbox="308 1257 974 1369">Requiring high vacuum, using nanotechnology on wood is expected to be less opportune, at least from a commercial perspective. Nevertheless, this invention offers solutions that overcome such shortcomings.</p>
Description	

RO.177.	
Title EN	Bio-borate glass doped with cerium oxide in the form of a thin film for improving surfaces of medical interest and obtaining method
Authors	Gabriela- Irina UNGUREANU (NEGUȚ), Bogdan SAVA, Grațîela GRĂDIȘTEANU, Bogdan BIȚĂ
Institution	National Institute for Laser, Plasma and Radiation Physics
Patent no.	A/00615/27.10.2023
Description	<p>The invention relates to bio-borate glasses doped with cerium oxide (BBGi) in the form of thin films for the improvement of Titanium (Ti) surfaces of medical interest and to a method of obtaining them.</p> <p>The doped BBGi according to the invention is composed of: vitreous network formers - 40...65% B₂O₃ and 2.5...10% P₂O₅, vitreous network modifiers - 15... 30% Na₂O and 20...30% CaO, as well as dopants with special properties - 1...3% CeO₂ and 0...1% SrO₂, in molar percentages.</p> <p>The production process involves the following stages: volumetric and gravimetric dosing of raw materials, homogenization, mixture of raw materials dried in the oven, melting, glass annealing, glass mortaring, mixing with dimethyl sulfoxide (DMSO), freezing in liquid nitrogen and deposition on Ti substrates by matrix assisted pulsed laser evaporation technique (MAPLE), with the help of a KrF* excimer laser source, the substrates being placed plane-parallel in the deposition chamber.</p>

RO.178.	
Title EN	Process for obtaining of mesoporous ceria thin films for green energy
Authors	A. Bercea, M. Filipescu, I. Boerasu, A. Palla Papavlu
Institution	National Institute for Laser, Plasma and Radiation Physics
Patent no.	A/00480/01.09.2023
Description	<p>The invention relates to an environmentally friendly ("green") laser-based method for obtaining mesoporous polycrystalline layers of CeO₂, with a high specific surface area, applicable in the generation of "green" energy (SOFC-type devices).</p> <p>The method, according to the invention, presents the following advantages:</p> <ul style="list-style-type: none"> • It is carried out in a single step and is environmentally friendly;

- It allows for obtaining a thin, uniform, and mesoporous functional intermediate layer of polycrystalline CeO₂, used between the cathode and the electrolyte of an SOFC device;
 - It enables the production of a mesoporous layer of CeO₂ with a high specific surface area/volume ratio, with improved electrochemical efficiency in SOFC-type devices;
 - It allows for obtaining a thin mesoporous layer, where the thickness of the layer can be controlled by adjusting the number of laser pulses ablating the target;
 - It allows for obtaining a thin mesoporous layer of polycrystalline CeO₂ by adjusting the temperature during layer deposition;
 - It enables the production of a functional mesoporous layer in a single step, combining the CeO₂ layer growth process with its thermal annealing process at relatively high temperatures, thus eliminating the risk of impurities;
- It allows for obtaining a mesoporous layer, with pore sizes of 5 nm - 50 nm, by using a working pressure of 1000 mbar air.

RO.179.

Title EN	Method for obtaining WO₃-PPy composite layers with high specific surface area that can be integrated into resistive sensors
Authors	M. Filipescu, A. Bercea, S. Brajnicov, A. Bonciu, A. Palla-Papavlu
Institution	National Institute for Laser, Plasma and Radiation Physics
Patent no.	A/00510/19.09.2023
Description	<p>The invention relates to a method for obtaining porous composite layers of WO₃-PPy, with a high specific surface area/volume ratio, which can be integrated as sensitive layers in resistive sensors for detecting toxic gases (nitrogen dioxide/ ammonia/ hydrogen sulfide) and ambient operating temperatures (room temperature). The method is carried out in two steps, based on depositing the sensitive layer using laser ablation technique and combining two processing techniques: Matrix-Assisted Pulsed Laser Evaporation (MAPLE) and Pulsed Laser Deposition (PLD). The method, according to the invention, has the following advantages:</p> <ul style="list-style-type: none"> • It is environmentally friendly being less likely to generate hazardous chemical waste compared to other methods involving solvents or toxic chemicals. • It allows for obtaining a uniform and porous WO₃-PPy composite layer. • It allows for obtaining a porous sensitive layer whose

thickness can be controlled by adjusting the number of laser pulses ablating the target.

- It enables the production of a porous WO_3 base layer, with pores on the order of tens of nanometers, by using a working pressure of 1000 mbar synthetic air.
- It allows for the decoration of the porous WO_3 base layer with PPy, by ablating a frozen matrix of PPy at a concentration of 1% dissolved in solvent, at a working pressure of 10^{-5} mbar.

RO.180.	
Title EN	Process for preparing nanocomposites from Reduced Graphene Oxide and Si-Ge nanoparticles for Li-ion rechargeable battery anodes
Authors	Claudiu FLEACA ¹ , Florian DUMITRACHE ¹ , Lavinia GAVRILA-FLORESCU ¹ , Evghenii GONCEARENCO ¹ , Monica SCARISOREANU ¹ , Mihaela-Ramona BUGA ² , Giorgian Cosmin UNGUREANU ²
Institution	¹ National Institute for Laser, Plasma and Radiation Physics ² National Research And Development Institute For Cryogenic And Isotopic Technologies, Uzinei Street No. 4, Post code 240050, Rm. Valcea.
Patent no.	A/00851/2023
Description	The invention proposes the synthesis of a new composite material for anodes in Li-ion batteries formed by combining Ge-Si-based nanoparticles with flexible sheets of reduced graphene oxide (rGO), a material that has not been reported in the specialized literature. This composite gives the advantage of obtaining anodes with good stability while resisting volume variations during charge/discharge cycles, ensuring uniform behavior for at least 200 cycles, considering that anode materials based on Si nanoparticles/ Ge reported in the literature were tested for a maximum of 60 or 100 cycles. The better stability of these anodes is also translated by a coulombic efficiency of 100% throughout the letter/deliteration cycles.

RO.181.	
Title EN	Process for obtaining iron oxide nanoparticles, using isopropanol (IPR) as a sensitizer with potential biomedical or pharmacological applications
Authors	Lavinia GAVRILA-FLORESCU, Claudiu FLEACA, Florian DUMITRACHE, Anca CRIVEANU, Iulia LUNGU, Iuliana MORJAN, Ana-Maria BANICI, Elena DUTU
Institution	National Institute for Laser, Plasma and Radiation Physics, 409 Atomistilor Street, 077125 Magurele,

Patent no.	Romania. A/00862/2023
Description	<p>The invention describes a process for obtaining iron oxide nanopowders, by laser pyrolysis, using isopropanol as a sensitizer. The use of this weaker sensitizer comes with the advantage that, following the laser-molecule interaction, the energy transfer is not very high. The excitation of the molecule on the resonant level, then the thermalization process following intermolecular collisions are done, without endangering too much the decomposition of the sensitizer. Thus, the C content of the iron oxide samples obtained through the laser pyrolysis process with the sensitizer, isopropanol, is lower than when using ethene. Using a mixture of gaseous precursors - O₂ and vapors from volatile liquids - Fe(CO)₅ and C₃H₈O and driven by an inert carrier gas (Ar), iron oxide nanoparticles were synthesized by laser pyrolysis with dimensions below 10 nm.</p> <p>Due to the unique properties, the magnetic behavior, but also the optimized processes of stabilization and functionalization, these NPs have a real potential for use in biomedical applications, especially as vehicles for transporting biologically active compounds in the therapy of various types of cancer.</p>

RO.182.

Title EN	Resistive sensor for ammonia detection based on graphene active materials and its fabrication procedure
Authors	A. Palla-Papavlu, M. Filipescu, S. Brajnicov
Institution	National Institute for Laser, Plasma and Radiation Physics
Patent no.	A/00474/29.08.2023
Description	<p>In recent years there has been a growing interest for two-dimensional nanomaterials such as graphene, for applications in the electronic and optoelectronic industries. Graphene has many advantages; however, its main disadvantage for application in devices remains the need to use special growth / synthesis and handling conditions.</p> <p>In the field of sensors, most of the research work is focused on reducing the size of the sensors and identifying and quantifying several species. Also, fast response, minimum hardware requirement, good reversibility, sensitivity and selectivity are also qualities of an excellent sensor. The main</p>

problem related to the new generation of miniaturized sensors is the complexity of the manufacturing processes, i.e., the integration of many functions on the same device through a single manufacturing process.

Thus, the “Laser transfer of graphene sheets for the fabrication of sensors: process optimization via time-resolved imaging” project has as main objective the optimization of the laser induced forward transfer process (LIFT) by imaging techniques (shadowgraphy) that allows the deposition of two-dimensional atomic layers of graphene with high spatial resolution for the subsequent realization of sensors.

RO.183.

Title EN	Procedure for obtaining ZnO films with large specific surface area for surface acoustic wave humidity sensor
Authors	Cristian Viespe, Dana Maria Miu, Cornelia Enache, Izabela Constantinoiu
Institution	National Institute for Lasers, Plasma and Radiation Physics
Patent no.	A2022 00393/08.07.2022
Description	<p>The invention refers to a procedure for obtaining thin layers of porous ZnO, with a large specific surface area, usable as sensitive layers in humidity sensors of the SAW (Surface Acoustic Wave) type, based on laser deposition, using a working laser in pulses of the order of picoseconds.</p> <p>By using the process, SAW type sensors with improved humidity sensitivity are obtained. This process irradiates a ZnO target, placed in a controlled atmosphere enclosure, with a beam from a laser operating in picosecond pulses.</p> <p>The areas of applicability of humidity sensors are numerous: monitoring in various medical equipment (respiratory medical equipment, sterilizers, incubators, etc.), pharmaceutical processing, processing in the industrial field (e.g. in the integrated circuit industry), environmental monitoring.</p>

National Institute of Materials Physics

RO.184.**Title EN****Method for detecting melanin produced by B16 cell cultures****Authors****Teodor Adrian Enache, Daniela Bratu Oprea, Mihaela Cristina Bunea, Mihaela Beregoi****Institution***National Institute of Materials Physics***Patent no.**

Nr a 2022 00283 / 24.05.2022

Description

The work involves the implementation of an innovative three-step method for the detection of melanin produced by the cell line of epithelial origin B16. In the first stage, cells are seeded and cultivated on the surface of a porous adhesive membrane, in the second stage, the complex of fibers and cells is fixed on a planar electrochemical sensor consisting of three electrodes, and in the last stage, the cells can be irradiated and the electrochemical signal is measured corresponding to the melanin produced by B16, after irradiation, differential pulse voltammetry by sweeping the potential from 0 mV to – 800 mV.

RO.185.**Title EN****Manufacturing method of a dual analytical platform for electrochemical and colorimetric detection****Authors****Teodor Adrian Enache, Costas Liliana Andreea, Daciana Botta, Elena Matei, Victor Diculescu****Institution***National Institute of Materials Physics***Patent no.**

00755/19.11.2020

Description

The present work describes a dual analytical platform for electrochemical and colorimetric detection designed for applications such as analytical determination of molecular compounds of biological interest using simultaneously two methods. This platform is made on a nitrocellulose support with the areas of interest (ie. sample introduction and detection) interconnected and delimited with wax printed on the support. Electrodes for electrochemical detection are manufactured by photolithography, cathode sputtering with magnetron in radio frequency and thermal evaporation in vacuum. The platform contains four detection systems: two electrochemical (test and control) and two colorimetric (test and control).

RO.186.	
Title EN	Nanostructured substrate for the growth and transplantation of cell cultures and the manufacturing process
Authors	Teodor Adrian Enache, Daniela Bratu Oprea, Mihaela Cristina Bunea, Mihaela Beregoi, Monica Enculescu
Institution	<i>National Institute of Materials Physics</i>
Patent no.	Nr a 2022 00284/ 24.05.2022
Description	The present work involves the development and use of an innovative technique for the manufacture of a biocompatible substrate, adapted to support and stimulate the development of cell cultures. The substrate was made by the electrospinning technique and by adding nanometric polymer fibers on an adhesive polymer membrane. Cell cultures were added to the surface of the described support and the entire cell-substrate device, was transplanted at the level of planar sensors for the analysis of various cellular products of interest.

RO.187.	
Title EN	Generation of Highly Penetrating Water Jets by controlled detonations for civil and security applications.
Authors	Iacob Nicusor, Sasu Gheorghita, Ivan Ioan Alexandru, Schinteie Gabriel, Kuncser Victor-Eugen
Institution	Institutul Național de Cercetare-Dezvoltare pentru Fizica Materialelor, București (INCDFM)
Patent no.	Patent request A100136/2024
Description	The invention proposes an easy and flexible solution for generating highly penetrating water jets with cylindrical symmetry through controlled detonations. It is based on a water-explosive configuration in a conical geometry that allows the use of both detonating cords and explosive sheets as explosive materials. The explosive material can be partially or fully wrapped around the conical water layer (which forms the water jet), depending on the desired section size of the jet generated after detonation. The generated water jets have the ability to penetrate metallic materials under various diameters. The technical solution proposed in the invention was adapted to be also used for underwater applications. The proposed geometrical configurations were based on numerical simulations and proven by experiments. The devices for generating of highly penetrating water jets

with cylindrical symmetry made in the present invention can be used in special civil interventions and in ground or underwater interventions by specialized and security structures.

RO.188.**Title EN**

Synthesis method of films based on poly(ortho-toluidine)/reduced graphene oxide composite

Authors

Mirela Vaduva, Teodora Burlanescu, Ion Smaranda, Mihaela Baibarac

Institution

National Institute of Materials Physics

Patent no.

Patent application No. A/00334/2023

Description

Synthesis method of films based on poly(ortho-toluidine) composite (POT) and reduced graphene oxide (RGO) correspond to the electrochemical polymerization of the ortho-toluidine monomer in the semi-aqueous solution (water and N, N'-dimethylformamide in volumetric ratio 1:1) of H₂SO₄ and RGO in the potential range between -200 and +900 mV vs. ag/AgCl, when a dark green film is formed. This corresponds to the film of RGO functionalized with POT in the form of emeraldine salt. Knowing the vibrational properties of POT-ES, the functionalization of RGO sheets with POT-ES was confirmed by: a) the Raman scattering, when the decreasing the ratios between the intensities of Rmana lines assigned to the vibrational modes of a₁) the C-N bonds and protonated structure (B-NH⁺=Q), localized at 1275 and 1352 cm⁻¹, varies from 0.8 to 0.41 and a₂) C=C bonds in quinoide (Q) rings and C-C bonds in benzene (B) rings, having the maxima of Raman lines at 1575 and 1624 cm⁻¹ varies from 0.88 to 0.53; and b) FTIR spectroscopy, when the ratio between the absorbances of the IR bands assigned to the vibrational modes B-NH⁺=Q and N=Q=N, situated at 1100-1250 and 1600-1700 cm⁻¹, varies from 5.54 to 1.66. The main applicatin of the RGO/POT-ES films is as electrode active material in the energy storage field. Using cyclic voltammetry, a behavior of the type battery in the case of RGO/POT-ES composite was reported. The values of the capacitance equal to 1524.62 mF/cm² in the symmetrical electrochemical cells were reported.

RO.189.	
Title EN	Mobile Target for Shutting Training
Authors	Lazar Marian, Dobrescu Gabriel, Ighigeanu Adelina Maria, Sasu Gheorghita, Ivan Ioan Alexandru, Kuncser Victor-Eugen
Institution	Institutul Național de Cercetare-Dezvoltare pentru Fizica Materialelor, București (INCDFM)
Patent no.	Utility model request U100016/2024
Description	The invention aim is to provide a physical support for training of special forces of the Ministry of Internal Affairs. Real intervention conditions related to the sudden appearance of targets are reproduced. It helps to improve combat skills and enhance reactions (optimizing intervention times and methods) of special forces personnel. In this regard, the purpose of a mobile target is to mimic the dynamics of human movements. It simulates linear movements, sudden stops, changes of direction, as well as rotation or balancing movements as faithfully as possible. Accordingly, the Mobile target consists of a housing containing the linear displacement system, the target rotation system, the balance system, the command and control system, and the remote control. The essential characteristics are: (i) maneuverability, (ii) flexibility in setting target motion parameters, (iii) manual and automatic target control mode, (iv) convenient size and weight, (v) stability during movements, (vi) operational reliability, (vii) easy replacement of various types of humanoid target panels.

RO.190.	
Title EN	Silver metallic electrodes irradiated with low energy electron beams and the method of obtaining
Authors	Silviu Poloșan, Iulia Corina Ciobotaru, Constantin Claudiu Ciobotaru, Elena Matei
Institution	National Institute of Materials Physics – Romania
Patent no.	Patent application No. A 2023 00754
Description	Irradiation of metallic and transparent silver films (approx. 22 nm) deposited on a glass substrate, respectively Si/SiO ₂ by thermal evaporation, leads to a partial crystallization of silver mainly in the [1,1,1] direction, morphologically highlighted by analyzes by X-ray and scanning electron microscopy. Irradiation with low-energy electrons

accelerated at 400 V and obtained from a tungsten filament heated with a current of 37 A leads to the improvement of the electrical conductivity of the silver films by approx. 56 %, concomitantly with the decrease of the mechanical work of extraction from 4.3 eV to 4.67 eV, comparable to the mechanical work of extraction of indium and tin oxide anodes. This fact, combined with the transparency of approx. 40% on the visible range allows the use of irradiated silver films to manufacture transparent anodes for electroluminescent diodes and increase the efficiency of light emission by transferring it through the anode.

RO.191.

Title EN	Electrochemical biosensor for the detection of the enzyme methionine sulfoxide reductase
Authors	Teodor Adrian Enache, Mihaela-Cristina Bunea, Issam Boukhoubza, Elena Matei
Institution	National Institute of Materials Physics
Patent no.	A100152/2024
Description	The present invention describes a biosensor for the detection of the enzyme methionine sulfoxide reductase type A (MsrA) consisting of: i) screen-printed carbon electrode modified with catalytic zinc oxide nanostructures obtained by electrodeposition and ii) acetylated peptides of the form Ac-Gly-Gly -Gly-MetO-Gly-Gly-Gly, where MetO represents methionine sulfoxide and Gly glycine residues, as a biorecognition element. The present invention presents applications in the field of electrochemical biosensors usable for the detection of the enzyme methionine sulfoxide reductase.

RO.192.

Title EN	Top-electrode deposition process in vertical organic junctions
Authors	Bogdana Borca, Nicușor Iacob, Ioan-Alexandru Ivan, Lucian Trupină, Mihail Mihai, Aurel Leca
Institution	National Institute of Materials Physics
Patent no.	Patent application No. A/00785 from 29.11.2022.
Description	The present invention refers to the development of a process for depositing a metal film, which can be the upper electrode in vertical organic junctions, with an interface as smooth as

possible, without penetration channels through the organic film. Vertical organic junctions consist of a succession of metal/organic/metal thin films and are used to fabricate organic field-effect transistors, photovoltaic cells, organic spin valves, memristors and organic light-emitting diodes that have a series of applications in flexible, biocompatible, degradable, portable, efficient and low-energy electronic and/or spintronic devices. The developed process is based on a slow resistive evaporation method under vacuum, that is based on a fine wire of the metal to be evaporated wound on a filament of conical helical shape, installed on a vacuum flange provided with a compact cooling system.

The invention has the following advantages:

- allows low-speed metal evaporation in favor of the formation of smooth interfaces;
- the filament with the material to be evaporated wrapped around can be exchanged very easily;
- the device is very practical: has small dimensions (can be mounted on a CF 40 or even CF 16 flange, and is only a few centimeters long); it can be placed in any geometry (including horizontal orientation, or vertical in an upside-down configuration);
- it works with a low electrical power (of only a few W)
- it is equipped with a cooling system to avoid radiative overheating of the neighboring elements;
- it can be fabricated with low production costs compared to other commercial devices.

RO.193.

Title EN	Process for obtaining oxide materials with garnet structure based on iron and rare earths.
Authors	Cristina Bartha, Cezar Comanescu, Andrei Alexandru-Dinu, Mihai Grigoroscuta, Andrei Kuncser, Petre Badica, Victor Kuncser
Institution	National Institute of Materials Physics
Patent no.	Patent application No. A/00200/2023
Description	The present invention relates to; i.) obtaining rare earth-based oxide mesoporous nanopowders with garnet structure ($\text{RE}_3\text{Fe}_5\text{O}_{12}$) using a modified hydrothermal method employing an environmentally friendly nonionic surfactant; ii.) $\text{RE}_3\text{Fe}_5\text{O}_{12}$ (RE = rare earth) bulks obtained by sintering of mesoporous nanopowders processed by the modified

hydrothermal method with control of stoichiometry and cation inversions.

The present invention provides materials with high purity, near ideal stoichiometry and low cation inversion (below 10%) facilitating a rigorous control of properties and maximization of functional parameters. Another advantage is the use of environmentally friendly precursors, thus helping to reduce environmental pollution.

These materials show special magnetic functional properties useful in new types of room temperature switches and other devices.

RO.194.
Title EN

Oxide field-effect transistor operated by an electronic double layer and method of making

Authors

M.A. Husanu, D.G. Popescu, C. Chirila, C. Besleaga-Stan

Institution

National Institute of Materials Physics

Patent no.

A 2023 00775

The invention defines the method of preparing field effect transistor devices in thin oxide films, operated by the electronic double layer method with applications in electronics.

Description

More precisely, the invention refers to the method of making a field-effect transistor from thin layers of oxides, in which the mobility is increased by changing the interface between SrTiO₃ and LaAlO₃. The operation of the transistor is realized using the double electronic layer method, in which a ferroelectric material or an ionic liquid forms dipoles with a well-defined orientation when the operating voltage is applied to the upper electrodes. More precisely, the transistor consists of a succession of oxide layers deposited on the SrTiO₃ substrate, where at their interface the phenomenon of metallic conduction appears in the form of a two-dimensional electronic gas. This region defines the transistor channel, and the carrier density at the conductive interface is controlled by the voltage applied to metal electrodes lithographically deposited on the surface of the heterostructure. The method of making heterostructures of various oxides consists of a sequence of depositions using physical methods such as pulsed laser deposition or magnetron plasma deposition.

RO.195.	
Title EN	Design PEMFCs fed by bioethanol, with non-noble anodes based on SnO₂ decorated with different Ni chemical species
Authors	Mihaela FLOREA, Florentina NEATU, Stefan NEATU, Simona SOMACESCU, Tanta SPATARU, N. SPATARU, Petre. Osiceanu, Nicoleta PETREA, Vasile SOMOGHI
Institution	National Institute of Materials Physics
Patent no.	-
Description	<p>Fuel cells fed by bioethanol are energy resources with the potential to supply energy with minimized impact on the environment. In this study, we designed electrochemical cells with polymer membrane (PEMFCs) fed by bioethanol, with non-noble anodes based on SnO₂ decorated with different Ni chemical species. We proposed different Ni deposition methods for anchoring the Ni species on the SnO₂ surface. These methods involve the incorporation of the small amount of Graphene Nanoplatelets (GNP) in order to improve the electrochemical performance. A comprehensive study of the structure, morphology and surface chemistry was carried out using a complex of physicochemical methods (XRD, Raman, BET, SEM, TEM, XPS). We designed membrane-electrode assembly (MEA) using single cells sized 10 cm² of MEA with Ni-based anode (4mg/cm²) and Pt/C cathode (0.5mg/cm²).</p> <p>We found that all anodes were active for the bioethanol oxidation reaction, in 0.5 M NaOH solution. Also, the best performance was obtained for the cell working with Ni(OH)₂/SnO₂-GNP anode. The presence of GNP and the Ni(OH)₂ species favors the oxidation reaction of bioethanol at a lower potential, leading to the enhancement of the efficiency of the anodic process.</p>
RO.196.	
Title EN	Tandem solar cell with an integrated metal-oxide-semiconductor structure and metasurface
Authors	Costel Cotîrlan-Simioniuc
Institution	National Institute of Materials Physics
Patent no.	Patent application No. A2022 00434
Description	The invention refers to a tandem solar cell with an integrated metal-oxide-semiconductor structure and metasurface,

consisting of a crystalline silicon-based solar cell and a perovskite-based solar cell, respectively a heterostructure between a degenerated n-type semiconductor ITO layer and a SiO₂ layer for focusing solar radiation into the first active region of the tandem, a heterostructure that is profiled by polystyrene nanospheres lithography as an area of convex microlenses over the metasurface formed by tetrahedral plasmonic nanoparticles distributed hexagonally on the passivated perovskite surface in order to focus the incident light beams, the polarization of the heterostructure between an intermediate contact and the upper contact of negative polarity is achieved through a voltage divider together with the plasmonic confinement of the electromagnetic field, thus increasing the degree of interaction of light with matter in order to obtain a maximum conversion efficiency of solar power into electricity.

RO.197.

Title EN	Procedure for obtaining a dual transducer for electrochemical and electronic detection
Authors	Enache Teodor-Adrian, Costas Liliana-Andreea, Florica Camelia-Florina, Diculescu Victor Constantin, Onea Melania-Loredana, Apostol Mariana Mihaela, Enculescu Ionut-Marius
Institution	National Institute of Materials Physics
Patent no.	Patent application No. A/00850/03.12.2019
Description	The invention describes a process for obtaining a dual transducer designed for applications regarding analytical determination of molecular compounds of biological interest. The dual transducer is fabricated on Si/SiO ₂ substrates by photolithography, electron beam lithography, radio frequency magnetron sputtering and thermal vacuum evaporation. The transducer have two detection systems: one electrochemical and one electronic. The electrochemical system includes three metallic interdigitated electrodes: the working electrode (Ti/Au), the auxiliary electrode (TiAu) and the reference electrode (Ti/Ag). The electronic system is represented by a field effect transistor based on a single semiconductor nanowire channel formed by two Ti/Au metallic interdigitated electrodes (source and drain), the gate being represented by the Si substrate and the gate dielectric being a SiO ₂ thin film (50 nm). The invention presents the following advantages: reducing the development time and

the risk of failure that may occur in the development of these sensory platforms, increasing the detection yield and the possibility of integration into a unique reading system.

RO.198.	
Title EN	Process for obtaining an electroluminescent diode based on zinc oxide and zinc selenide core-shell nanowires arrays
Authors	Costas Liliana-Andreea, Preda Nicoleta-Roxana, Botta Oana-Daciana, Ciobotaru Iulia-Corina, Enculescu Ionut-Marius
Institution	National Institute of Materials Physics
Patent no.	Patent application No. A/00078/28.02.2024
Description	The invention describes a process for obtaining an electroluminescent diode based on zinc oxide (ZnO) and zinc selenide (ZnSe) core-shell nanowire arrays grown on Ti/Pt/Zn metallic interdigitated electrodes on glass substrates, employing the following methods: (i) fabrication of Ti/Pt metallic interdigitated electrodes on glass substrates by photolithography and thin film deposition methods; (ii) electrodeposition of Zn films on Ti/Pt electrodes; (iii) thermal oxidation in air of Zn films in order to obtain ZnO nanowire arrays and (iv) radio-frequency magnetron sputtering deposition of ZnSe thin films on the ZnO nanowire arrays surface. The preparation methods used in the fabrication of the optoelectronic device are straightforward and imply low costs. The optoelectronic properties of such semiconducting structures highlights an electroluminescence effect, confirming their applicability in the development of electroluminescent diodes in the UV and visible domains.

RO.199.	
Title EN	Antenna for 5G N79 frequency band with triangular dielectric resonator fabricated by spark plasma sintering
Authors	Liviu Nedelcu, Marian Gabriel Banciu, Cezar Dragoş Geambaşu, Mihai Alexandru Grigoroşcuţă, Mihail Burduşel, Petre Bădică
Institution	National Institute of Materials Physics
Patent no.	Patent application No. A/00663/2022
Description	We present a microwave antenna device using a dielectric resonator in the shape of an equilateral triangle with rounded

corners. The dielectric resonator is manufactured of zirconium tin titanate (ZST) ceramic material by using spark plasma sintering (SPS). The conventional processing methods currently used show the problem of limitations in obtaining high mass densities of the ZST bulk body due to the reduced sinterability of the $ZrO_2 - SnO_2 - TiO_2$ ternary system. However, by using the spark-plasma sintering, high densification over 99% was achieved without secondary phases. Moreover, the ceramic material obtained by SPS method shows improved thermal stability. The ceramics exhibit a dielectric constant of 38 and a product $Q \times f$ about 50 000 GHz. The proposed antenna addresses the issue of reducing the volume of dielectric material, exhibits low profile, improved gain, and a larger operating bandwidth of the antenna, better than 16%. The bandwidth increase is achieved by coupling two resonance modes of the new shape dielectric resonator. The antenna is excited through a microstrip line of 50 Ohms characteristic impedance, allowing an easy integration with many microwave systems. The antenna's characteristics make it suitable for the use in 5G communication systems for the N79 frequency band (4400 – 5000 MHz). The antenna represents an efficient solution for wireless 5G communications.

RO.200.
Title EN**Two-step process for the fabrication of Graphene\MoS₂ heterostructures****Authors****Mihai Claudia; Buruiana Angel-Theodor; Bocirnea Elena Amelia; Sava Florinel; Matei Elena; Tide Tedy, Șimăndan Iosif - Daniel; Galca Aurelian-Catalin; Velea Alin****Institution**

National Institute of Materials Physics

Patent no.

Patent application No. A/00787/04.12.2023

Description

The patent describes an innovative two-step process for the fabrication of Graphene\MoS₂ heterostructures, with applicability in the field of advanced materials and nanostructures. The first step consists in synthesizing the graphene by chemical vapor deposition (CVD) on a copper foil, which is transferred to a Si/SiO₂ substrate. In the second step a layer of Mo is deposited on top of graphene by magnetron sputtering, followed by annealing the Graphene\Mo sample is in sulfur atmosphere, to obtain a Graphene\MoS₂ heterostructure. This process provides

improved control over the structural and electrical properties of the heterostructures. The methodology eliminates the need to use toxic gases, such as H_2S , being cost-effective and favorable for the production of large-area heterostructures, applicable in wide areas from flexible electronics to energy storage devices and optoelectronics. The innovation lies in the simplified and efficient approach to obtain these advanced materials, demonstrating their vast potential in modern technologies.

RO.201.**Title EN**

Low-cost production method of quasi-two-dimensional crystalline materials

Authors

Florinel Sava, Angel Theodor Buruiana, Claudia Mihai, Elena Matei, Teddy Tite, Alin Velea

Institution

National Institute of Materials Physics

Patent no.

Patent application No. A/00333/29.06.2023

Description

The invention refers to a method for synthesizing quasi-two-dimensional (2D) crystals, aimed at enhancing the fabrication processes of nanoelectronic and optoelectronic devices. Unlike conventional techniques, this method minimizes the consumption of expensive raw materials and reduces the duration of high-temperature conditions to under 30 minutes, thereby decreasing production costs significantly. The method, according to the invention, involves the controlled sublimation of raw materials within a microreactor, constructed by aligning two substrates horizontally, one bearing the raw material. This enables the condensation of vapors into 2D crystals, which can be either doped or undoped, depending on the requirements. The key to this self-organization lies in the inherent layered structure of the materials, similar to that of graphite, which allows for the formation of crystalline materials with quasi-two-dimensional properties. Performed in an inert atmosphere, the procedure can operate at atmospheric pressure or in a rarefied environment, further illustrating the method adaptability. This technique not only offers a cost-effective process to produce 2D crystalline materials but also holds potential for a wide range of applications.

**National Institute for Research & Development in
Chemistry and Petrochemistry – ICECHIM Bucharest**

RO.202.	
Title EN	Organic/inorganic composite material with antimicrobial effect for consolidating archaeological wood with excess of moisture and method of obtaining it
Authors	Toma Fistos, Sorin-Viorel Dolana, Radu Claudiu Fierascu, Irina Fierascu, Anda Maria Baroi, Roxana Ioana Brazdis (Matei), Andrei Sarbu, Tanta-Verona Iordache, Anamaria Zaharia
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application No. A-00070/2024
Description	<p>The present invention refers to a nanocomposite coating material with antimicrobial and consolidant properties (demonstrated by the improvement of the mechanical properties) for archaeological wood with excess moisture (known in the specialized literature as waterlogged wood), material constructed of two components: an antimicrobial component (substituted apatitic material with various heavy metals) that gives protection against biodeteriogens and a polymeric component that gives the compound compatibility with the support material on which it is applied (archaeological wood) and improves the mechanical properties (consolidation) and to a method of obtaining it.</p> <p>Acknowledgements. This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2021-0627, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.</p>

RO.203.	
Title EN	Active composite material with antimicrobial and sun protection properties with the potential for use in cosmetic formulations and procedure for obtaining
Authors	Irina Fierascu, Anda Maria Baroi, Radu Claudiu Fierascu, Roxana Ioana Brazdis (Matei), Toma Fistos, Ioana Silvia Hosu, Florentina Monica Raduly
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application No. A-00069/2024
Description	The present invention refers to a composite material with antimicrobial and sun protection effect, intended for use in cosmetic applications, consisting of an apatitic material, used as an active ingredient and natural bioactive compounds (such as quercetin or rutin). The procedure for obtaining the composite material consisting of two stages, obtaining the apatitic material by the sol-gel method, respectively obtaining the composite material. Acknowledgements. This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2021-0273, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

RO.204.	
Title EN	Coating with photocatalytic and antimicrobial effect for the protection of natural limestone elements of vernacular buildings and procedure for obtaining it
Authors	Toma Fistos, Radu Claudiu Fierascu, Irina Fierascu, Mihaela-Alina Melinescu, Anton Ficai, Denisa Ficai, Lia Mara Ditu, Irina Gheorghe-Barbu, Roxana Ioana Brazdis (Matei), Anda Maria Baroi
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest/ National University of Science and Technology POLITEHNICA Bucharest/ University of Bucharest
Patent no.	Patent application No. A-00558/2023

Description

The present invention refers to a nanocomposite coating material with photodegradation and antimicrobial properties, which provides protection (consolidation) for natural stone elements in the composition of vernacular constructions (materials with high calcium content), represented by an alcoholic dispersion, made in a mixture ethanol: isobutyl alcohol, containing a composite material consisting of two phases: a phase based on a double-layered hydroxide mixture (hydrotalcite)/metal oxide nanoparticles (Ti, Zn) of commercial origin and a phase consisting of a mixture of hydroxide calcium and hydroxyapatite in which calcium has or has not been partially dislocated with zinc. The formulation, due to the inorganic composition, presents an improved stability in relation to other formulations based on organic polymers and organic antimicrobial substances.

Acknowledgements. This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2021-0627, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

RO.205.	
Title EN	Composite material for dental restoration with increased compression strength and antimicrobial properties and method of producing it
Authors	Radu Claudiu Fierascu, Roxana Ioana Brazdis (Matei), Anda Maria Baroi, Toma Fistos, Irina Fierascu, Irina Elena Chican, Lia Mara Ditu
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application No. A0425/2023
Description	The present invention refers to a composite material with improved mechanical properties and antimicrobial effect, intended for use in dental applications, consisting of aluminofluorosilicate glass with a particle size below 45 µm, the liquid component of the glass ionomer cement and an antimicrobial component with a role in improving the properties mechanical, consisting of apatite material (of the

hydroxyapatite type - $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ in which the calcium:magnesium ratio is 10:0..1:1) decorated with silver nanoparticles having a crystallite size below 15 nm, phytosynthesized using extracts of plants from the Lamiaceae family, such as hyssop (*Hyssopus officinalis* L.), white horehound (*Marrubium vulgare* L.), oregano (*Origanum vulgare* L.) or white dead nettle (*Lamium album* L.) and eugenol in concentration 7..14% (alcoholic solution), the procedure for obtaining the composite material consisting of five stages, obtaining the apatite material (in which calcium may or may not be partially substituted with magnesium) by the sol-gel method, the phytosynthesis of silver nanoparticles, the decoration the apatite material with metallic nanoparticles and the phenolic compound (eugenol) followed by mixing with the aluminofluorosilicate glass until complete homogenization, and in the fifth stage the liquid component of the glass ionomer cement is added.

Acknowledgements. This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CNCS-UEFISCDI, project number PN-III-P4-PCE-2021-0292, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

RO.206.

Title EN	Cosmetic formulation for sun protection with antimicrobial effect based on silver nanoparticles and natural extracts and procedure for obtaining it
Authors	Radu Claudiu Fierascu, Roxana Ioana Brazdis (Matei), Anda Maria Baroi, Toma Fistos, Irina Fierascu, Irina Elena Chican, Lia Mara Ditu
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application No. A-00375/2023
Description	The present invention relates to a cosmetic formulation for sun protection, based on silver nanoparticles and natural extracts from viticulture waste and to the method of obtaining it. The proposed material is obtained in the form of a hydrogel (with the composition: polymeric base, the active

substance silver nanoparticles in dispersion, natural extract from vine shoots, obtained by microwave extraction, glycerin), for its emollient properties, non-greasy texture, ease of handling, compatibility with various excipients and miscibility in water, isopropyl alcohol and water. The method of obtaining the material consists in three stages: obtaining the extract, phytosynthesis of metallic nanoparticles and obtaining the final cosmetic formulation. Acknowledgements. This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2021-0273, contract 644PED/2022, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

RO.207.
Title EN

Organic/inorganic composite material for the adsorption of heavy metals from aqueous solutions and procedure for obtaining it

Authors

Roxana Ioana Brazdis (Matei), Radu Claudiu Fierascu, Anda Maria Baroi, Toma Fistos, Irina Fierascu, Irina Elena Chican, Ioana Silvia Hosu

Institution

National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest

Patent no.

Patent application A00444/2023

Description

The present invention refers to a composite material formed from an organic phase, namely pectin obtained from vegetable waste of: apple peels, citrus peels, and an inorganic phase formed from apatite material of the hydroxyapatite type in which calcium has been displaced by magnesium in atomic ratios Mg:Ca = 0.01..0.5:1, the composite material being used for the adsorption of heavy metals from aqueous solutions, an effect demonstrated by the adsorption of lead and cadmium. The process of obtaining the organic/inorganic composite material consists of two stages, in the first stage pectin is obtained from vegetable waste, and in the second stage the apatitic material is obtained in the presence of pectin.

Acknowledgements. This work was carried out through the

PN 23.06 Core Program - ChemNewDeal within the National Plan for Research, Development and Innovation 2022-2027, developed with the support of Ministry of Research, Innovation, and Digitization, project no. **PN 23.06.01.01-AQUAMAT**. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

RO.208.

Title EN	Catalytic system with the structure of metal oxides for the treatment of traces of waste water residues
Authors	Cristina-Emanuela Enășcuță, Elena-Emilia Sîrbu, Radu Claudiu Fierăscu, Mihaela Ganciarov, Grigore Pșenovschi, Alexandru Vlaicu
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application A0339/2023
Description	<p>The invention refers to a process for obtaining in the ultrasound field a catalytic system with the structure of metal oxides used in the advanced treatment of waste water resulting from the pharmaceutical and agriculture industry. The invention belongs to the technical field of wastewater treatment by photocatalytic oxidation. The magnetic photocatalyst containing oxide components of Fe_2O_3, TiO_2 and La_2O_3 is obtained by the co-precipitation-calcination method. Mixed titanium and lanthanum dioxide is used as an intermediate coating, over which a layer of Fe_2O_3 is deposited. The magnetic photocatalyst can be activated in the presence of sunlight, being used to treat water impure with organic compounds from the pharmaceutical industry or agricultural water.</p> <p>Acknowledgements. This work was carried out through the PN 23.06 Core Program - ChemNewDeal within the National Plan for Research, Development and Innovation 2022-2027, developed with the support of Ministry of Research, Innovation, and Digitization, project no. PN 23.06.01.01-AQUAMAT. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-</p>

development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021

RO.209.	
Title EN	Composition for stimulation and amplification of biogas yield
Authors	Alin Cristian Nicolae Vintilă, Alexandru Vlaicu, Cristina Emanuela Enășcuță, Grigore Psenovschi, Constantin Neamțu
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application A00640/2023
Description	<p>The invention refers to a composition for stimulating and amplifying the yield of biogas generation (biomethane content 62-65%) consisting of a mixture of vegetable biomass (tomato mixtures, chopped cabbage, sugar beet roots and leaves, potato tubers, corn silage, straw wheat) and animal waste containing ultrasonic microalgal mass, from the species <i>Chlorella vulgaris</i> sp., in a proportion of 4...15% of the total mass of dry matter subjected to the anaerobic digestion process.</p> <p>Acknowledgements. This work was carried out with the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021</p>

RO.210.	
Title EN	Procedure for realization of electrochemical biosensors based on nanomaterials for biogenic amines determination
Authors	Lucian-Gabriel Zamfir, Ana-Maria Gurban, Mihaela Doni, Maria-Lorena Jinga, Iuliana Răut, Mariana Constantin Maria Luiza Jecu
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application 00443/2023
Description	<p>The invention describes the process for obtaining miniaturized electrochemical biosensors based on electrosensitive material for the sensitive and selective determination of biogenic amines, from soil and food/beverages. Biogenic amines are indicators of plant stress levels and food freshness. The biosensors were obtained by</p>

modifying carbon paste screen-printed sensors made on a flexible PVC support with a nanomaterial obtained by mixing single-walled carbon nanotubes with the redox mediator Prussian Blue and enzyme solutions, diamine and monoamine oxidase (DAO/MAO), respectively.

The analytical method, according to the invention consists in placing the miniaturized biosensors modified with the electro-sensitive materials and enzymes in the soil or food/beverage solutions containing the target analyte and interfering molecular species, and the quantification of biogenic amines, putrescine and histamine by amperometry.

RO.211.	
Title EN	Polymer electro dialysis membranes, multicomponent, containing functionalized multi-walled carbon nanotubes and their production process
Authors	Anita-Laura Chiriac, Andreea Miron, Andrei Sarbu, Tanta-Verona Iordache, Celina-Maria Damian, Simona Caprarescu, Teodor Sandu, Anamaria Zaharia, Ana-Mihaela Gavrila, Marinela Victoria Dumitru
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application 00656/2023
Description	The invention refers to a multicomponent, electro dialysis membrane, prepared from a ternary mixture of polymers: acrylonitrile copolymer: acrylic acid, polyvinyl alcohol and polysulfone and containing multi-walled carbon nanotubes (MWCNT), non-covalently functionalized with aminopropyltriethoxysilane (APTES) and which allows the reduction, by electro dialysis, by 95.99 % of the concentration of Cd^{2+} ions, from a 1g/L solution of Cadmium sulfate.
RO.212.	
Title EN	Organic-inorganic polymer pearls based on chitosan, for the retention of copper ions in water and their preparation process
Authors	Andreea Miron, Anita-Laura Chiriac, Andrei Sarbu, Tanta-Verona Iordache, Teodor Sandu, Anamaria Zaharia, Ana-Mihaela Gavrila, Sorin-Viorel Dolana
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application 00599/2023
Description	The invention refers to inorganic-organic polymer pearls based on chitosan, having a Cu (II) adsorption of 50-65 mg/g, consisting, on the one hand, of partially demineralized chitosan obtained from
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crustacean carcasses: shrimp, crayfish, lobsters, crabs, etc. and on the other hand from an inorganic-organic composite obtained from mesoporous titanium dioxide, which contains acrylonitrile in the pores, the concentration of this composite being 15...30% compared to chitosan.

RO.213.

Title EN	Process for obtaining cellulose nanofibers from lignocellulosic waste and method of using them to obtain bionanocomposites
Authors	Denis Mihaela Panaitescu, Florin Oancea, Mădălina Oprea, Adriana Nicoleta Frone, Diana Constantinescu Aruxandei, Bogdan Trică, Cristian Andi Nicolae, Augusta Raluca Gabor
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application 00186/2024
Description	The invention refers to a process for obtaining cellulose nanofibers from the spent lignocellulosic substrate resulting as a waste from the cultivation of mushrooms and to a process for valorizing these cellulose nanofibers as reinforcing agents for a biopolymer. The process of obtaining cellulose nanofibers with prospective applications in medicine, pharmaceuticals, or in the production of packaging consists of grinding the lignocellulosic waste, a series of chemical treatments, dialysis and lyophilization steps that result in the formation of a fine powder of cellulose nanofibers with diameters between 20 and 200 nm that can be stored for several months without changing their properties under normal storage conditions (temperature 20-30 °C, humidity below 60%). Melt mixing these cellulose nanofibers and a biopolymer in different ratios, yields bionanocomposites with potential uses in medicine as medical implants, in pharmaceuticals for the controlled release of drugs, in packaging, in electronics, and for obtaining of consumer goods.

RO.214.

Title EN	Concentrate for improving the properties of bio-Polyamide, process for obtaining and using it
Authors	Zina Vuluga, Florin Oancea, Victor Alexandru Faraon, Marius Ghiurea, George Mihail Teodorescu, Andreea Ioniță, Augusta Raluca Gabor, Cristian Andi Nicolae, Gabriel Vasilevici
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent application 00630/2023
Description	The invention refers to a concentrate based on bio-

Polyamide (bio-PA), reinforcing agent, mixture from hydrolyzed keratin from chicken feathers and nanoparticles of silicate nanotubes or nanosilica, to a process for obtaining the concentrate consisting of mixing the components in a rotary gravimetric mixer and homogenization in the melt in a co-rotating twin-screw extruder, and to a process of using said concentrate for obtaining nanocomposites based on bio-PA reinforced with keratin/nanoparticles mixture, with thermal stability and improved mechanical and aesthetic properties, usable in the production of injected parts for the automotive industry.

RO.215.

Title EN	Procedure sound-absorbing and heat-insulating panels obtained from recovered cellulose with short fiber.
Authors	Marin Laurentiu, Rodica Mariana Ion, Nelu Ion
Institution	National Institute for Research and Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Patent no A/00053 / 07.02.2023
Description	The presented patent application was obtained as a result of the research and development works within a research and development project POC ID P_40_352 acronym SECVENT. Thus, panels were obtained from cellulose fiber waste recovered from various sources. The panels were obtained by tying them in the form of reinforced glass fiber plates with the help of a polyurethane adhesive patented by ICECHIM. RO 97432 30.01.1987

RO.216.

Title EN	Procedure for cleaning the surfaces of heritage metallic objects
Authors	Rodica Mariana Ion, Marin Laurentiu, Nelu Ion
Institution	National Institute for Research and Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Patent no.	Pending
Description	The invention refers to a non-abrasive cleaning process of ferrous and non-ferrous metal surfaces of old valuable objects. The use of mechanical methods of abrasion or grinding would lead - especially in the case of old coins - to an alteration of the details of the engravings and implicitly to the loss or substantial reduction of the value of the respective object or the coin

**National Research and Development Institute for
Cryogenic and Isotopic Technologies - ICSI Rm. Valcea**

RO.217.	
Title EN	CATALYSTS IN THE FORM OF OXIDE COMPOSITE METAL/COAL AND THEIR OBTAINING PROCEDURE
Authors	Elena David, Adrian Armeanu, Violeta-Carolina Niculescu
Institution	National Research and Development Institute for Cryogenic and Isotopic Technologies – ICSI Ramnicu Valcea
Patent no.	135258 / 29.11.2023
Description	<p>NOVELTY - A catalyst consists of a mechanically prepared mixture comprising 5-20 wt.% catalytic material consisting of iron oxide particles with particle size of 45-50 μm and coal particles with size of 1-2 mm and prepared by pyrolysis of rapeseed grit/walnut shell biomass. The catalyst has density of 0.521-0.732 g/cm^3 and BET specific surface area of 706-864 m^2/g.</p> <p>The residual biomass formed by rapeseed grit/walnut shell biomass is pyrolyzed for 30 minutes at 700 °C in atmosphere containing 99.9 vol.% nitrogen, cooling under a stream of nitrogen, followed by extraction, crushing/grinding and sieving the carbonaceous material, and mechanical mixing of iron oxide particle and coal particles in various ratios (5-20%) for 5-10 minutes.</p> <p>APPLICATION: Catalyst for reforming tar present in gas generated by biomass conversion.</p>
RO.218.	
Title EN	MIXING SYSTEM WITH VARIABLE INJECTION NOZZLE GEOMETRY
Authors	Eusebiu Ilarian Ionete, Ștefan-Ionuț Spiridon
Institution	National Research and Development Institute for Cryogenic and Isotopic Technologies – ICSI Rm. Vâlcea
Patent no.	Patent application No. A/00428/04.08.2023; BOPI 12/2023
Description	The invention relates to a mixing system with variable geometry of injection nozzles, mixing that can be carried out continuously and in adjustable mass percentages in a certain range of values. The mixing system, according to the invention, together with the procedure related to the good operation, is made up of a series of nozzles with variable geometry arranged aligned on a fixed support with glide

system for petals (4) through which the minority gas flows and an external body (1) at the end of which a majority gas is introduced. Each set of nozzles with variable geometry is accompanied at a certain distance by a deflector screen, the nozzles having the heads with variable geometry actuated from the outside, with the help of rods (3) and a linear guide system (2) possible to be operated manually or automatically by means of a wheel. The component elements of the mixing system are arranged in a particular sequence and configuration, that allows when actuated by means of an actuating element (8) and of an outer jacket (7) that moves horizontally left-right, to generate a movement that increases or reduces the space between the inner petals (5) and between the outer petals (6) of the nozzles, simultaneously, allowing the human operator automatically or manually controls of the desired mixing ratios.

RO.219.

Title EN	Method and device for partial recovery of periodic gas emissions in the atmosphere
Authors	Brad Sebastian Davides, Grafov Aleksandr, Sirosh Oleksandr, Vijulie Mihai, Lazar Alin, Bogdan Maria Claudia, Brill Catalin, Matei Danes, Dracea Gheorghe, Dracea Ionut
Institution	National Research and Development Institute for Cryogenic and Isotopic Technologies
Patent no.	Patent application No. A/00106/07.03.2023
Description	The invention relates to a method and a device for the partial recovery of gas emissions in the atmosphere, with applicability in those fields of technology where there are emissions of valuable or dangerous gases discharged into the atmosphere, especially in the field of health regarding medical investigations by imaging through magnetic resonance imaging (MRI), equipment that uses liquid helium whose vapors are periodically vented into the atmosphere. The invention makes it possible to partially recover the amount of periodically discharged gas, respecting the conditions imposed for the operation of the equipment within the parameters, without preventing the possibility of its free release into the atmosphere in case of emergency.

RO.220.

Title EN	Ternary catalyst of graphene materials functionalized with platinum-cobalt-cerium and method of obtaining them
Authors	Marinoiu Adriana, Răceanu Mircea, Carcadea Elena
Institution	National Research and Development Institute for Cryogenic and Isotopic Technologies – ICSI Rm Valcea
Patent no.	Patent application No. A/00429/04. 08.2023; BOPI 12/2023
Description	The present invention relates to a process for obtaining a nanocomposite catalyst based on graphene-based materials functionalized with platinum-cobalt-cerium. The synthesis process according to the present invention includes a single-step working methodology based on the reaction between graphene oxide, a mixture of inorganic salts and a reducing agent. The technical problem that this invention solves consists in the fact that a synthesis process of graphene materials functionalized with platinum-cobalt-cerium is developed, through a simple, fast and economical process, under mild reaction conditions, and the produced material can be used as a catalyst for proton exchange membrane fuel cells.

**National Institute for Chemical - Pharmaceutical Research
and Development, Bucharest, Romania ICCF**

RO.221.	
Title EN	8-Chloro-quinolone-carboxylic acids with antimicrobial activity and process for their preparation
Authors	Pintilie Lucia, Nicu Alina Ioana, Stefanu Amalia, Deaconu Mihaela, Caproiu Miron Teodor
Institution	National Institute for Chemical-Pharmaceutical Research and Development ICCF Bucuresti
Patent no.	RO131025-B1
Description	The invention relates to quinolones (I) with antimicrobial activity and to a preparation process, in which: R ₆ = fluorine or chlorine, R = hydrogen, acetyl, methyl, R ₁ = hydrogen, methyl, and R ₈ = hydrogen or chlorine. The steps of the process: protecting the piperazine nitrogen of quinolone in which R ₆ = fluorine or chlorine; R = R ₁ = R ₈ = hydrogen, the chlorination of the compound wherein which R ₆ = fluorine or chlorine; R = acetyl, R ₁ = R ₈ = hydrogen, quinolone hydrolysis wherein R ₆ = fluorine or chlorine; R = acetyl, R ₁ =hydrogen and R ₈ = chlorine. From the synthesized compounds, the compound FPQ 50 shows a better antibacterial activity against E. Coli (MIC 2 µg/mL) and St. Aur. (MIC 4 µg/mL). Docking studies have been performed to achieve accurate predictions on the optimized conformations for both ligand and protein targets E. Coli (PDB ID:1S14) (II) and St. Aur (PDB ID:5CDQ) (III) to form a stable complex.

RO.222.	
Title EN	Process for obtaining poly-3-hydroxyoctanoic acid
Authors	Lupescu Irina, Stănescu Paul Octavian, Eremia Mihaela-Carmen, Săvoiu Gabriela, Petrescu Maria, Ştefanu Amalia, Spiridon Maria
Institution	National Institute for Chemical - Pharmaceutical Research and Development, Bucharest, Romania
Patent no.	RO 130766 / 30.03.2020
Description	The invention relates to a process for obtaining poly 3-hydroxyoctanoic acid (PHO) in amounts and yields of biotechnological interest by using the Pseudomonas fluorescens ICCF 392 bacteria, as well as citric acid and

sodium octanoate as carbon and energy sources. The polymer is isolated from native damp biomass by extraction with a 1:3 mixture of hypochlorite and chloroform, yielding a PHO content of 79.6%.

RO.223.	
Title EN	Microorganism and process for obtaining a microbial polysaccharide by biological synthesis
Authors	Roxana-Mădălina Stoica, Mișu Moscovici, Mihaela-Claudia Sevcenco, Georgeta Neagu
Institution	National Institute for Chemical-Pharmaceutical Research and Development, Bucharest, Romania
Patent no.	RO 137243 A2/30.01.2023, BOPI 1/2023
Description	<p>The invention relates to a process for obtaining a microbial polysaccharide by biological synthesis using the microorganism <i>Rhizobium radiobacter</i> ICCF 410, isolated from nature. The present invention describes the biosynthesis process of a polysaccharide called rhizoban, using a newly isolated bacterial strain of <i>Rhizobium radiobacter</i> and obtaining an original polysaccharide, with a different structure from other microbial polysaccharides known until now, consisting mostly of glucuronic acid (40-45%), glucose (30-35%), and rhamnose.</p> <p>Applications: - medicine and pharmaceutical industry, as a vehicle with selective target release of antitumor substances in cancer therapy; -cosmetic industry, for the development of cosmetic formulations with high moisturizing potential.</p>

RO.224.	
Title EN	Multipurpose topical product based on natural ingredients, addressing to skin and joint disorders associated to inflammatory-type processes
Authors	Sha'at Fawzia, Pirvu Lucia Camelia, Păvăloiu Ramona-Daniela, Hlevca Cristina, Starăș Adela, Albulescu Radu, Niță Sultana
Institution	National Institute for Chemical-Pharmaceutical Research & Development - ICCF Bucharest, Romania
Patent no.	Patent application No. RO137146/2022
Description	The invention relates to a multipurpose topical product for the treatment of skin and joint disorders associated to

inflammatory-type processes. According to the invention, the product consists of 3% a mixture of standardized extract of burdock leaves (*Arctium lappa*): linden inflorescence (*Tiliae* sp.), and magnolia petals (*Magnolia virginiana*), respectively, in a 1:1 ratio, 19% grape seed oil (*Vitis vinifera*), and sweet almond oil (*Prunus amygdalus dulcis*), respectively, 1.5% cinnamon essential oil (*Cinnamomum zeylanicum*), and vitamin E, respectively, in a fatty base consisting of 28% lanolin, 14% white wax, 5% cocoa butter and 9% shea butter, the percentage being expressed by mass. The process to obtain the multipurpose topical product consists in the preparation of a fatty base in a water bath at a temperature of 60-70 °C, which later cools down to a temperature of 30 °C, after which the fatty oils and extracts are added under continuous stirring, resulting in a homogeneous mixture in which the essential oil and vitamin E are added, the product having a straw yellow color and a semi-solid texture.

Application: Biomedical Field

RO.225.	
Title EN	Natural therapeutic compositions from macromycetes and obtaining process
Authors	Bubueanu Elena Corina, Popa Gabriela, Cornea Calina Petruta, Zagrean Valentin Alexandru, Munteanu Laurentiu, Grigore Alice Elena, Pirvu Lucia Camelia, Iuksel Rasit, Panteli Minerva
Institution	National Institute for Chemical-Pharmaceutical Research & Development, Bucharest, Romania
Patent no.	RO133128-B1/2022
Description	Natural therapeutic composition, made entirely of mushroom extracts obtained from the species <i>Agaricus campestris</i> , <i>Pleurotus ostreatus</i> and <i>Laetiporus sulphureus</i> . It can be obtained by 2 processes, either by combining individual, selective extracts in different proportions, or by obtaining an extract, selective from a mixture of raw materials consisting of the species <i>Agaricus campestris</i> , <i>Pleurotus ostreatus</i> , <i>Laetiporus sulphureus</i> in different proportions. It is intended for human use in oral administration. Natural product, obtained from native macromycete species with a definite hypolipidemic effect, usable as an adjuvant in specific diseases

RO.226.	
Title EN	COSMETIC COMPOSITION WITH MOISTURIZING, NUTRITIVE, REPAIRING AND CALMING EFFECT
Authors	Angela CĂȘĂRICĂ, Cristina BALAȘ, Mișu MOSCOVICI, Traian POPESCU
Institution	National Institute for Chemical-Pharmaceutical Research & Development, Bucharest, Romania
Patent no.	RO136079 A2 / 29.11.2022, BOPI 11/2022
Description	The invention refers to a cosmetic cream composition with moisturising, nourishing, repairing and calming effect, for skin revitalization, for use in medical and cosmetic field. According to the invention, the composition is rich in active components with natural (vegetable) origin, with high bioavailability such as Tamanu oil, basil, cloves, carrot seeds essential oils, natural tocopherol, co-enzyme Q and purified nanofibrillar bacterial cellulose. The cosmetic cream composition offers moisturising, emollient, nourishing, repairing, calming effect, with synergic and antimicrobial effect for skin revitalization, being efficient, stable, pleasant, relatively cheap, easy to administer, applied and used safely.

**National Institute for Research and Development
in Microtechnologies - IMT Bucharest**

RO.227.	
Title EN	Ethanol sensor and method of making it
Authors	Bogdan-Cătălin Serban, Octavian Buiu, Cornel Cobianu, Octavian Ionescu, Dragos Varsescu, Roxana Marinescu, Nicolae Dumbravescu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest/
Patent no.	Application No. A00233, 28-03-2018, OSIM, Romania
Description	<p>The invention presents the design and manufacturing processes for a new chemiresistive ethanol sensor using a nanocomposite material Sm₂O₃/oxidized carbon nanohorns, Gd₂O₃/oxidized carbon nanohorns, In₂O₃/oxidized carbon nanohorns - as a sensing layer. The ethanol sensor includes: a dielectric substrate such as quartz, electrodes (made up of gold, platinum etc.) and a sensing layer obtained via sol – gel and deposited through drop casting and/or spin coating methods. The dielectric substrate proposed in this invention can be formed from plastic such as polycarbonate (Lexane), Kapton and polyethylene terephthalate (PET), glass (thickness from 50 microns to 5 millimeters);</p> <p>The electrodes (aluminum, copper, chromium) can be deposited onto the surface of the dielectric substrate by using different methods, such as sputtering, direct printing and evaporation; The ethanol sensing formulations claimed in this invention exhibit some attractive features, such as:</p> <ul style="list-style-type: none"> • improved mechanical properties and processability of the sensing layer; • large surface area of sensing layer; • detection over a wide range of temperature (25-400⁰C); • fast response and selectivity;

RO.228.	
Title EN	Formaldehyde chemiresistive sensor
Authors	Bogdan-Cătălin Serban, Octavian Buiu, Marius Bumbac, Cristina Mihaela Nicolescu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest/ Valahia University of Targoviste
Patent no.	Romanian Patent Application A00358, RO, OSIM, 10.07.2023
Description	<p>The sensitive film described in this invention, which is used to obtain resistive formaldehyde sensors, is a binary nanohybrid of the nitrogen-doped onion-polyvinylpyrrolidone type nanocarbon materials. The mass percentage of nanocarbon material in the sensitive layer varies between 80 and 90%. From the point of view of the detection principle, the resistance of the sensitive layer increases with the formaldehyde concentration level. The decrease in conductivity is explained by the fact that polar formaldehyde molecules interact coulombically with onion-type nanocarbon materials (p-type conduction), leading to the formation of a layer depleted in electric charge, disrupting the percolation channels. This situation leads to an increase in the electrical resistance of the sensitive material. The sensor substrate is made of Si/SiO₂ and has a size of 5 mm, the electrodes being made of gold.</p> <p>The formaldehyde monitoring capacity is investigated by applying a constant current between the two electrodes and measuring the voltage at different values of the formaldehyde concentration to which the sensitive layer is exposed, such as nanocarbon materials of the carbonic onion type doped with nitrogen - polyvinylpyrrolidone. Among the advantages of the proposed sensing layer we can mention:</p> <ul style="list-style-type: none"> -CNOs doped with nitrogen offers high specific surface/volume ratio, affinity for formaldehyde molecules as well as a variation in the resistance of the sensitive layer upon contact with them; -polyvinylpyrrolidone is an effective dispersant for onion-type nanocarbon materials doped with nitrogen. -additionally, the gradual swelling of PVP has an effective contribution in the detection and monitoring of formaldehyde.

RO.229.	
Title EN	Formaldehyde resistive sensor
Authors	Bogdan-Cătălin Serban, Octavian Buiu, Marius Bumbac, Cristina Mihaela Nicolescu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest/ Valahia University of Targoviste
Patent no.	Romanian Patent Application A00359, RO, OSIM, 10.07.2023
Description	<p>The sensitive film described in this invention, which is used to obtain resistive formaldehyde sensors, is a binary nanohybrid of the nitrogen-doped carbon nanohorns (N-CNHs) / copper oxide (CuO) type. The mass percentage of nanocarbon material in the sensitive layer varies between 70 and 90%. From the point of view of the detection principle, the resistance of the sensitive layer increases with the formaldehyde concentration level. The decrease in conductivity is explained by the fact that formaldehyde donates electrons to the sensitive layer, reducing the concentration of holes. The sensor substrate is made of Si/SiO₂ and has a size of 5 mm, the electrodes being made of gold. The width of the electrodes is about 200 microns, with a separation of 6 mm between them. The formaldehyde monitoring capacity is investigated by applying a constant current between the two electrodes and measuring the voltage at different values of the formaldehyde concentration to which the sensitive layer of the binary nanohybrid type. Among the advantages of the proposed sensing layer we can mention:</p> <ul style="list-style-type: none"> -N-CHs give a high specific surface / volume ratio, affinity for formaldehyde molecules as well as a variation in the resistance of the sensitive layer upon contact with the formaldehyde molecules; -copper oxide is a p-type semiconductor and has a synergistic effect with nitrogen-doped carbon nanohorns, also p-type semiconductors, when in contact with formaldehyde molecules;

RO.230.	
Title EN	Matrix nanocomposite for surface acoustic waves NO₂ sensor
Authors	Bogdan-Cătălin Serban, Octavian Buiu, Marius Bumbac, Cristina Mihaela Nicolescu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest/ Valahia University of Targoviste
Patent no.	Romanian Patent Application A00361, RO, OSIM, 10.07.2023
Description	<p>The devices described in this invention consist of new sensing layers for the detection of nitrogen dioxide. The sensitive films described in this invention are used in the design of a surface acoustic wave (SAW) sensor. A surface acoustic wave device is usually composed of a piezoelectric substrate, a pair of interdigital transducers, as well as a layer sensitive to the analyzed gas. The proposed sensitive layers is made of new binary nanocomposite matrices with boron-doped reduced graphene oxide (rGO - B) / oxidized carbon nanohorns (CNHox). The sensitive layers made of rGO-B / CNHox are deposited on the piezoelectric quartz substrate by the drop-casting method or by the spin-coating method.</p> <p>Among the advantages of the proposed sensing layer we can mention:</p> <ul style="list-style-type: none"> -reduced graphene oxide, doped with boron has a higher affinity for NO₂ molecules compared to reduced graphene oxide; - π-π type interactions between reduced graphene oxide, doped with boron and oxidized carbon nanohorns ensure mutual homogeneous distribution in the sensitive layer.
RO.231.	
Title EN	Nanocarbonic matrix for NO₂ sensor with surface acoustic waves
Authors	Bogdan-Cătălin Serban, Octavian Buiu, Marius Bumbac, Cristina Mihaela Nicolescu
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest/ Valahia University of Targoviste
Patent no.	Romanian Patent Application A00360, RO, OSIM, 10.07.2023

The sensitive films described in this invention are used in the design of a surface acoustic wave (SAW) sensor.

A surface acoustic wave device is usually composed of a piezoelectric substrate, a pair of interdigital transducers, as well as a layer sensitive to the analyzed gas. The electrical signal, applied to one of the transducers, generates a surface acoustic wave that propagates to the other transducer, the mechanical wave being converted into an electrical signal. The invention refers to sensitive layers made of new binary nanocomposites based on oxidized onion-type nanocarbon materials (oxCNOs) / reduced graphene oxide (rGO).

The sensor used is a "delay line sensor" type, dual, made on a quartz piezoelectric substrate. The sensor presents a dual delay line to compensate the thermal drift. The sensitive layers made of rGO / ox CNOs are deposited on the piezoelectric quartz substrate by the drop casting method or by the spin coating method. When the sensitive layer is exposed, the physisorbed and chemisorbed molecules of NO₂ (oxidizing gas) will act as electron acceptors, increasing the concentration of holes in the nanocarbon material and thus leading to a decrease in resistance.

RO.232.

Title EN **Quaternary hydrophilic nanohybrid composition for resistive humidity sensors**

Authors **Bogdan-Cătălin Serban, Octavian Buiu, Cornel Cobianu, Viorel Avramescu, Nicolae Dumbravescu**

Institution National Institute for Research and Development in Microtechnologies - IMT Bucharest/ Valahia University of Targoviste

Patent no. European Granted Patent EP3992622B1, 06/28/2023

Description Many principles and methods were described in literature for measuring relative humidity (RH) and several types of materials were employed as RH sensing layers. The present invention relates to the RH sensing response of a resistive sensor employing a sensing layer based on a quaternary nanohybrid composition comprising or consisting of CNH_{ox} /GO/SnO₂/PVP at 1/1/1/1 to 0.75/0.75/1/1 w/w ratio. The interdigitated (IDT) sensing structure was manufactured on a Si substrate (470 μm thickness), covered by a SiO₂ layer (1 μm thickness). The metal stripes of IDT comprised a Cr (10

nm thickness) and Au (100 nm thickness) stack, having 200 μm . The quaternary hydrophilic nanohybrid compositions exhibit several significant advantages, when employed as RH sensitive layers:

- both oxidized carbon nanohorns (CNH_{OX}) and graphene oxide (GO) are nanocarbonic materials with high specific surface area (SSA)/volume ratio, affinity for water molecules, and exhibit rapid variation of the electrical resistance in contact with water molecules, when varying RH from 0% to 90%;
- nanometric tin (IV) oxide (SnO_2) powder exhibits good RH sensitivity;
- PVP is a hydrophilic polymer with excellent binding properties;
- detection at room temperature;
- low response time;
- low cost, small size, and simplicity in manufacturing

RO.233.
Title EN**Quaternary oxidized carbon nanohorns -based nanohybrid for resistive humidity sensor****Authors****Bogdan-Cătălin Serban, Octavian Buiu, Cornel Cobianu, Viorel Avramescu, Nicolae Dumbravescu****Institution**

National Institute for Research and Development in Microtechnologies - IMT Bucharest/ Valahia University of Targoviste

Patent no.

European Granted Patent EP3992623B1, 07/05/2023

Description

The present invention relates to the RH sensing response of a resistive sensor employing a sensing layer based on quaternary nanohybrid composition comprising or consisting of $\text{CNH}_{\text{OX}}/\text{SnO}_2/\text{ZnO}/\text{PVP}$ at 1.5/1/1/1 w/w ratio to 3/1/1/1 w/w ratio. When employed as RH sensing layers, these quaternary nanohybrid compositions exhibit several significant advantages:

-Oxidized carbon nanohorns (CNH_{OX}) have high specific surface area/volume ratio, water molecules affinity and show rapid electrical resistance variation when RH varies from 0% to 90%.

-The nanometric tin (IV) oxide (SnO_2) nanopowder exhibits good RH sensitivity. CNH_{OX} have p-type electrical conduction (through holes), while SnO_2 is a n-type metallic oxide semiconductor (through electrons). By adding SnO_2 to CNH_{OX} , one will obtain islands of p-n semiconductor heterojunctions embedded in PVP (a dielectric material) that increase the sensitivity of the sensitive layer.

- Zinc oxide (ZnO) nanopowder exhibits good RH sensitivity. Both ZnO and SnO₂ are n-type electrical conductors. The ZnO – SnO₂ nanocomposite has sensing properties superior to each of the single oxides, because each of the oxides interacts differently with the oxidized carbon nanohorn material, leading to alterations in the pore distribution, which increase the specific surface area;
- Polyvinylpyrrolidone (PVP) is a hydrophilic polymer with excellent binding properties, which enables its employment in sensing structures with either flexible or rigid substrate;
- Detection at room temperature,
- fast response time, low cost, small size, simplicity in manufacture

RO.234.

Title EN

Chemiresistor humidity sensor based on Fe₂O₃- oxidized carbon nanohorns nanocomposite

Authors

Bogdan-Cătălin Serban, Octavian Buiu, Cornel Cobianu, Roxana Marinescu,

Institution

National Institute for Research and Development in Microtechnologies - IMT Bucharest/

Patent no.

ROMANIAN PATENT APPLICATION RO 134518-A2-30/10/2020

Description

This patent application refers to the development of resistive relative humidity (RH) sensor, employing a sensing layer based on a binary nanocomposite comprising oxidized carbon nanohorns (CNHox) –Fe₂O₃. The RH sensor includes a Kapton substrate, interdigitated electrodes and a sensing layer obtained via spin coating method. The RH monitoring capability of the sensing layers was investigated by applying a current between the two electrodes and measuring the voltage at different values of the RH level at which the sensing layer was exposed. The resistance of the sensitive layer varies with RH level. The new synthesized sensing layer used in the manufacturing of resistive RH sensor have several significant advantages:

- the presence of CNHs-ox and CNOox ensures a high specific surface area / volume ratio as well as a substantial affinity for water molecules;
- the presence of ferric ions gives the sensor increased sensitivity. According to the HSAB theory (Hard Soft, Acids and Bases), water is classified as a hard base, while Fe³⁺ cations are hard acids, so that a "hard acid-hard base" type interaction between the analyte and the sensitive layer is very likely.
- detection at room temperature
- fast response time

RO.235.

Title EN	Polyelectrolyte –oxidized carbon nanohorns for relative humidity sensor and its manufacturing method
Authors	Bogdan-Cătălin Serban, Octavian Buiu, Cornel Cobianu, Roxana Marinescu,
Institution	National Institute for Research and Development in Microtechnologies - IMT Bucharest/
Patent no.	ROMANIAN PATENT APPLICATION RO 134779-A2-26/02/2021
Description	<p>RH sensors have received increasing attention in the last years due to their importance in a large variety of residential, industrial, and commercial applications. This patent application refers to the development of resistive relative humidity (RH) sensor, employing a sensing layer based on a binary nanocomposite comprising oxidized carbon nanohorns (CNHox) –poly(acrylamide-co-diallyldimethylammonium chloride). The RH sensor includes a Si/SiO₂ substrate, interdigitated electrodes and a sensing layer obtained via spin coating method. The RH monitoring capability of the sensing layers was investigated by applying a current between the two electrodes and measuring the voltage at different values of the RH level at which the sensing layer was exposed. The resistance of the sensitive layer varies with RH level.</p> <p>The new synthesized sensing layer used in the manufacturing of resistive RH sensor have several significant advantages:</p> <ul style="list-style-type: none"> • the presence of CNHs-ox and CNOox ensures a high specific surface area / volume ratio as well as a substantial affinity for water molecules; • the presence of poly(acrylamide-co-diallyldimethylammonium chloride) confers hydrophilicity and small hysteresis. -- detection at room temperature -- fast response time

National Institute for Research and Development in Environmental Protection – INCDPM

RO.236.	
Title EN	Harnessing complementary curricular preparedness via sustainable management in response to civil and military pollution on the coastline, tributaries and lagoons in Black Sea's North, West, South zone
Authors	DEÁK György; MATEI Monica; BOBOC Mădălina; TUDOR Georgeta; HOLBAN Elena; SADÎCA Isabela
Institution	National Institute for Research and Development in Environmental Protection, Bucharest
Patent no.	
Description	<p>The Black Sea SIERRA project will prepare and adapt decision-makers' response capacity to current/emerging marine pollution, by coordinated cross-border response to armed conflict contamination. The consortium, by Black Sea (RO, BG, UA, TR) and Mediterranean experience (IT), lists two priorities:</p> <p>Identifying specific types of marine pollution, including war-related contaminants, on an area of cca. 90,000 km² along the Black Sea shoreline (territorial, international waters), tributary rivers, and lagoons; Quantifying added marine pollution from armed conflicts, by detecting new contaminants and by hotspot diachronic and synchronic assays of undisturbed core sediments (thru project risk maps); Detection/assay of novel hazardous substances: war-generated/emerging contaminants, microplastics, pesticides, to assess the impact/threats on key marine biodiversity; A map of underwater noise pollution will assess its impact on biodiversity (dolphins).</p> <p>The research in demand grants premises to the management plan and training curricula and outputs on armed conflict contribution to marine pollution; Providing a handbook on marine pollution assessment methodology and sources, including armed conflicts in the Black Sea region; Development of remedial measures to be implemented by competent authorities; Conducting training workshops and meetings with decisional stakeholders and policymakers to increase response capacity, and to optimize cooperation of Black Sea participant countries.</p>

RO.237.

Title EN	Autonomous mobile system, monitored by AI, for the transport of wild sturgeons
Authors	DEÁK György, HANGANU Lucian, RAISCHI Marius, BURLACU Laurentiu, HOLBAN Elena
Institution	National Institute for Research and Development in Environmental Protection, Bucharest
Patent no.	RO137990
Description	<p>The present invention intends to address an issue in the conservation and monitoring of wild sturgeons and relates to a technical concept for transporting wild sturgeons in a controlled environment to preserve their vital integrity. At the global and national levels, there are currently transport systems that only facilitate the transportation of fish species other than native sturgeon species to various locations, without providing a controlled environment or broadcasting real-time data on their condition during transport.</p> <p>The technical problem that the invention solves, in comparison to other previous systems, is the possibility of facilitating the transport of wild sturgeons in a controlled environment, which ensures the optimal state of vitality (avoiding injury, decreasing the level of dissolved oxygen, and respectively increasing the level of oxidative stress during the transport period), as well as the transmission of data in real-time regarding their health. The sturgeon transport system in a controlled environment is a national and international first, to facilitate the transport of sturgeons in optimal vitality conditions while ensuring a controlled environment, which makes it applicable in a wide range of directions and research applications, to restore the route of historical sturgeon migration.</p>

RO.238.

Title EN	Ecofoundations for construction in strictly protected wetlands, in particular for communication network pillars
Authors	DEÁK György, GEORGESCU Tudor, MATEI Monica, BOBOC Mădalina, SADÎCA Isabela
Institution	National Institute for Research and Development in Environmental Protection, Bucharest
Patent no.	PCT/RO2023/000008
Description	The invention refers to a foundation prototype for

communication pillars, which ensures minimal impact on the protected area soil and the functionality of the communication network, regardless of the adverse weather (storms) and hydrodynamic conditions (flooding), that are characteristic of wetlands. The execution, functionality, and location of the shell-shaped assembly permanently maintains connectivity between neighbouring communication pillars, despite the environmental factors. In terms of taxonomy, the solution is sustainable and takes into consideration the effects of climate change on the region. The technical solution of this patent aims to reduce the anthropogenic impact by developing an ecological foundation for communication network pillars located in areas with strictly protected conservation status, including the Danube Delta Biosphere Reserve (DDBR), which ensures minimal impact on the soil of the strictly protected area.

The invention guarantees the proper functioning of the communication network in extreme environmental conditions found in wetlands and ensures their interconnection, especially those belonging to the Lora-Net network, thus providing valuable data on biodiversity, especially regarding sturgeons in extremely protected areas. One key advantage is that it limits the impact on the environment by using a plateau covered with soil and native vegetation during assembly, reducing contact with the ground in strictly protected areas, particularly wetlands.

RO.239.

Title EN	DALIA Danube Region Water Lighthouse Action
Authors	TUDOR Georgeta; DEÁK György; MATEI Monica; BOBOC Mădălina; HOLBAN Elena; RAISCHI Marius, SADÎCA Isabela
Institution	National Institute for Research and Development in Environmental Protection, Bucharest
Patent no.	
Description	DALIA project is implemented by a consortium of 22 expert organizations (universities, authorities, SMEs, NGOs) from 8 different Danube EU and Associated countries. DALIA innovation actions are supported by the 9 Demonstration Pilot Sites (DPS) in the 6 countries in the Danube River basin area. INCDPM is in charge of DPS 6 dedicated to

sturgeon migration by-pass Iron Gates I and II and the proposed activities will provide a technical & scientific solution in order to ensure the connectivity of the migration routes for the ultrasonic tagged sturgeon specimens to by-pass the two Hydropower Stations. The implementing methodology involves four main stages: measurement campaigns in order to determine the exact location for the INCDPM patented monitoring stations (DKMR-01T and DKTB); commissioning ultrasonic tagged sturgeon specimens detection gates (two located downstream the Iron Gates I and II and one downstream Bazias and more in the Serbia and Hungary Danube sectors); developing the best strategy to assist ultrasonic tagged sturgeon specimens to pass upstream and adopting the use of special solutions adapted for each hydropower station; continuous mobile monitoring using boat-mounted VR-100 reception stations for then tagged specimens and recording their behaviour and movements until Bazias and further upstream for 700 fluvial km until Danube km 1780.

RO.240.

Title EN	OBTAINING NANOMATERIALS AND DESIGNING SENSORS FOR THE REAL-TIME DETERMINATION OF PM10 AND CO₂ POLLUTANTS
Authors	DEÁK György, GHEORGHE Florina-Diana, RAISCHI Marius, MARIA Cristina, DUMITRESCU Cristina
Institution	National Institute for Research and Development in Environmental Protection Bucharest
Patent no.	PN 23 31 03 01.1
Description	The project aims to develop innovative solutions that contribute to the EU directives to minimize pollution to zero, determining an improvement in air and water quality, and as a result the quality of life. Therefore, initially the types of nanomaterials that can be used for the development of filters for air pollutant retention were analyzed, taking into account the main atmospheric pollutants that affect the outdoor and indoor air, but also the nanomaterials that can be used for the remediation of the quality of water bodies, considering the source (natural, sewage or industrial wastewater), the adopted techniques, the number of treatment stages, the materials used, and the type and amount of pollutants. Additionally, the synthesis methods of nanopowders were analyzed, including the most effective and current chemical

methods, which are part of the bottom-up syntheses strategy, the physical methods including the radiative techniques that follow the principle of converting the energy of electromagnetic radiation from microwaves, plasma, gamma radiation or ultrasound absorbed by materials that will undergo structural transformations in the context of polymorphism, as well as biological methods.

In addition, the project aims to develop a multifunctional sensor system for real-time determination of PM10 and CO2 pollutants. Thus, the design of sensors may include semiconductors based on metal nanomaterials and metal oxides, that can detect changes in their environment based on changes in their electrical properties, or bio/chemical semiconductors with applications in numerous fields, including monitoring the environment.

RO.241.	
Title EN	Nature-based solutions for adapting to climate change in cities from different regions of Romania, in accordance with the objectives of the EU Mission - ClimGES
Authors	DEÁK György, LASLO Lucian, MATEI Monica, ENACHE Natalia, BOBOC Madalina, BUGEAC Larisa
Institution	National Institute for Research and Development in Environmental Protection, Bucharest
Patent no.	PN 23 31 04 02/2023
Description	The project responds to the needs of adaptation and mitigation to climate change in cities from different regions of Romania and provides scientific evidence through monitoring means to quantify the impact of measures based on nature and hydrogen in order to adapt to climate change and maximize the benefits. Through the means of quantifying the impact caused by climate change in the urban environment, concrete adaptation solutions will be offered and the implementation of nature-based measures and the replacement of fossil fuels with hydrogen obtained from renewable sources will be promoted. The goal of this research is to assess vulnerability to climate change and identify nature-based adaptation and mitigation measures in representative pilot areas, as well as estimate GHG emissions using automated methods with multiple chambers within the ecosystems and through laboratory tests. The pilot areas were identified and characterized based on a proposed methodology for assessing the condition of representative

ecosystems in Romania's Central and Southern regions. The proposed methodology consists of the evaluation of natural-based solutions, including aquatic and terrestrial ecosystems with the roles of adaptation and mitigation to climate change, respectively, to their effects.

RO.242.

Title EN	Technological system for real-time monitoring of physical parameters for water/wastewater samples
Authors	György Deák, Monica Matei, Mădălina Boboc, Raluca Prangate, Laura Lupu
Institution	National Institute for Research and Development in Environmental Protection, Splaiul Independenței 294, Bucharest, Romania, 060031, e-mail: incdpm@incdpm.ro
Patent no.	Patent application No. A00234/2024
Description	Real-time monitoring of physical parameters in water/wastewater samples that require a controlled environment is a necessity for quality assurance and tracking of assay results. The invention refers to a set of components that generate a set of data which are important for avoiding uncertainties in the sample profile and sample transport conditions. The DKLP-MB technology system consists of a multi-parameter sensor (I), a software application (II) and a server (III).

RO.243.

Title EN	Quantification of the contamination of wetlands and lakes in the metropolitan area of Bucharest with microplastics and emerging pharmaceutical micropollutants and the provision of innovative technological solutions for their advanced removal from the aquatic environment.
Authors	Mihaela ILIE, György DEAK, Gina GHITA, Cristina MARIA, Alexandru-Anton IVANOV, Ioana SAVIN, Camelia ZAMFIR, Gheorghe GRIGORE , Cristian-Emilian POP
Institution	National Institute for Research and Development in Environmental Protection (INCDPM)
Description	Maintaining and improving the quality of aquatic ecosystems are main objectives of European and national water policy. The presence of emerging pollutants such as microplastics and pharmaceutical compounds in surface waters, even at low concentrations, endangers the life cycle of aquatic

organisms and disrupts the ecological balance, so the identification and evaluation of these compounds in the environment and the establishment of solutions for removing them at the source have become a necessity. As part of this project, preliminary investigations were carried out regarding the presence of microplastics and emerging pharmaceutical contaminants from wetlands and lakes in the metropolitan area of Bucharest and the antibiotic resistance profile of potentially pathogenic bacteria isolated from different aquatic environments. Also, a working protocol for the selection of bacterial strains was developed and a bacterial culture specialized in the degradation of polymeric materials was obtained.

From the analysis of the obtained results, the following aspects can be observed:

- the presence of plastic materials was detected in all investigated lakes/wetlands;
- the range of variation of the total mass of separated plastic particles was from 0.4 mg/L to 5.5 mg/L;
- quantitatively, from the total of microplastics identified, the analyzed samples approx. 47% were fibers, approx. 37% were granules and 16% were fragments, of various sizes and colors;

preliminary investigations regarding the presence of emerging pharmaceutical contaminants have highlighted the presence of most compounds in Lake Plumbuita, including paracetamol, tinidazole, carbamazepine, trimethoprim, clindamycin, caffeine and piroxicam.

**National Institute of Research and Development for
Optoelectronics - INOE 2000**

RO.244.	
Title EN	Biomimetic coatings based on bioactive ceramics for medical implants made of titanium
Authors	D.M. Vrânceanu ² , I.Titorencu ³ , A.Vlădescu (Dragomir ¹), E. Ungureanu ² , V.Pruna ³ , A.C. Pârâu ¹ , C.M. Cotrut ²
Institution	¹ National Institute of Research and Development for Optoelectronics - INOE 2000; ² University POLITEHNICA of Bucharest Institute of Cellular Biology and Pathology “Nicolae ³ Simionescu
Patent no.	A/00760/28.11.2023
Description	The invention relates to obtain hydroxyapatite (HAp) based coatings with a plate like morphology, similar to the natural HAp found in the bone hard tissue. The proposed biomimetic HAp structures with different morphologies are obtained by electrochemical means on Ti substrate and are characterized by tailored in vitro behaviour, contact angles smaller than 20°, modified through adequate and optimized manufacturing strategies which provides superior osseointegration abilities
RO.245.	
Title EN	Multilayered coatings for protecting of cutting tools which work in server wear regimes used in woodworking tools
Authors	Alina Vlădescu (Dragomir), Anca C. Pârâu, Diana M. Vrânceanu, Mihaela Dinu, Lidia R. Constantin, Cătălin Vițelaru
Institution	¹ National Institute of Research and Development for Optoelectronics - INOE 2000; ² Drugon International SRL
Patent no.	A/00093/28.02.2023
Description	The patent application relates to a solution to obtain multilayered coatings consisting of alternate layers of metal, nitrides and binary or ternary carbonitrides of some transition metals (Ti, Cr, W, Fe), to be used as protective layers of cutting tools subjected to a severe regime abrasion, erosion and corrosion wear used in the woodworking industry. The multilayer coatings, according to the invention,

are made of alternating thin individual layers, with total thicknesses between 1 and 4 μm , having high adhesion to the substrate, the critical normal forces in the "scratch test" being in the range of 24 ... 42 N, with hardness between 18 ... 55 GPa, a corrosion rate $< 4 \times 10^{-4}$ mm/year, having friction coefficients in dry mode of 0.1...0.4 and in solution saline 3.5% NaCl of 0.10...0.22, and the wear rate in the dry ball-on-disc test of $0.6...2.6 \times 10^{-6}$ mm $3\text{N}^{-1}\text{m}^{-1}$.

RO.246.	
Title EN	Hybrid equipment for stratigraphic characterization of cultural heritage objects
Authors	M. Dinu, I.M Corcea, L. Ghervase , R. Rădvan
Institution	National Institute of Research and Development for Optoelectronics, INOE 2000
Patent no.	Patent application No. A/00757/28.11.2023
Description	The present invention consists of a hybrid equipment that incorporates three major laser spectroscopy techniques: Laser Induced Break-Down Spectroscopy, Laser Induced Fluorescence and Raman Spectroscopy delivering an important tool for the field of cultural heritage applications: the stratigraphic characterization of cultural heritage objects, in situ, without sampling. The hybrid equipment is configured to collect LIF and RAMAN data from the stratigraphy of materials using the micro-destructive component: LIBS. The proposed equipment can be operated in lab or in situ, providing a complex characterization of the investigated surfaces, at the ionic, atomic and molecular level, in real time.
RO.247.	
Title EN	European Research Infrastructure for Heritage Science - Implementation Phase - E-RIHS
Authors	R.Rădvan , M. Dinu, M.C. Stancu
Institution	National Institute of Research and Development for Optoelectronics, INOE 2000
Patent no.	Research project Programme HORIZON-INFRA-2021-DEV-02
Description	The mission of E-RIHS is to deliver access to interdisciplinary expertise, data and cutting-edge technologies by integrating world-leading European facilities into an organisation with a clear identity and a strong

cohesive role within the global heritage science community. The project aims at enabling the E-RIHS implementation phase and preparing the operation of E-RIHS ERIC.

RO.248.

Title EN	<i>Implementation and exploitation of the scientific research results in the practice of restoration and conservation of cultural goods- IMPLEMENT</i>
Authors	<i>Roxana Rădvan , Monica Dinu, Marilena Claudia Stancu</i>
Institution	<i>National Institute of Research and Development for Optoelectronics, INOE 2000</i>
Patent no.	<i>PN-III-PI-1.2-PCCDI-2017-0878</i>
Description	The overall objective of the complex project is the valorization of competitive scientific research by implementation in the field of heritage conservation & restoration. The main specific objectives that the project pursues, essential for the sustainable improvement of conservation and restoration practice, are: (1) valorization and dissemination of the knowledge and of the research results; (2) technical assistance and scientific and technological services in the Heritage priority area; (3) initiating and developing of viable collaborations with partners from the public and private economic domain; (4) increasing international engagement and visibility.

RO.249.

Title EN	“The Danube Water Collector”
Authors	Ioan Lepădatu, Valentin Barbu, Radu-Iulian Rădoi, Adriana Mariana Boș
Institution	INCD INOE 2000, Subsidiary Hydraulics and Pneumatics Research Institute INOE 2000-IHP
Patent no.	Financial agreement no. 2994 / 22.06.2023
Description	“The Danube Water Collector” (“The Water Wheel”) is a floating kinetic subassembly attached to a floating pontoon, part of the IVAN PATZAICHIN Memorial Ensemble, being the sixth work in the ensemble and the only dynamic one. The monument, a tourist attraction built in memory of the great Romanian rower, is located in the Northern Dobrogea region, Tulcea county, with access from the seafront that bears his name, and offers drinking water from the water of the Danube, for the general public. The collector consists of two systems:

1. **Water intake and storage system** - made of a kinetic structure in the form of a wheel with 24 axially arranged galvanized arms, on which buckets and paddles are fixed, as well as 20 x 24 ornamental wings, and a fixed metal structure consisting of wheel axle, collecting basin, support pillars, water pipes and decorative waterfall. The “water wheel” is driven, in addition to the force given by the flow of water from the Danube, by a hydraulic system consisting of hydraulic motor coupled to speed reducer, pump driven by electric motor, and adjustment, drive and control actuators.
2. **Water filtration and purification system** – comprises, in a stainless steel housing, several filters of different porosities (Big Blou: fineness >150 μ ; NW 32: fineness >50 μ and fineness >25 μ) for pre-filtration, the operation of which is ensured by a hydrophore, and an automated ultrafiltration system (TKR2) that purifies and makes drinking water that reaches the public well.

RO.250.

Title EN	Drying Technologies and Innovative Energy-Independent Equipment for Mountainous and Isolated Areas
Authors	Gheorghe Șovăială, Gabriela Matache, Ioan Pavel, Valentin Barbu
Institution	INCD INOE 2000, Subsidiary Hydraulics and Pneumatics Research Institute INOE 2000-IHP
Patent no.	Financial agreement no. 87PTE/2022 Project submission code: PN-III-P2-2.1-PTE-2021-0306 As part of the project, technologies for dehydrating berries, mushrooms, medicinal and aromatic plants from the spontaneous flora, and also fruits from the orchards of small agricultural producers in isolated hill and mountain areas have been developed. Moreover, a small capacity convective dryer has been created, with total energy independence from the electricity grid, with the help of which the aforementioned technologies were implemented and validated.
Description	The dryer is composed of a chamber for dehydrating vegetable products, a thermal module, and a module for monitoring and automating the drying process. The thermal energy required for the dehydration process is produced with the help of a 10 kWt thermal generator, operating on the TLUD principle, from locally available

biomass. The heat exchanger, of the air-to-air type, provides a clean drying agent (hot air), without contact with combustion gases, with major positive implications regarding the health of consumers.

The electrical energy required for the operation of the fan and the electronic module that monitors the work parameters and controls the drive elements (electric actuators) is provided by a latest generation photovoltaic panel.

The dryer has a useful drying area of 4 m², corresponding to the mass of vegetable products to be processed harvested by a family daily (between 20 and 100 kg/day).

RO.251.
Title EN

Device for Drying in Tunnel-Type Fluidized Bed with Material Conveyance by Vibrations

Authors

Iulian-Claudiu Duțu, Petrin Drumea, Radu-Iulian Rădoi

Institution

INCD INOE 2000, Subsidiary Hydraulics and Pneumatics Research Institute INOE 2000-IHP

Patent no.

RO128419B1-29.11.2017

Description

The invention relates to a device for drying in a fluidized bed, tunnel type, with transport by vibration, of the material, intended for drying organic and inorganic materials of small and medium sizes, such as sawdust, wood chips, chopped plant residues, small or chopped fruits and vegetables, rock or ore powders, etc.

The technical problem that the invention solves is the uniform drying of the mass of wet material. The solution to this problem is the composition of the path of the wet material with some baffles on the surface of the lower floor, as well as some side chambers, provided with some baffles with the role of regulating the flow of air blown on the wet material.

The device as per the invention has the following advantages:

- It allows the drying of heavier materials, which cannot be transported by air currents;
- It allows a uniform drying of the material mass;
- It has multiple adjustment possibilities, so it can adapt to a wide range of productivity with accurately fitting the parameters to be achieved;
- It can be built in a simple construction, involving materials and technological processes of current use.

Field of application: the invention can be used to dry sawdust used in the production of pellets.

National Research and Development Institute for Non-ferrous and Rare Metals – IMNR

RO.252.	
Title EN	<p>Defying Microbial Threats: Machine Learning Approach for High Entropy Alloys and Antimicrobial Coatings to Combat Microbiologically Influenced Corrosion</p>
Authors	<p>Stefania Caramarin (Chiriac), Laura-Madalina Cursaru, Dumitru Mitrica, Beatrice-Adriana Serban, Arcadii Sobetkii, Laurentiu-Florin Mosinoiu, Nicoleta Vitan, Mihai Ghita, Bogdan Postolnyi, Alexander Pogrebnyak</p>
Institution	<p>National Research-Development Institute for Non-ferrous and Rare Metals - IMNR</p>
Description	<p>Awareness regarding the existence of natural antimicrobial materials, such as silver, has persisted for many years, leading to their utilization in hygiene and protective applications through nanoparticles or metal ions. However, while effective at low concentrations, higher levels often lead to rapid degradation of material properties. This delicate balance between antimicrobial efficacy and material integrity presents a significant challenge, particularly in extreme conditions.</p> <p>This project aims to address this challenge by developing coatings with enhanced physical, mechanical, and biocorrosion-resistant properties, thereby significantly improving their performance and lifespan. This involves pioneering a novel approach: embedding biocorrosion-inhibiting metal atoms into a high-entropy alloy (HEA) matrix composed of five or more carefully selected elements. The process entails comprehensive research, from initial thermodynamic calculations and simulations to predicting mechanical and corrosion properties using machine learning techniques. Following fabrication, the coatings undergo rigorous experimental characterization, including tests for physical, mechanical, and bio-corrosion behaviors, validating their antimicrobial efficacy.</p> <p>The potential applications for these advanced HEA-based materials and coatings are vast, addressing critical needs in various sectors. From enhancing hygiene on frequently touched surfaces in healthcare facilities, public transportation, and services to bolstering corrosion resistance in marine infrastructure and underwater components, the impact of our innovation spans diverse industries.</p>

RO.253.	
Title EN	Preliminary study to obtain 3D printed electrolyte for SOFC applications
Authors	Anca Elena SOBETKII, Alexandru Cristian MATEI*, Lidia LICU, Ștefania CARAMARIN, Gabriela Florentina IONIȚĂ, Radu Robert PITICESCU, Cristian BOGDĂNESCU, Adrian MOTOC
Institution	National Research & Development Institute for Nonferrous and Rare Metals-IMNR, Blvd.Biruinței no.102, Pantelimon, Ilfov, Romania
Patent no.	PN23250102
Description	<p>Solid oxide fuel cells are efficient energy conversion technologies with zero emissions. Recently, 3D printing has been used to develop SOFCs with unique geometries with capabilities never before explored.</p> <p>In this study, robocasting was used to obtain electrolytic 3D structures based on ZrO_2 doped with Y_2O_3 (Zr8Y), the standard material currently used in fuel cells. These structures will be used as benchmarks in the following researches, where the development of 3D structures based on new materials with improved properties is pursued.</p> <p>To create the structures in this study, Zr8Y obtained by the hydrothermal synthesis technique was used as raw material, and pluronic F127 with ~30% concentration was used as binder. In an attempt to obtain structures with a higher density, the green bodies were subjected to the debinding process (process guided by the results of the thermal analysis) and sintering at $T=1450^\circ C$.</p> <p>The densified structures were characterized from a morphological point of view. Future studies will focus on optimizing the sintering process of 3D structures in order to obtain denser structures.</p> <p>These results can be considered a first step in the development of complex-shaped SOFC cells, which will pave the way to operate at lower temperatures and with higher performance.</p> <p>This work was supported by MCID, Core Program no. 5N/01.01.2023 – ENERCLEAN, project number PN23250102/2023 and INOVADIT project of the Ministry of Research, Innovation, and Digitization through Program</p>

1—Development of the national research-development system, Subprogram 1.2—Institutional performance projects for financing excellence in RDI, contract no. 9PFE/2021

RO.254.	
Title EN	Structural and thermal properties of doped ZrO₂
Authors	A. I. Tudor, C.F. Ciobota, M. Petriceanu, S. Caramarin, G.F. Ionita, A. Nicoara,
Institution	National Institute for Non-Ferrous and Rare Metals-IMNR
Patent no.	Project: PN 23 25 01 01: Integration of combinatorial EB-PVD technology in material development with applications in energy co-generation
Description	The rare earth zirconate (RE-ZrO ₂ , RE = La, Gd, Sm, Yb, Nd) ceramics were successfully prepared by hydrothermal method (200 °C, 2h, 100 atm). The aim of this paper is to investigate the influence of doping elements on structural and thermal properties of nanostructured ZrO ₂ material synthesized by hydrothermal method. The powder was analyzed after the synthesis, after heat treatments at 1200 °C and 1500 °C. The samples have good high-temperature thermal stability and a single cubic phase at 1500 °C. The compound exhibits a low thermal conductivity (0.61 W·m ⁻¹ ·K ⁻¹), a low heat capacity (0.42 J·g ⁻¹ ·K ⁻¹) and a low thermal diffusivity (0.34 mm ² ·s ⁻¹).

National Institute for Research and Development in Electrochemistry and Condensed Matter

RO.255.	
Title EN	Linear Array Ionic Thruster. Demonstrator: In-atmosphere ionic craft with linear-array emitters
Authors	Adrian Ieta, Marius Chirita, Dante Rogers, Likashmi
Institution	Deosaran, Joshua Ambrose, Rana Ayash, Jack Gallager SUNY Oswego, Oswego NY, USA and National Institute for Research and Development in Electrochemistry and Condensed Matter, Timisoara, Romania
Patent no.	1) Chirita Marius, Patent application, "Toroidal Counter-electrode for ionic thruster". INCEMCT, OSIM Nr. A/00268/17.05.2022 2) Adrian Ieta & Marius Chirita, "Toroidal counter-electrode for ionic thruster". Patent application, SUNY RF case #: 230-2218. 3) Ieta, A., "Electrohydrodynamic Rotary Systems and Related Methods.", US20210143722A1, patent application -May 21, 2019, patent issued January 2024. https://patents.google.com/patent/US11863040B2/en
Description	<p>We developed a new electroaerodynamic device able to achieve liftoff when powered by negative high voltage. Our Linear-Array Ion Thruster (LAIT) uses a linear-array emitter electrodes placed above and asymmetrical to a ground cylinder collectors-array. The device has no moving parts. The emitter simulates the behavior of a wire emitter commonly used in electrostatic lifters. However, in our case, the emitter is made of a very thin metal sheet (copper tape) that can be easily applied on a thin piece of balsa wood increasing its robustness. It also eliminates additional difficulties related to the need for tension in the emitter wire. The linear emitter sits above and in-between two collector cylinders - quite different than in most used configurations where the emitter is placed straight above the collector electrode. The advantage of the present configuration relies on the generation of a stronger electric field at the emitter where cold plasma is generated, and the ions are emitted. The field is created because of superposition of the electric fields generated between the emitter and the adjacent collector cylinders. The configuration allows for a given voltage, an optimal vertical thrust to be obtained for specific values of the collector diameter and of the distance between emitter – collector planes. The superposition of electric fields idea was an extrapolation of how the field is generated in an axial ion emitter above a coaxial toroidal collector. A 28 g prototype was first created and tested. A scaled-up model was later built (126 g) and tested. Both LAIT devices were able to achieve liftoff with the larger one having a much-increased power</p>

efficiency (5 N/kW) than the smaller scale model (1.2N/kW). This demonstrated that the electrode design is scalable. Also, from theoretical considerations, the power efficiency should increase with a larger LAIT device size and this was observed from our experimental work.

As a demonstrator, we present ionic flights of two LAIT devices. With the experimentally proven scalability of the system, larger systems could be built with potentially even better power efficiency. As the miniaturization of the high voltage power supplies greatly progresses, such LAIT devices may later be at the core of ionic drones with no moving parts and minimal sound and thermal signatures. This project work was sponsored by the Electrical and Computer Engineering Department at SUNY Oswego.

RO.256.	
Title EN	Toroidal Ion Thruster. Demonstrator: flight device with ionic toroidal thruster
Authors	Marius Chirita, Adrian Ieta, Mircea Nicolaescu, Marius Constantin Chirita Mihaila, Virgil Rotaru
Institution	National Institute for Research and Development in Electrochemistry and Condensed Matter, Timisoara, Romania
Patent no.	<p>1) Chirita Marius, Patent application, “Toroidal Counter-electrode for ionic thruster”. INCEMCT, OSIM Nr. A/00268/17.05.2022</p> <p>2) Adrian Ieta & Marius Chirita, “Toroidal counter-electrode for ionic thruster”. Patent application, SUNY RF case #: 230-2218.</p> <p>3) Marius Chirita, Virgil Rotaru, Patent application, A00323/26.07.2022 for “Ion Thruster with Toroidal Counter-electrode”.</p>
Description	<p>The ionic toroidal thruster (ITT) developed by us, use an innovative electroaerodynamic device, having the toroidal ground electrode without any moving component. Compared to the rotary ion engine (RIE - presented by us in previous EUROINVENT editions), ITT has no moving components. The propeller was replaced with a fixed cylindrical electrode of radius "r" and width "l" which is placed above a toroidal electrode of radius "R" ($R > r$), in a configuration with axial symmetry, at a distance "d" from each other, thus determining a truncated cone geometry. A DC high voltage is applied between the two electrodes, in negative polarity. The radii "R" and "r", as well as the distance between them "d" can be scaled according to the maximum voltage available. A software package SIMION was used to calculate electric fields and trajectories of charged particles in these fields in given configuration of electrodes and voltages.</p> <p>As a demonstrator, we present here a flying device called “Flight</p>

EUROINVENT 2024

Device with Ionic Toroidal Thruster” which consists of four **ITT**'s that act simultaneously in a frame that holds them together. The generated force is twice as high as the own weight of the entire device; the effect is lifting off the ground. The tests and improvements of the designed static and dynamic characteristics ensure the total reproducibility of its static and dynamic performances. *This achievement was done through the CCCDI project, PN-III-P2-2.1-PED-2019-3646, won by Fiz. Dr. Marius Chirita from INCEMC Timisoara, through the direct competition organized by the Romanian Ministry of Education and Research, within PNCDI III, in 2019. The project title is: "Experimental validation of ion propulsion under laboratory conditions".*

National Research and Development Institute for Textiles and Leather INCDTP

RO.257.	
Title EN	Electroconductive composite based on nickel microparticles for electrodes, sensors and electromagnetic screens
Authors	Aileni Raluca Maria, Chiriac Laura, Toma Doina, Soare Vasile
Institution	National Research and Development Institute for Textile and Leather Bucharest, Romania
Patent no.	Patent application no. A/00527/21.08.2020
Description	<p>The invention refers to a process used for the functionalization of a fabric, the development of the electroconductive composite and the chemical composition of the electroconductive polymer paste based on Ni microparticles intended for the production of textile electrodes, sensors or screens for electromagnetic attenuation for technical applications in electronics, medicine or smart textiles.</p> <p>The invention is characterized by the fact that the manufacturing of the composite material consists of the fabric functionalization in RF plasma oxygen and the deposition of the polymeric film-based Ni microparticles on the textile surface by lamination, scraping or direct printing process followed by crosslinking at 150 - 170 °C.</p> <p>The novelty of the invention consists of the following aspects:</p> <ul style="list-style-type: none"> - the polymer film obtained mainly from polyvinyl alcohol, ethyl acetate, ethyl alcohol, acetone and Ni microparticles is uniform, hydrophilic, adheres to the surface of the fabric and crosslinks at 150-170 °C for 2-5 minutes, showing low values of low electrical surface resistance ($10^3 \Omega$), characteristic of electrical conductors. - the initial functionalization of the textile support oxygen plasma, using the generator in MHz or kHz, increased the hydrophilicity and absorption capacity of polymeric substances in order to develop the electroconductive composite material by scraping, lamination, or direct printing on the textile surface.

RO.258.

Title EN	Bioactive textile dressing with anti-inflammatory and antibacterial protection properties and manufacturing process
Authors	Laura Chirila, Alina Popescu, Carmen Mihai, Alexandra Ene, Sabina Olaru, Roxana Rodica Constantinescu
Institution	The National Research and Development Institute for Textiles and Leather
Patent no.	Patent application No. A/00401/12.07.2021

Description	<p>The invention refers to a manufacturing process for obtaining of a bioactive textile dressing for topical use, with anti-inflammatory and antibacterial protection properties, used for curative therapy of various inflammatory skin conditions. The dressing is made of a woven fabric with special weave, having in fibrous composition cellulosic man-made fibers functionalized with zinc oxide in blend with cotton, which is further functionalized with an emulsion type polymeric system containing chitosan, propolis tincture and cinnamon essential oil.</p> <p>The innovation consists in the raw material chosen, the weave of woven fabric, the composition of the emulsion-type polymeric system, so that the bioactive textile dressing as a whole facilitates the regeneration process of the integumentary tissue, by ensuring the following requirements:</p> <ul style="list-style-type: none"> ▪ high values of air and water vapor permeability; ▪ appropriate hydrophilicity to ensure the absorption of the exudate generated by the affected skin; ▪ slow release of the selected natural therapeutic agents; ▪ anti-inflammatory and antibacterial effect to ensure the protection of the affected area and the prevention of secondary bacteria infections.
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RO.259.	
Title EN	Method for automating the take-off and landing phase of an flexible textile wing
Authors	Salistean Adrian
Institution	INCDTP- National Research and Development Institute for Textile and Leather
Patent no.	Patent application no. A00540/03.10.2023
Description	The present invention refers to a method of automatic control of the take-off and landing phase of a collapsible/inflatable AirFoil textile wing. The control method is applicable in the context of the realization of the automatic control system of a high-altitude ground-gen wind generator that uses a textile wing to capture wind energy from high altitudes. Thus the control of the wing captive to the wind is done by a self-propelled WCU (Wing Control Unit) module attached on the cable near the wing. The module incorporates active control elements to automate the launch/retraction of the wind captive textile wing when wind conditions are not favorable, too light or too strong wind, high intensity storms and is commanded according to the method claimed in this documentation.
RO.260.	
Title EN	Green method for obtaining silver nanoparticles-based dispersion using naringenin as reducing agent
Authors	Mihaela-Cristina Lite, Roxana Rodica Constantinescu, Alina Popescu, Laura Chirila
Institution	The National Research and Development Institute for Textiles and Leather
Patent no.	Patent application No. A/00635/31.10.2023
Description	The invention refers to an ecological process for obtaining silver nanoparticles in a stable dispersion, using a flavonoid compound, called naringenin. The established dispersion exhibit antibacterial properties, demonstrated when applied on textile fabrics (cotton and wool). The invention ensures the repeatability of the AgNPs synthesis process, with the formation of stable, non-toxic, environmentally friendly dispersions, by using 5,7-dihydroxy-2-(4-hydroxyphenyl)-chroman-4-one, a compound known as naringenin, as a green reducing agent, for the reduction of Ag ⁺ ions to metallic Ag. The AgNPs

dispersion exhibit antibacterial efficiency, proving its potential application in the conservation of heritage textiles.

The advantages of the invention are:

- Reduction of toxic waste from the AgNPs synthesis process;
- Environmental-friendly reducing agent, non-toxic, constant chemical composition, reproducible synthesis technological process, applicable on an industrial scale;
- Accessible, ecological raw materials, without toxic potential for human or animal health;
- Simple technological process, without additional stages of purification, extraction or filtration of the raw material.

RO.261.

Title EN	Dispersion of liquid crystals for the creation of thermochromic surfaces and production process
Authors	Alexe Cosmin- Andrei, Cîrcu Viorel, Gaidău Carmen-Cornelia, Iliș Monica-Victoria
Institution	1. The Research and Development National Institute for Textiles and Leather (INCDTP)-Division Leather and Footwear Research Institute (ICPI) Bucharest University from Bucharest
Patent no.	<i>Patent application A00807 from 06.12.2023</i>
Description	<p>The invention refers to the preparation of a new dispersion of liquid crystals with thermochromic properties for covering the surface of natural, synthetic leather, cardboard, or other types of surfaces, to achieve color transitions under the influence of temperature. The dispersion of liquid crystals is carried out in a material with film-forming properties that ensures both the preservation of the thermochromic properties of the liquid crystals, as well as the adhesiveness on various surfaces such as natural leather, leather substitutes, or cardboard. The surfaces obtained by coating with dispersed liquid crystals are uniform and have thermochromic properties, stable over time.</p> <p>The invention refers to a dispersion of cholesteric liquid crystals, the method of preparation and application on surfaces of natural, synthetic leather, cardboard, paper, or dark felt, to obtain thermochromic properties in the temperature range 20-40°C. The dispersion according to the invention is prepared by mixing cholesteric liquid crystals</p>

with NOA65 photopolymer dissolved in dichloromethane, when a homogeneous mixture is obtained that is dosed over PVA 3% under stirring magnetically, at 400 RPM, and irradiated with UV light at a wavelength of 365 nm for 20 minutes, then add 3% PVA and increase the magnetic stirring speed to 1000 RPM, under UV light, when a homogeneous, thermochromic dispersion is obtained, which after 20 minutes is deposited by scraping on various surfaces, which is then dried with convection air at 60°C when a glossy, thermochromic film is formed.

The new dispersion and application method allow the realization of smart surfaces, with advanced aesthetic properties with high added value for consumer goods. The natural leather is for the first time finished on the surface with cholesteric liquids that preserve their thermochromic properties.

RO.262.	
Title EN	Innovative treatments based on protein gels for the increase of vegetable quality and production within a sustainable agriculture
Authors	Maria Stanca¹, Carmen Gaidau¹, Antoaneta Mihalcea², Mihaela Niculescu¹, Cosmin-Andrei Alexe¹, Daniela Balan³, Gabriela Luta³, Aykut Sancakli⁴, Aşşegül Uzuner Demir⁴, Zehra Betül Ahi⁴
Institution	¹ Reseach and Development National Institute for Textiles and Leather (INCDTP)-Division Leather and Footwear Research Institute (ICPI) Bucharest, Romania ² SC Marcoser SRL Matca, Galati, Romania ³ Faculty of Biotechnologies, UASVM, Bucharest, Romania ⁴ KAZLIÇEŞME DERİ ÜRN. AR-GE SAN.TİC.LTD.ŞTİ, Istanbul, Turkiye
Patent no.	PN-III-P3-3.5-EUK-2019-0249, Eureka E!13432-Gel-Treat, Contract no 260/2020
Description	The theme of the Gel-Treat project is in agreement with the latest European circular economy strategies and, based on these principles, it purposes to increase the production and quality of vegetables through innovative treatments based on protein gels obtained from by-products of the leather industry, sheep breeding or fish processing. The general objective of the GEL-TREAT project is to

obtain innovative protein gels based on collagen and / or keratin, from renewable sources, used for the root and / or foliar treatment of tomato plants as an alternative to the use of fertilization treatments based on synthesis chemistry.

The main results are summarized as follows:

- Development of new products for prick-out, flowering and fruiting stages based on bovine hide or fish skin gelatin and keratin/collagen hydrolysates extracted from leather industry, sheep breeding and fish processing wastes as alternatives to commercial classical or synthetic based gel foliar fertilizers.
- Demonstrative experiments on tomato crops with the new protein gels made with renewable resources

The researches carried out indicated beneficial effects of treatments with protein gels both on the growth and biochemical parameters of seedlings, as well as on the biochemical quality indicators of tomato fruits.

After the completion of the project the new biobased materials will be produced by the project partner, KAZLIÇEŞME (Turkey) and new circular technology for ecological leather processing will be integrated in the production of SC Marcoser SRL (Romania), assisted by the research partners, ICPI and UASVM.

**National Institute for Research - Development of Machines
and Installations designed for Agriculture and Food
Industry - INMA Bucharest, Romania**

RO.263.	
Title EN	ACTIVE ORGAN OF CHISEL TYPE, FOR SOIL WORKS
Authors	Marin Eugen, Manea Dragoş National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Institution	
Patent no.	Patent application No.: A-00763 / 2023
Description	The invention refers to a chisel-type active body for tilling the soil intended for equipment provided with active body supports for tilling the soil without turning the layers, such as scarifiers, chisels, cultivators, etc.
RO.264.	
Title EN	DEVICE AND METHOD FOR THE 3D PRINTING OF HONEYCOMBS USING NATURAL WAX
Authors	Matache Mihai, Epure Mariana, Găgeanu Iuliana, Gheorghe Gabriel, Voicea Iulian, Cujbescu Dan National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Institution	
Patent no.	Patent application No.: A-00591 / 2023
Description	The invention relates to a device and a method for the 3D printing of Apis mellifera beehives using natural wax, on wooden or plastic frames, for the purpose of using them directly in beehives.
RO.265.	
Title EN	SYSTEM FOR MONITORING THE WORKING PARAMETERS OF TREE ROOT CUTTING EQUIPMENT
Authors	Ciupercă Radu, Zaica Ana, Popa Lucreția, Ștefan Vasilica, Constantinescu Mihai National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Institution	
Patent no.	Patent application No.: A-00590 / 2023

Description The invention relates to a system for monitoring working parameters (angle and depth of cutting roots) intended to equip the equipment for cutting tree roots.

RO.266.

Title EN **FLOW PARTICLE SEPARATOR FOR AQUAPONIC SYSTEMS**

Authors Voicea Iulian, Vlăduț Valentin, Matache Mihai, Persu Cătălin, Cujbescu Dan, Olan Mihai

Institution National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -

Patent no. **Patent application No.: A-00537 / 2023**

Description The invention presents a particle separator, with radial flow, with increased filtering capacity, used in an installation for aquaponic culture to separate the solid parts from the water.

RO.267.

Title EN **TECHNOLOGICAL SYSTEM FOR THE PRODUCTION OF BIO GRANULATED FODDER FOR POULTRY**

Authors Voicea Iulian, Vlăduț Valentin, Matache Mihai, Persu Cătălin, Cujbescu Dan, Olan Mihai

Institution National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -

Patent no. **Patent application No.: A-00536 / 2023**

Description The invention relates to a technological system for the production of bio-granulated feed for the poultry (equipment and technology) for the use of vitamins from fruits and vegetables that will be dehydrated and which are added instead of growth premixes in the production process of granulated feed of the poultry.

RO.268.

Title EN **ECOLOGICAL PORTABLE CRYOGENIC DEVICE FOR LOCALIZED DESTRUCTION OF WEEDS**

Authors Matache Andreea, Sorică Elena, Matache Mihai, Găgeanu Iuliana, Gheorghe Gabriel, Ionescu Alexandru

Institution National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -

Patent no.	Patent application No.: A-00535 / 2023 The invention relates to a portable cryogenic ecological device with liquid nitrogen for the localized destruction of weeds in organic vegetable crops or in civil constructions
Description	such as sidewalks with curbs, lawns, paved surfaces, where they are undesirable and mechanical destruction or with herbicides is not possible, in order to protect the respective spaces as well as to beautify them.

RO.269.

Title EN	INNOVATIVE COULTER FOR FORESTRY SEEDLINGS PLANTING EQUIPMENT
Authors	Ciupercă Radu, Zaica Ana, Ștefan Vasilica, Cristea Oana-Diana
Institution	National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Patent no.	Patent application No.: A-00492 / 2023
Description	The invention refers to an innovative coultter for forest sapling planting equipment intended for opening grooves in the soil during the mechanized planting of forest saplings.

RO.270.

Title EN	LABORATORY EQUIPMENT FOR BIOCHAR PRODUCTION FROM VEGETABLE REMAINS
Authors	Vlăduț Valentin, Voicea Iulian, Olan Mihai, Vlăduțoiu Laurențiu, Nițu Mihaela
Institution	National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Patent no.	Patent application No.: A-00472 / 2023 European Patent application No.: EP23020420.8 / 2023
Description	The invention presents an equipment for the laboratory that will produce biochar and synthesis gas from plant residues, the equipment being equipped with temperature and pressure control sensors that provide the information to a process-computer which ensures the operation of the system.

RO.271.	
Title EN	METHOD FOR DETERMINING THE UNIFORMITY OF SOWING IN STRAW CEREAL SEEDERS
Authors	Cujbescu Dan, Voicea Iulian, Persu Cătălin, Matache Mihai, Anghelache Dragoș, Constantinescu Mihai
Institution	National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Patent no.	Patent application No.: A-00604 / 2023
Description	The invention relates to a method for determining the uniformity of sowing in sow seeders, that distribute the seeds in equidistant rows, in a continuous flow.
RO.272.	
Title EN	METHOD FOR DETERMINING THE SEEDING ACCURACY OF GRASS PLANT SEEDERS
Authors	Cujbescu Dan, Voicea Iulian, Persu Cătălin, Ionescu Alexandru, Tăbărașu Ana-Maria, Vlăduț Valentin
Institution	National Institute for Research - Development of Machines and Installations Designed for Agriculture and Food Industry -INMA Bucharest, Romania -
Patent no.	Patent application No.: A-00602 / 2023
Description	The invention refers to a method for determining the quality indices of the distribution devices (seeding accuracy) of the precision seeders, which carry out the sowing of one or more seeds (grains) of grass plants in equally spaced nests on equidistant rows.

National Institute for Research and Development in Mine Safety and Protection to Explosion - Insemex Petroșani

RO.273.

Title EN	VENTILATION MANAGEMENT METHOD.
Authors	Ciocele Doru, Găman George Artur
Institution	National Institute for Research and Development in Mine Safety and Protection to Explosion - INSEMEX Petroșani
Patent no.	CBI A00641/2021
Description	<p>The invention refers to an intelligent and interactive management method of ventilation networks by using a program for modeling, solving and simulating several complex ventilation networks and creating an interactive ventilation management system.</p> <p>Complex ventilation networks are solved, a ventilation network management expert center is created, virtual machines are created for each ventilation network, access of the mining unit to the distributed virtual machine is ensured, the link between the expert center and the mining unit is secured, the technical problems that arise at the level of the calling ventilation network are promptly resolved.</p>

RO.274.

Title EN	REPLACEMENT OF CRITICAL VENTILATION STRUCTURES METHOD.
Authors	Ciocele Doru, Ianc Nicolae
Institution	National Institute for Research and Development in Mine Safety and Protection to Explosion – INSEMEX Petroșani
Patent no.	CBI A00642/2021
Description	<p>The invention refers to a method of replacing critical ventilation constructions, by eliminating the degree of instability induced at the level of active fans. The ventilation network is solved under normal working conditions. Critical ventilation structures are identified. The critical ventilation constructions and the dispersion of the total resistance related to it are eliminated, on parallel links, located downstream or upstream of the branch on which it is located, parallel links on which ventilation constructions with resistances equivalent to that of the critical ventilation construction are located. The functional parameters specific to the active main fan are obtained in the new configuration.</p>

RO.275.	
Title EN	STAND FOR IMAGING RECORDING OF THE FORMATION OF EXPLOSIVE ATMOSPHERES AND OF THE INITIATION AND DEVELOPMENT OF RAPID COMBUSTION PROCESSES
Authors	Vlasin Nicolae-Ioan, Găman George Artur
Institution	National Institute for Research and Development in Mine Safety and Protection to Explosion - INSEMEX Petroșani
Patent no.	CBI A00692/2021
Description	The stand for imaging recording of the formation of explosive atmospheres and of the initiation and development of rapid combustion processes includes a construction with transparent walls and interconnected spaces. The first recording system – arranged horizontally – based on the PIV (Particle Image Velocimetry) technique, consists of a pulsed laser source correlated in frequency with a CMOS video camera, a particle generator and a computer. The second recording system – arranged vertically – uses Schlieren techniques and consists of a point light source, two parabolic mirrors, a shutter, a high-speed video camera and a computer.
RO.276.	
Title EN	SCALABLE APPLICABLE SYSTEM TO OPTIMIZE BLASTING PARAMETERS SPECIFIC TO SAFE EXPLOITATION TECHNOLOGIES IN SURFACE MINING OPERATIONS
Authors	Laszlo Robert, Găman George-Artur
Institution	National Institute for Research and Development in Mine Safety and Protection to Explosion - INSEMEX Petroșani
Patent no.	CBI A00702/2021
Description	Setting the blasting work parameters in a way that ensures rock detachment from the ore body, reduced ore body back cracking, proper granulometry, reduced ore mass scattering, a low seismic effect, and a low carbon footprint is a requirement for achieving the best results in mining operations. The invention relates to the creation of an applicable system that enables the establishment in real time of the ideal blasting work parameters in close connection with the uniqueness of each ore deposit, the types of explosives, and the seismic limitations due to the blasting works.

RO.277.

Title EN**DYNAMICS DETERMINING OF EXPLOSIVE ATMOSPHERES FORMATION METHOD.****Authors**

Cioclea Doru, Găman George Artur

Institution**National Institute for Research and Development in Mine Safety and Protection to Explosion - INSEMEX Petroșani****Patent no.**

CBI A00534/2022

Dynamics determining of explosive atmospheres formation method is based on the analysis of dispersion dynamics in the accumulation phase, with the highlighting of areas with low concentrations as well as the reaction capacity of the ventilation system in the dilution and evacuation phase, through:

- the choice of the closed enclosure;
- determining the total free volume of the closed enclosure;
- establishes the shape and layout of the measuring equipment;
- the methane concentration measurement system is located;
- the ventilation system is configured for the evacuation of the dangerous atmosphere;
- the gas flow control system is installed at the measurement site;
- the system for continuous determination of gas concentrations is connected;

Description

- data resulting from continuous measurements are collected;- the airing time is set;

- the gradient of dispersion and progressive dilution of the gas at the level of the closed enclosure is determined, which determines the dynamics of the formation of the explosive atmosphere.

Dynamics determining of explosive atmospheres formation method can be applied to any closed, semi-closed or open industrial premises where there is a risk of explosive atmospheres.

The method for dynamics determining of explosive atmospheres formation method was designed within INCD INSEMEX and can be used for any combustible gas with explosive properties and for any closed, semi-closed or open premises.

The method for dynamics determining of explosive atmospheres formation method was tested with good results in the closed premises of the experimental laboratory, regarding the study of industrial ventilation systems.

National Research & Development Institute for Welding and Material Testing – ISIM Timisoara

RO.278.

Title EN	Research on the development of 3D printed high entropy alloys for the construction of severely wear and vibration stressed components
Authors	Nicușor-Alin Sîrbu
Institution	National Research and Development Institute for Welding and Material Testing – ISIM Timisoara
Patent no.	Nucleu Research-Development Program Project number: PN 23 37 01 03
Description	<p>The research project aims to develop innovative products, new high-entropy alloys printed with 3D technology, and 3D printing manufacturing techniques to withstand wear and vibrations. These components endure wear through contact in the active zone and vibrations up to 80μm with frequencies ranging between 20 and 50 kHz. They find application in welding, cutting, cavitation, homogenization, etc., serving industries such as textiles, leather, machinery manufacturing, food, toys, packaging, pharmaceuticals, and energy, thereby replacing traditional methods of manufacturing high-entropy alloys. In addition to creating alloys that are difficult or impossible to produce using conventional methods, 3D printing also yields finished components. Alongside research on the development and testing of 3D-printed high-entropy alloys for constructing components subjected to severe wear and vibration with similar structures, the project proposes the production of components with different structures (layer by layer), whose internal chemical composition varies. This includes hardening layers in areas prone to wear to meet the needs of the economic and social environment. Additionally, there is a desire to develop components subjected to severe wear and vibrations with various degrees of internal structural filling.</p> <p>From the perspective of increasing lifespan and promoting a circular economy, the project aims to utilize research results for refurbishing worn active surfaces of components subjected to severe wear.</p> <p>The objectives of the project are:</p> <ul style="list-style-type: none"> - Development of 3D-printed high-entropy alloys for constructing components subjected to severe wear and vibrations; - Development of manufacturing technologies and innovative products through 3D printing.

RO.279.	
Title EN	Friction stir welding device with air cooling of the FSW welding tool and the materials to be joined
Authors	Radu Cojocaru, Lia-Nicoleta Boțilă
Institution	National Research and Development Institute for Welding and Material Testing – ISIM Timisoara
Patent no.	A/00028/27.01.2022 (publication number RO 137552A2), OSIM Bucharest, Romania
Description	<p>The patent application refers to the development of a specialized welding device usable for friction stir welding FSW, whose constructive solution ensures an additional air-controlled cooling of the FSW tool and the materials to be joined, in the welding area and in adjacent areas.</p> <p>The constructive solution of the device meets the necessary technical conditions to protect the FSW welding tool and the materials to be joined from overheating, in the action area of the welding tool, during the actual welding process, by cooling them with an additional air flow. So, the overheating effect of the welding tool and of the materials to be joined by welding will be reduced, ensuring an increase of the tool service life and also protecting the bearings of the main shaft of the FSW welding machine.</p>
RO.280.	
Title EN	Device for transverse processing through the water jet cutting process
Authors	Nicușor-Alin Sirbu, Ion Aurel Perianu, Dan Ionescu
Institution	National Research and Development Institute for Welding and Material Testing – ISIM Timisoara
Patent no.	RO 131032 B2, OSIM Bucharest, Romania
Description	<p>The device for transverse machining by the water-jet cutting process, in which the workpiece is clamped, can be positioned in a horizontal plane or inclined to the horizontal plane of the work surface. It is possible for the workpiece to be tilted mechanically by means of transmissions (stepping motor-reducer) which have the effect of providing the angles of tilt of the workpiece in the vertical and/or horizontal plane, so that this possibility can be used either in ordinary machining operations or to be included in the aforementioned programme, i.e. the automatic operation programme.</p>

RO.281.	
Title EN	Device for transverse processing through the water jet cutting process
Authors	Ion Aurel Perianu, Nicușor-Alin Sirbu
Institution	National Research and Development Institute for Welding and Material Testing – ISIM Timisoara
Patent no.	RO 130329 B1, OSIM Bucharest, Romania
Description	The invention pertains to a device for waterjet cutting or abrasive waterjet cutting processes, used in the machine construction industry. The device consists of a metal frame (1) with a height of 100mm, which has two faces (A and B), some support elements (2) with a height of 100mm, made in a welded construction, adjustable legs (9) that allow for the levelling of the device, guiding elements (5), a slide (6), and a rail (7), all necessary for positioning the workpiece to be processed with a waterjet on the surface of the metal frame (1).

RO.282.	
Title EN	Computerized system for thermal fatigue testing of functional or protective layers
Authors	Alin-Constantin Murariu, Radu Cojocaru, Ion Aurel Perianu, Lia-Nicoleta Boțilă
Institution	National Research and Development Institute for Welding and Material Testing – ISIM Timisoara
Patent no.	RO 134649 A2, OSIM Bucharest, Romania
Description	The invention pertains to the development of a computerized system through which thermal fatigue tests can be conducted on functional and protective layers made of advanced materials, deposited using various methods, on different substrate materials, under specific test conditions determined by the operator based on the substrate material and the characteristics of the deposited layer. It enables the assessment of the thermal fatigue resistance under preliminary calibration, real-time monitoring, and control of test conditions, as well as compensation for axial dimensional changes of the test specimen exposed to various temperature values during the test to maintain constant stiffness (deformation resistance) of the simulated spring, implemented in the system through its operating mode.

**National institute for Research and Development
URBAN-INCERC**

RO.283.	
Title EN	THE LARGE-SCALE IMPLEMENTATION OF SEISMIC INSTRUMENTATION AS SUPPORT FOR THE BIM AND FOR THE CONSOLIDATION OF URBAN STRUCTURAL RESILIENCE
Authors	Daniela DOBRE, Claudiu-Sorin DRAGOMIR, Cornelia-Florentina DOBRESCU, Iolanda-Gabriela CRAIFALEANU, Emil-Sever GEORGESCU, Marta-Cristina ZAHARIA, Gabriela VOLOACA
Institution	NIRD URBAN-INCERC
Patent no.	-
Description	<p>The research aims to address that dimension from the seismic vulnerability assessment for which multidimensional databases are needed, containing reliable information with multiple urban scales, sustainability levels, visualization and simulation possibilities in space and time. In this context, the dual seismic instrumentation-Building Information Modelling (BIM) relationship appears useful and is essential to understand what information is necessary to support BIM with updated data from the seismic instrumentation activity and how, in a reverse process, the BIM control procedure requires seismic instrumentation or other in-situ non-destructive tests.</p> <p>An approach is proposed in which the data obtained in-situ for a series of buildings of some research institutes, which complete the list of buildings already instrumented in recent years by NIRD URBAN-INCERC, can be included in databases defined according to the pattern imposed by BIM, allowing comparative analyses between the calculated vibration periods vs. values from sensor measurements, the definition of significant correlation relations/linear regression for estimation of the vibration period related to height, dynamic amplification and damage to the building.</p> <p>The structural vulnerability corroborated with the social exposure highlights a state of fact from which any risk analysis should rely on field data for planning the enhancement of defense against the potential of seismic disasters. The creation of scientific and experimental databases for the building stock represents an emerging approach in current world research, being at the same time a basic pillar of the Romanian National Strategy for Seismic Risk Reduction.</p>

RO.284.

Title EN	Confirmations and new challenges regarding the valorization of natural agro-industrial by-products in construction
Authors	Irina Popa, Cristian Petcu, Vasilica Vasile, Alina Dima, Daniela Stoica
Institution	<i>NIRD URBAN-INCERC</i>
Patent no.	PN 23 35 02 01
Description	<p>In the spirit of concerns supported at national and international level, for the development of sustainable, high-performance construction materials that can be integrated into the Romanian circular economy, the work underlines the high potential of valorization in construction of two local agro-industrial by-products: sunflower seed husks and rice husks. The paper exemplifies, on the one hand, confirmations in this sense, presenting experimental results regarding the valorization of sunflower seed husks by obtaining products with an average thicknesses of only 5 mm, with a finishing role in constructions, heat-insulating properties and low impact on indoor air quality, by reducing Total Volatile Organic Compounds emissions, and on the other hand, results of preliminary experimental research on the potential of using rice husks in construction, as new challenges.</p> <p>The rice husks are also recommended to be used in this field, because of its thermal conductivity, fire behavior and reduced water absorption capacity.</p> <p>Due to the predominantly agrarian character of the national economy, such kind of valorization of the rice husks is an opportunity to address the environmental challenges generated by this natural agro-industrial by-product, contributing to the sustainable development of the built environment and of the Romanian circular economy.</p>

RO.285.

Title EN	Acoustic barrier - sound-absorbing and insulating layered panel, a solution against the noise for highways and for streets in urban areas
Authors	Marta Cristina ZAHARIA
Institution	NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT IN CONSTRUCTIONS, URBANISM

AND SUSTAINABLE SPATIAL DEVELOPMENT
URBAN-INCERC

Patent no.

122864 /30.03.2010

In *Building Physics* the domain of *Urban Acoustics* is a special one, which gives solutions for designing an urban area such as to be with a good urban acoustical configuration and to help people to live in acoustically comfortable conditions inside that urban area.

The invention, Patent nr. 122864 /30.03.2010, relates to *an acoustic barrier - sound-absorbing and insulating layered panel* - which was created for mounting along highways and traffic arteries road and / or rail roads in urban areas, to protect by forming the *acoustic shadow* against noise from the vehicle in the vicinity of the inhabited areas.

Description

The problem solved by the invention is to create a layered sound insulating and sound absorbing panel, which can *increase simultaneously* the percentage of *insulation and sound absorption* characteristics, due to the shape and type of materials and by overlapping multiple noise insulating and soundproofing materials.

The conclusion is that by applying the invention, the following advantages are obtained:

- A decrease by 15...30 dB the noise from road traffic and/or rail traffic, to the receiver (people inside buildings that are bordering the roads);
- A decrease by 2...6 dB the noise from road traffic and/or rail traffic, to the driver of a traffic vehicle that circulates on the road, comparing to the case with a *not absorbent* noise barrier panel bordering a road;
- Resistance to the weather elements (ie. rain, snow);
- High resistance to mechanical shock;
- A very natural pleasant aesthetic aspect.

RO.286.

Title EN

THE IMPACT OF ARTIFICIAL INTELLIGENCE IN THE CONSTRUCTION INDUSTRY

Authors

RUS Mircea-Iosif, AIVAZ Kamer Ainur

Institution

NIRD URBAN-INCERC Cluj-Napoca Branch

Patent no.

Project no. PN 23 35 05 01

Description

Artificial Intelligence (AI) is having a significant impact in

the construction industry, bringing several important benefits and changes. Overall, the implementation of artificial intelligence in construction can bring several benefits, such as reduced costs, improved efficiency and sustainability, and increased safety on the construction site. However, it is also important to consider the challenges and risks associated with the use of AI in this field, such as data security and the impact on traditional workplaces.

Thus, the use of AI in construction brings with it certain risks and concerns that need to be considered during implementation.

To manage these risks, it is crucial that construction companies take a proactive approach to data security, ethics, and legal compliance, invest in staff training, and promote a culture of transparency and accountability in the use of AI technologies in construction.

RO.287.

Title EN	THE INFLUENCE OF AGGREGATES ON THE PHYSICO-MECHANICAL PERFORMANCE OF ALKALI ACTIVATED FLY ASH GEOPOLYMER COMPOSITES
Authors	LĂZĂRESCU Adrian-Victor, HEGYI Andreea, CSAPAI Alexandra, POPA Florin
Institution	NIRD URBAN-INCERC Cluj-Napoca Branch
Patent no.	Project no. PN 23 35 05 01
Description	The aim of this study is to explore the effects of mixing different aggregates with an alkali activated fly ash geopolymer binder in composite materials. These aggregates are sourced from either recycled waste (glass waste, spent garnet) or quartz aggregates, each being characterized by a different granulation that influences the basic physico-mechanical properties of the material.

RO.288.

Title EN	INNOVATIVE SUSTAINABLE SOLUTIONS TO SUPPORT THE IMPLEMENTATION OF EMERGING TECHNOLOGIES THROUGH THE DEVELOPMENT OF ADVANCED, ECO-SMART COMPOSITE MATERIALS
Authors	LĂZĂRESCU Adrian-Victor, CSAPAI Alexandra, IONESCU Brăduț-Alexandru, CHIRA Mihail, RUS Mircea-Iosif

Institution	NIRD URBAN-INCERC Cluj-Napoca Branch
Patent no.	Project no. PN 23 35 05 01
Description	The novelty of the solutions proposed in the project derives on the one hand from the multi and transdisciplinary approach of a research field still in the avant-garde phase at the non-interaction level, and on the other hand from the ambitious design of the combination of two characteristics, one of the "smart" type - self-maintenance and self-cleaning capacity, and the other of the "eco-friendly" type - cement-free material with low environmental impact, obtained by alkaline activation of industrial wastes and by-products, and last but not least, by targeting high durability performance (especially in terms of resistance to microbiological corrosion), all with an impact both on increasing national skills and visibility and on creating the right framework for mobilising entrepreneurship towards innovation and providing products of excellence.

RO.289.

Title EN	CRITICAL ANALYSIS OF THE REHABILITATION OF STRUCTURAL ELEMENTS IN ROMANESQUE ARCHITECTURE BUILDINGS IN TRANSYLVANIA
Authors	Anamaria BOCA, Tudor Panfil TOADER, Călin G.R. MIRCEA, Carmen DICO, Andreea MIRCEA, Ioana Camelia TIȘE
Institution	NIRD URBAN-INCERC, Cluj-Napoca Branch / Technical University of Cluj Napoca / Babeș-Bolyai University
Patent no.	WOXXX12345 / Patent application No. XXXX/2020
Description	The Romanesque architectural structures in Transylvania include churches, fortified churches, monasteries, citadels, and castles. These buildings were strategically located in elevated areas during construction and were surrounded by strong, towering walls. The Romanesque churches follow the basilica architectural style, which includes three naves. Challenges in their rehabilitation arise from limited or virtually absent contemporary documentation, imprecise dating, and significant alterations or interventions over time, posing obstacles to the restoration process. Rebuilding resistance structures requires knowledge of the design and construction details of a building's structural assembly.

The rehabilitation of Romanesque buildings' resistance structures is carried out in two stages: the structural diagnostic stage and the structural remedial stage

The structural diagnosis includes the knowledge of the design of the structural resistance units of the components, the details of the composition and the architectural sub-assemblies in the vicinity of the structural units, such as anchors, floor details, installations, water channel networks, mechanical properties of the foundation soil, etc... This phase includes the identification of the building materials, the traditional building techniques, the structural defects and their causes, the resistance tests and the identification of the necessary structural interventions.

Structural restoration means preserving the structural requirements proposed by the structural interventions carried out, which must be minimal in order to deliver the historical messages conveyed in the most authentic way.

RO.290.

Title EN	Incorporating recycled aggregates and TiO₂ nanoparticles for sustainable improvement of cementitious composites
Authors	Carmen FLOREAN, Horațiu VERMEȘAN Alexandra CSAPAI, Andreea HEGYI, Brăduț IONESCU, Toader TUDOR,
Institution	NIRD URBAN-INCERC Cluj-Napoca Branch
Patent no.	PN 23 35 05 01
Description	The responsible use and exploration of essential resources such as land, energy, water, and air are closely linked to the urgent global challenge of climate change. This study explores sustainable options within cement production, specifically the replacement of natural aggregates with recycled waste and the incorporation of TiO ₂ nanoparticles and aims to gain a comprehensive understanding of how these factors influence the physico-mechanical properties of cementitious composites. The cementitious composites were formed using locally sourced raw materials, including Portland Cement, Natural Aggregates (NA), Recycled Ceramic Brick Aggregates (RBA), Blast Furnace Slag Aggregates (BFS), and Recycled Textolite Waste Aggregates (RTA). While aggregate replacement has a significant effect on the compressive strength, the incorporation of TiO ₂ nanoparticles shows variable effects. The positive influence

of recycled aggregates on abrasion resistance, further enhanced by TiO₂, highlights the potential for sustainable improvements in the properties of cementitious composites.

RO.291.

Title EN	PROMOTING CARBON STORAGE IN CONCRETE PRODUCTION: EXPLORING PRE-CARBONATION STRATEGIES FOR IMPROVED SUSTAINABILITY
Authors	Ioan Nicolae SCURTU, Iulia Maria Felicia ILIE, Tudor Panfil TOADER, Călin G.R. MIRCEA, Carmen DICO, Andreea MIRCEA
Institution	NIRD URBAN-INCERC, Cluj-Napoca Branch / Technical University of Cluj Napoca
Patent no.	WOXXX12345 / Patent application No. XXXX/2020
Description	<p>In view of the pressing environmental concerns arising from significant greenhouse gas emissions and the escalating demand for concrete-based materials, there is an urgent need to develop a blueprint for the promotion of a climate-friendly concrete industry. Extensive research efforts are underway to explore effective strategies for reducing the carbon footprint of the concrete sector, with a particular focus on CO₂ storage through accelerated carbonation processes.</p> <p>Previous research has focused on using carbon dioxide (CO₂) to improve the properties of recycled concrete aggregates, fly ash and slag. Alternatively, CO₂ has been incorporated into concrete primarily through accelerated carbonation processes applied to fresh or hardened concrete, although this technique is constrained by the limited diffusion of CO₂ within the concrete matrix. Aiming to overcome these limitations of existing strategies, this study investigates pre-carbonation by direct use of gaseous CO₂ in the fresh concrete mix. In this method, an aqueous carbonation treatment is used in the first step to ensure the absorption of CO₂ by immersing the aggregates in a liquid mixture into which gaseous CO₂ is injected. In the second step, the aggregates are mixed with the remaining ingredients, using the liquid mixture with gaseous CO₂ as an additive at different concentrations in the fresh concrete mix. The impact of this method was studied in order to increase both the carbonation speed/storage and the compressive strength of concrete.</p>

RO.292.	
Title EN	Designing masonry elements from traditional sustainable materials
Authors	Aurelia BRADU, Adrian-Alexandru CIOBANU, Marius MÂRȚ, Ștefania-Mădălina RUSU, Cristian PETCU, Alexandrina-Maria MUREȘAN, Cristian GRIGORAȘENCO
Institution	National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN - INCERC”, Iasi Branch
Patent no.	PN 23 35 03 01
Description	The general objective of the project aims to open new directions of research and development studies dedicated to increase the community resilience to extreme environmental actions. It focuses on decarbonizing the construction sector amidst climate change challenges, while also leveraging sustainable resources from traditional, local materials for essential construction needs. Traditional local materials are recognized as eco-friendly options with significant potential, particularly for economically disadvantaged communities in Romania. The project seeks to identify practical solutions for using these materials that are both environmentally sustainable and financially accessible, aiming to improve energy efficiency and ensure the safety of citizens against environmental, climatic, and seismic threats

RO.293.	
Title EN	Clay – Sustainable local building material
Authors	Marius MÂRȚ, Aurelia BRADU, Adrian-Alexandru CIOBANU, Ștefania-Mădălina RUSU, Ionel PUȘCAȘU
Institution	National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN - INCERC”, Iasi Branch
Patent no.	PN 23 35 03 01
Description	<p>The main raw materials used to make traditional constructions are earth (soil), stone, wood, aggregates and some plant or animal waste. Clay soil is composed of clay, sand, silt, water, air, etc. Stratification is based on specific gravity and grain size.</p> <p>Clay is a sedimentary rock, whose main ingredient is aluminum silicate (kaolinite) with a colloidal appearance and agglutinating properties.</p>

The main characteristic of clay is the ability to absorb water in large quantities, thus turning into a pasty, ductile mass, easy to shape into any shape. The more fat clay the soil contains, the more moldable it is. The sandier (weaker) the clay is, the less suitable the soil is for modeling.

Using clay as a building material has many advantages, such as: it balances air humidity, maintains heat, saves energy and reduces environmental pollution, is reusable, reduces costs for materials and transport, is suitable for self-built houses, absorbs polluting agents.

RO.294.

Title EN	Experimental research methods for the development of complex certification systems
Authors	Ștefania-Mădălina RUSU, Aurelia BRADU, Adrian-Alexandru CIOBANU, Marius MÂȚ, Ionel PUȘCAȘU, Andreea HEGYI, Adrian Lăzărescu
Institution	National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development „URBAN - INCERC”, Iasi Branch
Patent no.	PN 23 35 03 01
Description	The successive, simultaneous, or combined method represents different approaches in laboratory experimental research for environmental action certification. Method IHS 1 focuses on successive tests under individual environmental actions, while method IHS 2 involves the simultaneous application of these actions. Method IHS 3 combines successive, simultaneous, or combined tests based on the specific requirements and expertise of specialists. The common goal of these methods is to certify the product or solution, ensuring compliance with quality standards and environmental safety. Methods IHS 1 and IHS 2 are based on requirements established in standards or technical documents, while method IHS 3 offers flexibility for cases where there is no rigid framework defined.

RO.295.

Title EN	Study for Integrating Steel Furnace Slags (SFS) in Construction Materials as Sustainable Solution for Aggregate Replacement
Authors	Baeră Cornelia, Vasile Ana-Cristina, Gruin Aurelian, Bolborea Bogdan, Ion Alexandru
Institution	NIRD URBAN-INCERC Timisoara

Description Slags, by-products or wastes generated by the ore smelting processes, are mixtures containing mainly metal oxides and silicon dioxide. Slags are of various types (ferrous, ferroalloy or non-ferrous), but slags generated by iron and steel-making industry are usually considered recycling options for construction industry. The present research considers the valorization of steel furnace slags, specifically the electric arc furnace slags (EAF), produced and stored in the western part of Romania, in Reșița, Caraș-Severin County. The slag deposits were present on this site since 1771, due to cast iron production in Caraș-Severin County. The current study preliminarily evaluates the possibilities of integrating some SFS slags samples of Caraș-Severin County as a partial substitute of aggregate in cementitious materials. This integration is considered an initial step for further increase of the industrial by-product added value, by evaluating possibilities of use in products for construction industry. The initial results shows the viability of the concept applied to the Reșița, Caraș-Severin County slag landfill, encouraging future exploration of this environmental engineering topic.

Acknowledgement:

This work was carried out within Nucleu Programme of the National Research Development and Innovation Plan 2022-2027, supported by MCID, "ECODIGICONS" project no. PN 23 35 04 01: "Fundamental-applied research into the sustainable development of construction products (materials, elements, and structures, as well as methods and technologies) that utilizes current national resources to enhance the eco-innovative and durable aspects of Romania's civil and transport infrastructure", financed by the Romanian Government.

RO.296.

Title EN

Preliminary studies on the use of clay materials (compositional matrix) in construction products

Authors

Gruin Aurelian, Baeră Cornelia, Vasile Ana-Cristina, Bolborea Bogdan, Ion Alexandru

Institution

NIRD URBAN-INCERC Timisoara

Patent no.

-

This research project analysis poured earth construction, presenting it as a promising eco-friendly alternative to conventional cement-based materials. By utilizing earth material bonded by clay particles, this technique mimics natural concrete, offering a slew of environmental advantages including recyclability and effective hygrothermal regulation. The process involves pouring a mix of local earth, sand, gravels, and/or portland cement or alternative additives into formworks to create both load-bearing and non-loadbearing structures. Despite its sustainability potential, challenges such as shrinkage control and durability remain hurdles to overcome.

The incorporation of dispersants in earth compositions has shown promising results in terms of settlements and mechanical strengths, warranting further investigation into the optimal water/dispersant percentage. Additionally, preliminary tests suggest that lignin plays a stabilizing role, enhancing strengths, with potential for further exploration into different percentage variations and combinations with other additives.

Description

In light of these findings, continued research efforts are essential to evaluate the capabilities of earth compositions and materials, particularly in meeting strength requirements for various construction applications. This ongoing research will provide valuable insights into the suitability and potential utilization of earth-based materials in diverse construction scenarios.

Acknowledgement:

This work was carried out within Nucleu Programme of the National Research Development and Innovation Plan 2022-2027, supported by MCID, "ECODIGICONS" project no. PN 23 35 04 01: "Fundamental-applied research into the sustainable development of construction products (materials, elements, and structures, as well as methods and technologies) that utilizes current national resources to enhance the eco-innovative and durable aspects of Romania's civil and transport infrastructure", financed by the Romanian Government.

RO.297.	
Title EN	Landscape permeability analysis in the Ramnicu Valcea metropolitan area
Authors	Antonio-Valentin TACHE, Oana-Cătălina POPESCU, Cristina IVANA, Adrian SIMION
Institution	Research and Development in Construction, Urban Planning and Sustainable Territorial Development National Institute „URBAN-INCERC”
Patent no.	-
Description	The objective of this presentation is the implementation of an innovative methodology for identifying the connectivity of green-blue areas and the design of green-blue infrastructure at the level of the metropolitan area of Râmnicu- Vâlcea
RO.298.	
Title EN	A comprehensive improvement of blue-green infrastructure concepts
Authors	Antonio-Valentin TACHE, Oana-Cătălina POPESCU, Cristina IVANA, Gabriela VOLOACĂ
Institution	Research and Development in Construction, Urban Planning and Sustainable Territorial Development National Institute „URBAN-INCERC”
Patent no.	-
Description	Identification of areas of greatest ecological value - wetlands, rivers, lakes, primary forests, critical recharge areas, intact cores with high potential for biodiversity, marine areas and estuarine and connecting areas with the highest cultural and scenic values.
RO.299.	
Title EN	THE RELEVANCE OF ACTIVE MOBILITY IN THE STUDY OF ACCESSIBILITY FOR URBAN GREEN AND BLUE INFRASTRUCTURE IN ROMANIA
Authors	Teodora UNGUREANU, Andreea Cătălina POPA
Institution	The National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC
Patent no.	-
Description	The study investigates the potential of active mobility to play an important role in the research on accessibility for green and blue infrastructure in Romanian cities. We consider active mobility activities that include walking, cycling, and

other human-powered forms of transportation.

Our objective is to provide a technique for evaluating accessibility by examining the different advantages of active mobility, including the type of active mobility, the required infrastructure, and the outcomes. Romanian urban areas present potential for developing and growing green and blue infrastructure; the presence of green spaces, woods, rivers, and coasts inside these cities presents a substantial opportunity for the promotion of tourism and recreational pursuits. Implementing active mobility infrastructure, such as walking and cycling routes, can benefit not only local communities but also tourists and outdoor enthusiasts, boosting local economies and encouraging sustainable healthy practices.

Our research findings indicate that active mobility has the potential to significantly contribute to the improvement of connectivity within Romania's green and blue infrastructure. Studies have shown that the positive impact was seen in different domains such as public health, pollution reduction, improved accessibility, support for tourism and recreation, the creation of connections between natural spaces, and the mitigation of climate change impacts.

We conclude that investments in improving active mobility in Romanian cities are not only beneficial to individuals' general well-being, but may also play an important role in the development of sustainable, resilient, and livable communities.

**National Institute of Research & Development for
Technical Physics, Iasi**

RO.300.	
Title EN	ECOLOGICAL METHOD OF PREPARING CAVITARY NANOPARTICLES OF NOBLE METAL
Authors	D.D. Herea, N. Lupu, H. Chiriac, G. Stoian, O.G. Dragoș-Pinzaru, G. Buema, C. Staviilă, M. Grigoraș, L. Lăbușcă, C.M. Zară, A.E. Minuti, G. Ababei, D. Gherca
Institution	National Institute of Research & Development for Technical Physics
Patent no.	Patent application No.: OSIM - A/00290 / 09.06.2023 and WIPO - PCT/RO2023/000014
Description	<p>The invention refers to an ecological method for the synthesis of cavitation noble metal particles, functionalized on the surface with natural molecules. The method involves individually coating some magnetic nanoparticles with a noble metal to form a "core-shell" type particle, mixing the core-shell nanoparticles with a natural acidic compound and partially or completely removing the magnetic core to obtain noble metal cavity nanoparticles coated with biocompatible natural molecules. In different cases, the diameter of the cavity particles can vary between 5 nm and 100 nm, being able to reach micrometric dimensions, e.g., 20 μm, in function of the size of the magnetic cores.</p> <p>Particularly magnetic can be naturally ferromagnetic, ferrimagnetic or antiferromagnetic. In some cases, the magnetic core may consist of magnetite, maghemite, hematite, ferrihydrite, wustite, lepidocrocite, goethite, iron, nickel, cobalt, nickel ferrite, manganese ferrite. The magnetic core of the magnetic particle may have a diameter between 3 nm and 10 μm.</p> <p>The noble metal coating can be between 1 nm and 1 μm thick. In most cases, the thickness can vary between 2 nm and 20 nm. In some situations, the cavity nanoparticle can be activated by a reactive site of a biomolecule, for example a thiol group in the case of gold nanoparticles.</p> <p>The magnetic core is partially or completely removed with an acidic extract of lemon or another acidic extract of a natural product. Biomolecules are provided by the natural juice and can be limonoids, flavonoids, carotenoids, vitamins such as ascorbic acid, folic acid, etc.</p>

RO.301.	
Title EN	“Core-shell” type Ce(FeCo)B/FeCo nanoparticles and their preparation procedure
Authors	Marian Grigoras, Dumitru-Daniel Herea, Mihaela Lostun, Nicoleta Lupu
Institution	National Institute of Research & Development for Technical Physics
Patent no.	Patent application No.: RO20210000723 20211202 OSIM - A/00723 / 02.12.2021
Description	<p>The invention refers to a process for the preparation of new Ce(FeCo)B/FeCo “core-shell” nanopowders based on the coating of nanometric particles Ce(FeCo)B as “core” with a film of FeCo as “shell” by chemical co-precipitation.</p> <p>The co-precipitation reaction involves the introduction of two main ingredients into a reaction medium maintained at a constant temperature. The first main ingredient consists of the Ce₁₄Fe₇₆Co₄B₆ "core" particles with a size below 150 nm prepared previously by mechanical grinding of precursor nanocrystalline strips in liquid nitrogen. The second ingredient consists of a mixture of ferrous chloride and cobalt acetate, in a ratio that allows the composition of the FeCo "shell" layer to be controlled. Both ingredients are transferred over a certain volume of ethylene glycol preheated to a certain temperature. The vessel in which the ethylene glycol is located is in an ultrasound bath that has the role of dispersing particles to be coated.</p> <p>The reaction is activated by adding solid NaOH as a precipitating agent, followed by mechanical stirring and continuous ultrasonication for a well-established reaction time by which the thickness of the FeCo layer will be controlled. The final step consisted of magnetic separation and washing the obtained particles with ethyl alcohol and subsequent drying in an oven.</p> <p>Obtaining the “core-shell” type structure for the Ce(FeCo)B/FeCo powders results in achieving a strong exchange coupling between the core and the shell, increasing the saturation magnetization and implicitly the energy product (BH)_{max}.</p>

Regional Institute of Gastroenterology and Hepatology Cluj-Napoca

RO.302.	
Title EN	Method for Obtaining A Prototype with Applications in Pancreatic and Colon Cancer Immunoprophylaxis.
Authors	Iancu Cornel, Matea Cristian, Mocan Lucian, Mocan Teodora
Institution	Regional Institute of Gastroenterology and Hepatology „Prof. Dr. O. Fodor”, Cluj-Napoca, Romania
Patent no.	131850 / 2020
Description	The invention relates to a process for preparing a carcinoembryonic product to be applied in pancreatic and colonic cancer immunoprophylaxis. According to the invention, the process consists in that, in the first stage carboxylated carbon nano- tubes of MWCNT type are obtained, after which they are functionalized by covalent binding with the carcinoembryonic antigen, the so-functionalized nanostructures are subjected to successive stages of centrifugation and redispersion by ultrasound treatment in double distilled water, for removing the secondary reaction products.
RO.303.	
Title EN	Process for Obtaining Biofunctionalized Nanostructures with Applicability in Photothermal Therapy Of Tumors.
Authors	Mocan Lucian- Constantin, Iancu Cornel, Matea Cristian-Tudor, Ilie Ioana- Rada, Mocan Teodora.
Institution	Regional Institute of Gastroenterology and Hepatology „Prof. Dr. O. Fodor”, Cluj-Napoca, Romania „Iuliu Hatieganu”University of Medicine and Pharmacy , Cluj-Napoca, Romania.
Patent no.	130737 / 2020
Description	The invention relates to a process for preparing a product to be applied in the photothermal therapy of hepatic tumours. According to the invention, the process consists in that the gold nanoparticles - GNP - are prepared in an aqueous medium and stabilized with citrate, after which they are functionalized with beta-mercaptoethanol, at a neutral pH, at the room temperature, for 15 min. The thus functionalized gold nanoparticles are then subjected to successive stages of centrifugation and redispersion by ultrasonication in bidistilled water, for removing the secondary reaction products.

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering

RO.304.

Title EN	Development of the biological approach for Holmium(III), Erbium(III), and Gadolinium(III) recovery from wastewater
Authors	Inga Zinicovscaia ^{1,2,*} , Liliana Cepoi ³ , Ludmila Rudi ³ , Tatiana Chiriac ³ , Dmitrii Grozdov ²
Institution	¹ Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering, Magurele, Romania ² Joint Institute for Nuclear Research, Dubna ³ Institute of Microbiology and Biotechnology, Technical University of Moldova, Chisinau, Moldova
Description	Rare-earth elements (REEs) are released into the aquatic environment as a result of their extensive use in industry and agriculture, and can be harmful for living organisms. The uptake of gadolinium(III) (one of the most studied REEs), holmium(III), and erbium(III) (two less well-examined elements) by the cyanobacterium <i>Arthrospira platensis</i> was evaluated. According to the results of the neutron activation analysis, <i>Arthrospira. platensis</i> demonstrated a relatively high accumulation capacity for the studied metal ions, which were in the following order: gadolinium(III) > holmium(III) > erbium(III). The accumulation of gadolinium(III) did not provoke a significant impact on the biomass productivity or content of proteins, chlorophyll a, and β -carotene. The maintenance of the mentioned parameters on the level of the control biomass indicated the satisfactory physiological state of the culture under the conditions of contact with different concentrations of gadolinium(III). At the same time, important quantitative changes occurred in the content of carbohydrates and phycobiliproteins. The changes in these two parameters in <i>Arthrospira platensis</i> were associated with stress, or at least with a significant external impact. In the cases of erbium (III) and holmium(III), a decrease in the biomass productivity and the content of phycobiliproteins and an increase in the content of carbohydrates indicated the potential toxic effects of lanthanides. <i>Arthrospira platensis</i> can be applied for the remediation of water containing REEs in concentrations that do not cause toxic effects on biomass.

RO.305.

Title EN	<i>Accumulation and translocation of copper and gold nanoparticles in <i>Petroselinum crispum</i> segments under root irrigation conditions</i>
Authors	Inga Zinicovscaia ^{1,2*} , Alexandra Peshkova ^{1,3} , Liliana Cepoi ⁴ , Ludmila Rudi ⁴ , Tatiana Chiriac ⁴ , Nikita Yushin ^{1,3}
Institution	¹ Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering, Magurele, Romania ² Joint Institute for Nuclear Research, Dubna ³ Doctoral School Biological, Geonomic, Chemical and Technological Science, State University of Moldova, Chisinau, Moldova ⁴ Institute of Microbiology and Biotechnology, Technical University of Moldova, Chisinau, Moldova
Description	<p>The application of metal nanoparticles in the industry and medicine results in their release into the environment which can have a negative impact on human health. The effects of gold (AuNPs) and copper (CuNPs) nanoparticles at the concentration range of 1-200 mg/L on parsley (<i>Petroselinum crispum</i>) under conditions of root exposure and the translocation in roots and leaves were investigated in a ten-day experiment. The content of copper and gold in soil and plant segments was determined using ICP-OES and ICP-MS techniques, while the morphology of nanoparticles was analyzed using transmission electron microscopy. Differences in the nanoparticle uptake and translocation were observed: CuNPs mainly accumulated in soil (4.4-465 mg/kg), while accumulation in the leaves was at the control level. AuNPs mainly accumulated in soil (0.04 -108 mg/kg) followed by roots (0.05-45 mg/kg) and leaves (0.16-53 mg/kg). The influence of AuNPs and CuNPs on the biochemical parameters of parsley was on the content of carotenoids, the levels of chlorophyll, and antioxidant activity. Application of CuNPs even at the lowest concentration led to a significant reduction of carotenoids and total chlorophyll content. AuNPs at low concentrations promoted an increase in the content of carotenoids, however, they also significantly reduced it at concentrations higher than 10 mg/L. To our knowledge is the first study of the effect of metal nanoparticles on parsley.</p>

„Petru Poni” Institute of Macromolecular Chemistry, Iasi

RO.306.	
Title EN	Original alternative approach in tailoring coexistent photo/piezo-actuation on polyimides substrates for flexible/stretchable electronics and sensors
Authors	Iuliana Stoica, Ion Sava, Cristian Ursu, Andreea Irina Barzic, Raluca Marinica Albu, Mihai Asandulesa, Irina Butnaru, Diana Diaconu
Institution	„Petru Poni” Institute of Macromolecular Chemistry, Iasi
Patent no.	PN-III-P1-1.1-TE-2021-1044
Description	<p>Futuristic technologies are currently envisioning production of flexible electronics devices involving circuits that can bend and stretch, affording outstanding adaptability to applications like consumer electronics. Following the prospect of low-cost and low-time consuming fabrication processes, the project goal is to develop new flexible electronics supports based on novel high-performance supramolecular polyimide systems attained via a simple and innovative approach, leading to concomitant thermal stability, high flexibility and resistance, adequate morphological features, good adhesion to metals and inks, resistance to solvents, good photochromic behavior, improved dielectric and piezoelectric properties. A significant contribution of the project relies on elaboration of patterning procedures, associated in an authentic manner. Fundamental insights are given on the mechanism of hierarchical patterns formation upon careful combination of either manageable laser irradiation/diffuse coplanar surface barrier discharge plasma exposure/directional pre-strain, to induce surface anisotropy and implicitly enhanced piezo-response. Tests are performed to check the products efficiency. Such fundamental studies will advance the knowledge in material science and engineering by using different synthesis routes and fast and facile morphology texturing approaches, enabling their applicability in flexible/stretchable electronic devices and sensors.</p>

RO.307.**Title EN****Innovative strategies to reduce optical losses through shielding polymer materials for more efficient photovoltaics****Authors**

Andreea Irina Barzic, Iuliana Stoica, Raluca Marinica Albu, Camelia Hulubei

Institution**„Petru Poni” Institute of Macromolecular Chemistry, Iasi****Patent no.**

PN-III-P1-1.1-TE-2019-1878

Description

Solar cell systems (SCSs) have arisen as a substitute to classical fuels for ‘green’ energy generation and they keep a clean environment. The energy conversion efficiency of the SCS is strongly affected by the characteristics of the device components. The project had the goal of enhancing light propagation in the upper thin layers of the SCS in superstrate configuration by ingenious design of polymer shielding layers (SLs) as alternative for traditional glass. The novel SLs are based on polyimides with properties optimized by combining antagonistic elements of cycloaliphatic/fluorinated moieties, aromatic rings and chalcogen atoms in the backbone. This is crucial to solve the issue of sharp variations in the refractive index of each layer covering the active region and thus diminishing light losses. Besides tailoring the refraction, another advantage arises from adjustment of SL morphology in order to trap a larger amount of photons in the active zone of SCS. This was attained by surface modification through an original method conceived to control the balance among the random/ordered textures for better guidance of solar radiations towards the junction. The developed technique consisted in multi-directional roughening and plasma exposure. Structural, thermal, morphological and optical analyses were undertaken to elucidate the performance of polyimide-based SLs and their impact light trapping efficiency. Project outcome rendered a competitive SCS component, which via its original design leads to considerable scientific breakthrough, while the low cost and relative facile methods enable access to consumers at affordable products of green energy production, maintaining a clean environment.

**Research Development Institute for Plant Protection
INCDPP**

RO.308.	
Title EN	METHOD AND APPARATUS FOR PREVENTING AND MONITORING PLANT DISEASES
Authors	Viorel Fătu¹, Razavan Ungurelu², Roxana Tulea², Hannelore Valkanov²
Institution	¹RESEARCH-DEVELOPMENT INSTITUTE FOR PLANT PROTECTION BUCHAREST, ROMANIA ²SYSWIN SOLUTIONS SRL
Patent no.	Patent application No. A00182/2024
Description	The invention refers to a system designed for monitoring climatic parameters involved in favoring the infection process of cereal crops with specific pathogens. The system according to the invention is an assembly consisting of a method and an apparatus capable of collecting meteorological data, processing this data, and issuing warnings regarding the degree of infection risk. The purpose of the invention is to inform users about the risk of plant illness before the appearance of disease symptoms.

RO.309.	
Title EN	Equipment and method for extraction of entomopathogenic viruses from lepidopteran larvae.
Authors	Viorel Fătu, Fatu Cristina
Institution	RESEARCH-DEVELOPMENT INSTITUTE FOR PLANT PROTECTION BUCHAREST, ROMANIA
Patent no.	Patent application No. A00122/ 2023
Description	The invention relates to equipment and a method for extracting entomopathogenic viruses from lepidopteran larvae with applicability in obtaining bioinsecticides based on entomopathogenic viruses. This method presents high efficacy, low production costs, and requires minimally qualified operating personnel. The equipment according to the invention consists of: a magnetic stirrer with temperature and rotation speed control, an enclosure for virus extraction from larvae, two microbiological air filters, an air valve, a unisens valve, a vacuum gauge, a flood protection enclosure for the vacuum pump with liquid or foam from the extraction enclosure, and a vacuum pump. The process of extracting entomopathogenic viruses from lepidopteran larvae, according to the invention, involves the movement of viral particles from inside the cells through fissures in the cell membranes during the degassing of cellular liquids through the vacuuming process in the extraction liquid.

Research and Development Station for Cattle Breeding Dancu, Iasi

RO.310.	
Title EN	Biogenic Silver Nanoparticle-Enriched Salicylic Acid Dressing for Improved Hoof Care in Cattle
Authors	Neculai-Văleanu Andra-Sabina; Ariton Adina- Mirela; Radu Ciprian; Sănduleanu Cătălina; Ioana Poroșnicu
Institution	Research and Development Station for Cattle Breeding Dancu, Iasi, Romania, 707252
Patent no.	-
Description	<p>Hoof diseases are a significant concern for cattle farmers, leading to lameness, reduced milk production, and increased susceptibility to other infections. The proposed innovative product aims to enhance hoof health in cattle by combining the established keratolytic properties of salicylic acid with the antimicrobial and anti-inflammatory effects of BSNPs, thus offering a target approach for cattle hoof health. Silver nanoparticles were synthesized using a biological method, employing a non-toxic and eco-friendly approach. Cinnamon extract was used as a reducing and stabilizing agent, resulting in biocompatible nanoparticles. The biogenic silver nanoparticles were incorporated into a salicylic acid-based dressing using a suitable formulation technique, which involved homogenization and ultrasonication to achieve a uniform dispersion of nanoparticles within the dressing. BSNPs offer a broad spectrum of antimicrobial activity against potential hoof pathogens. Additionally, can reduce inflammation associated with hoof injuries and disorders. Salicylic acid effectively promotes hoof wall shedding and debris removal. The newly designed product has the potential to improve hoof health and decrease lameness in cattle, hence lowering the need for antibiotics on farms and enhancing animal welfare.</p>
RO.311.	
Title EN	Herb & spice infused traditional cheese marinated in cold-pressed oil
Authors	Neculai-Văleanu Andra-Sabina; Ariton Adina- Mirela; Radu Ciprian; Sănduleanu Cătălina; Ioana Poroșnic; Genoveva Cojocaru
Institution	Research and Development Station for Cattle Breeding

Patent no. **Dancu, Iasi, Romania, 707252**
-

Description Romania boasts a long history of cheese production, with diverse regional specialties. The aim was to leverage this heritage by setting up synergies and collaboration with local dairy and oil producers. This project brings together the rich traditions of Romanian cheesemaking with the health benefits of cold-pressed oils to create a unique, flavorful product: herb & spice-infused (Rosmary and chili) cheese marinated in cold-pressed oil. We aimed to leverage this heritage by setting up synergies and collaboration between local dairy and oil producers. Local cheesemakers may enrich their expertise in crafting high-quality cheeses with an improved attractiveness for consumers. The product offers a delicious and innovative culinary experience and promotes the preservation of cultural heritage and foods produced locally. Additionally, it fosters collaboration between local cheesemakers and oil producers, promoting sustainable practices and supporting regional economies.

RO.312.

Title EN **Yogurt fortified with bioactive carrot powder encapsulated in white buckthorn oil**
Authors Arition Adina-Mirela, Neculai-Văleanu Andra-Sabina ; Ioana Poroşnicu
Institution **Research and Development Station for Cattle Breeding Dancu, Iasi, Romania, 707252**
Patent no. -

Description The addition of various ingredients to formulate a dairy product particularly appreciated by consumers is a constant concern for specialists in the dairy industry. The paper proposes the use of a bioactive carrot powder embedded in sea buckthorn oil in a yogurt recipe to improve its physical-chemical, textural, and sensory characteristics. The carrot is considered the perfect ally in protecting the health of the eyes because it contains carotenoids and a series of vitamins (A, B6, B7, H, K), having a potential and attractive source from a nutritional point of view. The sea buckthorn oil comes to complete the content of Omega fatty acids, antioxidants, phytosterols, carotenoids, and vitamins in this recipe, all of which have effects in the anti-inflammatory,

antibacterial, and antifungal processes. Carrot powder is in the attention of specialists because it is a very good source of vitamins and beta-carotene, and its addition to yogurt embedded in sea buckthorn oil modifies its physical-chemical, textural, and sensory properties, giving the product the possibility of introducing a product with important nutritional properties.

RO.313.

Title EN	Snacks from Moo to You: Cheese carrots
Authors	Cătălina Sănduleanu, Andra Sabina Neculai Valeanu, Roxana Nicoleta Ratu, Ioana Porosnicu, Alina Narcisa Postolache
Institution	Research and Development Station for Cattle Breeding Dancu, Iasi
Patent no.	Iasi University of Life Sciences "Ion Ionescu de la Brad"
Description	<p>-</p> <p>Cheese brings an immense variety of flavors and textures to the table. From creamy mozzarella to sharp cheddar, it is a nutritious food, being a rich source of essential nutrients such as fat, fatty acids, proteins, peptides, amino acids, vitamins and minerals. Cold-pressed Sea buckthorn oil is a unique and beneficial oil extracted from the sea buckthorn berry. Cold-pressed Sea buckthorn oil has a vibrant orange color and is packed with vitamins, antioxidants, and other beneficial compounds, particularly rich in vitamin A, vitamin E, omega-7 fatty acids, and carotenoids, including beta-carotene. The objective of this invention was to incorporate cold-pressed sea buckthorn oil from our local producers in cheese. The milk was heated to 39°C, added mesophilic cultures, calcium chloride, and rennet, were allowed the curds to settle and then removed the whey, then coated the curds with sea buckthorn oil and salt. The curds got a specific carrotish-orange color, hence the cheese carrots. Cheese packs a nutritious punch and can be a delicious way to boost overall health, even in this form, a simple snack. This new flavor combination of a functional product could appeal to adventurous eaters looking for something different.</p> <p>Potential Benefits: Increased nutritional value, interesting flavor combinations, creation of functional foods.</p> <p>Current Stage: Limited production, ongoing research.</p>

RO.314.	
Title EN	NutriBoost Spread - Hempseed and Sea buckthorn Organogel-Based System for the delivery of bioactive compounds in spreadable cheese
Authors	Cătălina Sănduleanu, Andra Sabina Neculai Valeanu, Roxana Nicoleta Ratu, Aida Albu, Vasile Maciuc, Marius Giorgi Usturoi
Institution	a) Research and Development Station for Cattle Breeding Dancu, Iasi Iasi University of Life Sciences "Ion Ionescu de la Brad"
Patent no.	-
Description	NutriBoost Spread is a spreadable cheese product that combines the creaminess of cheese with the nutritional benefits of hempseed and sea buckthorn using an organogel-based system to incorporate the oils into a gelled structure for even distribution. Hempseed oil is a highly unsaturated product that is pressed or extracted from the achenes of Cannabis, which are also a source of highly digestible protein. The essential fatty acids are well represented in hempseed oil. The omega-6 linolenic acid (18:2n-6) component is present at about 55%, and omega-3 α -linolenic acid (18:3n-3) occurs at about 20%. While most vegetable oils have at least some essential fatty acids, it is unusual to have this high amount of both in this proportion, in addition to their respective metabolic products γ -linolenic acid and stearidonic acid, thus no other industrial crop can make this claim. Organogels are semi-solid materials used in the food industry, to mimic fats and, one of the most exciting applications, to deliver bioactive compounds. The addition of organogels to cheese products allows for the exhibit of interesting organoleptic properties, such as texture, mouth-feel, and flavor. This process changes the degree of saturation and confers to these products a self-standing thermo-reversible viscoelastic structure, firmness and plasticity desired by food manufacturers and consumers.
RO.315.	
Title EN	MOO-ve Over Fungus & Pests: Natural Repellent & Antifungal Spray for Cattle based on Nanoencapsulated Neem, Clove and Lavender oil
Authors	Ioana Poroșnicu, Andra-Sabina Neculai-Văleanu, Adina-Mirela Ariton, Cătălina Sănduleanu, Luminița Ailincăi
Institution	a) Research and Development Station for Cattle Breeding

Dancu-Iasi Iasi

b) Iasi University of Life Sciences, Faculty of Veterinary Medicine

c) Iasi University of Life Sciences, Food and Animal Sciences

Patent no.

Cattle health is significantly impacted by both insects and fungi. Insects can act as pests, causing irritation, blood loss, and reduced weight gain. However, their bites also present a potential gateway for fungal infections. These complications can arise from opportunistic fungi present on the insect itself or in the environment. Understanding the interaction between insects and fungi in cattle health is crucial for developing effective management strategies to protect these animals. **Moo-ve Over Fungus & Pests** presents a novel, eco-friendly spray designed to combat fungal and pest threats using the power of natural ingredients. Our innovative formulation leverages nanoencapsulation technology to deliver a potent blend of neem, clove, and lavender essential oil, renowned for their natural pest-repellent and antifungal properties. Traditional fungicides and pest repellents often rely on harsh chemicals, raising concerns about environmental impact and potential harm to cattle. Nanoencapsulation technology further optimizes the product by improving penetration, increasing potency, and ensuring sustained release of the active ingredients. **MOO-ve Over Fungus & Pests** promises a healthier cattle population, reduced reliance on synthetic chemicals, and a more sustainable approach to animal care.

Description

Agricultural Research and Development Station Secuieni – Neamț

RO.316.

Title EN	Olivia – a new monoecious hemp variety
Authors	Lorena-Diana Popa, Alexandra-Andreea Buburuz
Institution	Agricultural Research and Development Station Secuieni – Neamț
Patent no.	00635/05.08.2021
Description	<p>The accelerated trend of market expansion and development, along with the reshaping of the global economic system, has given hemp culture, over the last years, an upward trend. Thus, the market dedicated to hemp seeds and the oil obtained from them is gaining new momentum, in the context of the increase in cultivated areas worldwide and the increase of consumer interest in the diverse and sustainable hemp products.</p> <p>To align with market requirements, a new monoecious hemp variety for seed - Olivia was created and homologated at ARDS Secuieni. It was patented in 2021 and is registered in the European Database of Plant Varieties. It is a vigorous genotype with a growing period of 130 – 140 days in seed culture and is resistant to high temperatures and diseases. As a distinguishing feature, the Thousand Kernel Weight is, on average, between 25 and 28 g, being the highest within the existing varietal conveyor on the European market. This feature is particularly important, especially for processing to obtain hulled seed, edible oil, protein flour etc., hemp seed being a rich resource in sustainable proteins and with a unique spectrum of essential fatty acids. The production potential of Olivia is very high: 1600 - 2000 kg/ha seed and 9.5 - 11 t/ha stems. Its high amount of biomass can be used as a valuable renewable raw material in the emerging sectors of the circular bioeconomy.</p> <p>Due to its ecological plasticity, Olivia is suitable for cultivation in different eco-pedo-climatic conditions from European space.</p>

National Institute for Research and Development in Tourism

RO.317.	
Title EN	GIS information tools in green-blue infrastructure connectivity analyses. Pilot study: Bucharest metropolitan area
Authors	Cristina LIXĂNDROIU, Alexandru-Ionuț PETRIȘOR, (1) National Institute for Research and Development in Tourism; (2) Ion Mincu University of Architecture and Urbanism, Bucharest, Romania; Technical University of Moldova, Chisinau, Moldova; National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC; National Institute for Research and Development in Tourism
Institution	Moldova, Chisinau, Moldova; National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC; National Institute for Research and Development in Tourism
Patent no.	N/A
Description	Green-blue infrastructure system planning successfully contributes to curbing urban sprawl and land uses affecting sustainability and green spaces. Implementation green-blue areas in large cities must account for a vision, historical and geographical context, socioeconomic issues, and governing mechanisms. Romanian periurban landscapes are under pressure and particularly important to introduce effective cooperation, design common green spaces, use green infrastructure planning tools, and increase public participation. The methodology is designed as a part of urban and territorial development of big cities, sectoral policies and financial instruments, relying on processing land use data based on landscape values, requirements of GIS tools, and correct choice of green nuclei. The analysis was carried out at regional and local levels. The results were overlapped with data on the property type to change corridors routes, so that they intersect as few private lands as possible. Finally, for a realistic assessment of connectivity, we overlapped the resulting raster with high-resolution Copernicus satellite images. Strategic spatial planning is crucial to make outdoor spaces resilient to climate change and extreme weather. A green-blue infrastructure requires integrating land management and strategic spatial planning. The main issues are collecting data, assessing their quality, and managing large amounts of data. For this reason, connectivity analyses require GIS and a good knowledge of landscape features like biodiversity and socio-economic values, connectivity issues and type of ecosystem services provided.

Institute for Research in Circular Economy and Environment "Ernest Lupan" - IRCEM

RO.318.

Title EN	Microorganism and process for obtaining some biosurfactants by biological synthesis
Authors	LAKATOS Elena-Simina, CIOCA Lucian-Ionel, STOICA Roxana-Mădălina, MOSCOVICI Mișu, NIȚĂ Sultana
Institution	Institute for Research in Circular Economy and Environment "Ernest Lupan"
Patent no.	Patent application No. A/00729/2023 The present invention refers to a process for obtaining biosurfactants of the rhamnolipid type, by biological synthesis, using the microorganism <i>Pseudomonas putida</i> ICCF 421, isolated from the nature. The technical problem that the invention solves consists in a process for obtaining rhamnolipid-type biosurfactants, by microbial synthesis, using the newly isolated bacterial strain <i>Pseudomonas putida</i> , on a mixed substrate that contains, as a carbon source, used sunflower oil, waste from food preparation, and glycerin, a byproduct of the biodiesel industry, resulting in biosurfactants containing rhamnolipid compounds. By applying the invention, the following advantages are obtained: - the isolation from nature of a new rhamnolipid-type biosurfactant-producing microorganism, identified by the Rep-PCR method as the bacterial species <i>Pseudomonas putida</i> , included in the Collection of Microorganisms of Industrial Importance CMII-ICCF-WFCC 232, with the identification number ICCF 421, as well as within the International Depository Authority NCAIM in Budapest, Hungary (National Collection of Agricultural and Industrial Microorganisms, Institute of Food Science and Technology), with registration number NCAIM P (B) 001516. - obtaining by biological synthesis rhamnolipids with biosurfactant activity, using the microorganism <i>Pseudomonas putida</i> ICCF 421, which contain rhamnose (1-3%) and lipids (10-12%). - the utilization of sunflower oil waste resulting from food preparation, as well as glycerin resulting as a by-product from the biodiesel industry. Therefore, the present invention describes obtaining biosurfactants of the rhamnolipid type by utilization of waste vegetable oils and glycerin, using the newly isolated microorganism <i>Pseudomonas putida</i> ICCF 421.
Description	

Romanian Research & Development Institute for Gas Turbines COMOTI

RO.319.	
Title EN	Polycarbureted Annular Combustion Chamber with Vaporization
Authors	Cârlănescu Răzvan, Silivestru Valentin, Prisecaru Tudor, Cârlănescu Cristian, Mangra Andreea Cristina, Floean Florin Gabriel, Kuncser Radu Eugen, Enache Marius Ștefan
Institution	COMOTI - Romanian Research & Development Institute for Gas Turbines
Patent no.	RO135478
Description	The invention relates to a polycarbureted annular combustion chamber with vaporization, used in the field of gas turbochargers with liquid and gaseous fuels. According to the invention, the combustion chamber is comprised in a turbocharger with a centrifugal compressor with an axial diffuser, with the housing of a chamber for burning and discharging flue gases into an axial turbine, the ignition being provided by a spark plug and it consists of an outer annular wall, on which there are some vaporizers through which the liquid fuel brought through an annular fuel rail is introduced and distributed to each vaporizer through some feeding and flow calibration pipes, a front wall to which an annular rail is attached by welding and distributes the gaseous fuel through some holes, positioned in front of each vaporizer, having attached a radial duct, which distributes the gaseous fuel through a single hole positioned in front of the spark plug, the primary combustion air being introduced through some tangential slots placed on the outer wall and through some tangential slots located on an inner annular wall.
RO.320.	
Title EN	Aircraft Engine with Horizontally Arranged Cylinders
Authors	Panaitescu Costin, Dediu Gabriel, Catană Răzvan Marius
Institution	Romanian Research & Development Institute for Gas Turbines COMOTI
Patent no.	Patent application No. RO 137511 A0 / 2023
Description	The invention is referring to a new design of an internal combustion engine with horizontal arrangement of cylinders, an aeronautical piston engine type equipped with a propeller

for aviation application, with six horizontal cylinders, a reduction gear and with a specific oscillating system for converting the translational movement of the pistons into the rotational movement of the propeller shaft. The invention is defined by a specific design and technical solution of horizontally arranged cylinders, a specific oscillating system for converting the translational motion into rotation motion by removing the classical crankshaft and a specific rotary cam distribution system.

RO.321.	
Title EN	Fixed-wing U.A.V. with vertical takeoff/landing system with tri-rotor propulsion system and method of intercepting the specific sound emitted by thermal engine-powered chainsaw
Authors	Tiberius-Florian FRIGIOESCU, Gabriel-Petre BADEA, Victoraş-Florentin ANGHEL, Grigore CICAN, Mihaela-Raluca CONDRUZ, Marius-Adrian DIMA
Institution	Romanian Research & Development Institute for Gas Turbines COMOTI
Patent no.	Patent application No. A/00305/2023
Description	The present invention refers to a fixed-wing drone that incorporates an innovative tri-rotor system with vectorization capabilities, enabling both vertical takeoff and landing as well as forward flight propulsion. It has been designed as a flying wing, involving the elimination of the tail, which result in the transformation of ailerons into elevons, control surfaces serving the functions of both elevators and ailerons. To enhance the drone's stability, winglets have been introduced with the purpose of eliminating vortex production at the wingtips. The mission of this aircraft is to identify illegal deforestation by equipping it with an artificial intelligence system capable of detecting the specific noise of a thermal powered chainsaw. To achieve this, the drone has been equipped with sensitive microphones to detect the sound and a high-performance camera capable of capturing and recording the identified areas and transmitting to authorities. All of the mentioned functions can be performed autonomously with the assistance of the onboard autopilot.

RO.322.

Title EN	Combustion chamber with premix, swirl and primary dilution
Authors	Enache Marius Ștefan, Prisecaru Tudor, Silivestru Valentin, Cărlănescu Răzvan, Mangra Andreea Cristina, Florean Florin Gabriel, Kuncser Radu Eugen
Institution	COMOTI - Romanian Research & Development Institute for Gas Turbines
Patent no.	RO137923
Description	The present invention relates to a premix, swirl and primary dilution combustion chamber used in the field of gas turbines that are using gaseous fuels, in particular hydrogen, in which the fuels are represented by gas mixtures with high burning rates.

Research and Innovation Center for CBRN Defense and Ecology

RO.323.	
Title EN	Unmanned aerial system for hazardous chemical and radiological agents' detection
Authors	Raluca-Elena Ginghină, Alexandru Cristea, Nicoleta Petrea, Sorina Băjenaru, Adriana Bratu, Constantin Toader
Institution	Research and Innovation Center for CBRN Defense and Ecology
Patent no.	-
Description	<p>Unmanned aerial system for hazardous chemical and radiological agents' detection (UAS-CBRN-Det), represents a set of equipment that provides information about the CBRN situation in the area of responsibility by performing the detection, identification and assessment of CBRN dangers from the air or from the ground, on equipment or installations; quickly collects and transmits information specific to a CBRN incident by using the communications and IT system; ensures the protection of the force by adopting measures to prevent or reduce exposure to CBRN agents, applying prophylactic measures in order to prevent or reduce negative psychological effects on personnel, ensuring the protection of vital equipment for the performance of missions; and allows the confirmation of the completeness of the chemical and radioactive decontamination carried out and implicitly the confirmation of the restoration of combat capacity.</p> <p>UAS-CBRN-Det main elements consist of the octacopter type flying machine, RAID-M chemical warfare agent detector (Bruker Detection Corporation, Germany), AP4C chemical warfare agent detector (PROENGIN SAS, France), integrated radiological detection module, with detector integration and data transmission capabilities. The newly developed integrated module receives and transmits data from chemical warfare agent and radiation detectors and consists of radiation detector, GPS receiver, LIDAR device, communication module, dedicated software application and accumulator batteries.</p> <p>UAS-CBRN-Det is a technology validated in relevant environment, maturity level in 2023.</p>

RO.324.	
Title EN	Robotic ground vehicle for chemical, biological and radiological decontamination
Authors	Raluca-Elena Ginghină, Alexandru Cristea, Adriana Bratu, Nicoleta Petrea, Liliana Rece
Institution	Research and Innovation Center for CBRN Defense and Ecology
Patent no.	-
Description	<p>Robotic ground vehicle for chemical, biological and radiological decontamination (STR-RBC), through its functional components and performance characteristics, is a system that ensures chemical, biological and radiological decontamination of surfaces, vehicles or land, without the operator entering the contaminated environment.</p> <p>The factors that were the basis of the development of this product were the reduction of personnel exposure to highly toxic environments and the reduction of the level of psychological stress due to being equipped with personal protective equipment and carrying out the activity in a highly toxic environment for a prolonged period.</p> <p>STR-RBC consists of an autonomous transport platform with tracks that moves at a speed of 3-5 km/h depending on the load and the type of terrain, supports a system autonomy of 1.5-2 h and allows passing over obstacles with a height of up to 20 cm; an electrically operated hydraulic arm that allows opening at a height of 4 m from the ground level, equipped with nozzles for decontamination at height; video system with stabilizer that ensures total field of view and dome camera with 180° angle, with real-time transmission; integrated controller that allows real-time monitoring and control of subsystems and proximity and level sensors; battery system and generator set for extending autonomy.</p> <p>STR-RBC is a technology validated in the laboratory, maturity level in 2023.</p>

SC BIOTEHNOS SA

RO.325.	
Title EN	Porphyrin derivative for theranostics use
Authors	Laura Olariu^{1,2}, Rica Boscencu³, Gina Manda⁴, Radu Petre Socoteanu⁵, Mihail Eugen Hinescu⁴, Ionela Victoria Neagoe⁴ Brindusa Dumitriu¹
	¹ Biotehnos SA, 3-5 Gorunului St., 075100 Bucharest, Romania
	² Academy of Romanian Scientists – correspondent member, Bucharest, Romania
	³ Faculty of Pharmacy, “Carol Davila” University of Medicine and
Institution	Pharmacy, 6 Traian Vuia St., 020956 Bucharest, Romania
	⁴ “ Victor Babeş” National Institute of Pathology, 050096 Bucharest, Romania
	⁵ „Ilie Murgulescu” Institute of Physical Chemistry Roumanian Academy 060021 Bucharest Romania
Patent no.	Patent No. 132752 B1 published in RO-BOPI, 11 from 29 November 2023
Description EN	The current statistics regarding cancer-related mortality as well as the financial implications in the field of antitumor therapy are alarming. Therefore, it is necessary to intensify interdisciplinary research in order to identify new molecules with theranostics potential. With the purpose to development novel compounds as theranostics agents in cancer therapy, an unsymmetrical porphyrin, 5-(2,4-dihydroxyphenyl)-10,15,20- <i>tris</i> -(4-acetoxy-3-methoxyphenyl) porphyrin (P4.2), was obtained, photophysical and <i>in vitro</i> evaluated. Solvent-free reaction activated by microwave irradiation was applied for the synthesis of unsymmetrical porphyrin. The spectral properties of P4.2 were evaluated, the results suggesting a suitable photophysical profile for imagistic detection. The cellular uptake and biocompatibility on the human HaCaT keratinocytes, human Hs27 skin fibroblasts, human colon carcinoma HT-29 cells and human monocytic SC cells were <i>in vitro</i> assessed, in correlation with the structural and photophysical properties of the P4.2. The potential of the porphyrin to kill cells when activated with light of a specific wavelength (<i>in vitro</i> photodynamic therapy), was also evaluated. The <i>in vitro</i> study performed on non-malignant and malignant cells highlighted that the unsymmetrical P4.2 porphyrin qualified to be a promising theranostic candidate for cancer theranostic Research was carried out within the PORPHYDERM Project, ctr. 637 PED-2022

RO.326.	
Title EN	Bio fungicide prototype for crop's protection against <i>Monilinia</i> spp. aggression
Authors	Brindusa Dumitriu¹, Laura Olariu^{1,2}, Stelica Cristea³, Mirela Calinescu⁴, Mihaela Doina Niculescu⁵, Vasile Plugaru¹, Natalia Rosoiu²
Institution	<ol style="list-style-type: none"> 1. S.C. Biotehnos S.A., Otopeni, Romania 2. Academy of Romanian Scientists, 54 Splaiul Independentei 050094, Bucharest, Romania 3. University of Agricultural Science and Veterinary Medicine from Bucharest, Romania 4. Research Institute for Fruit Growing, ICDP-Maracineni, Pitesti, Romania <p>Bucharest National Research-Development Institute for Textiles and Leather, Leather - Footwear Research Institute Branch</p>
Description EN	<p>In the context of the global agricultural economy, one of the priorities is the creation of innovative, authentic phytosanitary solutions for plant protection and growth stimulation, with the aim of long-term elimination of the harmful effects of synthetic substances. The development of a bio-fungicide and bio-stimulator prototype (GLYCAM-PLUS) was thus pursued, with enhanced effectiveness through the profile and ratio of the associated active compounds. This complex study is based on the exploitation of the indigenous potential of natural antifungal compounds by obtaining vegetable extracts from <i>Trigonella foenum-graecum</i> and <i>Tagetes</i> spp., associated with glycoalkaloids from tomatoes and camelina oil. One of the elements of originality is the utilization of protein hydrolysates from leather industry's waste to support the fertilization and improvement of harvests. The laboratory's results obtained on <i>Monilinia</i> spp.'s mycelia growths were transposed in cherry orchards where the efficacy of the bio-fungicide was demonstrated, in percentages of 59%. The treatment of tomato seeds with bioactive combinations of plant extracts and protein hydrolysates was also carried out, as a possible extension in the use of structural components for bio-fungicidal activity and bio-stimulation. This ensured a superior growth of the plants. During the vegetation period, no specific pathogens or insect attacks were reported. The development of the GLYCAM-PLUS prototype brings added value through innovation in the bio-fungicide and fertilization treatment. The research was conducted as part of the project BIO-PLANT-PROTECT 262 / 2021.</p>

HOFIGAL Export Import

RO.327.	
Title EN	Dietary supplements recommended for alleviating of unpleasant symptoms of menopause, method of production and procedures for establishing bio-safety and biological efficacy.
Authors	Mihaela NEAGU ¹ , Cristina – Mihaela LUNTRARU ¹ , Alexandru SUCIU ¹ , Justinian – Andrei TOMESCU ¹ , Sevinci POP ² , Emilia MANOLE ² , Lucian ALBULESCU ² , Cristina TĂNASE ²
Institution	HOFIGAL Export Import S.A.¹/ Institutul Național De Cercetare-Dezvoltare În Domeniul Patologiei Și Științelor Biomedicale „Victor Babeș”²
Patent no.	Patent application No. a/2022/00228
Description EN	<p>The invention refers to obtaining of two dietary supplements, as capsules, one for daytime administration and the other for nighttime administration, to alleviate the unpleasant symptoms of menopause.</p> <p>The novelty lies in the active principles of extracts from the medicinal plants Red Clover, Goosefoot, Sage and Hops, rich in phytoestrogens with estrogenic action and maximum efficiency, with no undesirable effects on the woman's body.</p> <p>The formulations were tested in vitro to evaluate the estrogenic effect using the method of assessing breast adenocarcinoma cell proliferation (ATCC-MCF7). Both formulations showed estrogenic activity being able to stimulate proliferation of MCF-7 cells in the absence of estrogen receptor inhibitor.</p>
RO.328.	
Title EN	FOOD SUPPLEMENT TYPE PRODUCT BASED ON NATURAL ECOLOGICAL COMPONENTS AND PROCEDURE FOR OBTAINING
Authors	Ionescu Daniela ¹ , Fierascu Radu Claudiu ² , Alina-Ruxandra-Eugenia Ortan ³ , Buhaev Stefan ¹ , Fierascu Irina ² , Marcu-Spinu Simona ³ , Tomescu Justinian-Andrei ¹ , Baroi Anda-Maria ² , Babeanu Narcisa ³ , Trausan-Matu Theodor ¹ , Brazdis (Matei) Roxana Ioana ² , Fistos Toma ²
Institution	HOFIGAL Export Import S.A.¹/ INCDCP-ICECHIM² / USAMV Bucuresti³

Patent no.	Patent application No. A/00762/2023 This invention refers to a food supplement type product, based on natural and ecological components and the method of obtaining it. According to the invention, the product consists of 15 - 35% <i>Passiflora incarnata</i> L. powder, 7 - 21% <i>Salvia officinalis</i> extract, 7 - 21% <i>Rosmarinus officinalis</i> extract, <i>Withania somnifera</i> root powder, encapsulated in hard capsules, with a role in improving and increasing the quality of life, addressing to the segment of population with an unbalanced lifestyle.
Description EN	The process consists of four stages, the preparation of natural extracts from the lateral streams of the volatile oil hydrodistillation process, the preparation of the active support material (the aerial parts of <i>Passiflora</i> are naturally dried until constant mass, chopped to sizes below 10 mm and then grinded until the particle size is less than 355 µm), homogenization of the powdered raw materials and then the application of the liquid component, respectively the final preparation of the mixture.

RO.329.

Title EN	Phytotherapeutic product for the stimulation of collagen synthesis in a natural way and manufacturing process
Authors	Manea Cristina, Radanta Vila, Alexandru Georgeta, Crisan Iuliana
Institution	HOFIGAL Export-Import S.A.
Patent no.	Patent application No. a/2021/00301 The present invention refers to a process of obtaining a phytotherapeutic product, conditioned in gelatin capsules, which contains Biotin powder in association with Hawthorn fruit powder (<i>Crataegus monogyna</i>), Acerola fruit extract, with 32% vitamin C, Zinc gluconate and Sea Buckthorn fruit powder (<i>Hippophaë rhamnoides</i>), dried and defatted, together with excipients used in the pharmaceutical industry and manufacturing process.
Description EN	The product according to the invention stimulates the natural way for production of collagen, has a significant action of stabilizing and stimulating the activity of collagen in the bone system, the muscular system, from the skin, hair and nails, in blood vessels and joints, to improve the quality of life.

RO.330.	
Title EN	Phytosomes with biologically active compounds from ginger rhizomes and rosehip fruits with increased bioavailability and manufacturing process
Authors	Deleanu Mariana ¹ , Toma Laura ¹ , Sanda Gabriela Maria ¹ , Niculescu Loredan Stefan ¹ , Barbalata Teodora ¹ , Suciu Alexandru ² , Alexandru Georgeta ² , Crisan Iuliana ² , Popescu Mariana ² , Stancu Camelia Sorina ¹
Institution	Institutul De Biologie Și Patologie Celulară “N. Simionescu”¹, HOFIGAL Export-Import S.A.²
Patent no.	Patent application No. A00502/18.08.2022
Description EN	The invention refers to a process of obtaining the FITOGINROSA phytosomes with active principles from hydroalcoholic extracts of ginger rhizomes (<i>Zingiber officinale</i>) and rosehip fruits (<i>Rosa canina</i>) with increased bioavailability, antioxidant/anti-inflammatory properties, intended for oral administration. The process consists of obtaining extracts in alcohol solution, concentrated, freeze-dried, and formulated with phosphatidylcholine. The antioxidant/anti-inflammatory properties of FITOGINROSA were demonstrated by increasing the activity of antioxidant enzyme paraoxonase-2 and decreasing the tumor necrosis factor- α in plasma of mice with systemic inflammation. FITOGINROSA have increased bioavailability of active principles by 150% versus hydroalcoholic extracts and do not exhibit cytotoxic effects at the established optimal concentration.

CONTINENTAL Automotive Romania S.R.L.

RO.331.	<p>Remote pedal actuation unit mechanic adapter for a vehicle hydraulic electronic control unit HECU comprising the remote pedal actuation unit mechanic adapter</p>
Title EN	
Authors	Gorea Gabriela Maria, Gavrilă George, Ulian Tudor, Luca Dragos
Institution Patent no.	CONTINENTAL Automotive Romania S.R.L. GB2586615B
Description EN	<p>The inventors developed a remote pedal actuation unit mechanic adapter for a vehicle, connecting a hydraulic electronic control unit HECU assembly on the vehicle's firewall to a second assembly in the motor compartment. The second assembly includes a brake master cylinder MC, brake fluid reservoir, valves support, and pressure fluid output line. The remote pedal actuation unit mechanic adapter consists of a two-parts mono-block piece, a cylinder part, a flange part, a brake master cylinder feeding connection pipe, and a brake master cylinder output connection pipe. It connects the valves support to the brake fluid feeding line and the master cylinder output pipe to the pressure fluid output line. The two-parts mono-block piece is designed to feed and evacuate brake fluid from the master cylinder MC towards the hydraulic brake circuit.</p>
RO.332.	<p>Electro-mechanic brakes for a vehicle</p>
Title EN	
Authors	Alexandru Iulian Timofte, Marius Vasilica Adam, Adrian Stanila, Dragos Luca
Institution Patent no.	CONTINENTAL Automotive Romania S.R.L. GB2599676B
Description EN	<p>The conventional brake systems are based on the hydraulic principle and vacuum controlled with an electric motor. The future of the braking systems will go towards dry-brake full electric by-wire. The objective of the present invention is to provide a brake system that does not depend on the brake fluid. The invention solves the technical problem by providing an electro-mechanic braking system comprising an electric motor, a scissor jack provided with ball screws and a screw</p>

drive, a caliper, a fixation support for caliper, brake plates, a support for brake plates, a disc, wherein the brake plates press the disc by means of the scissor jack with ball screws whose screw drive is driven by the electric motor. Basically, the brake pads will be pressed on the brake disc by a system formed from a lever mechanism like a car jack with a ball screw act by an electric motor. The jack mechanism will amplify motor power to provide braking force. The system will be encapsulated so that to not be influenced by dust.

RO.333.**Title EN****Anti-lock braking system****Authors**

Victor Andrei Vadeanu, Ovidiu Alexandru Nemteanu, Ratus Daniel

Institution

Continental Automotive Romania

Patent no.

UK Patent GB 2604147 B

**Description
EN**

The present invention relates to an anti-lock braking system to operate on a vehicle, especially a vehicle equipped with a braking lever actuated by a rider's hand, or a braking pedal actuated by a rider's foot. The main problem to be solved by the present invention is to overcome the complexity of the anti-lock braking system. The objective of this invention is to replace the hydraulic control unit and to provide a linear electro- mechanical actuator instead.

The advantages of the invention:

- no need for a hydraulic block and valves;
- versatile system that allows multiple combinations;
- possibility to have brake booster with a faster reaction time;
- possibility to have an automatic brake function for ATVs and tricycles;
- reduced volume of brake fluid;

easy to assemble on the motorcycle.

**Center for Study and Research for AgroForestry
Biodiversity “Acad. David Davidescu”
Romanian Academy**

RO.334.**Title EN****Procedure for Obtaining Bio Bricks from Agricultural and Industrial Waste****Authors****Nicoleta Raluca JIANU, Gabriel POPESCU, Ioana Corina MOGA, Aneta CHIVOIU****Institution**North Giurgiu Technological and Industrial Park (NGTIP)
Center for Study and Research for AgroForestry Biodiversity
“Acad. David Davidescu”**Patent no.**

Patent application No. A/00313/21.06.2023

**Description
EN**

The purpose of the invention carried out by the authors started from the need of recycling different materials, such as that from agriculture, from wastewater treatment plants and from the construction industry in order to obtain bricks. The inventors designed and tested new recipes for making bricks, starting from a series of existing waste materials in significant quantities.

The receipt for bricks fabrications, protected by the patent request, contains the following composition: wastewater sludge (5-55%), agricultural waste (20-80%), cement (55%), sand (30%), glass fiber (4%), clay (5-15%).

Agricultural waste are due to the improved characteristics of the material obtained (bricks), mainly in terms of thermal and acoustic insulation, lower costs and environmental protection by reducing the use of conventional raw materials. utilization of plant waste such as cereal straws, sunflower stems, represents a solution to reduce pollution.

The resulted bricks were tested in an external laboratory (INCERC) and the result was that they can be used in non-structural brickworks.



Fig. 1 – Bricks made with corn cobs - recipe 1



Fig. 2 – Bricks made with corn cobs - recipe 2



Fig. 3 – Bricks made with sunflower residues - recipe 1



Fig. 4 – Bricks made with sunflower residues - recipe 2

DFR SYSTEMS

RO.335.

Title EN

The implementation of CMOS multiplexers in a water quality control station to reduce costs in recirculating aquaculture

Authors

Radu POPA, Vily Marius CIMPOIAȘU, Vasile GHERMAN, Elena Laura TROANCĂ, Iulian PETRIȘOR, Silviu SĂRARU, Petru NEGREA, Narcis DUȚIANU, Gabriel PETRESCU, Ioana Corina MOGA

DFR Systems SRL

Institution

University of Craiova

Politehnica University of Timisoara

Patent no.

Research project 103PTE/2022

In order to increase the economic efficiency of small recirculated aquaculture systems farms, while also maintaining environmental quality, the authors have developed a novel multiplexer switch for the analysis, monitoring and control of water properties.

This innovative instrument is for monitoring water samples extracted from 8 points of origin. The instrument includes a system for water sampling and transfer, a decision-making system about which water source is to be sampled at a given time, the amount and frequency of sampling, a chemical sensors system, a set of measuring instruments and a data recording system.

**Description
EN**

The equipment is designed as a proof of concept for instances when a single measuring instrument is used to make measurements in samples taken from numerous locations and to analyze chemical evolution in a large system. Examples of situations requiring this equipment include water systems with numerous tanks, numerous locations in a large artificial system, ecosystem, or experiments with multiple containers by means of a single measuring entity that is repeatedly re-calibrated. Applications for this equipment include cases with numerous water tanks in aquaculture and/or hydroponics, numerous locations along a water circulation system and/or water processing system, time-resolved samples from a single location or taken from multiple locations along a geographical transect and/or water ecosystem.

A BETTER LIFE SOLUTIONS

RO.336.
Title EN
iSentinel® FIRESHIELD
Authors
Mircea MANOLESCU
Institution
A BETTER LIFE SOLUTIONS
Patent no.
Patent application No. A.003732020
**Description
EN**

"The iSentinel® FIRESHIELD is a comprehensive fire safety solution that combines advanced warning systems, intelligent fire management technologies, and a human-sized protective shelter. Designed to offer life-saving protection during both bush and building fires, this innovative system integrates state-of-the-art fire detection sensors with responsive mechanisms such as automated fire doors and sprinkler systems to effectively mitigate fire risks. Upon detecting a fire, FIRESHIELD issues real-time alerts to occupants and emergency services, activating fire suppression systems that provide critical evacuation time or a safe refuge within the shelter for those trapped by flames.

Constructed with fireproof and insulating materials, the iSentinel® FIRESHIELD shelter is engineered to accommodate individuals or protect valuable assets, maintaining a controlled environment that shields against direct flames and ensures breathable air quality, while keeping the interior temperature safe for human survival. Ideal for both residential and commercial properties, FIRESHIELD preserves lives and critical assets until the fire is extinguished, serving as a vital component in disaster preparedness strategies.

This cutting-edge technology not only minimizes the risk of fire escalation but also provides a critical sanctuary during emergencies, making it an indispensable tool for enhancing individual safety and minimizing the economic impact of fire incidents.

SC Holistic Lounge SRL

RO.337.

Title EN

QVibe frequency generating therapeutic device - used in fibrillation

Authors

Oana Codruta Bacean Miloicov

Institution

SC Holistic Lounge SRL

Patent no.

009015340-0001, 06/05/2022

The innovative QVibe device offers a novel approach to fibrillation management, utilizing therapeutic frequencies to modulate myocardial activity. Unlike conventional therapies, QVibe provides a non-invasive and physiologically harmonious intervention.

Mechanism of Action: QVibe operates by emitting targeted frequencies tailored to counteract the pathophysiological mechanisms underlying fibrillation. Its unique formulation integrates anti-inflammatory agents to mitigate myocardial inflammation, optimize coronary perfusion, and enhance myocardial contractility and conduction. Patients can conveniently integrate QVibe into their daily regimen, benefiting from its therapeutic effects irrespective of their location. Fig- Fibrillation episode and Fig.- After using QVibe device, sinusal rhythm- NORMAL

Description

EN

Synergistic Effects of Dual Device Deployment: For enhanced efficacy, simultaneous usage of two QVibe devices is recommended. By wearing one device as a wristband on the right wrist and another as a necklace close to the cardiac region, direct transmission of therapeutic frequencies into the circulation is achieved, augmenting therapeutic outcomes. Fig.3 – After 10 days of using QVibe device, sinusal rhythm- NORMAL AND Fig. 4- – After aprox one MONTHS of using QVibe device, sinusal rhythm- NORMAL

Immediate Symptomatic Relief and Prophylactic Benefits: QVibe offered in this case immediate relief from fibrillation symptoms while also exerting prophylactic effects, reducing the likelihood of recurrent episodes and promoting sustained cardiovascular wellness.

Personalized Therapeutic Approach: QVibe embodies a tailored therapeutic paradigm, customized to accommodate the unique pathophysiological profiles of individual patients. Its innovative algorithmic design ensures precise modulation of frequencies, optimizing therapeutic efficacy for

fibrillation management.

In summary, the advent of the QVibe device heralds a transformative era in fibrillation management. By furnishing a gentle, natural, and patient-centric therapeutic modality, QVibe empowers individuals to proactively engage in the preservation of cardiac health and enhance their quality of life.

RO.338.

Title EN	CO-TECH- test, measure, balance (innovative concept of Automated Software Process for evaluation and therapy through biofeedback)
Authors	Oana Codruta Bacean Miloicov
Institution	SC Holistic Lounge SRL
Patent no.	301240/29.12.2023
Description EN	<p>The innovative QVibe device offers a novel approach to fibrillation management, utilizing therapeutic frequencies to modulate myocardial activity. Unlike conventional therapies, QVibe provides a non-invasive and physiologically harmonious intervention.</p> <p>Mechanism of Action: QVibe operates by emitting targeted frequencies tailored to counteract the pathophysiological mechanisms underlying fibrillation. Its unique formulation integrates anti-inflammatory agents to mitigate myocardial inflammation, optimize coronary perfusion, and enhance myocardial contractility and conduction. Patients can conveniently integrate QVibe into their daily regimen, benefiting from its therapeutic effects irrespective of their location. Fig- Fibrillation episode and Fig.- After using QVibe device, sinusal rhythm- NORMAL</p> <p>Synergistic Effects of Dual Device Deployment: For enhanced efficacy, simultaneous usage of two QVibe devices is recommended. By wearing one device as a wristband on the right wrist and another as a necklace close to the cardiac region, direct transmission of therapeutic frequencies into the circulation is achieved, augmenting therapeutic outcomes. Fig.3 – After 10 days of using QVibe device, sinusal rhythm- NORMAL AND Fig. 4- – After aprox one MONTHS of using QVibe device, sinusal rhythm- NORMAL</p> <p>Immediate Symptomatic Relief and Prophylactic Benefits: QVibe offered in this case immediate relief from fibrillation symptoms while also exerting prophylactic effects, reducing</p>

the likelihood of recurrent episodes and promoting sustained cardiovascular wellness.

Personalized Therapeutic Approach: QVibe embodies a tailored therapeutic paradigm, customized to accommodate the unique pathophysiological profiles of individual patients. Its innovative algorithmic design ensures precise modulation of frequencies, optimizing therapeutic efficacy for fibrillation management. In summary, the advent of the QVibe device heralds a transformative era in fibrillation management. By furnishing a gentle, natural, and patient-centric therapeutic modality, QVibe empowers individuals to proactively engage in the preservation of cardiac health and enhance their quality of life.

RO.339.

Title EN

ANTISTRESS PROTOCOL used in a vitiligo case

Authors

Oana Codruta Bacean Miloicov

Institution

SC Holistic Lounge SRL

Patent no.

301240/29.12.2023

Description

EN

The results obtained, including physical outcomes, clinical appearance, and psycho-emotional levels, demonstrate the effectiveness of this innovative copyrighted protocol. Its non-invasive nature, combined with optimized clinical parameters, enhances skin appearance and mental equilibrium, as confirmed by the results.

The therapeutic ANTISTRESS PROTOCOL has shown significant benefits in the treatment of vitiligo. Beyond its impact on the physical manifestations of the condition, it also addresses the psycho-emotional aspects that can accompany the disease.

By promoting psycho-emotional balance, this protocol helps individuals cope with the psychological impact of vitiligo. It addresses the underlying traumas stored in the subconscious, aiding in their release and healing.

Furthermore, the therapeutic ANTISTRESS PROTOCOL protocol focuses on CHACKRA balancing, which plays a vital role in overall well-being. Through this process, the energy centers of the body are harmonized, resulting in improved physical and mental health.

Justin Capra Association

RO.340.**Title EN**

Nazomer Magnolia -*Natural solutions to combat odor disorders, frequent post-pandemic*

Authors

MORARU Ionut

Institution

SC Pro-Natura SRL (www.Pro-natura.ro)

Natural solutions to combat frequent post-pandemic odor disorders,

Description EN

Nazomer Magnolia is a revolutionary remedy, based on natural extracts from magnolia and manna-mother-of-the-lord, essential oils of boswellia, chestnut, CBD; its innovative formula also contains unique ingredients: Col-Ker (colostrum fermented with keranium granules) and Setria Glutathione, proven by scientists to bring significant benefits to people affected by anosmia and parosmia as a result of SARS-COV2 infection. A synergistic action is obtained by associating with Magnolia 3xBiotics, a fermented tribiotic product with a role in the regeneration of the body intestinal flora, combating rhinosinus congestion and neurotropic

RO.341.**Title EN**

Effective Methods of Elimination a Spike proteins

Authors

MORARU Ionut

Institution

SC Pro-Natura SRL (www.Pro-natura.ro)

Natural solutions to combat frequent post-pandemic disorders

Description EN

Spike proteins represent a feared element in the confrontation with the SARS-CoV-2 virus and can be present both after infection and as a result of vaccination with messenger RNA (mRNA). In the fight against these harmful elements, we have developed two innovative methods of elimination:

- 1) Induction of Autophagy with Spermidine 3xbiotics and Intermittent Fasting: For the spike proteins present inside human cells, the induction of autophagy is crucial. This vital process can be stimulated by administering spermidine and adopting intermittent fasting of 14-16 hours, thus offering the affected cells a way to eliminate these dangerous proteins;
- 2) Proteolytic enzymes for the destruction of Circulating Spike Proteins: Spike Cov 3xbiotics.

RO.342.

Title EN	Study of the favorable effects of the use of BioResonant Pasive Device “EMCOPAD Doctor Tech” on the human body
Authors	VELCEA Marian (1,5), MOLDOVAN Ion-Corneliu(3,9), PLOTOG Ioan(6), MIHĂILESCU Bogdan(6), HIDEG Cătălin Robertino (1,11), CARACAS Eugen (3,7), ENE Ciprian(4), MANDREA Lucian(4,6), CURTA Ioan(4), CHETAN Mihai(8), VELCEA Ion Alexandru(1), NICOLAE Valentina(1), RADU Ana Maria (10). GHERMAN Beatrice(10), POPESCU Emil (12)
Institution	SC Doctor Tech SRL (www.DoctorTech.ro)(1)/ Asociatia Justin CAPRA(2)/ Clinica Qi Bucuresti(3)/ Clinica Quantum Therapy Bucuresti(4)/ Universitatea de Stiinte Agronomice si Medicina Veterinara Bucuresti(5)/ Universitatea Politehnica Bucuresti(6)/ Universitatea Ecologica Bucuresti(7)/ Med-Co SRL Bucuresti(8)/ Institutul National de Medicina Complementara si Alternativa “Florin Bratila”(9)/ Institutul National de Recuperare Medicina Fizica si Balneoclimatologie Bucuresti(10), Institutul de BioTehnologii “Sanimed”(11) ELOP-Electro-Optic Components SRL(12)
Patent no.	Based on Patent peding RO132423A2 / WO2018037379 EMCOPAD (ElectroMagnetic Coherent Polarizing Device) "Doctor Tech" works by increasing system coherence, multiple resonances and cooperative effects between devices applied to the skin. The original method and devices presented have multiple and safe medical applications with no energy consumption and no harmful effects.
Description EN	The " EMCOPAD Doctor Tech Therapy Kit" contains a "Practical Guide" for recommending therapeutic procedures (organized alphabetically for more than 100 common conditions), a set of 200 pieces of “EMCOPAD Doctor Tech” (passive resonant electromagnetic patches) and adhesive rolls for attaching the devices to the body of the treated person. The devices are applied periodically on the acupuncture points recommended in the therapy of the diagnosed condition. The application period is 21 days and is followed by a 10-day break. The procedure is repeated, if necessary, twice more. “EMCOPAD Doctor Tech “devices are used indefinitely. It is recommended to disinfect them with alcohol before each use. (www.DoctorTech.ro) The advice of a doctor or acupuncturist is recommended. (TCM -Traditional Chinese Medicine is officially approved by the WHO)

Technological High School of Targu Ocna

RO.343.

Title EN	Is our duty to save the planet! Sustainability through recycling in 3D printing
Authors	Simina Tănasă, Andrei Pîrvu, Nicoleta Vartolomei
Institution	Technological High School of Targu Ocna An experimental station for recycling plastic materials to produce filament for 3D printing. Increasing involvement in environmental protection through the implementation of an experimental station for the recycling of plastic materials in order to produce filament for 3D printing, proposes an integrated approach in the management of plastic waste (especially PET) and recycling them into filament for 3D printing. The general objective of the project is to increase the degree of involvement in environmental protection by implementing an experimental station for the recycling of plastic materials in order to produce filament for 3D printing.
Description EN	

RO.344.

Title EN	Colorimetry and image analysis of muffins with rosehip powder addition
Authors	Nicoleta Vartolomei, Simina Tănasă, Alin Cristian Teusdea, Ileana Denisa Nistor, Alisa Vasilica Arus, Maria Turtoi
Institution	Technological High School of Targu Ocna University of Oradea „Vasile Alecsandri” University of Bacau, „Dunarea de Jos” University of Galati, Cross-Border Faculty
Description EN	The purpose of this work was to estimate the colorimetry and image analysis of muffins with rosehip powder in the 5 and 10% addition. The analysis method used to highlight the change of muffins at different additions of rosehip powder was color image analysis (ACI) uses the CIE L*a*b* trichromatic space, instead of the native digital image coding, namely RGB. The samples were studied by means of a digital analysis of the image with our own software, the code being written in the Matlab R2015 programming environment. Univariate statistical analysis was used to determine statistical differences between samples for the factors rosehip powder addition and storage time (days). The ensemble of multivariate samples revealed how the rosehip powder addition changes the keeping properties of muffins.

ARC Metropolitan Secondary School

RO.345.

Title EN

Our Target : Understanding The World – Art & Science &Tech Fair – Winning project of the 5th edition

Authors

Luiza Cristea, Dan Giurgiu

Institution

ARC Metropolitan Secondary School

By involving the family and the educational and scientific community, we propose a different kind of parenting, where all stakeholders can work together for a common social goal: educating our children to become resilient, creative and responsible adults. The activities are designed to develop integrated experiential approach, which is in tune with natural processes and blends technology, scientific exploration, inspirational storytelling, artistic skills into the educational process.

Recommended theme: issues related to the social and environmental dimension of science and technology in order to prepare children for the professions of the future
 Sections: IT applications, functional installations and scientific experiments and static models respectively.
 Students (10-14 years old), present their own hypothesis about a phenomenon/experience in everyday life, create an experiment, a model, an installation or a software application, illustrating the causes or dynamics of a phenomenon, the causes of a problem or illustrating a solution to the problem. They benefit from training workshops to prepare their projects and online advice from jury members. Teacher facilitators (in multidisciplinary teams) benefit from support workshops supported by experts in scientific and teaching fields.

**Description
EN**

Winning project of the 5th edition, 2024, model/installation:
 The Geothermal Energy Model project was conceived with the dual objective of demonstrating the principles of renewable energy generation and fostering a hands-on, investigative approach to learning among students. A tangible connection between theoretical scientific concepts and their practical applications. This document outlines the process of building the model, the educational strategies employed, and the overall experience of participating in the science fair, where the project was awarded first place.



Paradis International College

RO.346.

Title EN	Tracker Droid (T-89)
Authors	David Grigore
Institution	<i>Paradis International College</i>
Description EN	The project is a cleaner robot which aims to remove objects from a perimeter. The robot was made using the LEGO Mindstorm EV3 platform.

RO.347.

Title EN	Spectrophotometer
Authors	Maia Ingrid Sava, Vlad Mavriș, Șerban Murariu, Rareș VARARIU.
Institution	Paradis International College
Description EN	A spectrometer is an instrument used to measure spectra. Optical spectrometers, in particular, analyze light intensity as a function of wavelength or frequency. In this case, we want to test the amount of light that will be captured by a photoresistor after the light emitted by an LED passes through a test tube with a specific solution. Thus, I used a breadboard, a series of wires, a battery, a switch, an LED and a photoresistor. I connected a multimeter in series with our parallel circuit and measured the resistance in ohms. Between the LED and the photoresistor, I placed a test tube into which I poured water (as a test value) and then water with various ink concentrations. Measuring the resistance, I noticed an upward trend and saw that with the increase in the concentration of the solution (the number of ink drops in the water) the absorption of light also increases. Thus, I drew a graph and a straight line to pass through all the obtained values. Now, any substance should be tested, we would see where it falls on the graph and deduce its concentration, just from the value measured by the multimeter.

RO.348.**Title EN** Skittle sorter with Arduino**Authors** Ștefan Albu**Institution** Paradis International College**Description EN** Skittle sorter with Arduino is a tool used to sort colored candies (4 different colors) by programmed color differentiation.**RO.349.****Title EN** Website for Game of Life**Authors** Șerban Untu**Institution** Paradis International College**Description EN** Game of Life is a two-dimensional cellular automaton that can tell us a lot about how computers work. At its base is a two-dimensional matrix of cells that can be alive or dead. After each generation, a set of rules is applied depending on the state of each cell and its neighbors, thus forming a new matrix. The rules of this 0-player "game" were devised by the English mathematician John Conway in 1970. Although simple, they can lead to complex figures when observed over many generations and on a larger scale. Many of these were first discovered using pencil and paper, but today we have the gift of an information processing speed many orders of magnitude higher than back then, and can thus display the entire process in real time. We created this website to present some of the most interesting figures and how the basic rules can be manipulated to obtain completely new behaviors.

Vasile LUPU

RO.350.

Title SOCKET WITH EXTERIOR AND INTERIOR
SOCKET PROVIDED WITH SWITCH
Authors Lupu Vasile
Institution INDIVIDUAL
Patent no. A/00030/2024

Description The invention SOCKET WITH EXTERNAL AND INTERNAL SOCKET PROVIDED WITH SWITCH will be used in the field of electricity where there is no socket and it is mounted in place of the socket for the light bulb, having the possibility to use this socket both for lighting and for connecting electrical devices.

Mihai Albert VLĂDESCU

RO.351.

Title	Plasma Space Launcher
Authors	VLĂDESCU MIHAI ALBERT
Institution	National College Mihai Viteazul Ploiesti, 7th grade
Description	<p>The "Plasma Space Launcher" combines Jacob's Ladder and my previous projects: The Ion Thruster and The Magnetohydrodynamic Thruster, by using ion discharge and Lorentz's law.</p> <p>The "Plasma Space Launcher" creates a sphere of plasma that is accelerated by the Lorentz force. In the case of outer space, plasma could travel impressive distances, carrying a huge amount of energy, due to small losses, energy that, once given to the obstacle towards which it was directed, will produce its sublimation.</p> <p>This device could be used to destroy space junk around Earth and obstacles that are in the path of spacecraft.</p>

Maria Sarah VLĂDESCU

RO.352.

Title	Terraced houses in the United Kingdom. From the Victorian Era to the Present
Authors	VLĂDESCU MARIA SARAH
Institution	"Ion Mincu" University of Architecture and Urban Planning, Bucharest
Description	<p>The article explores the historical and architectural significance of Victorian terraced houses in Britain. Originating from an era of economic and social upheaval during the Industrial Revolution, these houses became the primary dwelling for urban populations. They evolved from symbols of wealth to practical solutions for housing the working class. Examples such as Saltaire illustrate how entire communities were built around the need for affordable housing near industrial centers. The architectural diversity of Victorian terraces reflects the era's eclecticism, with styles ranging from Queen Anne revival to garden suburbs. Over time, these houses adapted to changing demographics and societal needs, from accommodating immigrants to becoming sought-after residences today.</p>

Cristian ALBU**RO.353.**

Title	Foldable Aerodynamic wing with roof function for cars
Authors	Albu Cristian
Institution	Individual
Patent no.	N/A

Description	<p>Invention consists in a foldable aerodynamic wing that in initial (or off) position constitutes the roof of a performance car. A hydraulic piston raises the wing first in an aerodynamic stopping position, and finally, in a working position (5-10 degrees from car's running plane) that generates downforce in the most beneficial point, the center of the car. The weight savings and handling improvement by using this solution are substantial. Application: Sports cars , convertible cars that won't have to hide the roof in the trunk when deployed ,race cars</p>
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Președinte al Forumului Inventatorilor din România

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Brandul EUROINVENT, susținut de Forumul Inventatorilor Români și de Europe Direct Iași, organizat sub egida **Academiei Oamenilor de Știință din România** reprezintă un proiect modern, care a permis în ultimii

16 ani realizarea unei manifestări complexe, cu multiple implicații academice și ținte, adresându-se tuturor creatorilor de bunuri materiale și spirituale (inventatori, universitari, cercetători științifici, artiști etc.). S-a dorit acest lucru, pentru a atrage atenția guvernanților asupra faptului că inventica este un segment al creativității naționale, care asemănător artei și științei, trebuie să fie subvenționată de stat, iar brevetarea să fie gratuită. Mai mult, proprietatea intelectuală și cea industrială să fie protejate prin legi diferite, să nu mai existe sistemul de rebrevetare a invențiilor, ci doar cel de transfer tehnologic, sub formă de Patent (licență de aplicare).

O invenție, o dată brevetată, trebuie să rămână în portofoliul inventatorului, respectiv a titularului (aplicantului) și în zestrea unei națiuni sub forma unui brevet de autor, respectiv patent ca licență industrială, din fondul personal sau public (Fondul Național de Invenții), de unde la cerere să fie transferată ca licență de aplicare în baza unui contract, prin Oficiul de Stat pentru Invenții și Mărci (OSIM).

Juridic, pentru a proteja inventatorul este de preferat sistemul de re-patentare și nu cel de re-brevetare.

Această sărbătoare a științei, tehnicii și artei românești, organizată sub sigla „Zilele Europei la Iași”, se desfășoară prin implicarea tuturor actorilor și vectorilor sociali: studenți, cadre didactice universitare, cercetători, artiști, mass media, mediul de afaceri, autorități etc. Un aport deosebit în aceste manifestări îl au cele cinci universități de prestigiu ale Iașului, care s-au remarcat prin performanță și tradiție de-a lungul istoriei lor, fiind recunoscute atât în țară, cât și în străinătate ca principalii formatori de inteligență românească și surse veridice ale cercetării fundamentale și tehnologice performante. Implicarea celor cinci universități în toate edițiile de până acum a condus la formarea și dezvoltarea de lideri ai creativității în domeniile lor de specializare.

Prin aceste manifestări se dorește o participare activă, printr-o bună conlucrare și dialog între inventatori, studenți, specialiști din diverse domenii, artiști, mediul academic și cel industrial.

EUROINVENT înseamnă un eveniment complex alcătuit din: Salonul European de Invenții și Cercetare Științifică, Salonul de Carte și Salonul de Artă, un rol important avându-l Workshop-ul organizat sub sigla „Cercetarea tehnico-științifică în contextul contemporan european”, unde se dezbate teme actuale de cercetare și aspecte moderne ale celor trei tipuri de proprietate: intelectuală, industrială și culturală, având în vedere printre altele, stimularea actului de creație și protecția dreptului de autor.

În ultimii 16 ani acest workshop, având genericul „Cercetări științifice prin elaborări electivă”, s-a alăturat Conferinței Internaționale de Cercetări Inovative - componentă principală a EUROINVENT-ului, cunoscută sub titlul: International Conference for Innovative Research (ICIR).

Cu ocazia zilelor dedicate inventatorilor sau instituțiilor de cercetare și de învățământ superior din țările participante la aceste manifestări, se vor prezenta sistemele actuale de transfer tehnologic, dinamica brevetării și alte aspecte privind ingineria creativității, respectiv rezultatele deosebite obținute de către școlile de inventică în formarea tinerilor.

Volumul de față cuprinde un număr de 12 lucrări elaborate de doctoranzi și masteranzi sub conducerea unor membri din comisiile de îndrumare a tezelor de doctorat și de dizertație, selectate de un grup de referenți, în acord cu direcțiile de cercetare din învățământul superior ieșean și cu evenimentele care vor fi marcate la a XVI-a ediție a EUROINVENT.

Sub titlul „Cercetarea românească în conext european”, lucrările au fost grupate pe următoarele secțiuni: Știința Conservării Bunurilor de Patrimoniu Cultural și Natural, Științe Conexe, Inventică și Istoria Neamului Românesc. Au fost acceptate lucrări în limba română și engleză, cu o bibliografie recentă și selectivă.

Prof.univ.emerit dr. Ion SANDU

Președinte de Onoare al Forumului Inventatorilor Români
Membru corespondent al Academiei Oamenilor de Știință din
România

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EUROINVENT

ICIR 2024

International Conference on Innovative Research

June 6th to 7th, 2024

Iasi – Romania

Organized by:

- Romanian Inventors Forum
- Faculty of Materials Science and Engineering, The “Gheorghe Asachi” Technical University of Iasi, Romania
- ARHEOINVEST Platform, Alexandru Ioan Cuza University of Iasi
- Centre of Excellence Geopolymer and Green Technology (CEGeoGTech), Universiti Malaysia Perlis (UniMAP)
- Department of Physics, Czestochowa University of Technology, Czestochowa, Poland

With support of:

- National Institute for Research and Development in Environmental Protection INCPDM
- International Federation of Inventors' Associations - IFIA
- World Invention Intellectual Property Associations – WIIPA

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Institute of the Structure of Matter,
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**Keynote
Speaker**

Carlos THOMAS, Professor PhD

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**Keynote
Speaker**

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University of Minho, Portugal

**Invited
Speaker**

Camilo ZAMORA-LEDEZMA, Professor PhD

Universidad Católica de Murcia, Spain

**Invited
Speaker**

Radu Claudiu FIERĂSCU, Senior Researcher PhD

National Institute for Research & Development in Chemistry
and Petrochemistry – ICECHIM Bucharest, Romania

**Invited
Speaker**

Mohamad Anuar KAMARUDDIN, Associate Professor PhD.

Environmental Technology Division,
School of Industrial Technology, Universiti Sains Malaysia

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