INNOVERSE INVENTION INNOVATION EXPO 2023

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INNOVERSE INVENTION & INNOVATION EXPO 2023

Introduction

Greetings to all the visionaries, pioneers, and curious minds,

It is with immense pride and excitement that we introduce the Innovverse Invention & Innovation Expo 2023 event booklet, your compass to the wonderland of inventions and breakthroughs that await within the heart of Georgia, America. Scheduled for the 28th and 29th of August, this expo promises not just a showcase, but a true celebration of the human spirit of discovery and the undying passion to push boundaries.

In these pages, you will find a meticulously curated overview of the event. This booklet is designed to ensure that you capture the essence of this grand exposition in its entirety.

As you flip through, you'll encounter insights into the groundbreaking technologies on display, profiles of the brilliant minds behind them, and a snapshot of the transformative ideas that will shape our tomorrow. It’s more than just a guide—it’s an invitation to immerse yourself in a journey of inspiration.

While the exhibits, showcases, and panels form the crux of the expo, we deeply believe that the true essence of Innovverse lies in the connections made, the conversations sparked, and the collaborations initiated. We hope that this booklet serves not only as a guide to navigate the event but also as a keepsake of the memories and inspirations you gather along the way.

So, dear attendee, as you stand on the cusp of discovery and innovation at the Innovverse Invention & Innovation Expo 2023, let this booklet be your trusted companion. Dive in, explore, engage, and let your imagination be kindled.

Welcome to a world where the future is being crafted today. Welcome to Innovverse 2023.

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Ania Association - Iran

Institute for Invention and Innovation-SANVIC - Vietnam

Shanghai Association of Inventions - China

Smart Care tech - Sudan

Qatar University Young Scientific Center - Qatar

Algeria

DZ.1.	
Inventors	BENTERKI MOHAMED SADEK
Inventions	Mécanisme de propulsion de véhicules à propulsion humaine par des leviers qui pivotent sur un axe horizontal et/ou deux axes verticaux parallèles et symétriques.
Institution	Algeria
Abstract	The invention relates to a vehicle propulsion mechanism comprising a frame and levers, clutches (freewheel) and gears which converts a reciprocating pushing motion into a circular motion which drives anything requiring motive power, with at least a user in a vertical position (standing) and/or a user in a horizontal position (sitting).

Australia

AU.1.

Inventors Emily Thompson, Alex Hughes
Inventions AquaPure Filtration System
Institution University of Sydney, Australia
Abstract

The AquaPure Filtration System is a novel water purification technology developed by Emily Thompson, Alex Hughes, and Isabella Kim from the University of Sydney, Australia. With an increasing global need for clean drinking water, the AquaPure Filtration System aims to provide an efficient, cost-effective, and eco-friendly solution, particularly benefiting remote and rural areas in Australia. Australia, being the driest inhabited continent on Earth, often faces water scarcity challenges. While the urbanized coastal regions have access to modern water treatment facilities, the interior and certain rural parts of Australia do not. The AquaPure system utilizes a unique combination of solar-driven distillation and bio-active filtration. This two-stage approach ensures the removal of impurities, pathogens, and certain chemicals, resulting in water that meets global drinking standards.

The first stage involves a solar concentrator which heats untreated water to produce steam. This steam is then cooled and condensed, effectively removing salts, heavy metals, and other non-volatile contaminants. The second stage involves passing this distilled water through a bio-active filter, which contains beneficial microorganisms that neutralize pathogens and break down organic contaminants.

Beyond its technical features, the AquaPure Filtration System has been designed to be easily deployable. It requires minimal maintenance and uses locally sourced materials for construction, making it highly suitable for Australian outback conditions. This invention not only addresses the pressing water security issue but also embodies the spirit of Australian innovation, benefiting both the environment and the communities it serves.

AU.2.

Inventors Lucas Bennett, Amelia Green, Owen Mitchell
Inventions SolarWind Hybrid Harvester (SWHH)
Institution Monash University, Melbourne, Australia
Abstract

In a world grappling with energy demands and environmental challenges, SolarWind Hybrid Harvester (SWHH) — a game-changing energy solution tailor-made for Australia's unique climatic conditions. Harnessing the continent's abundant sunlight and the vast coastal winds, SWHH epitomizes the concept of sustainable energy. The innovation integrates advanced photovoltaic cells and compact wind turbines, allowing for efficient energy generation, even during periods when one energy source might be less available. For instance, on cloudy days with limited sunlight, wind energy can compensate, ensuring a consistent energy output. Conversely, during calm days with no wind, the solar cells ensure that energy production doesn't halt.

A significant advantage of the SWHH is its compact design. By synergizing solar and wind energy components into a single unit, it reduces the installation

footprint, making it ideal for both urban and rural settings. Moreover, its integrated energy storage system uses state-of-the-art graphene batteries, ensuring longer energy retention and rapid charging capabilities. The SolarWind Hybrid Harvester represents a leap forward in Australia's journey towards energy independence and sustainability. By effectively capturing the best of both solar and wind energy, it offers a robust solution to meet the power demands of the future, fostering a greener Australia.

AU.3.

Inventors Nathan Foster, Chloe Wong, Jacob Reid

Inventions BioBarrier Reef Protector (BRP)

Institution Queensland University of Technology, Brisbane, Australia

Abstract

The BRP integrates a combination of biodegradable materials and cutting-edge sensor technology. These sensors continuously monitor water quality parameters such as temperature, salinity, and pH, sending real-time data to central monitoring stations. In response to detected threats, the BRP releases beneficial microorganisms or environmentally-safe compounds to counteract harmful substances or pathogens.For instance, when a rise in water temperature (which could lead to coral bleaching) is detected, the system can release specific compounds to increase the water's albedo, reflecting more sunlight and providing temporary cooling. Similarly, the presence of pollutants can trigger the release of microorganisms that can either neutralize or consume these contaminants, thus protecting the coral ecosystem.

The BioBarrier Reef Protector offers a two-fold solution: immediate protection against acute threats and invaluable data for long-term conservation strategies. As a beacon of hope for coral reef ecosystems worldwide, the BRP showcases Australia's commitment to preserving its natural heritage and advancing marine conservation technology.

Belgium

BE.1.

Inventors Julien Moreau, Elise Dubois

Inventions Smart Urban Greens (SUG)

Institution Ghent Association, Ghent, Belgium

Abstract Urbanization and limited green spaces have posed challenges for city-dwellers worldwide. Utilizing modular plant units equipped with sensors and AI, SUG efficiently monitors and manages soil health, hydration, and air purification needs. These units can be easily installed on rooftops, terraces, or sidewalks, optimizing green space utilization. An interconnected network allows the modules to communicate, ensuring efficient resource sharing and environmental responsiveness. SUG not only enhances city aesthetics but also improves air quality and promotes biodiversity, marking a significant stride towards sustainable urban living.

BE.2.

Inventors Isabelle Maes, Maxime Janssens, Anouk De Clercq, , Lukas Vermeulen

Inventions EcoCharge Bicycle System (ECBS)

Institution Leuven

Abstract A visionary approach to urban mobility, ECBS integrates kinetic energy harvesting mechanisms into bicycle designs, allowing cyclists to generate and store electrical energy while they pedal. This harvested energy can later be utilized to power up personal electronic devices, bicycle lights, or even transferred to the local grid. Moreover, a complementary app offers real-time tracking of energy produced, calories burned, and environmental contribution. ECBS not only promotes a healthier lifestyle but also fosters an eco-conscious mindset by converting everyday commutes into green energy contributions. In cities where cycling is prevalent, such as in many parts of Belgium, the widespread adoption of ECBS can lead to a significant reduction in carbon footprint, paving the way for a cleaner, greener urban future.

BE.3.

Inventors Mathias Lefevre

Inventions WasteAway - Organic Waste Convertor

Institution -

Abstract This compact, household-friendly system transforms organic waste — like food scraps and yard trimmings — into nutrient-rich compost and biogas within hours. By employing rapid decomposition methods and integrating AI-driven optimization algorithms, WasteAway ensures efficient breakdown with minimal odor and greenhouse gas emissions. The generated biogas can be harnessed for domestic heating or cooking, reducing reliance on non-renewable energy sources. Additionally, the system's design incorporates a user-friendly interface that allows residents to monitor waste reduction metrics, biogas production, and compost readiness. In a world pressing for sustainable waste solutions, WasteAway stands as a testament to Belgium's forward-thinking approach, merging practicality with environmental stewardship.

BE.4.	
Inventors	Sophie Lambert, Hugo De Bruyn, Céline D'hooghe, , Clara Van de Velde, Pieter Desmet
Inventions	ClearSound – Adaptive Urban Noise Barrier
Institution	-
Abstract	Unlike traditional barriers, ClearSound utilizes active noise canceling (ANC) technology, similar to that found in high-end headphones, but on a much larger scale. Integrated sensors detect ambient noise levels and frequencies, with the system subsequently emitting opposing sound waves to nullify the noise. The barrier is further enhanced with resilient, eco-friendly materials, ensuring durability and environmental responsibility. ClearSound's modular design allows easy customization for diverse urban landscapes, from busy highways to bustling city centers. This groundbreaking approach not only dramatically reduces noise pollution but also represents a harmonious blend of technology and urban planning, making cities more livable for everyone.

Cambodia

KH.1.

Inventors	Prof. Chan Mithona, Mr. Hach Phanong, Ms. Srun Muoykieng, Mr. Oeun Thea, Ms. Poly Pheary
Inventions	SMART HYDROPONIC SYSTEM
Institution	Norton University
Abstract	Hydroponics is the practice of growing plants using only water, nutrients, and a growing medium. The idea behind hydroponics is to remove as many barriers as possible between a plant's roots and the water, oxygen and nutrients it needs to grow (and thrive). Some of the hydroponics is a small garden for homemade and the owner control by manually. Hence, our team designed a project called Smart Hydroponic System to provide the ability to easily grow and sustain the plants and it will be working as automatically.

KH.2.

Inventors	Prof. Chan Mithona, Ms. Poly Pheary, Mr. Leang Sengthai, Ms. Ratha Sophanith, Ms. Poly Pheanin
Inventions	AUTO PLASTIC BOTTLE BANK
Institution	Norton University
Abstract	The plastic bottle is very useful in everyday life and make life so much easier, but the environmental impact they produce is unsustainable. The large number of plastic bottles we send to landfills and oceans has become a burden on the environment. Plastic bottle has affected the environment such as climate change, ocean pollution, Greenhouse gas emissions, drain blockage, human health etc. Hence, our team created a project called Auto Plastic Bottle Bank that is easy for controlling and change cashback while the user inserts the plastic bottle into our system.

KH.3.

Inventors	Prof. Chan Mithona, Mr. Sambath Vibol, Mr. Yet Chanseyha, Ms. Poly Pheary
Inventions	SMART PAYMENT SYSTEM FOR HIGHWAYS IN CAMBODIA
Institution	Norton University
Abstract	Cambodia is progressing on many infrastructures including highway roads, buildings, technology, and industrial or modern medical equipment. Due to Cambodia being in an upgrading period, the highway road is charged to Cambodian people when they cross the road. The price for charging is depending on the type of car and the charging system will be used by the traditional system by using people in the control center for controlling and managing on the gate. Hence, we would like to create a project called Smart Payment System for Highway in Cambodia without the need people for controlling on the gate.

KH.4.	
Inventors	Prof. Luy Mithona, Prof. Chhoeung Rachana, Mrs. Keo Lakhena, Ms. Huy Mouyheng, Ms. Map Leangheng
Inventions	NU STUDENT PROFILE
Institution	Norton University
Abstract	We are hoping to open more doors for Norton University students and alumni via “NU Student Profile". This website allows students to showcase their dedicated work, assignment, achievement, and fruit of labor during their journey in the built-in CV feature. Through the 2nd feature “Post Announcement” NU could post relatively new jobs and opportunities to ensure their students are up-to-date with the company that is interested in hiring our students. Moreover, offering students to become “service providers” allows them to increase their chances of exposing their skills and service to employers.
KH.5.	
Inventors	Dr. So Sokuntheary, Mr. Chuop Sopheak, Mr. Vong Chakravuth, Mr. Ly Sunleng, Mr. Ly Chandavin
Inventions	NU SMART STUDENT ATTENDENCE
Institution	Norton University
Abstract	Observing that today the modernization of technology is more advanced, especially the use of these technologies integrated in architecture, building construction, etc. Our team inspired the introduction of an automatic classroom system through the use of individual student face identification. Which Helps to ease the load to check the presence of students, professors and staffs during school day.
KH.6.	
Inventors	Dr. So Sokuntheary, Mr. Chuop Sopheak, Ms. Horn Seavmey, Mr. Vong Chakravuth
Inventions	PHNOM PENH SMART BUS STOP
Institution	Norton University
Abstract	Phnom Penh smart bus stop info board is designed to provide an extra level of convenience for muti-generational and user with disabilities. With new technology equipment that haven’t existed in Cambodia, the user will completely avoid complication use, time and budget saving to be contributed on clean street and environment. Especially, disable user will easy to use and feel completely the same as regular user.
KH.7.	
Inventors	Dr. So Sokuntheary, Mr. Chuop Sopheak, Mr. Mao Sothea, Mr. Lim Thiden, Mr. Chhoun Virak
Inventions	PUBLIC ELECTRIC BIKE PARKING
Institution	Norton University
Abstract	Due to the increasing of many tourists come to Phnom Penh, so our team had an ideal to create Public electric motor station for our people and foreigner that come to Phnom Penh can be use. To be part of part facilitating for their travel, and they are part of helping promote Cambodia tourism sector to grow.

KH.8.	
Inventors	
Inventions	THE SMART CONTAINER CLASS OF COCONUT SCHOOL
Institution	Norton University
Abstract	Conclusion of this project, our team has thought of ways to alleviate these problems in Sala Dong to continue, as well as to stop the problems that occur, we have the idea to use the container cabinet to transform into a classroom. Modern chairs, chandeliers, as well as LEDs and other modern materials based on the use of solar panels.
KH.9.	
Inventors	Dr. So Sokuntheary, Mr. Chuop Sopheak , Mr. Vong Chakravuth , Mr. Ly Sunleng , Mr. Ly Chandavin
Inventions	NU SMART PARKING SYSTEM
Institution	Norton University
Abstract	Norton University was one of the first private Cambodian educational institutions and was established since the 2nd December 1996 by Professor Chan Sok Khieng (The chancellor). It started to offer classes in December 1996 and was recognized as a university by sub-degree on September 18, 1997. Recently, there are 6 academic programs such as Foundation Studies department, College of Science, College of social sciences, College of Art, Humanities and Languages, Faculty of health science and Graduate school. The campus in the downtown part of Phnom Penh consists of five buildings with 92 rooms, including 67 classrooms (19 rooms equipped with LCD), and 25 offices. The physical plant greatly enlarged when the purpose-built building in the new campus in Chrouy Changva peninsula became operational. The 5-story building that has an area of close to 20,000sq. and is designed inspire by classic Khmer architectural style. It has offices and the library on the ground floor and classrooms and laboratories in the upper floors. The rooms' windows provide a panoramic view of the surroundings and are fed by soothing breezes. Norton University is known as one of the best educational institutions in Cambodia. Therefore, around 10,000 students from all three shifts have enrolled here to continue their learning journey.
KH.10.	
Inventors	Mr. Ung Chisreng, Dr. So Sokuntheary, Mr. Chuop Sopheak
Inventions	NU THE BOOKS SHELVES OF NEW TECHNOLOGY
Institution	Norton University
Abstract	NU books shelves are an automated system with tablet displays built in with bookshelves for searching any books. The system on the tablet will lights up at the bookstall (or book installed place) when searching information or name of the book or hint of any books.

Canada

CA.1.

Inventors Dr. Madeleine Tremblay, Lucas Moreau, Ava Patel, Ethan Desrochers, Charlotte Giroux, Jacob Nguyen, Olivia Beauchamp

Inventions ClearIce: Sustainable Icemelt Solution for Urban Infrastructure

Institution -

Abstract

Winter climates pose a myriad of challenges to urban areas, particularly when it comes to the maintenance of infrastructure such as roads, bridges, and sidewalks. Traditional methods of de-icing, predominantly reliant on salt, are not without environmental repercussions, as they can result in damage to concrete structures, roadside plants, and aquatic ecosystems upon runoff. Recognizing this challenge, the ClearIce solution emerges as an innovative and sustainable alternative for urban winter maintenance.

ClearIce is a cutting-edge solution that combines natural, biodegradable materials with patented slow-release technology. The formula ensures efficient melting of ice and snow, while its controlled-release mechanism minimizes the need for frequent reapplications. This not only results in operational savings for municipalities but also significantly reduces the environmental footprint of winter maintenance.

CA.2.

Inventors Sophia Bennett, Noah Tremblay, Chloe Dufour, Samuel Gauthier, Aria Morin, Benjamin Beaulieu

Inventions EcoGuard: Biodegradable Drone Shield for Forest Conservation

Institution -

Abstract

Forests, often termed as the lungs of our planet, are under constant threat due to illegal logging, forest fires, and invasive species. Monitoring vast stretches of wilderness has always posed significant challenges. The EcoGuard drone emerges as an intelligent response to these challenges, ushering in a new era of forest conservation powered by technology.EcoGuard is not just any conventional drone; it is a biodegradable aerial vehicle equipped with an array of sensors that detect early signs of forest threats. These sensors are designed to identify changes in temperature (indicative of a potential forest fire), unauthorized machinery sounds (indicating illegal logging), and spectral changes in vegetation (signifying disease or pest invasion).

One of EcoGuard's standout features is its eco-conscious design. Made from a composite of mushroom mycelium and other organic materials, the drone can biodegrade naturally, leaving no trace behind, if ever it becomes non-functional or lost during operations. This ensures minimal impact on the ecosystems it's designed to protect.

China

CN.1.	
Inventors	Dr. Li Wei, Chen Xiu, Zhang Hui, Liu Yang, Wang Fen, Zhou Ling, Jiang Xin
Inventions	Biodegradable Infrastructure Mesh
Institution	China Association of technology and sciences
Abstract	Infrastructure maintenance, especially in vast and rapidly urbanizing landscapes, requires sustainable and efficient solutions. SilkNet, a groundbreaking creation, introduces a mesh made from a genetically enhanced silk derivative, offering both strength and biodegradability for various civil engineering applications. SilkNet is malleable and can be molded into various forms, from roadbed reinforcements to erosion barriers on hill slopes. The mesh's key property is its high tensile strength, rivaling that of many synthetic materials, yet it retains the ability to decompose naturally over time, leaving no harmful residues. This ensures minimal environmental impact and reduces the need for extensive rework or material removal after its intended usage period.
CN.2.	
Inventors	Xiao Li, Shen Jing,
Inventions	Air-Purifying Building Blocks
Institution	China Association of technology and sciences
Abstract	As urban centers expand and air quality becomes a pressing concern, the built environment plays a crucial role in shaping the health and well-being of its inhabitants. EcoBrick, an innovative construction material, addresses this concern head-on by serving a dual purpose: a building block that also purifies the air. Each EcoBrick contains a core of porous materials infused with microalgae. This core captures pollutants from the air, such as carbon dioxide and particulate matter. The microalgae, sustained by sunlight and these pollutants, undergo photosynthesis, converting the contaminants into oxygen. The outer layer of the brick is translucent, allowing sunlight to reach the algae while protecting the inner core from external damage and wear.
CN.3.	
Inventors	Li Na, Feng Bo, Qin Yu, Zhang Ke, Mao Lian, Wu Tian
Inventions	Plant-Based Urban Air Purification System
Institution	-
Abstract	Air pollution in urban areas presents a formidable challenge, demanding innovative and sustainable solutions. PhytoFilter steps into this arena, merging the principles of botany with cutting-edge engineering, resulting in a scalable urban air purification system centered around specialized plant species. PhytoFilter's main component is a series of vertical gardens, housing an array of plants specifically chosen for their exceptional pollutant-absorbing capabilities. These plants not only absorb airborne contaminants but also break them down into less harmful constituents through natural metabolic processes. To enhance efficiency, the vertical gardens are integrated with a concealed

airflow system. By drawing ambient air through these botanical filters, the system ensures maximized exposure to the plants, facilitating a rapid purification process.

Croatia

HR.1.

Inventors TOMISLAV BRONZIN

Inventions SmartArt

Institution CITUS d.o.o.

Abstract

SmartArt is an innovative digital platform that enables museums to independently create additional multimedia content that enriches the user experience of museum visitors. It uses elements of artificial intelligence (AI) that include computer vision to quickly identify each artwork without applying any markers.

The application enables the creation of content on the museum's collection, where all multimedia content that will be assigned to a particular exhibit is defined and enables the creation of exhibitions, catalogues, etc. according to needs. It supports multimedia records (sound, video, image, animation, 3D objects, link, text) and associated formats.

The application consists of two parts:

- WEB application - background solution intended for content creators in the museum. It contains components for cataloging exhibits, organizing digital content, linking digital content with individual exhibits, and creating and managing exhibitions. The most important component is the multimedia editor that edits the museum collection, digital content, and defines the exhibitions, and connects all the necessary elements into one logical and functional whole.
- MOBILE application - intended for museum visitors. It is easily adapted to the currently available exhibitions and contents, and every museum visitor can very simply and easily install it on their mobile device (smartphone or tablet)

Due to its concept and built-in technological solutions, SmartArt meets the real needs of the museum, both in terms of technology and business.

The key elements of innovation are the application of artificial intelligence (AI) in art recognition and a flexible platform that enables the management of a large number of exhibitions.

It can be installed on all standard mobile devices (smartphones and tablets).

The solution is available on Android and iOS platforms.

HR.2.

Inventors VJEKOSLAV MAJETIC

Inventions GASIFICATION OF WASTE SLUDGE

Institution DOK-ING d.o.o.

Abstract

Problem: The way in wich the unprocessed waste is deposited on the depargalist without prior treatmant has become unacceptable, ecological and economical.

How to solve it: The newer approach to the treatment of waste in a completely ecological and economically acceptable way is the use of gasification technology

Device description: Gasification plant. The device is intened for safe and economic processing of all types of waste materials and electrical energy production.

It consist of:

- Unit for waste sludge processing
- Electrical energy production units
- Production materials ensure long-lasting and safe operation
- The monitoring system enables the monitoring of processes and continuous operation without delays and oscolation.

Characteristics:

- Fully automatic and 24 hours continuous production adopting advanced technology can produce good quality fuel oil.
- Fully automatic, no need labor, high-temperature and enclosed discharging, which is environmental-friendly, clean and dust-free.
- Unique anti-sticking devices, wich can achieve continuous production of special materials.
- Large capacity with 20-50 tons per day; during production, there is no need for fuel because the non-condensable gas produced gasification can support the whole process of production.
- Raw material input– Sludge from biological waste water treatment.
- Waste treatment unit- Reactor.

The gasification process is completely closed, unfolding without the presence of oxygen.
Environmental-friendly and pollution-free (general hazardous waste processing standards), with national patent smoke scrubbers which can remove acid gas and dust from smoke,
Products are:

- synthetic gas (main fuels: methane, hydrogen and carbon monoxide)
- solid residue (consisting of non-combustible materials (eg minerals) and small amounts of carbon)

No unpleasant odors are released during operation.
Part of the generated electricity is used in the process, and the rest is delivered to the electric power system.
Investment in an individual facility is returned within less than 2 years.

HR.3.

Inventors MATIJA CMELJESEVIC, ZELJKO SITUM

Inventions FLEXIBLE PNEUMATIC MANIPULATOR

Institution University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture

Abstract

BRIEF DESCRIPTION
The flexible pneumatic manipulator is a simple robotic arm composed of two joints interconnected by inflatable actuators that form one spherical joint. At

	the top of this manipulator there is a vacuum gripper that enables the acceptance and transfer of objects from the initial to the final positions and their release. ADVANTAGES The presented flexible pneumatic manipulator belongs to the field of soft robotics and has advantages over conventional robotics in certain segments of it's operation. Unlike rigid-body robots made of metal or hard plastic, the compliance of soft robots can improve their safety when working in close contact with humans. PURPOSE This type of robot could be useful as a collaborative robot since it's action does not pose a danger to the person in its immediate vicinity (unlike conventional robots that must work in a limited and fenced space for environmental safety).
HR.4.	
Inventors	DOMINIK DESPOT
Inventions	ÜBERENIGMA
Institution	ALGEBRA UNIVERSITY COLLEGE
Abstract	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 7.45x10316216 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.5.	
Inventors	ZELJKO KNEZIC, DUBRAVKO ROGALE, ROBERT MATASIC
Inventions	A SOURCE OF ELECTRICITY BASED ON THE MOVEMENT OF THE LIMBS
Institution	University of Zagreb Faculty of Textile Technology

Abstract

The source of electricity is placed on clothing near the limbs (arms or legs). It consists of a freely moving cylindrical permanent magnet and an induction coil made of thin varnish-insulated wire profiled into a suitable coil.
The movement of the limb causes the movement of the permanent magnet inside the cylindrical cavity around which the coil is located, where a voltage appears that can be used to power devices on clothing or the body (wrist watches, different types of sensors, charging batteries, lamps, or mobile phones, etc.).

HR.6.

Inventors

KRESIMIR CICKOVIC

Inventions

MD – LOCAL MUST

Institution

OPG MD Kresimir Cickovic

Abstract

We proudly and with a big Slavonian heart present MD – local must a „refreshement for 5“ – a beverage for all 5 senses!

Allow your palate to feel the fullness of the flavor of this extraordinary beverage in which all your senses will enjoy: experience the attractive and captivating color of this drink as well as the superior taste and a special aroma.

Add to that the sound of glasses toasting with loved ones and all our senses will be satisfied! Enjoy the moment! Cheers!

The first homemade MD must was created of grapes from the green slopes surrounded by an old mysterious forest, ripened beneath the wide blue sky and sun kissed in the Golden Valley, hand-picked in an idyllic family atmosphere. The fullness of the flavor comes from the ripe bean grapes, as well as from love and care of the vinedressers through each step of the production process.

What exactly is must?

Must is a fresh non-alcoholic, non-carbonated beverage obtained by pressing healthy and mature grape beans. It is characterized by a special fullness and harmonious taste. This quality sweet drink is considered extremely healthy due to the richness of ingredients since the grapes abound in numerous medicinal substances that remain preserved in the must even after pressing.

Grapes as a berry fruit of the vine represent a food of great nutritional and dietary values and are recommended in the diet of all age groups. Being distinctly nutritious food, grapes are also a great source of various minerals and vitamins and since they contain about 20% grape sugar (average amount), they are considered an energy-rich food.

Considering that the essence of bean grapes is in the bottle of homemade must, we might say that a liquid elixir of youth and beauty is found in the heart of Slavonia’s Golden Valley (Vallis Aurea).

Enjoy it with all your senses! Best served cold! Store in a dark and cool place! Gluten free and vegan friendly!

Due to the process of making – COLD PRESSING – Must Domestic is a freshly pressed and naturally sweet* grape juice. *No sugar added. No water added.

HR.7.

Inventors MARKO MARICEVIC

Inventions TACTILE PENDANTS FOR VISUALLY IMPAIRED AND BLIND PEOPLE

Institution University of Zagreb Faculty of Graphic Arts

Abstract Tactile pendants consist of braille and typographic elements. The innovation's distinctiveness lies in the personalization of the pendant to the user's needs and the ability to be produced using various additive manufacturing technologies. Additive manufacturing technologies allow for the production of personalized products without increasing the production time and cost.
Advantages:
An easy possibility of creating with a 3D printer. Selection of environmentally friendly thermoplastics that are wear-resistant. Possibility of individualization and personalization without increasing the cost and time of production. On-demand manufacturing.
Purpose:
Improving communication with visually impaired and blind individuals

HR.8.

Inventors DARKO SPILJARIC

Inventions Pop-up kitchen PIA

Institution DIZZ CONCEPT d.o.o.

Abstract A cabinet with a TV that hides a fully equipped kitchen. Less than 1.6m2 of space is enough for both functions. This concept offers significant space saving and provides a whole new way of space planning that architects can envision. The whole kitchen is packed in the crate with dimensions 110x100x210 and it is suitable for transport via elevator. It is possible to save from 3-5m2 through better use of the available space thus lowering the cost of purchase or lease of the space. Significant savings are achieved by saving the energy used for heating, cooling, and maintenance. It is possible to install the kitchen in only 1 hour. The connection installations are possible to connect anywhere behind the base elements. Typical kitchens become waste after their initial usage. PIA kitchen can be easily moved to other spaces and used multiple times.
Advantage:
It is possible to save from 3-5m2 through better use of the available space thus lowering the cost of purchase or lease of the space. Significant savings are achieved by saving the energy used for heating, cooling, and maintenance. It is possible to install the kitchen in only 1 hour. The connection installations are possible to connect anywhere behind the base elements. Typical kitchens

become waste after their initial usage. PIA kitchen can be easily moved to other spaces and used multiple times.

Intended use:

Standard configuration includes the TV, sink, dishwasher, waste selector, built-in refrigerator, microwave or standard oven, cooking hood, LED light, cooking hob, electrical sockets, shelves, and cabinets. Doors have depth of 15 cm and can hold items like glasses, bottles, groceries, etc, and they feature a safety switch that turns the power off for cooking hob when upon closing the doors. Hence, PIA can be used to furnish comfortable small apartments, apart-hotels, holiday homes, mobile houses, student accommodation, offices, yachts, guest rooms in large houses, etc.

Estonia

EE.1.	
Inventors	Kristo Käär, Liis Mägi
Inventions	eScribe Digital Prescription Authenticator
Institution	Individual
Abstract	eScribe is a cutting-edge digital prescription authenticator designed to streamline pharmacy experiences and eliminate prescription forgeries. Using blockchain technology, eScribe securely logs and verifies physician-issued prescriptions, ensuring both authenticity and patient privacy. Patients receive a unique QR code linked to their prescription, which can be scanned by pharmacists for immediate verification. With an integrated alert system, eScribe notifies medical professionals of potential drug interactions based on the patient's digital medical history. As Estonia continues to innovate in the digital health sector, eScribe stands as a testament to its commitment to improving patient safety, efficiency, and the overall healthcare experience.

Egypt

EG.1.	
Inventors	Yasmine El-Sayed, Farid Mansour, Amina Zakaria, Tarek El-Masry
Inventions	NileGuard
Institution	Cairo inventors group
Abstract	Built upon a network of soil sensors and satellite data, NileGuard ensures that water is distributed precisely where and when crops need it, minimizing wastage. The system's AI-powered core processes real-time data on soil moisture, weather predictions, and crop type to calculate optimal irrigation patterns. Moreover, NileGuard's adaptive design allows it to work with various water sources, from the Nile's main channels to underground wells, maximizing utility for diverse farming setups.NileGuard goes beyond mere irrigation; it also tracks water quality, ensuring that crops receive optimal nutrients while flagging potential pollutants. As Egypt strives to sustain its agricultural heritage amidst changing environmental conditions, NileGuard offers a beacon of hope, merging ancient agricultural wisdom with cutting-edge technology.
EG.2.	
Inventors	Samir Nassar, Laila Fathi,
Inventions	Solar-Powered Desert Cooler
Institution	Cairo inventors group
Abstract	PyraSun harnesses Egypt's abundant sunlight through high-efficiency photovoltaic cells, converting it into energy that powers a unique evaporative cooling system. This system uses a minimal amount of water to produce a cooling effect, optimizing resource usage in water-scarce regions. With inbuilt sensors, PyraSun continuously monitors ambient temperature and adjusts its cooling mechanisms accordingly, ensuring consistent comfort levels.Additionally, the cooler's modular design allows it to be scalable, from individual tent units to larger community spaces or even agricultural storage areas. PyraSun also incorporates a secondary function: during the cooler nighttime desert hours, it can harness wind energy to produce heat, further adapting to the desert's diurnal temperature variations.With PyraSun, the dream of more sustainable living and working conditions in desert regions becomes a tangible reality, showcasing Egypt's innovative spirit in addressing its unique environmental challenges.

Hong Kong

HK.1.

Inventors Dr. Raymond Liu, Alice Wong, Samuel Chan, Lina Yeung, Rajan Patel, Carrie Lam, Edwin Ho

Inventions Vertical Hydroponic Farming Modules for Compact Cityscapes

Institution The Hong Kong University of Science and Technology (HKUST), Hong Kong

Abstract As cities become denser and available land for agriculture diminishes, the challenge of locally sourcing fresh produce becomes increasingly significant. UrbanGrow addresses this challenge head-on, introducing an innovative solution for hyper-local agriculture in the form of vertical hydroponic farming modules tailored for compact urban environments.

Designed as modular vertical towers, UrbanGrow can be easily integrated into urban spaces, from residential balconies and rooftops to public parks and unused plots. Each module utilizes a closed-loop hydroponic system that conserves water, eliminates the need for soil, and minimizes the use of pesticides and fertilizers.

However, what sets UrbanGrow apart is its integration of smart technology. Embedded sensors continuously monitor factors such as humidity, light levels, and nutrient concentrations, adjusting the environment in real-time to ensure optimal growth conditions. This level of precision, combined with the efficient use of space, enables the system to yield produce at a rate that rivals traditional farming, but within a fraction of the footprint.

HK.2.

Inventors Vivian Cheung, Kelvin Leung, Fiona Ma, Daniel Tsang, Serena Wu, Henry Chow, Grace Lo

Inventions NanoPure

Institution The City University of Hong Kong

Abstract Microplastics, tiny fragments of plastic less than 5mm in length, have become ubiquitous in aquatic environments worldwide, posing threats to marine ecosystems and human health. These minute contaminants, originating from sources such as degraded plastic waste, cosmetic products, and clothing fibers, have proven challenging to remove from water bodies using conventional methods. NanoPure emerges as a groundbreaking solution to this pressing environmental challenge, designed explicitly for the efficient capture and removal of microplastics from urban waterways.NanoPure's innovation is centered on its proprietary filtration mesh, composed of nanofibers engineered to target and trap microplastics without impeding water flow. The mesh, flexible and durable, is deployable in a variety of settings, from stormwater drains to wastewater treatment plants, offering a versatile solution suitable for various urban scenarios.Complementing its physical filtration mechanism, NanoPure incorporates a real-time monitoring system. Integrated sensors embedded within the mesh detect and quantify the volume and types of microplastics captured. This data is sent to centralized databases, enabling environmental agencies to gain insights into microplastic pollution patterns and the effectiveness of remediation efforts.

Indonesia

ID.1.	
Inventors	
Inventions	
Institution	INNOPA
Abstract	
ID.2.	
Inventors	
Inventions	
Institution	INNOPA
Abstract	

Iran

IR.1.	
Inventors	Majid Farhadi, Arefeh Sepahvand, Fatemeh Arbaby, Ali Farhadi
Inventions	Air purifier with the ability to measure and remove all physical, chemical and microbial pollutants
Institution	Jundishapur university of medical science, ahvaz, iran Lorestan university of medical science, khorram abad, iran Lorestan university of medical science, khorram abad, iran Lorestan university of medical science, khorram abad, iran
Abstract	PURPOSE OF THE INVENTION: The purpose of the design of this device is to measure gases, particles and microbes in the air. Then, it removes all kinds of environmental pollutants such as dust particles and odors, and finally disinfects the air and removes microbial agents. HOW DOES IT WORK? This device is a combination of cyclone, electrostatic precipitator, sorbent tube, PDA & TSA (to measure microbes), SULPA filter, UV lamp and activated carbon. The whole device is connected to an air suction pump. When the pump is turned on, the air enters the machine through the cyclone opening and due to the centrifugal force, the larger particles are removed from the air flow and the smaller particles continue on their way to reach the ESP (Electrostatic Precipitator). Before ESP, there is an optical particle counter. When the small particles reach the ESP, they are charged under the influence of the electric field and are drawn towards the non-identical poles, and the dust particles are removed from the air. Then a sorbent tube is used to remove and measure gaseous pollutants. In the next step, the air enters the PDA & TSA cultures to measure fungi and bacteria. Next, to control bioaerosols, SULPA filters are used, which have an efficiency of 99.9999 to remove impurities. Then the passing air passes through the activated carbon for fumigation. Finally, to reach completely clean air and remove microbial agents, the air is placed in contact with the UV lamp.
IR.2.	
Inventors	Mehdi Farzpourmachiani, Simin Naghibi Masouleh, Mohammadali Rajabi Torbehbar, Alireza Khalighi, Ali Farzpourmachiani, Amir Khodadadi Parashkouh, Salar Basiri, Mahmoud Daneshfar, Amirmohammad Khodadadi Parashkouh, Amirhossein Rajabi Torbehbar
Inventions	SMART FENCE
Institution	-
Abstract	A system for improving sustainable development in order to maintain citizen's civil rights. A system for protecting people's lives in places with potential levels of risk which is controlled by expert systems.

Employing such method and technique, it is possible to operate and control a system for protecting lives of and increase the safety level for users and citizens from a control office.
The control office may be located at any place and at any distance from the smart fence system.
Employing such a smart fence, the safety level is increased and the likelihood of occurrence of potentially dangerous circumstances is decreased.
Smart fence consists of flexible and smooth parts and also air. Therefore physical contacts between people and the system are of minimum level of risk and danger.

IR.3.

Inventors Reza Moallemian, H. NaderiNejad, A. Karamimanesh, AmirReza NaderiNejad, M.Dadar, A.Haghighipour, M.Dashtizadeh

Inventions Smart sanitary tape with biological nanosensor

Institution NewScience.ac

Abstract We have designed a smart sanitary pad to prevent some cancers in women and based on their monthly cycle. In this project, we have used a bio-compatible nanosensor of the body to react with specific proteins and measure the amount of hormones that are effective in the onset of cancer. The information obtained from the reaction of the nanosensor with hormones is sent to a dedicated application on the mobile phone or Apple Watch by a transmitter for analysis and comparison with standard information. The biological nanosensor can report the information related to the permitted amount of the desired hormones regularly every month. As a result, the dedicated application, apart from analyzing the monthly data, will notify the person or the family doctor of any sudden changes through the mobile phone or Apple Watch, so that necessary and effective measures can be taken by the doctor before the occurrence of cancer.

IR.4.

Inventors Artemis Banaeian,Hasti Mortazavi ,Tina Javadi ,Safa Moheb Rasoul

Inventions Anti Decay Gum

Institution ANIA Association

Abstract Streptococcus mutans and lactobacillus are two serious factors in causing tooth decay, which can destroy tooth enamel if oral hygiene is not followed. Acids produced by these two bacteria in the process of carbohydrate fermentation cause tooth enamel erosion. Many of the available methods to eliminate streptococci mutans and lactobacillus bacteria may affect the balance of oral microbiomes, mouthwashes can cause dryness in the mouth, and temporary dental covers and fluoride are only short-term protections. Our proposal to solve this problem is to prepare chewing gum mixed with a natural sweetener called xylitol, which not only does not cause caries, but has also been shown to be able to repair tooth decay. using low-dose baking soda to inactivate bacteria. as well as probiotic bacteria obtained from materials such as cocoa, apples, and garlic to eliminate harmful tooth bacteria. The results show that excessive use of baking soda damages the tooth enamel, therefore, a low dose of baking soda has been used in this gum, and also probiotic bacteria can prevent the formation

of streptococci mutans and lactobacillus bacteria, and xylitol, a natural sweetener, can replace chemical detergents and consumers can have less streptococci mutans bacteria in their dental plaque.

IR.5.

Inventors Ailin Barahimi,Mahta Yavari

Inventions Head Massage Aromatherapy

Institution ANIA Association

Abstract

Pain in the head and upper neck is known as headache. Headache has a nervous origin and the tissues and structures surrounding the brain become inflamed and painful. Nowadays, due to the conditions of the society, a wide range of people are involved in various types of headaches, the most common type of headache is tension headache or nervous headache. People who are exposed to stress and anxiety or depression experience headache, eye pain combined with temple pain and pain in the shoulder and trapezius muscles. Another important cause of this type of headache is body fatigue caused by improper sitting and positioning of the neck vertebrae, followed by pressure on the muscles in this area. Until now, most of the solutions are based on drug treatment, which has many side effects for the consumer in the long term, which can be mentioned as causing problems for the liver, kidney, and digestive system. Also, the person's body becomes resistant to painkillers after some time and will no longer have the initial reaction and efficiency, and for some people, including pregnant people, people prone to drug allergies and those who use other drugs, it causes drug interactions and as a result Problems become more serious. The proposed solution is the idea of making a wearable massager that targets the medical points of the head and neck and the trapezius muscle and helps to treat such headaches through massage, as well as the integration of this massager with aromatherapy that stimulates the sense of smell and open It doubles the effectiveness of this treatment method. Finally, all these features lead to increased blood flow in the head, neck and shoulder muscles and more oxygen supply to the brain, which in turn accelerates pain relief.

IR.6.

Inventors Ghazal Rahimi, Parnia Talebi, Rozana Falahati, Sayedeh Niloofar Ghaziasgar

Inventions GumFriend

Institution ANIA Association

Abstract

While the world is taking another step towards progress and innovation every day, people are still facing significant problems. One of these problems that few people pay attention to and prevent during their lives, and other people suffer from after neglecting this problem, is the receding and bleeding of the gums, each of which has consequences. But there is a schema that purposefully seeks to solve these problems. In short, this scheme, which is used to massage the gum area, includes a lever in the middle, two handles at the beginning for opening and closing, and two handles at the end of the lever, on which silicone rollers are placed to massage the gums. These two rollers are placed on both sides of the gums and (for the upper jaw from top to bottom and for the lower jaw from bottom to top) are moved and massaged. But since disinfectant liquid

	and mouthwash can be useful for any infection and gum disease, this design includes a tank that can deliver the mouthwash liquid to the gums at the same time as the massage using rollers. Among the features of this idea, in addition to the prevention of gingivitis and gum bleeding, it is possible to mention the improvement of blood circulation, the removal of gum congestion, the removal of gingivitis, and the improvement of oral and dental hygiene.
IR.7.	
Inventors	Farnaz Yaseliani, Hasti Jamali, Mozhdeh Shahmoradi, Nastaran Momeni, Nozha Mehni
Inventions	BioGuard Dental Shield
Institution	ANIA Association
Abstract	Tooth decay is one of the most common chronic multifactorial diseases worldwide. Plaque is an adhesive biofilm that forms on the tooth surface and is the main cause of the spread of decay. People typically use solutions such as toothbrushes along with toothpaste containing fluoride, a variety of mouthwashes, floss, etc. However the problem is that these solutions prevent biofilm from forming in a short amount of time in about an hour. We use a cloud ball product that uses substances such as mucilage, which is a type of oral adhesive that has antibacterial properties, along with the enzyme dextranase 50. We estimate that using this product prevents tooth decay and plaque formation over a longer period than other products and has a positive effect on slowing down the growth of bacteria in biofilms.
IR.8.	
Inventors	Mahak Sadat MirMoghtadaei
Inventions	MoodMate
Institution	ANIA Association
Abstract	Autism presents various challenges for children, one of which is their propensity to lose focus when discussing topics that fail to pique their interest. While numerous efforts have been made to alleviate this issue, existing solutions often fall short due to their lack of consideration for the feelings of autistic individuals. These solutions fail to discern their interests, such as identifying engaging activities or pinpointing challenging aspects within a game. Moreover, retaining information over an extended period remains a prevalent concern. Our proposed plan endeavors to tackle these challenges by developing a game that leverages spatial concepts to enhance a child's focus on a subject. This game incorporates shapes presented at varying distances to captivate the child's attention effectively. Furthermore, we aim to employ a state-of-the-art headband designed to monitor vital signs during gameplay, thereby providing invaluable data insights. Through meticulous analysis of this data, we can discern which segments of the game pose greater difficulties for the child. Consequently, this information will facilitate customizing a personalized treatment plan tailored to the individual's needs. The distinctive feature that sets our game apart from conventional approaches lies in its capability to monitor vital signs, offering unprecedented insights into the emotional experiences of the child during gameplay. This holistic approach

will empower caregivers and therapists to gain a profound understanding of the child's emotional responses, enabling them to adapt and optimize the game experience to suit the child's unique preferences and challenges effectively.In conclusion, our innovative approach seeks to address the common challenges faced by autistic children, empowering them to engage better with subjects of interest. By integrating spatial concepts and employing cutting-edge vital sign monitoring technology, we aim to create a game that not only captures the child's attention but also provides crucial data for crafting personalized and empathetic treatment plans. Through this endeavor, we aspire to foster a supportive environment that caters to the individual needs and emotions of autistic children during gameplay and beyond.

IR.9.

Inventors Zhina Amin al-Raaya Karladani

Inventions Tranquil Wings Abode

Institution ANIA Association

Abstract

Existing bird cages are often lacking in innovation and do not meet the important needs of birds and cause many problems including problems such as stagnant and dirty drinking water which can lead to bird diseases, also if the seed tank is empty to When the owner of the bird does not visit it, it may remain empty and the bird may remain hungry. Also, birds, as a habit, throw some of it around when they eat seeds.

In existing cages, some designers may have focused only on visual appeal and neglected essential practical aspects such as keeping the water clean and preventing disease. Others ignored the tendency of birds to scatter seeds, which leads to unattractive and unattractive cages.

In our proposed plan, emphasizing the welfare of the birds, a waterfall drinking system has been built in order to prevent water from stagnating and getting muddy as a result, in addition to being attractive, and it ensures that the water remains clean and unpolluted, and as a result, the risk of diseases. reduces in birds. In addition, the seed system has been replaced with a silo-like seed tank that can be easily filled from outside the cage.

And finally, as we said, the birds throw the seeds, the bottom of the cage is covered with fibers that have the ability to grow seeds, and it turns into a green canvas and adds to the attractiveness of the cage.

IR.10.

Inventors Ali Talebi, Mohammad Hossein Shamshiri, Iliya Ataei

Inventions Sustainable Shade Garden

Institution ANIA Association

Abstract

This design involves the use of a mat with indoor flower planting pits placed under the cooler. This design ensures that any water that condenses or drips from the cooler is not wasted, but helps the flowers grow. This mattress is designed with a sponge-like texture that can effectively absorb and retain water. This material allows water to be collected and distributed slowly in the plants. Pits are dug inside the mattress at different intervals. These pits are basically

holes in which plants can be planted. These pits serve as miniature planting beds for flowers. Each planting pit is filled with a mixture of soil and water absorbent powder. Water absorbent powders are materials that can hold several times their weight in water. When water drips or condenses from the cooler, it absorbs these powders.
As water accumulates on the mattress due to condensation or dripping from the cooler, the water absorbent powders in the planting holes gradually absorb the water. This absorbed water is then slowly released over time, providing constant moisture to the planted flowers. The absorbed water is gradually released to the plants in the pits. This controlled water supply promotes healthy plant growth without overwatering or wastage. A frame can be created around the mattress that provides support and stability. This frame can also be designed as a shade structure. When the cooler is exposed to direct sunlight, the frame and mattress provide shade, preventing overheating and maintaining a more comfortable environment. This plan combines water saving with gardening and makes effective use of the water that is being wasted from the cooler. The slow and controlled release of water allows for optimal plant growth without flooding, and the shade frame increases the mat's usability and provides more performance.

IR.11.

Inventors Vandad Mirzaei,Viana Farhadieh, Golshifteh Shamloo, Mohammad Taha Hami, Baran Soroudi

Inventions Institution EcoFocus Solar
ANIA Association

Abstract

The presented design is a creative and innovative approach to use solar energy for culinary purposes. By combining various optical and thermal principles, this design has the potential to concentrate and efficiently use solar energy for heating. The existing design of a gas stove for the use of nature, which works by using solar energy and heat, which is a clean and renewable energy and does not harm the environment, and includes three parts. The first part is an aluminum box, because aluminum is a good conductor of heat. is, so it quickly transfers the absorbed energy into the box. The second part is a concave dish covered with aluminum sheet. When the aluminum box is placed in front of the concave aluminum dish and both are exposed to direct sunlight, The concave dish acts as a concentrator of sunlight. Focused rays of sunlight are reflected from the concave surface and converge towards the focal point. And the focus point is inside the aluminum box, resulting in a strong concentration of energy at that point. This concentrated energy is what causes food to heat up faster. And in the third part, a rotatable convex lens is used, the combination of convex lens and concave aluminum dish causes multiple reflections and refractions of sunlight. This means that the light is reflected and bent several times before reaching the dish. Each reflection and refraction adds to the concentration of energy at the focal point, further increasing the thermal effect on the dish.

IR.12.

Inventors Forouzan Gholami, Alireza Tabazadeh, Sahar Mohammad Rezaei, Mohammadreza Rezaei kafrani, Sajjad Khodayari

Inventions	Hydrate-Lowering Spool
Institution	Tousan
Abstract	The anti-hydrate check used in oil and gas fields is designed and built to solve the problem of freezing or check the flow line during injection. Today, due to the pressure drop in the extraction wells and the so-called death of the well, engineers have started injecting gas to raise the oil, which causes serious problems in the cold seasons of the year and even puts the personnel at risk . The drop in temperature upsets the balance of hydrate formation and the gas injection pipe is blocked, and this path must be reopened by the well inspector, and during this time, the well is out of flow, and apart from the economic loss, there is also the possibility of explosion during reopening. A clear and precise statement of the benefits of the invention: Reduction of freezing and blockage of gas injection line to production wells Reducing environmental damage caused by wells Use of new and renewable energy in the device. Construction techniques: This device uses the laws of equilibrium and conditions of hydration and by taking advantage of the property of heat transfer and disturbing the balance of hydration, it performs the task for which it was made by shifting the temperature of hydration.

Italy

IT.1.	
Inventors	Marco Bianchi, Lucia Ferrero, Matteo Grasso, Giulia Romano, Stefano Bellini, Francesca Marino, Paolo Conti
Inventions	Smart Vineyard Management System VitaVino
Institution	-
Abstract	Italy, a nation celebrated for its rich wine heritage, continuously seeks advancements in vineyard management to uphold its prestigious reputation. Introducing VitaVino, a groundbreaking innovation crafted by a team of seven experts: Marco Bianchi, Lucia Ferrero, Matteo Grasso, Giulia Romano, Stefano Bellini, Francesca Marino, and Paolo Conti from the Polytechnic University of Milan. VitaVino integrates a comprehensive array of IoT sensors, drones, and AI-driven data analytics to revolutionize vineyard management. These sensors actively monitor soil moisture, temperature, sunlight exposure, and pest activity. Drones equipped with infrared cameras hover above vineyards, identifying areas of stress or disease, enabling timely interventions. All this data feeds into an AI platform, which offers actionable insights to vineyard managers.

Japan

JP.1.

Inventors Hiroshi Nakamura, Yuki Tanaka, Keiko Saito, Masaru Fujimoto, Ayumi Kobayashi, Ryo Takahashi, Miho Watanabe

Inventions SakuraNet

Institution University of Tokyo

Abstract

Facing urban pollution challenges, an innovative solution, SakuraNet, has been introduced, an advanced urban pollution scrubber inspired by the iconic cherry blossom trees. This system mimics the cherry blossom's natural ability to attract and trap airborne particles. Utilizing nanofiber membranes and bioengineered resins, SakuraNet efficiently captures and neutralizes harmful pollutants such as PM2.5, nitrogen dioxide, and volatile organic compounds. These membranes, strategically integrated within the system's modules, work in conjunction with low-energy fans, ensuring broad pollutant capture without significant power use. Beyond its core functionality, SakuraNet's design elegantly incorporates LED systems that light up the modules, making them resemble blooming cherry blossoms during nighttime, adding aesthetic beauty to urban settings. This solution stands as a testament to the harmonious blend of technology and nature, offering both practical benefits and a visual reminder of the importance of environmental mindfulness in urban development.

JP.2.

Inventors Dr. Hiroki Tanaka, Naomi Suzuki, Kenji Yamamoto

Inventions EchoMirror

Institution -

Abstract

EchoMirror represents a novel fusion of technology and acoustics, designed to enhance and manipulate sound in real-time environments. Drawing inspiration from traditional Japanese principles of sound and space, this device captures ambient noises and harmonizes them into serene soundscapes, providing a tranquil auditory experience in bustling settings. Equipped with advanced microphones and resonators, EchoMirror identifies and neutralizes disruptive frequencies while emphasizing calming ones, such as the gentle rustling of leaves or the distant chirp of a bird.

The device's sleek, minimalist design ensures seamless integration into urban spaces, from public transit hubs to open-air parks, offering auditory pockets of tranquility amidst the daily chaos. An accompanying app allows users to customize their acoustic experience further, choosing from an array of natural sounds or even introducing personal recordings. EchoMirror not only stands as an emblem of acoustic innovation but also serves as a testament to the enduring appreciation of nature and harmony in contemporary design. In a world inundated with noise, this invention offers a respite, echoing the timeless serenity found in traditional Japanese gardens and tea ceremonies.

Korea

KR.1.

Inventors	Dr. Joon-Ho Kim, Sun-Hee Park, Min-Jun Lee, Hye-Jin Choi, Daesung Kang, Soo-Min Cho, Ji-Won Yoo
Inventions	HanLight Bio Luminescent Urban Illumination
Institution	Busan society
Abstract	HanLight unveils the future of urban lighting by embracing an innovative amalgamation of biotechnology and urban design. At its core, HanLight utilizes genetically engineered microorganisms that produce natural luminescence, providing a sustainable and energy-efficient solution to urban lighting needs. These organisms are housed within translucent modules that can be strategically placed in public spaces, pathways, or even integrated into building facades. A key feature of HanLight is its ability to adjust luminosity based on ambient conditions. Sensors within each module detect surrounding light levels, ensuring that the bio-luminescent organisms adjust their brightness in response, offering consistent illumination from dusk till dawn. The system is not only energy efficient but also reduces light pollution, preserving the night's natural beauty in urban settings. Moreover, HanLight's modular design is inspired by traditional Korean lanterns, presenting a harmonious blend of age-old aesthetics with cutting-edge biotechnology. As cities worldwide grapple with rising energy costs and environmental concerns, HanLight emerges as a beacon of sustainable innovation, illuminating the path towards greener urban futures.

KR.2.

Inventors	Dr. Mi-Young Park, Hyun-Woo Kim
Inventions	K-CraftMatrix Digital Loom and Textile Designer
Institution	KPWA
Abstract	K-CraftMatrix revolutionizes the world of textile design, intertwining the rich tapestry of traditional Korean craftsmanship with the precision and innovation of modern technology. This state-of-the-art digital loom harnesses AI algorithms and sensor arrays to emulate and enhance age-old weaving techniques, producing textiles that range from authentic reproductions of historical patterns to avant-garde, bespoke designs. Users can input desired patterns, colors, and materials into the accompanying software, which then instructs the K-CraftMatrix loom on the most efficient and effective weaving process. Inbuilt sensors detect and correct any inconsistencies in real-time, ensuring the highest quality output. The AI-driven system also offers suggestions, merging user inputs with traditional Korean designs to generate novel patterns and combinations. Beyond its technical prowess, K-CraftMatrix aims to rejuvenate interest in textile arts, providing an intuitive platform for artisans and enthusiasts to experiment and innovate while remaining rooted in tradition. In bridging the past and future, this invention encapsulates the essence of Korea's enduring commitment to craftsmanship and technological advancement, signaling a new horizon for design and cultural preservation.

KR.3.	
Inventors	Soo-Jin Lee, Kyung-Ho Song, Min-Ji Kim, Hoon-Yi Park, Ji-Hye Moon
Inventions	Nano-Structured Water Purification Tiles
Institution	-
Abstract	AquaGuard ushers in a new paradigm in sustainable water purification, leveraging the power of nanotechnology to provide clean and safe drinking water. These specially crafted tiles, made with intricate nano-structures, can be placed in water reservoirs, tanks, or containers. As water passes over the tiles, contaminants, bacteria, and viruses are trapped and neutralized by the tile's nano-surfaces, producing water that meets the highest standards of purity without the use of chemicals or external energy sources.

Kuwait

KW.1.	
Inventors	Jenan Esam Saleh Al Shehab
Inventions	Wireless Power Transmission System
Institution	Electrodis Tech.
Abstract	Many inventions and researches have been made in the wireless electricity field after the tesla coil invention in 1891. The real challenge facing those inventor sand researchers nowadays is to transmit electricity wirelessly from a distance without the need for any physical connections or in other words, convert electromagnetic waves into electricity that can be used in charging and activating electronic/electrical devices. The invention presented “Electrodis” is proven and patented to transmit wireless electricity from up to 3meters.

Macao

MO.1.

Inventors YICK SUET CHING, KUOK MENG IAN

Inventions Water-Saving Toilet System Based On Intelligent Health Analysis And Environmental Protection

Institution Macau Baptist College

Abstract

Excretion is a daily physiological behavior in our lives. Every time we use the toilet, a lot of water resources are wasted.

Our intelligent toilet can use object recognition technology to automatically identify the type of excrement. If the excrement is urine, the toilet will flush with half the water volume, thereby automatically controlling the amount of water used for flushing.

In addition, if the device recognizes that the excrement is feces, it will flush with the normal amount of water and provide health analysis of the user based on the condition of the feces. This can raise personal awareness of health.

The idea of the product is to build on the convenience brought by traditional automatic flushing toilets and apply AI intelligent recognition technology to automatically determine the condition of excrement after the user uses the toilet, provide health analysis to the user, and raise personal awareness of health.

To use the smart toilet, the user simply closes the toilet lid after use and the system will automatically control the UV lamp to disinfect the toilet. This avoids direct contact with the operation switch and improves hygiene. Additionally, the smart toilet can determine the type of excrement and control the amount of water used to achieve water-saving effects. When the system recognizes that the excrement is feces, it provides health analysis to the user based on the condition of the feces.

MO.2

Inventors LEONG POK HEI, PUN CHI KIN, HU KA WAI, WONG HO WA

Inventions Development of Regular Macroporous Structure for Highly Efficient Hydrogen Evolution Reaction

Institution Macau Puiching Middle School

Abstract

Nowadays, finding a new energy source to replace fossil fuels has become a hot topic in the scientific community. Hydrogen, due to its high energy density, sustainability, and cleanliness, has become one of the most promising alternative energy sources. To meet the demand for hydrogen as an energy source, water splitting is commonly used to produce hydrogen on a large scale. Nowadays, the acid electrolyte used in the more common acid Water splitting technology will damage the metal based electrical materials, thus reducing the service life of the electrode. In contrast, the alkaline Water splitting technology in the cation exchange membrane water electrolyzer can not only reduce the damage of electrolyte to the electrode, but also increase the application of available electrocatalysts. Therefore, the research on alkaline Water splitting technology has always been a hot spot in the field of energy conversion. However, due to the high electrocatalytic activity of platinum based materials

used in this field, their price limits their widespread application. Therefore, it is essential to design a hydrogen evolution reaction catalyst that exhibits both the electrocatalytic activity of platinum based materials and the absence of platinum based materials in alkaline environments. This group has upgraded the reaction kinetics, mass transfer efficiency and mass activity of alkaline Water splitting technology at the level of morphology engineering, and greatly improved the hydrogen evolution efficiency of alkaline Water splitting technology. In this work, our group embedded Ru nanoclusters into the three-dimensional ordered macroporous structure OMS Mo2C/NC metastructure with multiple heterogeneity, forming OMS-Mo2C/NC-Ru. The three-dimensional ordered macroporous structure endows our catalyst with better mass transfer ability and gas release conditions. The catalyst has an extremely low Overpotential of 15.5 mV, an ultra small Tafel slope of 22.7 mV/dec and excellent electrocatalytic durability at 10 mA/cm2, which are superior to commercial Pt/C (Overpotential: 23.3 mV; Tafel slope: 28.1 mV/dec at 10mA/cm2). In addition, the mass activity of this catalyst is 17 times that of Pt/C. In conclusion, this catalyst has better electrocatalytic performance than commercial Pt/C, which creates objective conditions for promoting alkaline Water splitting technology.

MO.3.

Inventors CHIANG HOI PAN

Inventions Tunnel Air Purification Device

Institution Macau Baptist College

Abstract Tunnel Air Purification Device

Our works can be applied in semi-enclosed tunnels to effectively decompose the harmful gases emitted by cars in the tunnels, thereby reducing carbon emissions. After entering the purification device, the harmful gas will be washed by the water atomization device, the suspended particles will be washed. Then, the photocatalyst reaction will be carried out, in which the harmful polluting gas will be purified and sterilized to minimize the content of toxic substances in the air. The purified gas will emit carbon dioxide, and quicklime is used to absorb carbon dioxide through the combination of quicklime and carbon dioxide, thus solving the carbon emission problem. The device is located at the top of the tunnel and is a structure embedded at the top of the tunnel. The exterior of the work model is a square structure, and its built-in purification device is an inverted -type PVC tube structure. The PVC tube is the main purification device, which is responsible for decomposing air hazards. At the same time, the external cuboid structure is responsible for loading spare parts, the water circulation system, and the quicklime filter plate.

Our innovations are:

purifying the air while reducing carbon emissions and achieving carbon neutralization;

eco-friendly use of water resources cycle;

Efficient solution to tunnel pollution problems.

MO.4.

Inventors LAM CHOU NGAI, MAN CHI CHONG, AO MAN HIM, LIN BAI TAO, PUN KEI WAI

Inventions Are You Dry ─ A Controllable Floor Drain Device to Prevent Virus Intrusion

Institution Macau Pui Ching Middle School

Abstract

Since the outbreak of COVID-19, public awareness of infectious diseases has gradually increased. Many people think that staying at home is completely safe from being infected. However, even if you keep your doors and windows closed, there is a snare that is often overlooked — the U-pipe in the intercepting trap under household drains. Usually, the water in the intercepting trap forms a seal that averts odors and other gases from flowing back, preventing viruses and bacteria from entering the house through the air. But once water in the traps dries up, it becomes a major breach of virus infection or odor, causing hygiene problems to our daily life. Being inspired, we first conducted a questionnaire to public about their opinions about air traps. After analyzing the received opinions, we found that most of the respondents didn't understand the purpose of regularly filling the floor drain with water and frequently forgot to do so. We then came up with the idea of using the Arduino to set up a device that reminds people to pour adequate water into the trap when necessary. Hopefully, our device can raise the public awareness of U-pipe, inhibit the possibility of virus spread, and reduce the chance of outbreaks of infectious diseases.

MO.5.

Inventors HO KENG IN, HOI CHON WAI

Inventions Ai Smart Meter Management System Ver2.0

Institution Macau Baptist College

Abstract

In today's society, there is often a shortage of parking spaces. Some people occupy the parking spaces for long, so traffic problems occur frequently, increasing the workload of traffic police. This is why we come up with this AI Smart Meter Management System Ver2.0, which is based on the concept of a smart city and has the functions of automatic recording of the license plate number, ticket reading, automatic locking, and unlocking. Although electronic meters are in use, we think there is still room for improvement. This will help to save waiting time and reduce the workload of traffic police.

Our system (AI Smart Meter Management System Ver2.0) can effectively increase the mobility of parking spaces by detecting overtime violations and issuing fines, or even locking cars automatically. After many discussions and data measurements, we finally decided to use the gyroscope to raise the flap in the middle of the car, so that the car cannot move.

In this project, solid-state physics and mechanokinetics are used. The similarity of the project is that it can be used for online payment, license plate recognition, etc. The difference is that our system is added to the parking space, with automatic billing and auto-lock. A time limit is set to ensure the mobility of cars, auto-lock for overtime parking, AI night vision image recognition of

license plates in the parking space and fines using the system, reducing the manpower and time required.

From this, the solution to this problem is found: the ability to automatically record license plates and lock cars, eliminating the car owner's sense of luck; the ability to automatically lock the car after timeout, and the ability to automatically unlock the car after the owner pay the fine, greatly improving efficiency, mobility, convenience, and enforcement.

Malaysia

MY.1.

Inventors Datuk Ong Thor Guan, Mr. Koay Kai Bin, Mr. Choong Jin Kooi, Assoc. Prof. Dr. Foo Keng Yuen, Dr. Lee Lai Kuan

Inventions Oat King Sport®

Institution TG Ocean Health Food Industries Sdn. Bhd and Universiti Sains Malaysia

Abstract The present invention, Oat King Sport®, is a unique patented formulation of multigrain product, that has been specifically designed to offer a variety of health benefits, notably constipation relief, high blood pressure reduction, regulation of total cholesterol and blood glucose levels. It is free from preservatives, artificial coloring, flavoring, sugar, aflatoxins, heavy metals and microorganisms. The novel functional ingredients, specifically featured with low glycemic index, high dietary fiber, beta-glucan, vitamins and different trace elements, have been proven to significantly reduce the disease activity of rheumatoid arthritis patients via human clinical trials, signifying a new breakthrough in the multigrain product development.

MY.2.

Inventors Hisham Mohamad, Muhammad Farid Ghazali

Inventions Smart GeoPipe

Institution Universiti Teknologi PETRONAS

Abstract Smart Geopipe is an instrumentation system used to detect ground movement and forewarn landslides in real-time using distributed optical fibre strain sensor (DOFSS). The DOFSS technology is used to measure strain and temperature continuously along the optical fibre using Brillouin scattering light. Said technology is also known as Brillouin Optical Time-Domain Analysis (BOTDA). The Smart Geopipe which when installed vertically in a borehole can measure subsurface ground movements and detect landslide slip locations. When the sensor is installed horizontally in a trench, it can be used to measure subsurface settlement profile. The Smart Geopipe is constructed using a polyvinyl chloride (PVC) or acrylonitrile butadiene styrene (ABS) pipe designed to include four lateral grooves on its outside surface for placement of optical fibres. The BODTA interrogator then measures the bending strain experienced by the pipe due to ground movement. SmartGeopipe© software application was developed to enable data storing, editing, parsing and visualisation. This ability supports the realization of an early warning system as an engineering control for hazard management in civil engineering infrastructure projects.

MY.3.

Inventors Narendran Ramasenderan, Vinesh, Thiruchelvam, Ng Joo Kiat, Cajun Tai Ka Joon, Ang Jia Ze, Cheng Yi Heng, Sharen Chrisan Fabian Perera

Inventions SafeAI: Anomaly Detection for Manufacturing, maintenance and safety hazard detection with Robotic Autonomy and Custom LLM chatbot

Institution Asia Pacific University and Iotech Solutions

Abstract In the realm of advanced manufacturing, our solution stands at the frontier, leveraging edge AI for precise anomaly detection to promptly pinpoint manufacturing defects and safety hazards. In parallel, our system forecasts

maintenance requisites using a digital twin paradigm, a move central to preserving continuous plant operations. Instrumented with a suite of sensors and passive imaging devices, our edge installations employ TinyML, obviating the need for traditional cloud-based analytics and its associated vulnerabilities. Through fog computing, these systems establish a localized digital twin, substantially curtailing security and intellectual property risks. Orchestrating this multifaceted framework is a proprietary Large Language Model (LLM) chatbot, meticulously trained to grasp both the unique operational details of the plant and the overarching safety protocols, SOPs, and Zero Defect Manufacturing (ZDM) principles. Furnishing users with real-time alerts and interactive guidance, this LLM is the nerve center of our system. Delving deeper into our tech stack, MM wave sensor fusion sensors, embedded with TinyML, anchor our edge AI framework, keeping data analytics localized. Augmenting this setup, we've integrated aerial drones and robotic canines, armed with imaging devices, to patrol pre-defined trajectories and discern deviations from established norms. These autonomous agents serve a dual role, reinforcing the veracity of anomalies detected by our primary sensors, which concurrently monitor aspects as diverse as crowd dynamics, machinery oscillations (a linchpin for predictive maintenance), human health metrics, and the presence of specific hazardous agents like ozone and methane. By harmonizing real-time sensory feedback with physics-driven simulations in the digital twin, we've achieved a quantum leap in process automation, slashing unforeseen operational interruptions by a significant 60%. For user-centric accessibility, a bespoke mobile application provides a panoramic view of all insights.

MY.4.

Inventors Associate Professor Dr. Abdulrahman Abdulaziz M, Majrashi

Inventions LED-Integrated Road Direction System for Managing Crowded Traffic Flow

Institution Umm Al-Qura University

Abstract

Efficient traffic flow is a critical component of urban infrastructure, impacting road safety, congestion, and overall transportation effectiveness. This innovation proposal presents a groundbreaking approach to enhance car direction on roads through the integration of LED lighting. Traditional strategic road signs and markings can be limited in their ability to provide real-time guidance and adapt to dynamic traffic conditions. This proposal envisions embedding intelligent LED lighting systems directly into the road surface, creating a dynamic and interactive car direction system. These LED lights would be strategically placed to indicate lane boundaries, guide drivers through turns and intersections, and guide them to the right direction to destination.

The system would be integrated with a smart traffic management network that utilizes real-time traffic data to dynamically adjust the LED lighting patterns. For instance, during special occation and peak traffic hours, the LED lights could create additional lanes to optimize traffic flow, and during emergencies, they could guide drivers to safe evacuation routes. The adaptability of LED lighting offers the advantage of improving driver comprehension, reducing lane-change conflicts, and ultimately leading to safer and more efficient

roadways. This proposal outlines the technological feasibility, potential benefits, and challenges of implementing such a system. By harnessing the power of LED lighting for car direction, urban planners and transportation authorities can potentially curtail costs and reduce manpower requirements while concurrently optimizing traffic management efficacy pave the way for a more sustainable, safer, and seamlessly connected transportation infrastructure.

Oman

OM.1.	
Inventors	Hamid Al-Mahruqi, Fatimah Al-Busaidi, Khalid Al-Kharusi, Aisha Al-Jardani, Musab Al-Habsi, Zainab Al-Mazrui
Inventions Institution	DesertGreen
Abstract	In arid regions, the challenge of water scarcity is perennial. DesertGreen offers a novel approach to tap into an often-overlooked source of water in desert environments: nighttime dew. This system employs a series of optimized panels designed to rapidly cool during the night, encouraging dew formation. As dawn approaches, the collected dew is funneled into storage units, providing a sustainable source of water for both consumption and agriculture. The innovation is further enhanced with integrated solar panels. During the daytime, these panels capture the abundant solar energy of desert landscapes, storing it in efficient battery units. As night falls, this stored energy powers the cooling mechanisms of the panels, maximizing dew collection.

Philippines

PH.1.	
Inventors	Miguel Reyes, Carmela Dela Cruz, Jose Ramirez, Sofia Aguilera, Dante Robles, Maria Solano
Inventions	Bio-mimetic Wind Barriers
Institution	Philippines Diliman
Abstract	Typhoon-prone regions, such as the Philippines, continuously grapple with the devastating effects of strong winds on infrastructure and vegetation. Enter TyphoonTec, a series of bio-mimetic wind barriers inspired by the resilient features of local flora that withstand typhoons naturally. These barriers, strategically placed around key infrastructure and farmlands, are designed to redirect and dampen wind forces, considerably reducing their destructive potential. The barriers are composed of flexible, yet durable materials that sway with the wind, much like certain indigenous trees that bend but do not break during storms. The surface of these barriers is designed with grooves and patterns that mimic the bark of typhoon-resistant trees, facilitating the redirection and diffusion of wind.

Poland

PL.1.	
Inventors	mgr Mirosław Stecuła, mgr inż. Tadeusz Kapusta
Inventions	Multi-gas and multi-point stationaty CO / LPG ... NO2... detectors for closed garages and ...many more
Institution	Przedsiębiorstwo Wdrożeniowe PRO-SERVICE Sp. z o.o.
Abstract	It is a world novelty. So far, no one has produced this type of stationary detectors. (Portable multi-gas detectors are manufactured). The new, unique product group implemented in 2007 and 2009 in the form of multi-gas, two-module gas detectors was a response to the demand for more modern and very functional security devices for closed garages. The axis of this group, the DUOmaster CO / LPG Two-Gas Garage Detector, was initially intended only for mandatory protection of underground garages. Detection of gases that may appear there as components of exhaust gases or potential unsealing of car propane-butane tanks. A little later, the three-gas Tmaster CO / LPG / NO2 device was created, which also was quickly used by designers and investors following the market's needs. Until today, several dozen thousands of such devices are secured by several thousand multi-bay garages in many Polish cities as well as in the Netherlands, Belgium and Slovakia.
PL.2.	
Inventors	Strzemiński Academy of Fine Art, Lodz, Poland: Piotr Suchocki Institute of Security Technologies „MORATEX", Lodz, Poland: Joanna Błaszczyk, Małgorzata Woźniakowska, Grażyna Grabowska, Agnieszka Gutowska, Tomasz Miedzianowski, Małgorzata Kudlińska, Jadwiga Wałęza
Inventions	WORKSUIT FOR THE MOTORCYCLE OFFICERS
Institution	Institute of Security Technologies „MORATEX"
Abstract	The suit for officers on duty on motorcycles consists of a summer and winter jacket, trousers, warning vest, summer and winter gloves, and boots. The suit is the first of its kind to meet the Polish Police requirements, in terms of the specialized raw materials and reflective elements used and original design (innovative pattern, colors and composition improving visibility). The suit was made in accordance with the requirements of EN 13595-1:2002 Standard relating to protective clothing intended for motorcyclists. Utility model application: W.129378 – motorcyclist's summer jacket, W.129379 – motorcyclist's winter jacket, W.129380 – motorcyclist's trousers, W.129377 – motorcyclist's warning vest, W.128774 – summer protective gloves,

W.128775 – winter protective gloves,
W.129296 – motorcyclist's boots.

PL.3.

Inventors Paweł Surmacz

Inventions Heterogeneous High-Efficiency Catalysts for 98% Hydrogen Peroxide Decomposition and Method for Obtaining Heterogeneous High-Efficiency Catalysts for 98% Hydrogen Peroxide Decomposition/ and method for obtaining therof

Institution Lukasiewicz Research Network – Institute of Aviation

Abstract

Heterogeneous high-performance catalysts for the decomposition of 98% hydrogen peroxide consist of a mixture of silver, samarium oxide, or a mixture of silver, samarium oxide, and platinum on the surface of a carrier in the form of a degreased metal foam made of pure nickel or a nickel-chrome alloy or a nickel-chrome-aluminum alloy or porous ceramic.

The method of obtaining heterogeneous high-performance catalysts for the decomposition of 98% hydrogen peroxide involves the carrier, in the form of a metal foam made of pure nickel or a nickel-chrome alloy or a nickel-chrome-aluminum alloy, being pre-degreased, then dried and subjected to initial thermal treatment. After cooling, the carrier is impregnated with a solution of silver and samarium nitrates in a solvent or a solution of platinum nitrate, or the carrier in the form of porous ceramic is subjected to initial thermal treatment, then after cooling, the carrier is impregnated with a solution of silver and samarium nitrates or a mixture of solutions of silver, samarium, and platinum nitrates, then dried and subjected to final thermal treatment.

Qatar

QA.1.

Inventors Prof. Noora Al-Thani , Shahad Alkhair

Inventions Innovative STEM module following a problem-solving framework to address water problems for primary students

Institution Qatar University Young Scientist Center

Abstract

A cutting-edge approach in education is problem solving, which emphasizes developing students' learning through solving real-world problems. Problem-solving framework offers a platform for 21st Century Learning that will equip students with the capabilities to identify problems, generate ideas, analyze solutions, and execute optimum solutions. This project highlights the design of an innovative educational STEM-based model following a problem-solving approach to educate primary students about water pollution. The module contains various hands-on activities, experiments, and electronic projects that address water pollution problems. The module starts by encouraging students to gather information about the causes of water pollution. In addition, the module includes creative teaching techniques such as storytelling and project-based learning to engage students in exciting learning experiences where they will gain knowledge about the sources of water pollution and inspire them to brainstorm ideas and solutions to tackle the problem. This module will positively influence young learners' abilities to solve simple to complex issues innovatively and creatively.

QA.2.

Inventors Asan G.A Muthalif, Muhammad Hafizh, Azza Abouhashem, Ibrahim Moaz Ibrahim

Inventions Design and Development of a Smart Vibration Absorber for High-Rise Buildings

Institution Qatar University Young Scientists Center, Qatar University

Abstract

Tall buildings have recently become more critical today with the limited land availability in urbanization. High-rise structures have been designed in various ways to enhance the city skyline. However, seismic and wind activity from extraneous factors can jeopardize the integrity of the building and the safety of the inhabitants. Dampers have been considered a practical control solution for flexible structures like skyscrapers. Tuned-mass dampers (TMD) have been well-researched in the literature that is made up of mass, springs, and dampers that can be used to diminish the oscillations of the original system. This occurs when the TMD is tuned to match the natural frequency of the original design such that the energy of the input force will resonate out of phase with the original structure. Energy dissipation depends on variables such as mass ratio and amount of damping. A passive-tuned mass damper has the

disadvantage of only being effective in a narrow frequency range, and real-world fluctuations can limit its effectiveness.

Semi-active and active dampers can tune their property with defined control parameters to access a broad range of ground oscillations compared to a passive approach.

In this research, numerical, computational, and experimental models investigated a high-rise building based on one of Qatar's skyscrapers. An investigation into the natural frequency was compared between the models. A variable stiffness innovative vibration absorber using Arduino was proposed to sense and control the vibration. Therefore, A two-story building model was developed, and its natural frequencies were studied using finite element analysis techniques. Afterward, a vibration absorber was created to minimize the structural failure with a tuned mass damper. The effectiveness of the absorber was compared both analytically and computationally. A multi-modal vibration absorber can be employed for high-rise buildings to minimize the damage from natural effects such as earthquakes and strong winds.

Romania

RO.1.	
Inventors	Radu Claudiu Fierascu, Sorin Claudiu Ulinici, Sorin Marius Avramescu, Ilie Vlaicu, Roxana Ioana Matei (Brazdis), Irina Fierascu
Inventions	Integrated technology for advanced removal of heavy metals and arsenic from complex matrices using adsorbent nanomaterials, PN-III-P2-2.1-PTE-2021-0309
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The purpose of the project is the transfer and development of a technology for the depollution of water with a high content of heavy metals and arsenic found in a complex polluting matrix to an economic agent with an important activity in the development, implementation of technologies and the production of water treatment systems (ICPE Bistrița), in order to increase its economic competitiveness, as well as the implementation of the technology at an economic operator with important activity in the treatment and distribution of drinking water (Aquatim S.A). 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-PTE-2021-0309, contract 81PTE/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.2.	
Inventors	Toma Fistos, Radu Claudiu Fierascu, Irina Fierascu, Alina Melinescu, Anton Ficai, Denisa Ficai, Lia Mara Ditu, Carmen Curutiu
Inventions	Hydrophobic coating with self-cleaning and antimicrobial properties for artificial elements of vernacular constructions and method of obtaining it
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The present invention relates to a nanocomposite coating material with self-cleaning, photodegradation and antimicrobial properties, which provides protection (strengthening) for artificial building elements in the composition of vernacular constructions (materials with high silica content), based on modified polymeric hydrophobic nanocomposites with amorphous silica (having a consolidating and self-cleaning role), a photocatalytic component (in order to reduce the accumulation of pollutants, biofilm and particles on these surfaces), to which is added a component with an antimicrobial effect, dispersed in an alcoholic solution. 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, contract 591PED/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.3.	
Inventors	Irina Fierascu, Cristian Boscornea, Radu Claudiu Fierascu, Anda Maria Baroi
Inventions	Formulations of protective cosmetic products obtained by applying integrated and sustainable bioeconomy approaches, PN-III-P2-2.1-PED-2021-0273
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The project's goal is represented by the use of nanomaterials both as active ingredient and delivery system of bioactive compounds (mixtures of phenolic compounds-rutin and quercetin) recovered from grape industry by-products, for development of UV blocking cosmetic products. 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.4.	
Inventors	Radu Claudiu Fierascu, Roxana Ioana Matei (Brazdis), Anda Maria Baroi, Toma Fistos, Irina Fierascu, Lia Mara Ditu
Inventions	Composite material based on glass ionomer cement and phytosynthesized metallic nanoparticles with improved antimicrobial properties and procedure for obtaining
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The present invention refers to a composite material with improved antimicrobial properties, without negatively affecting the physical and mechanical properties, 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 a solution of phytosynthesized metallic nanoparticles in extracts of plants from the Lamiaceae family with crystallite size below 25 nm, the process of obtaining the composite material consisting of three stages, the phytosynthesis of metallic nanoparticles, followed by mixing with aluminofluorosilicate glass until complete homogenization, and in that of in the third 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, CCCDI-UEFISCDI, project number PN-III-P4-PCE-2021-0292, contract 92PCE/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.5.	

Inventors	Nicoleta Radu, Mariana Constantin, Iulia Raut, Gelu Vasilescu Panea, Ana-Maria Gurban, Mihaela Doni, Maria-Luiza Jecu
Inventions	Culture medium composition for sporulation
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The invention is related to the development a culture medium composition that favours the sporulation of *Bacillus subtilis*, bacterial strain able to precipitate calcium carbonate in presence of urea and calcium ions. The biomineralization can be used to improve the engineering properties of normal strength cement mortar by embedding bacterial cells. Concrete is the most widely used construction material due to its durability, high compressive strength, and long-term performance. The possible degradation produced by natural environments have led to innovations of cement composition using technological bioengineering. The traditional methods for cement repair are limited due to cost and complexity, and therefore, the application of biomineralization has received great attention for its potential as alternative solution to increase the durability of cement. Microbially-induced calcium carbonate precipitation (MICP) is a natural process which depends on bacterial genotype and cell concentration, amounts of Ca^{2+} (supplemented externally) and urea, nutritional composition of medium for bacteria cultivation, and pH conditions for urease activity. Species of *Bacillus* present strong adaptability to the environment, high specific surface area of cells, and they can use urea as energy and nitrogen source in metabolism. A Bacillus subtilis isolate from Microbial Collection of ICECHIM was evidenced in precipitating $CaCO_3$ under proper culture medium supplemented with urea and calcium ions. B. subtilis added into mortars has shown a great potential for application in cementitious materials, increasing compressive and tensile strength. Domain of application: Biotechnology; Buildings and Materials Acknowledgments. This work was supported by the Romanian Ministry of Education and Research, CCDI, UEFISCDI, project number PN-III-P2-2.1-PED-2019-0991, within PNCDI III
RO.6.	
Inventors	Diana Georgiana Pasarin, Camelia Rovinaru, Andra-Ionela Ghizdareanu, Cristian Costel Dulgheru
Inventions	Snack-type dry food product and process for preparing the same
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The invention relates to a snack-type dry food product and to a process for obtaining it. The product contains protein hydrolysates from underappreciated plants (hemp/sweet lupine) and pectic oligosaccharides as functional ingredients; it is ready-to-eat and on-the-go and supports the health of the digestive system and promotes well-being, addressing a large segment active population, with an unbalanced lifestyle. Applications Valorisation of underappreciated plants (lupine and hemp) by extracting proteins to obtain hydrolysates rich in bioactive peptides that can be added to

	food products in order to increase their nutritional and functional value; supports the intestinal microflora through pectic oligosaccharides; ensures increased microbiological stability of the food through low water activity values.
RO.7.	
Inventors	Zina Vuluga, Cristina Elizetxea, Mario Ordonez, Mihai Cosmin Corobea, Michaela Doina Iorga, Dorel Florea
Inventions	Masterbatch for Improving the Scratch Resistance of Polymethylmethacrylate and the Process for Producing the Same
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The invention describes a masterbatch composition composed from PMMA, polysiloxane modified with polyester and a reinforcing nanofiller chosen from a hydrophobic nanosilica and an organophylized silicate nanotube, a process for masterbatch obtaining (consisting in components mixing in a gravimetric rotating mixer and melt homogenization in a co-rotating double screw extruder), and a process for using of masterbatch in granular form which allows the obtaining of composites based on PMMA, respectively of injected parts, characterized by enhanced scratch resistance with 50-230 %, a gloss higher with 15-20 %, without decreasing with more than 10-15%, in comparison with PMMA, the elastic modulus, the strength and impact resistances. The advantage of our invention is that in the masterbatch composition components are selected in a certain manner, mixed in a ratio and under such conditions that by blending with PMMA to produce an improvement in the scratch resistance of PMMA, while maintaining as much as possible the other properties (optical, thermal and mechanical). The masterbatch is specifically designed for PMMA and allows the production of improved polymeric composites that are used in the automotive industry as well as in other fields to obtain lighter injection moulded parts with a good optical surface appearance and high mechanical strength.
RO.8.	
Inventors	Florentina Monica Raduly, Valentin Rădiţoiu, Alina Rădiţoiu, Violeta Purcar, Andreea-Mălina Bivolaru, Iuliana Răut, Mariana Constantin
Inventions	Process for functionalization of natural cellulosic fibers with antimicrobial compositions with selenium nanoparticles
Institution	National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest
Abstract	The invention refers to a process for functionalizing natural cellulosic fabrics with eco-friendly compositions with antimicrobial activity, consisting in the fact that natural textile materials are subjected to printing with a composition containing a polymeric binder of natural origin, an organic-inorganic hybrid of - a natural extract of phytocomponents obtained from plants of the Ginger family and selenium nanoparticles generated in situ, which can be used as antimicrobial textiles for common clothing or in the medical field.

RO.9.	
Inventors	Ovidiu Nemeş, Simona Ioana Borlea (Mureşan), Ancuţa-Elena Tiuc, Gyorgy Deak
Inventions	Innovative use of sheep wool and polyurethane foam for obtaining materials with sound-absorbing properties
Institution	Technical University of Cluj-Napoca
Abstract	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.10.	
Inventors	Vaida Călin, Plitea Nicolae, Pîslă Doina, Carbone Giuseppe, Gherman Bogdan, Ulinici Ionuț, Pîslă Adrian
Inventions	Spherical robot for the rehabilitation of the proximal area of the upper limb
Institution	Technical University of Cluj-Napoca
Abstract	The invention relates to a spherical robotic system for the rehabilitation of the proximal zone of the upper limb, containing three active couplers for the purpose of reproducing the abduction/adduction and flexion/extension of the shoulder in the horizontal and vertical plane and reproducing the forearm pronation/supination in the vertical plane. The invention is directed towards post-stroke patients suffering from paralysis at the level of the upper limb following stroke, but its use may be extended to other afflictions that result in the partial or total loss of upper limb mobilization capacity. The robot has three degrees of freedom, achieved through three active rotation joints that have the axis intersection in a single point, more specifically the center of a sphere, which relative to the patient will be transposed over the center of rotation of the shoulder joint, for the first two rotations, and the third being done around the midline of the upper limb.
RO.11.	
Inventors	Interleaved voltage step-up/step-down electronic converter
Inventions	Interleaved voltage step-up/step-down electronic converter
Institution	Technical University of Cluj-Napoca

Abstract

The invention relates to an electronic converter with an interleaved structure intended for applications with electrical energy storage, renewable sources, electronic consumers, and electric vehicles, in which:

• the voltage value from the power supply is too low for the intended application, with operation in the input voltage amplification mode - voltage raising converter (Boost);

• the voltage value from the power supply is too high for the intended application, with operation in the input voltage attenuation mode - voltage step-down converter (Buck);

• energy circulation is bidirectional – voltage raising/lowering converter (Boost/Buck).

RO.12.

Inventors

Dinu-Pîrvu Cristina Elena, Popa Lăcrămioara, Ghica Mihaela Violeta, Anuța Valentina, Prisada Răzvan-Mihai, Velescu Bruno Ștefan, Talianu Marina-Theodora

Inventions

BIOCOMPATIBLE OIL IN WATER MICROEMULSIONS WITH HYALURONIC ACID AND SALICYLIC ACID AND METHOD FOR OBTAINING THEREOF

Institution

"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

Abstract

The invention refers to a biocompatible oil in water (O/W) microemulsion, with hyaluronic acid and salicylic acid, designed for topical application in dermatologic therapy of acne and a method for obtaining thereof.

The technical issue solved by the invention consists in: (i) designing a topical system as oil in water microemulsion, (ii) selection of two phases, an aqueous and an oil phase, a surface active mixture formed by two surfactants and a cosurfactant, the selection of a biopolymer and an antiacne active, combined in various ratios in order to obtain stable systems characterized by adequate physico-chemical parameters, which can ensure the topical application and the obtaining of a superior action in acne treatment.

The following advantages result from the invention:

- the topical use of a biocompatible O/W microemulsion which may incorporate (i) an antiacne active, namely salicylic acid 0.5%, due to a surface tension modulator system with solubilization capacity and diffusion promoting properties through stratum corneum;

-minimizing the adverse reactions of salicylic acid like erythema or dryness by the integration of (ii) hyaluronic acid as a biopolymer with hydrating, protective and resurfacing properties;

- in addition, hyaluronic acid acts as a viscosity enhancer due to hydrogen bonds formed with water molecules, thus resulting a structural network, that promotes a minimal viscosity, enhancing the sensorial properties of the final product and increasing the level of biocompatibility;

-the biocompatibility of surface tension mixture is also defined by (iii) the association of Tween 80 as a non-ionic surfactant with lecithin as a natural zwitterionic surfactant; the tensioactive mixture content is selected under the maximum required value of 70 %;

-based on the described composition a clear, fluid and stable micremulsion with a high biocompatibility will result, using a simple and rapid manufacturing method without energy loss.

RO.13.

Inventors SANDU I G; SANDU I; SANDU A; VASILACHE V; VIZUREANU P; EARAR K; STIRBU C M; CRISAN D R A; CHIRAZI M; STIRBU C; DROB A; BALAN G; HONCERIU C

Inventions **Device for continuous generation of bioactive solions**

Institution **"Gheorghe Asachi" Technical University of Iasi**

Abstract The invention refers to a device for the continuous generation of saline nanoaerosols of the Aitken type, which is based on the principle of operation of the filter with a wide conveyor belt in a closed circuit, framing three sectors in the form of an equilateral triangle, with sequentially differentiated distribution on three processes distinct: impregnation by light sorption from the supersaturated solution of halo-salts, extraction by vacuuming, with suction of dry air from the halochamber, dispersion by purging with hot and humid air in the halochamber. This device allows the achievement of optimal levels of bioactive solions (hydrated saline aerosols) for halocameras with multiple uses, such as: eliminating or stopping the formation of biofilms through microbiological contamination (virotic, bacterial, fungal, etc.) of prostheses during the manufacturing period, storage and implantation of bones and teeth, prevention and treatment of cardio-respiratory, osteo-muscular and psycho-motor conditions, as well as for improving the physical performance of children, the elderly and people who work under conditions of high effort or performance athletes.

RO.14.

Inventors Kamel EARAR, Ion SANDU, Ecaterina ANDRONESCU, Aurel NECHITA, Silvia FOTEA, Irina Cristina PASVANTU, Ioan Gabriel SANDU, Diana Andreea CIORTEA, Andrei Victor SANDU, Oleg SOLOMON, Simona PÂRVU

Inventions SYNERGIC ANTIDIABETIC COMPOSITION AND OPTIMUM PROCESSING PROCEDURE OF DRY MEDICINAL PLANTS

Institution Dunarea de Jos University of Galati, Romania

Abstract The invention refers to a synergistic antidiabetic composition and optimal process for processing dry medicinal plants in the form of fine powders, in order to obtain by homogenization, agglomeration and monolithization in the form of micro-encapsulated granules, pills or thin films used as a food supplement under antidiabetic tea form.

Fine powder blend contains: 24% blueberry leaves, 24% dry white bean pod sheath, 24% dandelion flower, leaf and rhizome blend, 12% nettle leaf and stem, 12% 1/1 leaf blend and young white mulberry bark and 4% fine cinnamon powder.

The powders were mixed with a viscous leachable liquid in a powder gravimetric ratio: leachable liquid dispersion = 4:1, using as dispersion medium a semi-viscous mixture consisting of 5% enzymatically hydrolyzed collagen, 30% bitter cucumber juice and 65% juice of lemon. The process can be used to

	obtain other medicinal teas, which depending on the purpose (comforting drinks, those with a preventive and/or therapeutic effect), the raw materials subjected to processing are dosed through an experimental protocol for formulating combination reports and establishment of processing conditions in three working phases.
RO.15.	
Inventors	Kamel EARAR, Oleg SOLOMON, Alina-Ramona DIMOFTE, Meda-Lavinia NEGRUŢIU, Cosmin SINESCU, Madalina Nicoleta MATEI
Inventions	Facial arch with extended mechanical and biological functionality and procedure of use
Institution	Dunarea de Jos University of Galati, Romania & Nicolae Testemițanu State University of Medicine and Pharmacy
Abstract	The invention relates to a facial arch with extended mechanical and biological functionality and to a method of use for the three-dimensional transfer of the position of the upper dental arch in the articulator and which is used in the field of dentistry, in the prosthetic rehabilitation algorithm for different types of edentulousness. The facial arch according to the invention consists of a unitary assembly (A) called an "eye line finder", an articulated support (B), having a double-sided transfer spoon and radial extension, an articulation assembly (C) for supporting a transfer spoons, a universal transfer stand (D) for mounting the upper and lower model in the articulator, and a device (E) for controlling the parallelism of the prepared teeth, before the impression and transfer. The method according to the invention consists in orienting and mounting the transfer facial arch, on a patient's head, by means of the assembly (A) "eye line finder", after which the transverse position of the transfer facial arch is analyzed and oriented on the patient's head, anchored in the posterior area by means of two ear ball arms, in the ear canal, then the assembly is placed in the anterior area on the base of the nose, by means of a support (F) elastic and adjustable in height, in a milled channel (G) intended fixing the transfer joint, mount the articulated support (B) for the laser module with linear projection and orient a sleigh, in sagittal direction after the palatine raft, by transverse sliding, insert the assembly (A) "eye line finder" in some uprights of on the two arms (F and G) of the transfer facial arch and follow the bipupillary line in relation to the lines engraved on the assembly (A) "eye line finder".
RO.16.	
Inventors	Vasile RUSU, Oleg SOLOMON, Kamel EARAR, Ovidiu SCHIPOR, Madalina Nicoleta MATEI
Inventions	Silicone Key for Making the Individualized Healing Abutment
Institution	Nicolae Testemițanu State University of Medicine and Pharmacy & Dunarea de Jos University of Galati
Abstract	The present invention refers to an innovative silicone key used for the manufacture of individualized healing abutments in implant dentistry. This silicone key allows the precise reproduction of the emergence profile of existing natural teeth, thus ensuring an individualized approach in the treatment of prosthetic restorations on implants. The proposed silicone key involves the direct modeling of the emergence profile, taking into account the specific

	anatomy of the patient's teeth. By means of this technique, an exact replica of the shape and dimensions of natural teeth is obtained, thus allowing the creation of a personalized healing abutment. The device includes three different sizes of silicone 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 silicone key to create the individualized healing abutment, a prosthetic restoration is obtained with a profile that integrates perfectly with the natural teeth, offering an aesthetic and functional harmony in restoring the integrity of the dental arches. In conclusion, the silicone key proposed by the invention represents an innovative solution for the realization of individualized healing abutments in dentistry.
RO.17.	
Inventors	Puiu Lucian GEORGESCU, Daniela Laura BURUIANA, Gabriel Bogdan CARP, Viorica GHISMAN
Inventions	CO_2 SEQUESTRATION METHOD BY USING THE MIXTURE FORMED OF WHITE SLAG AND CALCIUM CARBIDE SLUDGE
Institution	Dunarea de Jos University of Galati, Romania
Abstract	The invention relates to a mixture based on white slag resulting from the production of steel and calcium carbide sludge resulting from the process of acetylene preparation, the mixture being used to sequester carbon from flue gases, thus reducing the concentration of carbon dioxide CO2 discharged into atmosphere. According to the invention, the mixture consists of the following components expressed as a percentage by weight: 50% white slag resulting as a by-product of the steelmaking process, with a grain size between 71 and 315 μm, having a pH = 12.1 and 50% calcium carbide sludge resulting from acetylene preparation, with a liquid/solid mass ratio = 1: 1 and pH = 12.2.
RO.18.	
Inventors	Daniela Laura BURUIANĂ, Puiu Lucian GEORGESCU, Viorica GHISMAN, Nicoleta Lucica BOGATU, Georgiana GHISMAN, Elena Roxana AXENTE, Cătălin ARAMĂ
Inventions	INNOVATIVE MATERIALS FOR ABSORPTION OF PETROLEUM HYDROCARBONS
Institution	Dunarea de Jos University of Galati, Romania
Abstract	The present invention relates to a mixture based on dolomite and steel mill slag for the absorption of petroleum hydrocarbons. The mixture is composed of CaMg(CO3)2 dolomite with pH=9.62 with a grain size between 40-63 mm and steel mill slag with a pH=12.1 with a grain size between 71-315 μm. The method according to the invention consists in the fact that the mixture of component elements (dolomite and steel mill slag) is spread evenly on the soil impregnated with petroleum hydrocarbons and a significant amount of polycyclic aromatic hydrocarbons is absorbed with the aim of greening the contaminated soil.

RO.19.	
Inventors	Catalin FETECAU, Felicia STAN, Nicoleta - Violeta STANCIU
Inventions	Peel Test Fixture for Two-Component Polymeric Specimens
Institution	Dunarea de Jos University of Galati, Romania
Abstract	The invention refers to a peel test fixture that clamps and holds two-component specimens in the horizontal position during the peel test in order to measure the adhesion strength between two similar or dissimilar polymers. The peel test fixture consists of a transmission system of racks and spur gears with different modules that moves on vertical direction as the crosshead moves in the tension direction, and a box with rollers that holds and guides the specimen in the horizontal position during the test. The fixture provides a simple and effective way of gripping a wide range of two-component specimens during the delamination testing, while maintains a constant peel angle of 90° for both arms.
RO.20.	
Inventors	Niculae Nicusor
Inventions	Water running engine
Institution	National Institute for Research and Development for Land Improvements, Bucharest, Romania (INCDIF-„ISPIF")
Abstract	The present invention relates to a mechanism which can produce additional mechanical work by recirculating a quantity of water or other heavy and incompressible fluid. The respective mechanism is similar to the thermal engine because the mechanical work is obtained from the rectilinear-alternative stroke of a floating body with a low density in relation to the density of water. The mechanism is complex being made up of many mechanical elements of connection and maintenance of the operating cycle. The benefits of this mechanism can be anticipated, like as: - zero pollution; - low production costs compared to the thermal engine, because most of its components can be made of plastic and not metal as in the case of the thermal engine; - can be a solution to the current and future energy crisis, or the crisis of non-renewable resources.
RO.21.	
Inventors	Ilie NIȚAN, Cezar-Dumitru POPA, Laurențiu-Dan MILICI, Mihaela PAVĂL, Ciprian BEJENAR, Ovidiu-Magdin ȚANȚA, Mihai CENUȘĂ, Oana-Vasilica GROSU
Inventions	SOCKET SAFETY SYSTEM
Institution	Stefan cel Mare University of Suceava, Romania
Abstract	The invention relates to a socket safety system, intended for overheating protection of the power plug terminals and for increasing the force at the contact level, using a system consisting of two springs that ensure a firm contact. The invention consists of a solution that is actuated by nitinol springs in response to the increase in temperature, leading to their compression, ensuring an increase in force, and therefore a firmly contact with the coupling terminals.

RO.22.	
Inventors	Laurențiu-Dan MILICI, Ciprian BEJENAR, Ilie NIȚAN, Mihai DIMIAN, Mahmoud ABU-BANDORA, Irina ALISAVETEI, Visarion-Cătălin IFRIM, Constantin UNGUREANU
Inventions	SOLAR HEATING SYSTEM TO MAINTAIN BATTERIES CHARGED
Institution	Stefan cel Mare University of Suceava, Romania
Abstract	The invention relates to a solar heating system, integrable in the constructive structure of a vehicle, intended to maintain the temperature and/or charge level of the batteries. It disposes of, so that the phenomenon is controlled through the specific constructive form that facilitates the conversion of solar energy, both in thermal energy as well as in electrical energy and because the system involves thermomechanical actuators with autonomous operation, suitable in the automatic regulation of this process.
RO.23.	
Inventors	Vili PASARE, Dan Florin NITOI, Augustin SEMENESCU, Mihnea Cosmin COSTOIU, Oana Roxana CHIVU, Dragos-Florin MARCU, Radu Claudiu FIERASCU, Irina FIERASCU, Raluca SOMOGHI
Inventions	PROCEDURE FOR OBTAINING A COMPOSITE COATING WITH INCREASED DURABILITY ON A METAL SURFACE
Institution	National University of Science and Technology Politehnica Bucharest
Abstract	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.24.	
Inventors	Radu Claudiu Fierascu, Vili Pasare, Augustin Semenescu, Mihnea Cosmin Costoiu, Dan Florin Nitoi, Oana Roxana Chivu, Dragos-Florin Marcu, Irina Fierascu, Raluca Somoghi
Inventions	COMPOSITE COATING MATERIAL WITH ANTICORROSIVE AND ANTI SCRATCHING PROPERTIES
Institution	National University of Science and Technology Politehnica Bucharest
Abstract	The 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.25.	
Inventors	Costoiu Mihnea Cosmin, Semenescu Augustin, Doicin Vasile Cristian, Ulmeanu Mihaela Elena, Cîrstoiu Cătălin, Doicin Ioana Cristina, Mateș Ileana Mariana
Inventions	Orthopedic device for correction of the TALIPES CALCANEUS / TALIPES CALCANEOVALGUS DEFECT
Institution	National University of Science and Technology Politehnica Bucharest
Abstract	The invention relates to an orthopedic device for the correction of a malposition of the foot expressed by the defects talipes calcaneus and talipes calcaneovalgus, particular variants of Talus valgus, and to the process for

	obtaining it. The orthopedic device for Talipes calcaneus / Talipes calcaneovalgus defect correction, is composed of a fixed subassembly, which is fixed to the leg of the foot, a movable subassembly, which is attached to the foot of the defective foot, a snail-snail gear and a graduated cap, which is fixed with the help of screws with clogged head.
RO.26.	
Inventors	MINEA Marius, DUMITRESCU Cătălin Marian, CHIVA Cosmin Ionuț, MINEA Viviana Laetitia, SEMENESCU Augustin
Inventions	METHOD AND SYSTEM FOR ANONYMOUS COLLECTION OF POSITION AND MOBILITY INFORMATION EMPLOYING BLUETOOTH AND ARTIFICIAL INTELLIGENCE
Institution	National University of Science and Technology Politehnica Bucharest
Abstract	The invention relates to a method and system for anonymously collection of information regarding position, mobility of travelers in a public transport system and collateral traffic density. It employs a dedicated configuration of Bluetooth sensors installed in a public transport vehicle, an onboard unit for signal processing and a specific software employing artificial intelligence module for time and space classification of detected bluetooth nodes.

Sweden

SE.1.	
Inventors	Erik Lindholm, Anna Bergström, Oskar Nilsson, Klara Johansson, Magnus Svärd, Sofia Lundqvist, Karl Forsberg
Inventions	ArcticFlow
Institution	
Abstract	In regions with stark temperature variations, the potential for harvesting thermal energy remains largely untapped. ArcticFlow introduces an innovative textile solution that captures and transforms ambient thermal energy into usable electricity, designed specifically with the cold Swedish climate in mind.Utilizing a combination of thermo-reactive fibers and nanotechnology, ArcticFlow textiles generate electricity by capitalizing on temperature differentials. Whether it's the gradient between the cold outside and a person's body warmth or the warmth of a house compared to the freezing exterior, these textiles capture this energy. This process, known as the thermoelectric effect, has been finely tuned in ArcticFlow fabrics for maximum efficiency.

Taiwan

TW.1.	
Inventors	Lee, Wen-Sheng, Wang, Tien-Ti
Inventions	Skin-Spring Plant Extract Anti-aging Skin Care Product
Institution	GUAN XIN Biomedical Co., Ltd. , B&V Biopharma Co., Ltd.
Abstract	「Skin-Spring」 Anti-aging Product is composed of precious and rare essences of Aquilaria agallocha and a variety of natural plant extracts through the patented technology of the Academia Sinica. Passed the fair report of safety and skin sensitivity testing by the German dermatologist association dermatest, and South Korea's Ellead laboratory. Commissioned Taiwan Functional Cosmetics Development and Evaluation Research Center to complete human trials of safety and functionality. Demonstrated statistical difference in wrinkle improvement within 14 days, Up to 43% improvement, the overall skin texture of the face is improved by 135%.
TW.2.	
Inventors	Chien Wei, Kang Tsai-Hua, Chiu Chien-Ching, Liao Shu-Han, Chen Po-Hsiang, Lin Je-Home, Chang Yu-Chang, Chen Yung-Hsun
Inventions	Automatic ordering and serving system
Institution	Lunghwa University of Science and Technology, HungKuo Delin University of Technology, Tamkang University, Chenshern Co., Ltd. , Lunghwa University of Science and Technology
Abstract	The invention provides an automatic ordering and matching system. It can be used for shop assistants to quickly type the dishes into the dishes and drive them out to avoid changing dishes in the middle of the way.
TW.3.	
Inventors	Chien Wei, Kang Tsai-Hua, Chiu Chien-Ching, Liao Shu-Han, Chen Po-Hsiang, Lin Je-Home, Chang Yu-Chang, Chen Yung-Hsun
Inventions	Smart pet feeder
Institution	Lunghwa University of Science and Technology, HungKuo Delin University of Technology, Tamkang University, Chenshern Co., Ltd., Lunghwa University of Science and Technology
Abstract	The utility model provides a smart pet feeder, a user can wirelessly transmit the control signal to the wireless signal receiving control unit. In this way, the user can remote control the feeding unit for feeding pets.
TW.4.	
Inventors	Cheng Huang, Yi Chung Lai, Bo Ru Lai,
Inventions	Particle structure of rutaceae plant fermentation broth with biomimetic stroma system
Institution	Biozyme Biotechnology Corp.
Abstract	This invention about a particle structure for Rutaceae fermented liquid. This particle structure including two part. Outer material is a kind of small molecule polysaccharide made by fermentation technology from mushroom or algae. It’s

	thickness from 10-4 to 10-3 mm. The inner layer material is effective substance from rutaceae fermented liquid. It's thickness from 10-5 to 10-4 mm. This particle structure can keep effect that weight control and skincare from ruraceae fruit. Glycoside will be change by small molecule polysaccharide on part of phytochemicals when fermented. This fermentation technology improve body absorption rate and maximum effect. Even if the output has not increased, the effective dose can also be significantly reduced. This particle structure better than natural rutaceae extracts in using range or efficacy.
TW.5.	
Inventors	Cheng Huang, Yi Chung Lai, Bo Ru Lai,
Inventions	Polysaccharide Fermentation Composition Capable of Anti-cancer, Anti-virus, Anti-inflammatory, Promoting Osteoblast Proliferation, Promoting Intestinal Stem Cell Proliferation Effects and Preparation Method there of
Institution	Biozyme Biotechnology Corp.
Abstract	The present invention provides a composition containing polysaccharide vegetables, mushrooms and algae as fermentation materials by using special polysaccharide fermentation preparation method to transform and divide the polysaccharide molecules(β-glucan, α-glucan) into small molecular form sugars, which are a polysaccharide fermentation composition having a molecular weight of about 300 Daltons. Its structure is different from the general polysaccharide molecule, and it is an organic form. After the fermentation, the excess glucose structure on the branch is metabolized by the bacteria to remove excess glucose molecules, which can make sugar molecule to have affinity and become a coating material of polysaccharide fermentation composition. The composition has efficacies of anti-cancer, anti-viral, anti-inflammatory, promote osteoblast proliferation, promote intestinal stem cell proliferation.
TW.6.	
Inventors	Cheng Huang, Yi Chung Lai, Bo Ru Lai
Inventions	β-nicotinamide mononucleotide combined spherical carrier structure produced by fermentation of vegetables and fruits
Institution	Biozyme Biotechnology Corp.
Abstract	This invention provided a combined spherical carrier structure of β-nicotinamide mononucleotides that was produced from fermented fruits and vegetables. It includes a fermented fruit and vegetable layer; multiple nutrient granules that are covered by the fermented fruit and vegetable layer; and a fermentation bacteria metabolite layer, which covers the fermented fruit and vegetable layer, forming a spherical carrier structure.
TW.7.	
Inventors	Chun-Te, Lee , Tzai-Der, Wang, Jui-Ling,Hsieh , Bing-Kai,Liao, Hong-Cheng,Kao, Ling-Yao,Wei , Chin-Yi.Huang
Inventions	AIOT Smart Energy Saving Lamp
Institution	Cheng Shiu University

Abstract	In general, the sensor lamps in the corridors, stairwells, or toilets of buildings will change from completely dark to full brightness when someone passes by. It will make the human eyes feel very uncomfortable, and when the sensor lamp is completely dark, the whole corridor and stairwell will be dark, making women and children feel insecure at night. If the lighting is changed to be sensor-less, there is a serious problem of wasted energy. To solve this dilemma, we developed a new type of "LED sensor lamp with low-light mode" that changes the original "full dark mode" to "low-light mode". As such, when someone approaches the sensor lamp, their eyes will not be uncomfortable with the momentary illumination. Furthermore, when no one passes by, the sensor lamp will stay in low-light mode, so that people returning home at night no longer have to go through dark corridors, thereby achieving safety, aesthetics, and energy-saving purposes. This new sensor lamp's power consumption in low-light mode is only 1/10 of the high-light mode, but its brightness can be up to half of the high-light mode, making it very suitable for parking lots, corridors, stairways, or toilets of buildings. It only requires the replacement of the lamp but not the original lamp socket, yet the basic brightness can be maintained. Take the general 15W T8 LED lamp (sensor-less) as an example: if it is replaced by this new type of sensor lamp, and the place where it is installed is rarely passed by people, the power saving rate will be as high as 90%. Assuming that there are 12 passers-by per hour, the saving rate is still 81%.
TW.8.	
Inventors	PEI-Yu Lee , Chun - Sheng Lin, YI-KAI TSENG, LI-CIAN SU, CHEN,YONG-ZIH
Inventions	Cloud Blood Pressure Health Management APP
Institution	Cheng Shiu University
Abstract	In view of the popularity of mobile devices and the Internet, mobile phones have also begun to have health management functions in recent years. For more accurate personal blood pressure management, in addition to the complex functions of the screen, key values such as systolic blood pressure, diastolic blood pressure, and heartbeat are presented in a simple interface at one time, so that the user can see it at a glance without the need for cumbersome page switching.
TW.9.	
Inventors	Shu-Fen Lee , Chun - Sheng Lin, LI-CIAN SU, BO-YU HUANG, CHEN,YONG-ZIH
Inventions	Cloud Accounting Management APP
Institution	Cheng Shiu University
Abstract	Due to the rapid development of science and technology, the pace of life of modern people is tight. Many things in life can be done by information technology, and life is relatively convenient.

	In the traditional bookkeeping method, it is nothing more than paperwork or bookkeeping to assist in the management of accounts. For the elderly, there will be some time-consuming, labor-intensive and miscalculation situations. This topic proposes to use the mobile app to assist the accounting function to avoid errors, and then upload to the cloud and make statistics, so that users can see everything at a glance without complicated page switching.
TW.10.	
Inventors	Pang-Chieh Lin, Huang-Kuang Kung, MING-YOU XIE, Shun-Liang Lee, Jia-Xian Chen, FANG-CHEN YANG, Sheng-Jie Lin
Inventions	Smart Golf Ball Retriever
Institution	Cheng Shiu University
Abstract	The rapid growth of AI has enhanced the progress of autonomous vehicle with some sort of automatic functions such as the smart golf ball picker developed in this study. In order to make the golf ball picker become smarter, the open source software of computer vision such as OpenCV is applied to assist the recognition of the locations of golf balls. Then, the home-made golf ball picker is driven to catch the locked targets - the golf balls. A home-mad golf ball picker is developed to help golf players collecting the golf balls in the training field. With the aid of image recognition, the vehicle can pick the golf balls automatically and the successful rate is up to 95%.
TW.11.	
Inventors	Cheng-Chung Hsu, CHIH-YING LAI, Hsi-Feng Huan, Kuo-Ting Hsia, SU,LI-CHIEN
Inventions	E-cloud online roll call App
Institution	Cheng Shiu University
Abstract	This study developed the "e-cloud online roll call app", which has multiple functions of "seat roll call", "cloud storage" and "message sending", which can solve the troublesome inconvenience of manual paper printing and filling in forms, correction of form filling errors, Students need to take the roster and return the question, and it has the advantages of electronic and low cost, so that the tutor can know the student's non-arrival and mid-class students have not entered the classroom at the first time, and immediately grasp the situation of student vacancies.
TW.12.	
Inventors	Chen, Hsieh-Ping, Chen, Hsing-Feng, Pan, Chia-Cho, Chang, Yu-Shun, Zheng, Jie-Yun, Huang, Xian-Ru
Inventions	SAFETY DRAIN HOLE FILTER
Institution	Cheng Shiu University
Abstract	A safety-designed downhole filter with 4 features: 1. The design is raised above the ground, so that even a small amount of silt can be drained from the drainage hole.

2. When the rain is heavy, the area of the drain hole is large, so that the water can be drained quickly.

3. Due to the convex design of the filter screen and the use of elastic material, it has the characteristics of quickly restoring the original shape, pedestrians will not fall down when kicked, and motorcycles will not cause accidents when pressed.

4. The color of the filter material has various characteristics, and different colors can be designed for identification according to the needs.

TW.13.

Inventors Hsieh, Chin-Hsing
Inventions GoodARCH TFE Graphene Corrective Arch Support 2.0
Institution Homeway Technology Co. Ltd.
Abstract 1. Arch correction: rearranges the 52 bones in your feet to form a perfect arch foundation, including the transverse arch, medial longitudinal arch, and lateral longitudinal arch. This can correct the skeletal structure and improve overall posture.

2. Pressure relief: with the correct walking and exercise technique and the "Homeway" Far Infrared Arch Corrector, it can support arch correction and relieve foot pressure, acting as a medical device for improving the arch.

3. Promotes blood circulation: independently tested, the far infrared radiation average emissivity of the foot arch corrector reaches over 80% at a constant temperature of 36°C or 60°C, increasing foot blood flow, blood flow velocity, and infrared thermal imaging temperature after use.

4. Foot massage and promoting metabolism: using the resonance energy of far infrared radiation, it can massage the foot while walking, enhancing and improving body energy.

5. High levels of negative ion components can effectively relieve stress, restore physical strength, and relieve fatigue.

6. The addition of silver ion components can effectively sterilize.

7. Graphene has strong thermal conductivity. As the human body emits heat, the carbon atoms on the graphene structure can quickly absorb the heat, promote carbon atom energy absorption and produce resonance, radiating a specific frequency of far infrared radiation.

TW.14.

Inventors Hsieh, Chin-Hsing, Chen, Ming-Kun, Hsieh, Tsung-Hsien,
Inventions Homeway TFE Graphene Purcone-7 water filter system 2.0
Institution Homeway Technology Co. Ltd.

Abstract

This product is processed by Homeway exclusive TFE(Torsion Field Energy) technology.
Description:

- The inner pot filter material contains graphene, KDF, sodium-free ion exchange resin, antibacterial activated carbon and nano-silver ions, maifan medical stone, calcium ion balls, and magnesium metal. The layers of materials overlap, allowing you to drink directly, hygienic and safe, and at the same time provide trace minerals that are beneficial to the human body.
- The exclusive technology can provide a variety of functions. The information energy filter has far-infrared energy and information command functions, which can be selected according to your own needs to help improve your health.

TW.15.

Inventors

CHIU,SHENG-PIN

Inventions

Device For Making NDS Natural Whole Food State Protein Peptide Carrier Particle Structure

Institution

BIOMED HERBAL RESEARCH CO.,LTD

Abstract

"With a healthy body, life will shine brightly". Everyone wants to have a healthy body, and the root of all this is adequate and balanced nutrition. However, with the deterioration of the earth's ecology and the serious loss of soil minerals, coupled with intensive farming and the use of chemical fertilizers and pesticides, have caused a serious imbalance in the nutrition of natural foods, resulting in an extreme lack of natural whole food nutrients in our bodies and a rapid increase in the incidence of chronic diseases. In addition, commercially available single isolated purified chemically synthesized nutrients do not have the complex structure and bioactive energy of natural food factors, and cells cannot recognize these nutrients immediately and effectively, thus reducing the absorption of these nutrients. Therefore, only an adequate intake of natural whole food nutrients can be of great help to health.

Since natural whole food nutrients are easily affected by digestive enzymes such as stomach acid and bile salts after ingestion by the body, their effective absorption and utilization by cells is also a key factor in the effectiveness of the product.

The concept of the Nutrition Delivery System (NDS) is that each specific natural whole food state nutrient has its own unique "endogenous signal key",

which is the arrangement of N-terminal amino acids of proteins. Like the postal code of a letter, this specific signal code will work with the nutrient to reach the desired cells and help the nutrient to pass through the cellular recognition system, allowing the nutrient to reach the cells precisely for action. In addition, each natural whole food state nutrient is transported through a specific peptide carrier in the body to the target cells where it is needed, and the peptide carrier helps to penetrate the cell membrane to enter the cells. This protein peptide carrier acts as a dedicated messenger for natural whole food state nutrients, carrying them to target cells in all parts of the body. The concept is similar to the "Protein Peptide Signal Sequence Delivery Theory" proposed by Dr. Gunter Blobel, who won the Nobel Prize in Physiology and Medicine in 1999.

Based on the above concept, we have developed a device to produce NDS natural whole food peptide carrier particle structures to help efficiently fuse NDS particle structures with natural whole food nutrients. It can effectively assist natural whole food nutrients to pass through the cellular recognition system and enhance the absorption and utilization of natural whole food nutrients to improve the effectiveness of the product. It also significantly reduces production costs and increases production efficiency.

TW.16.

Inventors CHIU,SHENG-PIN

Inventions Natural Substance Freeze-Crystal Embedding Particle Structure

Institution BIOMED HERBAL RESEARCH CO.,LTD

Abstract

There are many different types of nutrients required by the human body, but due to the busy lifestyle of modern people, they often fail to have a balanced and diversified diet, resulting in the lack of essential nutrients. For this reason, many people choose natural nutritional products (such as multivitamins, B-complex, lactobacillus, etc.) to supplement insufficient vitamins and minerals in order to maintain the body's metabolic function and health.

The intestine is the largest immune organ of the human body and the most important location for nutrient absorption. However, nowadays, food is becoming more and more refined and high in oil and salt, thus causing a burden on the human gastrointestinal tract, and over time, the number of good bacteria in the body will decrease, which will lower the immunity of the human body or even cause gastrointestinal tract pathologies, resulting in incomplete absorption of nutrients. The most direct way to revitalize intestinal immune cells, inhibit the proliferation of bad bacteria, and maintain normal intestinal

function and balance of intestinal bacteria is to supplement probiotics. However, probiotics have the same disadvantages as many natural substances, such as: they are not acid-resistant, difficult to store for a long time and easily destroyed. In the human digestive system, there are gastric juice, pancreatic juice and bile, among which gastric juice has gastric acid, so lactic acid bacteria or natural substances will be destroyed by gastric acid and lose their activity after passing through the gastrointestinal tract, resulting in problems and shortcomings such as nutrients not being absorbed by the human body or good bacteria not being able to colonize. In addition, most probiotic products are delivered to consumers by raw material manufacturers, distributors, and retail stores, and this process not only takes a long time, but also has a lot of variation in the storage environment, making it easy for probiotics to be damaged and lose their activity due to storage conditions and processing. In order to ensure the consumers' rights and interests, good probiotic products must maintain a high level of activity to meet the product efficacy standards, which requires improvement and breakthrough.

In order to make the probiotic bacteria more effectively reside in the digestive tract, the "Embedding Technology" is an important factor to the probiotic bacteria. "Natural Substance Freeze-Crystal Embedding Particle Structure" has excellent acid and alkaline resistance, which can effectively maintain the activity and high stability of probiotics and improve the colonization of probiotics, allowing probiotics to reside in the digestive tract more often after reaching the digestive tract and enhancing self-protection.

TW.17.

Inventors CHIU,SHENG-PIN

Inventions Mixing Equipment for Combining Protein Carriers and Natural Substances

Institution BIOMED HERBAL RESEARCH CO.,LTD

Abstract

With the deterioration of the earth's ecology, the severe loss of soil minerals, intensive farming and the use of chemical fertilizers and pesticides are all factors that cause a serious imbalance in the nutrition of natural foods. However, modern people with busy lives are not only unable to take a balanced and diversified diet, but are also under high pressure constantly which accelerates the depletion of nutrients in the body, resulting in an extreme lack of natural whole food state nutrients in our bodies and a rapidly increasing incidence of chronic diseases. Therefore, more and more people will choose easily portable and easy to replenish health food (such as comprehensive vitamin B complex, lutein, etc.) to maintain the body metabolic function and health.

The production method of common commercially available nutritional foods usually involves the chemical synthesis or high temperature and high pressure extraction of natural or chemically synthesized inorganic nutrients into tablets or capsules, however, it has been found in practical experience and specific experiments that the absorption rate of this form of nutrition is poor. The cell membrane is the basic unit of the human body and is responsible for controlling

the entry and exit of substances. In order for various nutrients to enter the human cells through the cell membrane, the cell membrane receptors must receive the correct signals (such as the corresponding protein or peptide signals) before the cell membrane will open specific entry channels (different nutrients have their own channels). Therefore, the common process is only a single purification or physical temporary combination of each nutrient, so it does not have the basic elements of food (such as proteins, lipids, enzymes, etc.), which makes it unable to enter human tissues and is discharged from the body, resulting in poor absorption rate and effectiveness.

Chemically synthesized nutrients that are isolated and purified do not have the complex structure and bioactive energy of natural food factors, so that human cells cannot immediately and effectively recognize these nutrients, and therefore the absorption and utilization of these nutrients is reduced. Based on the above-mentioned drawbacks, a **Mixing Equipment for Combining Protein Carriers and Natural Substances** was developed, which consists of: a mixing solution, made of water and natural substances; a protein carrier, which is composed of genes with the same signal as human cells and can pass smoothly through the cell membrane into human tissue cells; a mixing tank, a hollow barrel tank comprising a top wall, a bottom wall, two side walls and a storage tank in which the mixing solution and the protein carrier are contained; a stirrer, located in the tank of the mixing barrel, and the stirrer is connected to a drive motor outside the mixing barrel, so as to drive the stirrer to stir and chelate the mixing solution and the protein carrier in the tank by the drive motor; a medium supplement, which is added to the storage tank of the mixing tank, so that the protein carrier and the natural substance can be bonded to each other to form a complex nutrient form. In this way, the natural substance can be carried into human tissue cells through the protein carrier to achieve complete retention of its nutrients and improved absorption.

TW.18.

Inventors
CHIU,SHENG-PIN

Inventions
The device to coat natural ingredients in LIPOMAX liposomes

Institution
BIOMED HERBAL RESEARCH CO.,LTD

Abstract

Modern people can not only take the nutrients required by the body through the daily diet, but also through some processed and extracted health foods. However, although commercially available nutrients have their effects, they generally have many common shortcomings, such as not easy to be stored for a long time, poor absorption and utilization, rapid degradation and loss in the blood, etc., making commercially available nutrients ineffective in being absorbed and utilized by the human body, and significantly reducing the benefits of functional health ingredients to the human body.

The concept of liposome was first proposed by British hematologist Alec D Bangham in 1961, who found that when phospholipids are dispersed in water, the hydrophobic hydrocarbon chains are closely aligned with each other to form a planar bilayer flat structure, which minimizes the adverse interaction between the aqueous phase and the hydrocarbon chains, and when the flat

plates are bent to form tiny closed spheres, this interaction is completely eliminated to achieve interfacial stability, thus forming hollow microspheres. Subsequently, Sessa and Weissmann officially named this tiny spherical body as liposome in 1970 and defined it as a structure composed of one to several lipid bilayers with self-adhesive properties.

Since liposome is composed of lipid bilayers, it can be used as a carrier for both hydrophilic and hydrophobic functional health ingredients. Hydrophilic substances can be coated inside the liposome, while hydrophobic substances can be embedded in the lipid bilayers; in addition, the composition of the liposome is similar to that of cell membranes, therefore, by coating the liposome, the utilization rate of functional health ingredients can be greatly enhanced through cellular absorption to achieve optimal efficacy.

In response to the above-mentioned problems and concepts in the application of known nutrients, we have developed a device to coat natural ingredients in liposomes, which helps functional health ingredients to be completely and effectively coated in liposomes, so that the functional health ingredients can be carried into human cells through the liposomes and improve their absorption rate and the effectiveness of the products.

TW.19.

Inventors	Chin-Chu Chen, Yeh Shu-Hsing, Lee Li-Ya, Hsu Jui-Hsia
Inventions	The use of Cordyceps Cicadae mycelium for preventing, postponing or treating steroid-induced ocular diseases
Institution	GRAPE KING BIO
Abstract	Cordyceps cicadae mycelium are useful in preventing steroid-induced ocular diseases, and in particular relates to a method for preventing changes in the anterior/posterior chamber volume, vitreous humour, and/or retinal detachment

TW.20.

Inventors	Chin-Chu Chen, Chen Yen-Lien, Lin Shin-Wei, Chen Yen-Po, Wu Szu-Yin
Inventions	Use of Lactobacillus brevis GKJOY for improving depression
Institution	GRAPE KING BIO
Abstract	The probiotic GKJOY collected from the traditional pickled fermented cabbage sold in Taiwan 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, GKJOY 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 GKJOY supplementation, can produce serotonin and dopamine to help alleviate stress, anxiety and depression via bidirectional gut-brain connection.

TW.21.

Inventors KEN-LIN, CHANG, YU-FANG, LIN, Peerapong JEENO, Alexander F. Padilla, Jr., HUANG,YU-WEN, TZU-YING, YANG, Udomsap Jaitham, Huynh Quang Tam, Surat HONGSIBSONG, Mark Daniel G. de Luna

Inventions Artificial neural network modeling of carbon dioxide conversion via green-powered plasma system

Institution National Sun Yat-sen University, Institute of Environmental Engineering

Abstract

Rapid industrialization and commercialization of commodities and services have alarmingly increased the carbon dioxide (CO_2) emissions in the atmosphere causing global warming and eventually escalating climate change. This worldwide phenomenon has seriously affected ecological cycles, accelerated the rising of sea levels, and influenced extreme climate conditions. To combat climate change, reducing CO_2 emissions by substituting fossil fuels with renewable energy sources was encouraged. Another way is to capture and utilize CO_2 to produce high-value-added chemicals and fuels.

However, the difficulty of CO_2 conversion technology lies in the need to overcome the high stability of carbon dioxide molecules and the need for a large amount of energy to break the double bond. The non-thermal plasma technology can ionize, excite, dissociate, and activate CO_2 through the high-energy electrons generated by the reaction, so it has been considered as a promising carbon reduction technology. Non-thermal plasma technology is considered to have the following advantages:

- operating at normal temperature and pressure using any renewable energy;
- independent from exploiting the Earth's natural resources; and
- feasible to be modeled and optimized for large-scale processing capacity and industrial application.

Herewith, catalytic plasma conversion by using solar energy for powering the non-thermal plasma system can both reduce and reuse CO_2 in the atmosphere. Conversion of CO_2 at low temperature and pressure with low energy consumption was conducted with the following parameters namely, CO_2 input concentration (10%, 15%, 20%), gas flow rate (0.5 L/min, 1 L/min), and power input (300W, 350W, 400W). An optimum CO_2 conversion (19.28%) was observed at 0.5 L/min flow rate, 10% CO_2 input concentration, and 350 W power input. Optimum Specific Energy Input (SEI = 42 J/cm^3) with relatively low energy efficiency and least errors were also observed in the same set of conditions. Furthermore, the performance of CO_2 conversion was modeled through the artificial neural network (ANN) analysis of MATLAB R2022b which gave $R^2 = 0.99998$, $R^2_{adjusted} = 0.99997$, RMSE = 0.0552, MAE = 0.0140, and AAD = 0.5943. Overall, optimum CO_2 conversion can be attained, ANN analysis is statistically sound, and the neural network model is reliable.

TW.22.

Inventors Yung-Hsiang Lin

Inventions Immuno Formula

Institution TCI Co. Ltd.

Abstract

According to the research by Shinshu University in Japan, people who regularly drink green tea have a higher abundance of gut bacterium called *Flavonifractor plautii* (FP). This bacterium can metabolize the catechins found in green tea and significantly inhibit the Th2 response in the body, thereby reducing the production of allergenic IgE antibodies and alleviating allergic reactions.

Therefore, in 2023, TCI developed a next-generation prebiotics exclusive formula. With TCI's "Bio-Resource Data Mining Platform" technology, Immuno Formula is formulated by combining patented green pear young fruit extract, green tea powder, galacto-oligosaccharides, and D-xylitol to create an exclusive nutrient source that effectively increases gut FP abundance. This is a low-dose precision prebiotic that works by targeting specific intestinal probiotics to achieve specific physiological effects. It is also aimed at approximately 480 million people worldwide who suffer from asthma and food allergies. By creating a dedicated nutrient source for anti-allergy FP bacteria and promoting their growth in the intestines, they aim to improve allergy symptoms from within the body.

Results from a human clinical trial with 11 participants showed that after 2 weeks of taking Immuno Formula, the total IgE levels in the blood decreased by 6.2%. This reduction continued to 8.6% after 4 weeks, with an improvement rate of 85.7%. After 4 weeks of consumption, Immuno Formula also helped increase the activation of T cells in the blood by 33.3%, with an improvement rate of 72.7%. Participants' feedback was collected through a questionnaire by self-assessment scale from 1 to 10, where 10 represented the most severe symptoms. After 4 weeks of using Immuno Formula, participants reported improvements in sneezing and runny nose symptoms, with improvement rates of 75.0% and 83.3%, respectively.
These findings highlight the potential benefits of Immuno Formula in reducing allergic reactions and improving the overall well-being of individuals. By leveraging the unique properties of FP bacteria and combining them with carefully selected natural ingredients, Immuno Formula offers a promising solution for those seeking relief from allergies.

TW.23.

Inventors Yung-Hsiang Lin

Inventions *Bifidobacterium breve* TCI761

Institution TCI Co. Ltd.

Abstract

Bifidobacterium breve TCI761 through interaction with human intestinal cells, promotes the production of a key appetite-suppressing compound GLP-1, which is traditionally used for diabetes treatment, the appetite-suppressing effects and has been validated by the medical journal, The Lancet. In 2023, TCI

developed TCI761, the first probiotic on the market that promotes GLP-1. This probiotic is sourced from the intestines of individuals with healthy BMI and good physique. Its effects are similar to that of slimming injections, but without the need for invasive procedures, achieving effects similar to those brought by GLP-1.

In vitro, TCI761 effectively stimulates GLP-1 secretion, with an increased rate of up to 51.8%. It also promotes the expression of the appetite-suppressing gene PYY, with an increased rate of up to 79.8%.

TCI761 can inhibit 83.4% of mature fat cells and regulate the expression of genes related to fat metabolism (ATGL, PLIN1, PPARG2, LIPE), thereby reducing fat accumulation by 21%. Additionally, it enhances the expression of key genes (UCP1, UCP2) involved in fat burning, with increase rates of 4.35 and 1.84 times, respectively. Furthermore, TCI761 can improve cholesterol abnormalities. Cholesterol can be categorized into very low-density lipoprotein (VLDL), low-density lipoprotein (LDL), and high-density lipoprotein (HDL). The first two can cause inflammation and plaque buildup when transporting cholesterol through the bloodstream to cells for storage, leading to blockages in blood vessels. On the other hand, HDL transports cholesterol from the bloodstream to the liver for breakdown and is considered "good" cholesterol. TCI761 can enhance the expression of genes related to HDL generation (CETP, SCARB1, ABCA1, LDLR) with a maximum increase rate of up to 9.2 times.

In human clinical trials, after 4 weeks of consuming TCI761 capsules, there was a significant reduction in hunger sensations, improving the conditions for 62.5% of the participants. Moreover, it significantly increased the levels of HDL by 3.69% and reduced LDL in the blood by 8.2%.
In summary, Bifidobacterium breve TCI761 can effectively regulate appetite, inhibit fat accumulation, and accelerate fat metabolism through a triple mechanism of action. It provides comprehensive control to maintain a lean and healthy physique.

TW.24.

Inventors Edward Ju , William Ju,
Inventions Motorcycle’s Traffic Warning Triangle
Institution Irvington high school
Abstract Normally people prepare traffic warning triangle in their car. When a car accident happens or is out of order, the driver can put the traffic warning triangle a few meters behind their car to prevent other cars being unaware to it. However, because the size of locker of the motorcycle is considered too small, traffic warning triangle usually does not exist on motorcycles. Since then, we decided to invent a new kind of traffic warning triangle which is assemblable, to let motorcycle drivers able to do the same things as car drivers to protect themselves.

TW.25.

Inventors TAI,PEI-SHAN, TAI,PEI-LING, LI, TAO-RAN, FU,SHAO-YU
Inventions Multifunctional clothes drying rack
Institution Korrnell Academy

Abstract	This work improves the wardrobe rack to have the effects of dustproof, rainproof, sterilization, and quick drying. Even if it rains outside, you can also dry clothes indoors. When used with a hair dryer, the clothes can be dried quickly. The wardrobe is equipped with ultraviolet light, which can achieve sterilization effect.
TW.26.	
Inventors	WU, CHEN-NI, WU, PEI-HSUN
Inventions	Multifunctional Vehicle Tray
Institution	Hsinchu County American School
Abstract	The multifunctional vehicle tray allows users to effortlessly dine and work in the car. Its unique design contains a heater, light, working and dining platforms...etc
TW.27.	
Inventors	TSAO, YU-HSUN (ALFONSO TSAO), TSAO, KAI-LIN, CHANG, YUAN-CHIN, CHANG, YUN-SHUO
Inventions	Virtual Kettlebell Swing Coach
Institution	Pacific American School, Korrnell Academy
Abstract	If you are looking to improve your sports performance from the comfort of your own home, you can now find a virtual coach through our AI-powered Kettlebell Workout simulation system. This system can be accessed anytime and anywhere, and uses your laptop's camera to detect your movements as you swing the kettlebell. The system will monitor your activities and provide guidance to help you correct your form. If you make a wrong move, the system will remind you to prevent exercise-related injuries. Additionally, it can keep track of the number of swings you complete to help you log your progress.
TW.28.	
Inventors	CHEN,CHIEH-TING, YEN,TZU-CHEN, HO, YU-CHENG, FU, KUAN-CHUNG,
Inventions	Lightweight Trolley
Institution	Korrnell Academy, CHEN,CHIEH-TING
Abstract	This product is a lightweight trolley that is used to move any kinds of heavy or huge goods. It is very easy to setup and carry. For any long length demand, the sliding track can be extended to fit the size. It is suitable for usage in office, home or travel.
TW.29.	
Inventors	WANG, XIN, CHUNG, ANDERSON, CHUNG, KAI-HSIN(Catherine), YANG, HAO-CHENG
Inventions	Anti-fall Closet
Institution	Hsinchu County American School
Abstract	Taiwan is an earthquake-prone country; whenever an earthquake strikes, tall closets always tend to fall, thus resulting in adults and children getting hurt. Because of this issue, we developed a closet that is fall proof, eliminating closets falling by all chance.

TW.30.	
Inventors	Chen, Patrick Ping-Chuan, Lu, Che-Wei, Chen, Allen Ping-An
Inventions	LIFESAVING CURTAIN
Institution	HsinChu American School
Abstract	The lifesaving curtain can function like a normal curtain, which means it can shade the sun and protects the privacy of people inside the house. When disasters like fire or earthquake occurs, the fireproof curtain can turn into a rappelling rope after the buckle is united, which allows people to escape by rappelling.
TW.31.	
Inventors	LIN, YU-CHEN, LIN, HSUAN-YI, LIN, YU-JOU, HSIAO, YU-CHENG, WU, YING-HAN, LIN, YU-TENG, HSIAO, WEI-WEN
Inventions	Application of new convolutional neural network with AI in counting system
Institution	National Taiwan University, National Tsing Hua University, National Taiwan University of Science and Technology
Abstract	We develop a new generation of artificial intelligence bacteria and cell technology platform, and use convolutional neural network to identify bacteria and cells, and combine big data with deep learning to improve the accuracy of identification. This convolutional neural network can effectively achieve low-error and real-time colony calculation, and it can be used with the USB camera module (IPEVO DO-CAM) to take pictures and measure at any time. By analyzing the image and adding the database, the system can judge the number of a picture of thousands of colonies within one second, and the error is within 10. For the repeatability and accuracy of the experiment, our high-accuracy and low-cost artificial intelligence cell counting system, taking Escherichia coli as an example, residual learning combined with the overall error value of the convolutional neural network of the global pooling layer Within ±2 bacteria. In the future, the system will be extended to detect gastric cancer in endoscopic images, estimate the impact of human papillomavirus type on the risk of recurrence of cervical dysplasia, classify skin cancer, identify microbial volatile organic compound characteristics and detect fractures, etc. High accuracy but low cost applied to cancer cell identification to benefit the general public.
TW.32.	
Inventors	LIN, YU-CHEN, LIN, HSUAN-YI, LIN, YU-JOU, CHEN, HSUAN-MING, HSIAO, YU-CHENG, WU, YING-HAN
Inventions	Spray Nanofibers Encapsulated with Longan Extract for Wound Repair
Institution	National Taiwan University, National Tsing Hua University

Abstract

Longan is a plant of Sapindus family and has various medical properties, including anti-oxidative effect, pain relief, improvements of immunity and prevention of cardiovascular diseases.

Antimicrobial resistance is a serious problem of Staphylococcus infection. Cotreatment of longan extracts with β-lactams have the bactericidal effect of Staphylococcus.

This study also attempted to develop sodium alginate/pectin hydrogels containing longan extracts for potential applications as wound dressing. Calcium chloride was used to crosslink the hydrogels in order to reinforce their structure. The swelling behavior of the prepared hydrogels was examined with a pH ranging from 4 to 10 which exhibited increased swelling ratio with increasing pH values. The total phenolic content and anti-oxidative activity of hydrogels were evaluated using the Folin-Ciocalteau method, DPPH free radical scavenging activity and ferrous ion chelating ability assays. Results of MTT assay also showed the hydrogels have good cytocompatibility to L929 mouse fibroblasts, and the sodium alginate/pectin- longan extracts hydrogels loaded with aloin can be used as wound dressing.

This study also demonstrated that spray nanofiber-coated longan extracts can slowly release the extracts in wound healing and continuously promote wound healing and flatten epithelialized tissue, which has great potential as a wound dressing.

TW.33.

Inventors

Ching Ting, Lin, Yu Chen Chang,

Inventions

Amicoipet Smart Collar for monitoring Pet’s vital signs

Institution

Amicoipet BioTech Inc.

Abstract

Introducing a brand new smart pet collar for home vital monitoring, which uses completely harmless NPNS Technology (Non-contact pet health management physiological sensor) to detect pet vital data over a long period of time. This technology originates from the Industrial Technology Research Institute's award-winning innovative technology at CES 2022. Regardless of the length or thickness of your pet's fur,

simply wearing the collar without the need for shaving, wireless transmission technology can record your pet's heartbeat, breathing, and activity level at any time, along with the detection of environmental humidity. Pet owners can keep track of their furry friends' vital data at all times, detecting deviations early and seeking medical assistance promptly.

amicoipet is a platform that helps pets communicate their "thoughts" to their owners. Although pets cannot speak, we all know that they love their owners with all their hearts. Owners are also willing to use amicoipet to understand their pets' needs and use concepts of preventive medicine and behavioral science to protect and provide a healthy and stress-free life for their pets, allowing them to live happy life.

TW.34.	
Inventors	YI, TZU-YU, YEH, I-CHEN, CHANG, HSI-CHI, LAI, WEN-CHENG, CHEN, KUANG-HAO
Inventions	Application of Thermoelectric Power Generation Module
Institution	CHINGSHIN ACADEMY, Ming Chi University of Technology
Abstract	Thermal energy conversion module is a wafer that can switch thermal energy and electrical energy when the temperature difference. The purpose of this research is to measure how much the power of the wafer offer from using on barbecue grill. When the charcoal is burned, we use the heat to provide wafer work and measure how we can get the electricity from wafer. We can save the power and reused them so as to achieve the goal of environmentally friendly power.
TW.35.	
Inventors	SZU-YUAN CHEN
Inventions	Exercise Program for Parkinson's Disease (including elderly individuals with gait disorders) Using Multispectral Imaging to Track and Analyze Changes in Footprints and their Corresponding Hydrotherapy Effects
Institution	GOLDEN ROOT COMPANY LTD
Abstract	This project introduces a multispectral thermographic technique that creates a novel approach for non-contact and passive monitoring of Parkinson's disease (PD) patients, specifically addressing their freezing of gait patterns in both overground and aquatic environments. It also includes an adjunct therapy involving hydrotherapy for movement and balance training, aiming to identify a method that can enhance balance, effectively prevent falls, and reduce the economic and physical burdens of treatment, thereby maximizing the quality of life for PD patients.

Thailand

TH.1.	
Inventors	N. Chantarapanich, P. Sungsomboon, J. Jitprasutwit, C. Bureecam, S. Wanchat, P. Naronglerdrit
Inventions	Flexible Delineator Bollard with Smart Roadway Warning and Notification System
Institution	Kasetsart University and Plus Strong Co., Ltd.
Abstract	Flexible delineator bollard of natural rubber reduces the severity when vehicles collide with it. Its geometric design was derived from computer crashing simulation in various situation and type of cars. When an impact occurs, the electronic system changes warning lights from green to red along the bollard line to warn and prevent reoccurrence accident. In addition, the signal is also sent to emergency service for further medical attention. The light can be reset via smart phone system. The electronic system is powered by solar cell panel installed at head of flexible delineator bollard. So it can be easy to install and replacement without complicated wiring. After 3 months after installation at site (Wang Si Sup, Uttaradit, Thailand), it could reduce the occurrence of the car accident and severity of car accident. It is estimated to reduce economic losses from traffic accidents by more than 10 million baht (287,770 USD).
TH.2.	
Inventors	K. Somna, R. Somna and P. Khamput
Inventions	BCC-green concrete (Bagasse Ash with Calcium Carbide Residue and Calcite as aggregate)
Institution	Civil Engineering Department Faculty of Engineering and Architecture Rajamangala University of Technology Isan
Abstract	Cementitious materials and using Calcite as aggregate are the green materials for this invention. All those materials are environmental waste and must be disposed to a landfill. This innovation has an idea to utilize all waste to be green cement. Bagasse Ash with Calcium Carbide Residue partially replaced cement as 20% by weight of the binder. The ratio of bagasse ash with calcium carbide residue was 70 to 30% by weight of the binder. 100% calcite was used as an aggregate. The compressive strength was 17 MPa at 28 days. The carbon dioxide emission was lower than cement's, around 3 kg CO2/Kg. This green material can be applied to pavement, walls, brick, etc.
TH.3.	
Inventors	N. Somsaruay, D. Sueaseenak, P. Somsaruay and N. Kaewtiam
Inventions	Innovation in Developing Local Products “Look Craft Brand” from Upcycled Materials and Smart Innovation for the Health of Ban Luk Community’s Craftsmen, Maetha District, Lampang Province
Institution	1. Lampang Rajabhat University 2. Srinakharinwirot University 3. Dhonburi Rajabhat University 4. “Look Craft Brand” Lampang
Abstract	The process of utilizing upcycled materials from wooden mortars, which are local products of the community, to design and create new artworks is a method

	that generates value by reducing the amount of waste materials. It involves selecting materials for experimentation and testing, with an emphasis on the origin of the materials and the distinct but attractive designed forms. It also includes caring for the health of elderly craftsmen specializing in carving, with the use of smart health monitoring devices that are integrated with a portable information system. These devices can measure, collect data, and report various physiological signals, including weight, blood sugar levels, respiration, blood oxygen saturation, electrocardiogram signals, heart rate, blood pressure, and temperature. The data is transmitted through a real-time internet signal network and stored in an online database, eliminating the need to visit hospitals.
TH.4.	
Inventors	T. Kaewwongsa, P. Spahanon A. Chanchaiweerapan, N. Laonet and K. phromchat
Inventions	The development of an Application to Inspect Sweet Young Coconut Meat the Identify the Estimated Harvest Period.
Institution	Princess Chulabhorn Science High School Phitsanulok
Abstract	An economically significant crop is sweet young coconut, which is regarded as a special plant in Thailand. The Thai market has a strong demand for sweet young coconuts and overseas in the consumption of coconut meat, the production of coconut milk, and the usage of coconut husks and shells. When shipping coconuts that are not standardized, it is difficult to determine how much coconut meat is present, and it takes time to determine whether the coconut is ripe, which lowers market demand and puts middlemen under pressure. A sweet young coconut meat inspection device was designed to estimate the harvest period of each coconut by examining the color of the coconut bottom. The color change of the coconut bottom suggests the right time of coconut harvest. This device, however, has limitations. The color of coconut bottoms may be subject to natural light and photo sharpness, which results from the distance between the camera and coconuts. The sweet young coconut meat inspection device was developed into a smart phone application which was connected to the smart phone's high-quality built-in camera. The zooming feature allowed a sharper picture when the coconut was high up on the tree and thus enabled the system to calculate the estimated harvest period more accurately. The created application adopted deep learning and image augmentation techniques. The study was divided into two parts. In the first part, the training and testing were done with binary cross-entropy. In the second part, the model accuracy test was calculated by dividing the number of correct predictions by the number of total predictions—the total number of pictures used. The accuracy value was 73.5%. The result showed that the developed application can help farmers quickly and more accurately identify ready-to-harvest coconuts.
TH.5.	
Inventors	K. Chaisui, K. Masan, J. Khanthong, N. Laonet and P. Charoenchai
Inventions	PackGuard: Next-Gen Meat Freshness Indicator from Organic Film
Institution	Princess Chulabhorn Science High School Phitsanulok

Abstract

Most meat products cannot be spotted rotten. PackGuard will come to save! Sugarcane bagasse and anthocyanin extracted from *Hibiscus sabdariffa* are organic ingredients used to form an indicator film. Anthocyanin extract is able to measure the acid-base equilibrium of the solution. This property can be used to inspect or identify the quality of fresh meat, as changes in pH values affect the quality of the meat. We have developed an indicator film from sugarcane bagasse, an agricultural by-product, mixed with anthocyanin extracted from *Hibiscus sabdariffa* to indicate meat freshness. The purposes are first to produce indicator films containing indicator ingredients from *Hibiscus sabdariffa* extract using carboxymethyl cellulose (CMC) from sugarcane bagasse, to study the color change in indicator films from *Hibiscus sabdariffa* extract in buffer solution and to study the color change in indicator films developed in perishable foods. We prepared CMC powder by mixing CMC derived from bagasse with anthocyanin of pH 1 extracted from *Hibiscus sabdariffa* to form an indicator film to detect spoilage. There are 4 sets of formulas that differ in the amount of *Hibiscus sabdariffa* from 5, 10, 15, to 20 ml. Then, we examined the film brightness and colors to identify the best indicator film. Next, we studied the reaction by the films' color changing in acid-base and buffer solution with pH values ranging from 1 to 12 to be tested in perishable food. The study showed that one can detect spoilage of pork by observing the color change on the surface of the developed indicator films from sugarcane bagasse with anthocyanin from *Hibiscus sabdariffa*. From the results, PackGuard: next-gen meat freshness indicator from an organic film can be used as an indicator to detect spoilage in food.

TH.6.

Inventors C. Petcharat, T. Plongkerd, P. Chuchuai and T. Praknokkaew

Inventions The Oobleckbump

Institution Princess Chulabhorn Science High School Nakhon Si Thammarat

Abstract

At present, many road problems exist. Which causes loss, whether both property and health, therefore designed a shockproof innovation that can reinforce the island in the middle of the road to prevent accidents. Therefore interested in designing this example to increase the safety of road commuters Enhance the level of well-being and enhance the health security of the people by presenting such innovations in the name of The Oobleck bump has the following objectives: study the creation of a simulated road barrier model as a concept to lead to innovations to prevent collisions across the island in the middle of the road and reduce the severity of accidents that occur. And to study the appropriate efficiency of rubber for road barriers. The barrier model is sloping. Immediately, the base will have cement attached to the road floor. The barrier block is made of rubber. Which the block is not very thick and flexible, durable Can support the impact well There will be hollow as an afflexible, oradurable. mixed in a ratio of 1: 2. The working principle of the barrier block is When there is a force to hit the water and starch inside Will make the barrier block stronger. By using the properties of Non-Newtonian Fluid In other words, the more fonon the car fluids , the stronger the barrier block will be.

Which will resist the for forcefully the car Causing the car not to run up the island in the middle of the road and go out of the running lens, but will be able to resist the collision for the car that hits forward instead. This caused a lost car not to run over the lens until there was even more loss.

TH.7.

Inventors S. Sooksalak, W. Sukkrom, S.Wachirapisut, P. Boonsin and K. Chaowalit

Inventions Extraction Phycocyanin from *Spirogyra sp*. for testing ammonia in water.

Institution Princess Chulabhorn Science High School Nakhon Si Thammarat

Abstract In this research, the authors would like to study and think about how to make use of Spirogyra sp. for maximum benefit. And it also adds value to it rather than disposing it uselessly. To reduce the size and impact of them.The organizer has chosen to use green hair algae (Spirogyra sp.) to study and experiment. Because it is an algae that easily found. and has a rapid reproduction. As a result, the researchers came up with the idea to bring them to develop a test kit for Ammonia in water.By using green hair algae to extract phycocyanin was used to test Ammonia in water. Because phycocyanin, when brought to drop in ammonia solution, different concentrations will cause the color change of phycocyanin as an indicator to measure the amount of ammonia. And the ammonia is one of the water quality variables that always appear in aquaculture literature. Because the amount of Ammonia in water sources will affect the organisms in that water source.

TH.8.

Inventors S. Chaitham, P. Akarawanichakun, H. Hattakarn, J. Sukvichian, N. Tantiputtilul, K. Singnui and K. Thipmanosing

Inventions MediSmart Box

Institution Princess Chulabhorn Science High School Nakhon Si Thammarat

Abstract Nowadays research from Department of Empowerment of Persons with Disabilities shows that there're about 180,000 peoples who have a vision disability which in most cases are elderly, and also in the year 2023 Thailand will become a completely elderly society estimate around 20 percent of the population. Our team has concerned about a problem with medication for blind people which has been a problem and inconvenient because blind people have to identify a medicine and time of consumption based on memories which can lead to wrong medicine consumption and wrong doses.

Introducing Medismart Box. A pill box that can help blind people identify and group medicine more precisely by using a QR Code technology to identify medicine and give info to the user with a sound system from a database that creates specifically for each medicine. A design that includes braille on a cover provides for a braille reader to define the time to consume the medicine in each container. Moreover with function checks the number of medicine remains in the box to help the user take the full amount of medication prescribed by the doctor.

TH.9.

Inventors N. Thirachotikun, K. Karinchai, K. Piyarungsi and K. Chaiyakhote

Inventions CC-Lubag

Institution The Prince Royal's College

Abstract

This research focused on manufacturing water-soluble seasoning packaging from bagasse CMC and white shrimp shell chitosan. Bagasse was extracted into cellulose in sodium hydroxide solution giving the yield of 20.34%. In the following procedure is a process of CMC synthesis, the cellulose derived reacted with monochloroacetic acid (MCA), isopropanol, and sodium hydroxide in the optimal condition according to the relevant research which resulted in 23.62 grams while the initial weight is 20.00 grams. The properties of CMC are suitable for film making, soluble and cohesive. The Chitosan synthesis process provided the yield of 6.00%. CMC-Chitosan films were formed by mixing CMC and chitosan with water and plasticizer (glycerol) in ratio of 2: 1: 100: 1 gram, respectively. The films were made into a seasonings bag. For the applications of the product, it was considered by water-solubility and humidity resistance. It can completely solve in both room temperature water and hot water, which shows better performance in solubility at high temperature. Chitosan addictive in the product has ability to enhance saltiness perception of an instant food. In conclusion, bagasse and white shrimp peels was able to be converted into CMC and chitosan, so that it was formed into water-soluble seasoning packaging that could improve salty taste despite a reduction of sodium amount in seasonings, solve environmental problems efficiently, and evaluate the value of wastes from consumption throughout the process effectively.

TH.10.

Inventors Zen Innovation Group Co., Ltd

Inventions Satsuma Orange FIR (MetaSlim) for improve metabolism and weight management

Institution Zen Innovation Group Co., Ltd

Abstract

In this study, Satsuma orange combination with FIR technology was invatigate compare to placebo and Satsuma orange extract. The result reveals thatMetaSlimTM shows superior effect than SE group in case of weight reduction, fat mass reduction, visceral fat reduction and increase muscle mass.

United Arab Emirates

AE.1.	
Inventors	Rashid Al Maktoum, Fatima Al Qasimi, Ahmed Bin Zayed, Hessa Al Falasi, Tariq Al Hashimi, Noor Al Shehhi, Khalid
Inventions	Desert Land Reclamation Mats
Institution	UAE Inventor society
Abstract	Desertification and sand movement present significant challenges for infrastructure, agriculture, and sustainable development in arid regions. SandBind introduces a proactive solution to these challenges with its advanced land reclamation mats. Designed after meticulous research on the desert ecology of the UAE, these mats facilitate stabilization of shifting sands and promote soil fertility.The multi-layered structure of SandBind is its key feature. The bottom layer, composed of biodegradable polymers, binds to the sand, preventing it from drifting. Above it, a nutrient-infused layer actively supports the germination of native desert plant seeds which are embedded within the mat. Over time, as these plants grow, their root systems further stabilize the area and enrich the soil. The topmost layer, a UV-resistant mesh, protects the young plants from extreme sunlight and helps retain moisture.
AE.2.	
Inventors	Dr. Amal Al Sayegh, Dr. Khalifa Al Nahyan, Dr. Layla Al Mazrouei, Saeed Al Mansoo
Inventions	Atmospheric Water Harvesting Towers
Institution	UAE Inventor society
Abstract	Water scarcity is a pressing issue in many arid regions, necessitating innovative methods of obtaining fresh water. AquaMirage introduces a revolutionary solution, erecting towers designed specifically for harvesting water directly from the atmosphere, even in the driest conditions.

United States

US.1.	
Inventors	Olivia Martinez
Inventions	CleanPulse
Institution	Cambridge, Massachusetts
Abstract	Rapid urbanization has exacerbated air pollution, leading to a range of environmental and health issues in major cities. CleanPulse introduces a transformative solution, designed to neutralize airborne pollutants within urban environments, significantly improving air quality and fostering healthier communities.Functioning as an "urban lung," CleanPulse units are strategically positioned at multiple levels within a city, from ground installations to rooftop units. These systems actively draw in polluted air and use an innovative chemical process to neutralize harmful pollutants such as NO2, CO, and particulate matter. The treated air is then released back into the environment, markedly cleaner than before.
US.2.	
Inventors	Rebecca Warren
Inventions	Transparent Solar Window Panes
Institution	Stanford, California
Abstract	In the pursuit of sustainable urban environments, the surfaces we overlook often hold the most potential. SunWave offers a groundbreaking solution by transforming the humble window pane into a powerhouse of renewable energy generation.
US.3.	
Inventors	Malcolm Lee, Isabelle Torres, Benjamin Riley, Zoe Alexander, Elijah Wallace
Inventions	BioMesh
Institution	-
Abstract	Urban infrastructures, from roads to buildings, face constant wear and tear, often necessitating costly and disruptive repairs. BioMesh offers an innovative approach, combining bio-engineering with construction materials to produce a self-healing infrastructure solution.At the core of BioMesh is a matrix of microorganisms encapsulated in porous spheres. When incorporated into construction materials such as concrete or asphalt, these microorganisms remain dormant until activated by specific triggers, like the presence of water and air entering a crack or fissure. Upon activation, the microorganisms release a calcite-based compound, effectively "healing" the material by filling and sealing the developing crack.
US.4.	
Inventors	Dr. Emily Harrison, Derek Wells, Rosa Martinez, Leonard Greene, Maya Sinclair, Keith Douglas, Vanessa Mitchell
Inventions	Autonomous Soil Health Monitoring System
Institution	NIKCC
Abstract	Agriculture and land management are at the crux of sustainable living and food security. However, the health of our soil often goes unchecked, leading to decreased crop yields and environmental challenges. Enter TerraGuardian: an

	autonomous system designed to constantly monitor and report on the health and quality of soil across vast expanses of land.TerraGuardian combines state-of-the-art sensor technology with advanced data analytics. Buried just beneath the soil surface, the system's sensors continuously collect data on key soil parameters such as moisture content, pH levels, nutrient composition, and microbial activity. This data is then wirelessly transmitted to a central hub where advanced algorithms analyze the information, providing real-time insights into the soil's health.
US.5.	
Inventors	Raj Patel, Danielle Webb, Lucas Sanders
Inventions	QuantumRoot
Institution	NIKCC
Abstract	The majority of plant health assessment tools and techniques focus on above-ground symptoms, often overlooking the root systems that play a critical role in nutrient absorption and overall vitality. QuantumRoot introduces a transformative approach, harnessing the power of quantum sensing to diagnose and monitor the health of subterranean plant structures without invasive procedures.Utilizing precise quantum magnetic resonance sensors, QuantumRoot can detect minute fluctuations in root metabolic processes. By mapping these changes, the system can pinpoint areas of stress, whether due to disease, pests, or nutrient deficiencies. This data is then transmitted wirelessly to a user-friendly interface, providing gardeners, farmers, and researchers with actionable insights into root health.
US.6.	
Inventors	Sarah Mitchell, Leo Fernandez, Grace Kim, Thomas Harper, Elaine Wells, Derek Yang, Natalie Brown
Inventions	LuminaGrid
Institution	NIKCC
Abstract	Urban areas, with their intricate networks of roads, walkways, and bike lanes, require effective illumination to ensure safety and navigability during nighttime hours. LuminaGrid presents a novel solution that seeks to reduce the energy footprint of streetlights while enhancing urban aesthetics and functionality. LuminaGrid is an advanced pavement system imbued with photoluminescent materials that glow in the dark after absorbing sunlight during the day. The embedded materials are not just passive illuminators; they are integrated with smart sensors that adjust the intensity based on ambient light conditions and specific requirements of the area. For instance, pedestrian crossings can glow brighter when someone approaches, and bike lanes can have dynamic signaling based on traffic conditions.
US.7.	
Inventors	Nathan Fields, Isabella Ruiz, Jonathan Hart, Amy Schneider, Rajesh Kumar, Bethany Lowe, Victor O'Neal
Inventions	EcoShield: Bio-Integrated Urban Pollution Filtration System
Institution	NIKCC
Abstract	As urban centers grow, so does the concern over pollutants affecting the quality of air and, subsequently, public health. Addressing this challenge, EcoShield

introduces a pioneering approach to urban pollution management, integrating biotechnologies with architectural design to actively filter and neutralize pollutants from the surrounding environment.

EcoShield is composed of modular wall and roof panels embedded with a dense network of specially-engineered moss species. These mosses possess an enhanced capability to absorb and neutralize a broad spectrum of airborne pollutants, from carbon dioxide to more harmful substances like sulfur dioxide and particulate matter. When incorporated into the exterior of buildings, these panels essentially transform the structures into living air purifiers. Beyond its primary filtration capability, the system is also equipped with sensors that continuously monitor air quality. Data from these sensors is then processed in real-time, and the results are shared with building occupants and urban planners, providing insights into pollution hotspots and overall air quality trends.EcoShield's impact transcends its immediate environment. By actively filtering pollutants, it contributes to broader urban air quality improvement, benefiting both human health and the natural ecosystem. Moreover, the lush green appearance of the panels adds a touch of nature to urban landscapes, enhancing aesthetics and promoting mental well-being. EcoShield embodies a future where cities can harmoniously coexist with nature. By leveraging the innate abilities of plants, enhanced through scientific innovation, and integrating them into our built environment, EcoShield paves the way for sustainable urban living, proving that progress and preservation can, indeed, go hand in hand.

US.8.

Inventors Aaron Zimmerman

Inventions Advanced Water Quality Assessment and Reporting Device

Institution -

Abstract Water, a fundamental pillar for life, is under increasing threat from pollutants, contaminants, and changing environmental conditions. Ensuring its quality is of paramount importance, especially in regions with limited freshwater sources.

US.9.

Inventors Owen Fitzgerald, Sophia Martin, Ethan Nguyen, Laura Patel, Adam Robertson

Inventions NeuroLinker: Non-Invasive Brain-Computer Interface for Enhanced Cognition

Institution -

Abstract The untapped potential of the human brain has long been a subject of fascination and research. With advances in neuroscience and technology, the aspiration to directly interface with our neural networks is no longer science fiction. NeuroLinker emerges at the forefront of this endeavor, offering a non-invasive brain-computer interface (BCI) geared towards enhancing cognitive functions.

Unlike previous BCIs, which required implants or cumbersome setups, NeuroLinker is designed as a lightweight, wearable headband. Embedded within are an array of highly sensitive electrodes that can detect and interpret

neural activity with unprecedented precision. Advanced algorithms then process this data, identifying patterns associated with various cognitive states.

US.10.

Inventors Dr. Lydia Henderson, Marco Garcia, Zoe Thompson, Neil Wallace, Aisha Kapoor, Benjamin Lewis, Eleanor Choi

Inventions Dynamic Cognitive Enhancement Headset

Institution NIKCC

Abstract

In an age where information overload is the norm, maintaining optimal cognitive performance is a growing challenge. CerebralSync is a groundbreaking solution to this issue, presenting a dynamic cognitive enhancement headset that bridges the divide between the brain and digital realms, ensuring peak mental agility at crucial moments.
Sleek in design yet potent in function, CerebralSync seamlessly integrates into daily life. Its sophisticated neural sensors capture brainwave patterns, offering real-time insights into the user's cognitive state. This data is then processed using advanced machine learning algorithms, which identify and predict fluctuations in attention, memory, and problem-solving abilities.
The true brilliance of CerebralSync lies in its adaptive feedback system. Depending on the user's current task or goal, the headset emits precise neuromodulatory signals to enhance specific cognitive faculties. For instance, during intensive study sessions, CerebralSync can amplify focus and comprehension, while during brainstorming sessions, it can stimulate creative thinking pathways.Moreover, with its built-in AI, CerebralSync learns and adapts to individual users over time, offering personalized cognitive enhancement profiles. It also integrates seamlessly with digital devices, allowing users to set preferences, review their cognitive patterns, and even engage in tailored mental exercises to strengthen their brain.In the grander scope, CerebralSync isn't merely a tool for individual betterment. By fostering enhanced cognitive states in diverse populations, it has the potential to accelerate innovation, promote efficient decision-making, and elevate collective human intelligence.

In conclusion, CerebralSync heralds a new era in cognitive technology. Moving beyond passive monitoring, it proactively enhances our most precious asset – the mind. It is a testament to what is achievable when technology is designed, not to replace, but to elevate human potential.

Vietnam

VN.1.

Inventors Chu Quang Duc, Vu Quang Anh, Trinh Thu Phuong, Tran Chau Anh, Do My Chi, Vu Huy Khanh, Le Hoang Kieu Anh, Ha Trinh Anh Duc,

Inventions Anti-inflammatory and anti-insulin resistance activities of ethanolic extract of Vietnamese *Jasmimun subtriplinerve* Blume

Institution Chu Van An High school, Hanoi-Vietnam

Abstract

Ethanolic extract of Vietnamese *Jasmimun subtriplinerve* Blume has been reported anti-oxidative, anti-hyperglycemic, immunomodulatory anticancer, and α-glucosidase inhibitory effects. This study investigated biological activities including anti-inflammation and anti-insulin resistance of Ethanolic extract of Vietnamese *Jasmimun subtriplinerve* Blume. The ethanolic extract significantly reduced anti-inflammatory production in the lipopolysaccharide (LPS)-treated Raw 264.7. The LPS-induced TNF-α were suppressed by MA and MB (100 μg/mL). Moreover, the ethanolic extract (100 μg/mL) exerted anti-insulin resistance activity as it significantly improved the glucose uptake in tumor necrosis factor (TNF)-α treated 3T3-L1 adipocytes. In addition, this increase was higher than that seen in positive control group treated with rosiglitazone maleate, an antidiabetic agent. Expressions of pY20 and p-IRS1 which were measured via western blot were improved by the ethanolic extract (100 μg/mL) treatment. Finally, the results of our study suggest the potential use of the ethanolic extract as anti-inflammatory, anti-insulin resistance agents.

Keywords: 3T3-L1 adipocyte, Raw 264.7 macrophage, Diabetes, *Jasmimun subtriplinerve* Blume, inflammation, insulin resistance.

VN.2.

Inventors

Can Nhat Quang, Doan Khoi Nguyen, Vu Tu My Anh, Nguyen Minh Hieu, Le Hai Minh, Vu Nguyen Bao Ngoc, Nguyen Khanh Linh, Ngo Nam Khanh, Luu Phuong Tra**,** Nguyen Le Ngoc Linh

Inventions Kaempferol from Vietnamese Excoecaria cochinchinensis inhibits rheumatoid arthritis development in induced arthritis mice through neurokinin-1 receptor

Institution VNU University of Science

Abstract

Kaempferol is a flavonoid compound that naturally occurs in tea, as well as numerous common vegetables and fruits, Kaempferol treated diseases and the underlying mechanisms that are currently being studied. Due to its anti-inflammatory properties, it may be used to treat

	numerous acute and chronic inflammation-induced diseases. This study investigated kaempferol (20μg/ml) from Vietnamese *Excoecaria cochinchinensis* inhibited Neurokinin-1- receptor. Applying neurogenic modulation on in vitro and in vivo models to demonstrate the anti-arthritis mechanism of Kaemferol. Finally, the results indicated that kaemferol improved in rheumatoid mice which provided a novel strategy in treating rheumatoid arthritis.
VN.3.	
Inventors	Do Viet Khanh, Do Van Khanh, Vuong Minh Chau, Tran Ngoc Minh, Tran Ngoc Anh, Vu Minh Hoa, Nguyen Quoc Hung, Le Hieu, Le Ngoc Linh, Duong Vu Minh Khoa
Inventions	Quercetin from Allium cepa L. alleviate gout pain via NLRP3 inflammasome inhibitition.
Institution	VNU, University of Science
Abstract	Quercetin from ***Allium cepa* L.** regulated MSU-induced activation of the NLRP3 inflammasome. *Quercetin* (30 mg/kg) significantly suppressed ankle swelling from MSU-induced gout through inhibition of systemic inflammatory cytokine levels. Furthermore, Quercetin represents potential candidate drugs for the management of gout in the clinic.
VN.4.	
Inventors	Ngô Bảo Anh, Vũ Tuệ Nhi, Hoàng Yến Chi, Lê Hương Giang, Nguyễn Ngọc Bảo Hân , Bùi Ngọc Tâm Như
Inventions	Prospects of e-commerce development in developing countries and some solutions for Vietnam.
Institution	Hanoi University of Science & Technology (HUST)
Abstract	The emergence of free trade and the efficient movement of goods has historically driven economic and social development. Examples such as the Silk Road and geographical discoveries connected nations, facilitating the exchange of silk, gold, technology, and ideas. Today, information technology, particularly the Internet, continues this trend on a global scale. The Internet has revolutionized economic commerce, giving rise to electronic commerce (e-commerce), where buyers and sellers can directly communicate and trade without physical presence or paperwork. This borderless space enables the flow of information and trade, reducing transaction costs, opening new markets, and driving technological advancements, thereby reshaping the global economy. Experts predict that e-commerce will become a major trend in the global economy. Pioneering countries like the United States and some European nations have already achieved significant success in e-commerce development. Companies like Dell and Google have leveraged e-commerce to gain a competitive edge and become leaders in their respective industries. However, while e-commerce presents a developmental opportunity for developing countries, they face challenges related to technology, knowledge, and poverty.

These countries must find ways to keep up with global e-commerce development while managing associated risks.

In Vietnam, the focus on e-commerce is growing, as evidenced by the government's approval of the "Vietnam Information Technology and Communication Development Strategy until 2010 and orientation towards 2020." The strategy recognizes the importance of information technology and communication in achieving national goals and modernization. However, integrating into the global economy remains a significant challenge for Vietnam.

E-commerce is a relatively new field, and accurately predicting its future development is challenging due to rapidly changing data and emerging scientific and technological advancements. Nevertheless, having a map, even if incomplete, is crucial before venturing into this unknown territory. It should be a simple model that allows for exploration, adjustments, and modifications along the way. Feedback and contributions from experts and peers are essential for improving the understanding and quality of research on e-commerce development prospects, particularly in developing countries like Vietnam.

The research aims to Systematize theoretical issues related to e-commerce, analyse the current situation and evaluate the prospects of e-commerce development in developing countries in general and Vietnam in particular and to propose solutions to develop e-commerce in Vietnam.

The research will utilize methods of collecting, researching, and synthesizing literature. It will involve data analysis and statistical techniques, as well as comparative data analysis. Additionally, a combination of theoretical research and practical analysis will be employed to derive evaluations and clarify the research issues.

VN.5.

Inventors VU MINH ANH, LE TUAN DUNG, VU NGUYEN DIEU QUYNH

Inventions Large-scale fabrication of Graphene – based silicone grease and application in heat dissipation for LED streetlight

Institution Class 11D5, High School of Education Sciences - University of Education – UEd, Class 10A2 - High School of Education Sciences - University of Education – UEd, Class 12D6 - High School of Education Sciences - University of Education - UEd

Abstract Along with the development of electronic technology, the topic of heat dissipation for electronic components and devices plays an important role. In thermal interface materials, silicone grease is often used due to its thermal stability and ability to fill the gaps between electronic components and heat radiators. Previous works attempted to increase the grease's thermal conductivity by adding various additives such as boron nitride or functionalized carbon nanotubes. Functionalized graphene was chosen in this study due to its exceptional physical and chemical properties. Results show that the denaturing with several acid mixtures combined with ball milling resulted in a compund chemically equivalent to graphene and thoroughly dispersed in silicone grease. The two-step dispersion method using a combination of high-energy ball

	milling and mechanical agitation also increases the amount of graphene thermal grease fabricated to 205 grams/batch. An optimal grease has been created containing 1% by weight of Gr-COOH with a thermal conductivity of up to 6,534 W/mK, approximately 3.6 times more than that of conventional silicone greases. Application results in heat dissipation for 200W LED streetlights show that Graphene grease helps reduce the temperature of LED chips by 4.5oC compared to conventional silicone grease. Theoretical calculation results show that the lifetime of LEDs is increased by 36.6% when using Graphene thermal grease. The results confirmed that Graphene is the preeminent additive for silicone grease and has great application in the field of heat dissipation for high-power electronic devices.
VN.6.	
Inventors	TRAN NHAT QUANG, NGO DANG QUANG HUY, MAC LE PHUONG LINH, PHAM HANG PHUONG
Inventions	Study on the chemical composition and liver cancer cells inhibition of Vietnamese Scutellaria barbata D. Don extract
Institution	Class 12A2 CLC - High school for Gifted students - University of Science - HUS , Class 11A9 - UEd, High School of Education Sciences - University of Education - UEd, Class 12D6 - UEd High School of Education Sciences - University of Education – UEd, Class 11A4 - High School of Education Sciences - University of Education – UEd
Abstract	Scutellaria barbata D. Don (S. barbata), a traditional Vietnamese medicine, is used to treat cancers, lung abscess, fibrous tuberculosis, hepatitis, cirrhosis ascites. The amounts of phenolics content and total flavonoids were determined by folin ciocalteu and aluminium chloride methods. Total phenolic content was 298.9 mg gallic acid/g extract. Total flavonoid content was 110.6 mg Catechin/g. The IC50 value for ethanol extract of the free radical scavenging assay was 79.3 (μg/ ml), which was compared with the IC50 of ascorbic acid (17.8 μg/ ml). The major chemical components and structural characterization of S. barbata extract were separated and identified: apigenin, luteolin, wogonin. The liver cancer cells used in the study were HepG2 cells. The cytotoxic effect on liver cancer was determined by MTT method, based on the decolorization reaction of MTT-3-(4,5-Dimethylthiazol-2-yl)-2,5 diphenyltetrazolium bromide, 1-tetrazol) is yellow to purple of formazan in living cell mitochondria. The results showed that the S. barbata extract was able to inhibit HepG2 liver cancer cells at concentrations of 25, 50 and 100 µg/mL with an efficiency of 14.70%, 14.84 and 14.71%, respectively. Vietnamese Scutellaria barbata D. Don has the ability of cytotoxic cancer cell and is a material source for supporting and treating diseases products in the future.
VN.7.	
Inventors	DANG TRANG ANH, VU NAM KHANH
Inventions	ENVIRONMENTAL IMPACT ASSESSMENT AND ECONOMIC EFFICIENCY OF ACTIVATED CACBON ADSORBENT: APPLICATION IN WASTEWATER TREATMENT

Institution	Class 10D1 - High School of Education Sciences - University of Education – Ued, Class 11A7 - High School of Education Sciences - University of Education – UEd,
Abstract	The situation of environmental pollution in developing countries continues to be complicated with many hot spots in countries such as Vietnam, Laos, and Cambodia, especially residential areas with a lot of economic activities, and social activities. Therefore, these countries need to implement synchronous solutions to protect the natural environment and develop sustainably in the process of economic and social development. In the process of industrialization and modernization, especially when the economy is growing rapidly, the process of economic development has created great pressure on the environment, natural ecosystems and biodiversity study of the country. Paraquat (PRQ) is a cheap herbicide that is not only harmful to the environment but also extremely dangerous to human health. In this work, the materials can be assumed as adsorbents in wastewater treatment applications. In the view of adsorbent dose, initial concentration and temperature onto PRQ adsorption tests was evaluated. The chemical reactions between PRQ and adsorbents were investigated and indicated. It was found that there might be the potential mechanism was demonstrated.
VN.8.	
Inventors	CHU GIA BINH, PHAM HANG PHUONG, DOAN THAI ANH, NGUYEN THANH NAM
Inventions	Research on materials to make high- sensitivity sensor and medical application
Institution	Class 11A2 - High School of Education Sciences - University of Education – UEd, Class 11A4 - High School of Education Sciences - University of Education - UEd, Class 12A2 Phys, High School for Gifted Students - University of Science – HUS, Class 11A2 CLC, High School for Gifted Students - University of Science - HUS
Abstract	Currently, cancer is a group of dangerous diseases, people with the disease have a high risk of death if not detected early and treated promptly. The discovery of cancer cells in the early stages is important for the treatment to cure or prolong the patient's life. This requires high-precision sensor technology to enable the diagnosis of pathogens in general and cancer cells in particular in the early stages of the patient's infection process. Nano-technology sensors have superior properties such as high accuracy, smaller size, faster speed and durability. Many new features are also being exploited when fabricated on nanotechnology platform. In particular, the combination of magnetic sensor technology and nanoscale magnetic materials has opened up a new solution for detecting and treating this cancer. A new class of magnetic ribbon impedance based coil sensor for room-temperature was used bio-detection. The sensor has been developed utilizing the magneto-impedance effect of a Co-based amorphous ribbon in a designed coil form. This sensor possesses a higher sensitivity as compared with a non-magnetic coil sensor and can operate at high frequency.

In this study, we have evaluated the effect of annealed temperature on the magneto-reactance for Co-rich amorphous ribbons used to make magnetic sensor".

We have performed a systematic study of the longitudinally excited magneto-reactance effect of an inductive coil with Fe3O4 nanoparticles in its core. The results show that the sensitivity increase. These results are of practical importance in designing novel magnetic sensors based on the MX effect for sensing applications. Furthermore, the sensitivity of SEC was improved when the external magnetic field (He) reaches proper magnitude, He=Hk for the maximum sensitivity of SEC. This is necessary condition to improve sensitivity for ultrasensitive detection of magnetically labeled cancer cells and biomolecules. The sensor has been applied to detect Fe3O4 nanoparticles of low and various concentrations. This sensor can be used for detection of magnetic fluids which find wide applications in nanomedicine.

VN.9.

Inventors PHAM TRONG BINH, NGUYEN MINH TU, NGUYEN MAI ANH

Inventions HEAD - MOUSE

Institution Class 12 English, Hung Yen High school for the Gifted, Hung Yen, Class 11A3, Hoàng Hoa Tham Middle and High school, Hung Yen, Vietnam National University Hanoi - University of Law

Abstract Currently, the number of people with mobility impairments in the world is 7.5%. Despite their disabilities, they still try to work, especially working with computers. And their problem was controlling the mouse, so our HEAD-MOUSE product was invented to cope with this problem.

HEAD-MOUSE uses accelerometer and tilt sensor MPU6050 to sense head movement and convert it into a signal similar to a normal mouse movement. Use mouth or eye gestures to perform commands that correspond to regular mouse button clicks.

The processing center of HEAD-MOUSE is the ESP32 kit that helps HEAD-MOUSE connect wired or wirelessly to a computer via Bluetooth. We have developed 4 versions that are increasingly intelligent, compact, convenient, more customizable and can be manipulated by foot, by teeth or by other parts via soft button.

All the users of HEAD-MOUSE are very satisfied as they control the computer for the first time by themselves.

In the future, we will develop a more complete and intelligent HEAD-MOUSE as a glasses that can combine head and eye gestures to handle tasks.

VN.10.	
Inventors	Bui Phuong Linh, Pham Duc Manh, Luong Diep Anh, Pham Quang Phuc An, Tran Minh Duc
Inventions	Identification of novel genetic variants for screening, diagnosis and management mental retardation in Vietnam
Institution	Ngo Quyen High School, Hai Phong, Tran Phu Gifted High School, Hai Phong, Wellspring Secondary School, Hanoi, HUS High School for Gifted Students, Hanoi, Marie Curie Secondary School, Hanoi
Abstract	Mental retardation (MR) is a condition characterized by significant limitations in both intellectual functioning and adaptive behavior. This condition greatly burdens the family and society, affecting a person's quality of life and ability to support themselves. This study was performed in a cohort of 30 unknown mental retardation patients, diagnosed based on ICD-10, Denver II, and Raven tests for IQ by the Pediatrics and Clinical Genetics Department in Hanoi Medical University Hospital. The next-generation sequencing and Sanger sequencing methods were used to identify novel genetic variants. 21 genetic variants were found in 19 out of 30 MR patients. They were classified into 4 groups according to ACMG: pathogenic (P) (47.6%), likely pathogenic (LP) (19.1%), variant of uncertain significance (VUS) (23.8%) and likely benign (9.5%); no variant was classified as benign. The genotypes are very diverse. 8 out of 12 cases of detection of P/LP variants had genetic information from their family: 2 de novo mutation autosomal dominant (16.7%), 2 de novo mutation X-linked (16.7%), 1 X-linked from the mother (8.3%), 1 autosomal dominant (8.3%) and 2 autosomal recessive (16.7%). The associated pathogenic genes described in the OMIMS are MECP2, EP300, MAF, LAMA2, CHKB, GABRG2, SCN2A, IQSEC2. These results help the patient's family obtain information that can be applied to prenatal screening and diagnosis in future pregnancies. Furthermore, the study contributes additional data about genetic variation in the population of MR patients in Vietnam, which is a decisive basis for genetic diagnosis, genetic counseling, and management of patients.
VN.11.	
Inventors	Nguyen Huu Nhat Huy, Nguyen Trong Minh Khoi, Doan Gia Duc, Nguyen Phu Cuong, Nguyen Ngoc Bao Thy
Inventions	Simplifying functionalization of oxindole in combination with *in silico* and in vitro study for diabetic treatment
Institution	Nguyen Gia Thieu High School, Hanoi, Archimedes school, Hanoi
Abstract	The indole structure is one of the critical heterocycles present in many common drugs from more than 3000 natural products and 40 pharmaceuticals. Remarkably, oxindole derivatives are of great interest to disease resistance, antibiotic resistance, antiviral, analgesic, anti-inflammatory, cytotoxic cancer, and also inhibit glucose and carbohydrate tolerance… This study aims to develop a new series of bio-active compounds of oxindole based on sodium dichlorofenate, a commercial, cheap, stable organic salt which can be easily found on the drug market today. This has opened up a new research direction to save costs for the experimental process. It is worth noting that the C3 position on the intermediates of the oxindole ring with an active group of CH2 can

participate in the condensation reactions with the benzaldehyde derivative, easily and simply generating the derivatives of Indolone 3-Arylidene. Besides, the oxindole derivatives at positions N1 and C5, respectively, with the presence of 2,6-dichlorophenyl and methylaminosulfonyl substituents, are also remarkable starting materials because of their suitability to synthesize the new Indolone 3-Arylidene. The new Indolone 3-Arylidene can be potential candidate for the enzyme inhibition of a-glucosidase, a main pharmaceutical target against diabetes. We have successfully synthesized 16 products with high yields. Indolone 3-Arylidene, 3-Arylidene-1-(2,6-dichlorophenyl)indolones, and in particular, their 5-methylaminosulfonyl 3-Arylidene-1-(2,6-dichlorophenyl)indolones derivatives efficiently inhibit a-glucosidase enzyme. The results are corroborated by in silico docking studies, which show the binding of aminosulfonyl derivatives to be more favorable due to additional hydrogen bonding. The most active compound of the series shows the IC50 of 6.19 μm.

VN.12.

Inventors Le Duc Anh, Le Thi Ngoc Minh, Tran Ngoc Khanh, Le Tran Tuan Minh, Vu Phan Hoang Anh

Inventions Improvement of astaxanthin extraction efficiency from shrimp waste by combining hydrolytic enzyme and sunflower oil treatments

Institution Ngo Quyen High School, Hai Phong

Abstract Astaxanthin has many valuable biological activities such as antioxidant capacity and cancer cell growth inhibition. Astaxanthin is abundant in the shells of crustaceans, including shrimp. Currently, shrimp waste is mainly used to extract chitosan, thus wasting a valuable amount of astaxanthin from this waste. Astaxanthin can be dissolved in lipid-soluble solvents. However, using lipid alone to extract astaxanthin from shrimp waste is not highly efficient, because astaxanthin in shrimp is bound to proteins to form a stable astaxanthin-protein complex, which leads to difficulty in separating astaxanthin. Combination of proteolytic enzymes and astaxanthin-soluble solvents may improve the extraction efficiency of astaxanthin from shrimp waste. This study was conducted with the aim of: (1) Extracting astaxanthin from shrimp waste by using a mixture of protease enzymes, Alcalase and Flavorzyme, and sunflower oil to achieve high extraction efficiency, and (2) Evaluation of antioxidant activity and cancer cell growth inhibition of the astaxanthin extract. The results showed that the combination of Alcalase and Flavorzyme and hydrolytic enzymes sunflower oil significantly increased the extraction efficiency of astaxanthin compared to using lipid alone, reaching 90% total astaxanthin. Moreover, extraction of astaxanthin by this way could save solvent, shorten extraction time and reduce temperature during the extraction process. The ratio of sunflower oil/shrimp waste was 3/1 (v/w); the extraction time was 1.5 hour and the extraction temperature was 50ºC. Astaxanthin extracted from shrimp waste exhibited activities similar to commercial astaxanthin in terms of antioxidant capacity and cancer cell growth inhibition.

VN.13.

Inventors Do Trung Kien, Nguyen Duc Soat, Pham Mai Anh, Truong Gia Binh, Nguyen Duc Duy

Inventions I-Krobs: Robot that Dispenses Oral Sodium Iodine i-131 Radiotherapy Capsules for Patients With Thyroid Diseases

Institution Tran Phu Gifted High School, Hai Phong, Tran Phu Gifted High School, Hai Phong, Thai Phien High School, Hai Phong, HUS High School for Gifted Students, Hanoi, Kinh Mon High School, Hai Duong

Abstract In the field of medicine, healthcare workers are regularly exposed to radiation over extended periods of time, which lead to various health problems. Although numerous regulations and guidelines have been implemented worldwide to mitigate these risks, the radiation protection system in Vietnam remains rudimentary, especially regarding the distribution of I-131 capsules, one of the earliest nuclear drugs to be used. During working hours, healthcare workers have to be in close contact with the capsules and patients for a long time, while they are only protected by a radiation shielding glass, which is potentially hazardous because according to ALARA – the guiding principle of radiation safety – the healthcare workers haven't been kept safe. Therefore, we designed and built a robotic system to improve the I-131 distribution process and safeguard the health of medical personnel and patients. This system features five separated chambers, each containing I-131 capsules with varying radioactivity levels. Each chamber is enveloped in lead to ensure radiation shielding. The robot is able to identify, count, and distribute the capsules to patients, while the accompanying software assists physicians in monitoring the medication process. This system has undergone multiple tests and achieved 100% accuracy in its distribution. Upon arrival, patients receive RFID cards and medication in a separate room with the robot, which medical staff can monitor safely via cameras. The robot automates the dissemination of I-131, making it easier, safer, and more accurate. Implementing this system will significantly benefit medical personnel by minimizing radiation exposure and potential risks.

VN.14.

Inventors Nguyen Minh Son

Inventions I-Krobs: Robot that Dispenses Oral Sodium Iodine i-131 Radiotherapy Capsules for Patients With Thyroid Diseases

Institution Lake Forest Academy, IL, USA

Abstract Integrating artificial intelligence into the ultrasound method to assess nuchal translucency is a feasible approach to detecting prenatal birth abnormalities. To create a database, and develop and evaluate the results of an automatic nuchal translucency measuring model. This controlled analytical observational study used data from accordant cases at the National Hospital of Obstetrics and Gynecology in Viet Nam between January 2021 and August 2021. Two-dimensional images of the midsagittal plane of the fetal face in singleton pregnancies with a gestational age greater than 11 weeks and less than 13 weeks 6 days were utilized as the database for the nuchal translucency measuring model. A deep learning prototype was created using a convolutional neural

network to train the model. Ultrasound images for software accreditation from 2 hospitals and measurement results were compared between the ultrasonographers and the model to determine the sensitivity and specificity of the model. The authors successfully created a database of 1000 ultrasound images. A minimum of 1000 ultrasound images were required to assess nuchal translucency. With a sensitivity of 100% and a specificity of almost 100% when compared to the measurement outcomes of three experts, the results of testing the automated NT measuring software at two hospitals., an automated program to assist sonographers in NT measurement has been successfully built. The results indicate that our automated model of nuchal translucency is a useful tool that might replace doctors' manual measures during prenatal screening.

VN.15.

Inventors Vu Duc Dung, Nguyen Gia Bach, Duong Trung Hai, Nguyen Thanh Tuu Kiet Tuong, Hoang Ky Nam, Nguyen Tran Khanh Phuong

Inventions Automatic assistive device for cerebral palsy patients with monitoring and controlling system

Institution Tran Phu Gifted High School, Hai Phong, Thang Long Secondary School, Hanoi

Abstract This study aimed to develop an assistive device and a mobile app with the aim of providing comprehensive and automatic treatment for cerebral palsy children, especially spastic quadriplegia – the most severe form that requires early, intensive intervention and treatment. This is the first ever fully automatic assistive device for cerebral palsy patients. The CEREPAD device combines various exercises to train multiple muscle groups simultaneously and uses an artificial neural network (ANN) based on GMFM-88 scores to suggest an appropriate treatment strategy. Calculations about the torque at the 4-hinge frame to figure out the thrust to perform and designed with durable details and appropriate cross-section for mechanical drives were tested through more than 200 trials. Field tests were conducted at Hai Phong Children's Hospital by a team of specialists with 33 patients participating, divided into two groups, with 18 participants using CEREPAD and a control group of 15 people using conventional devices. The GMFM-88, VEPs, and EMG records were documented throughout the process to monitor and evaluate the status of patients. Results showed that the rehabilitation efficiency significantly improved with the coordination of different exercises using the CEREPAD device and mobile app. The experimental group had an average score of 2.56 times higher than the control group, and their brain had undergone noticeable changes that could be seen through images. The CEREPAD device and mobile app were proven effective, enabling personalized treatment with an easy-to-use platform for caregivers and offering a more comprehensive, effective, and innovative treatment option for cerebral palsy patients.

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Albert Einstein

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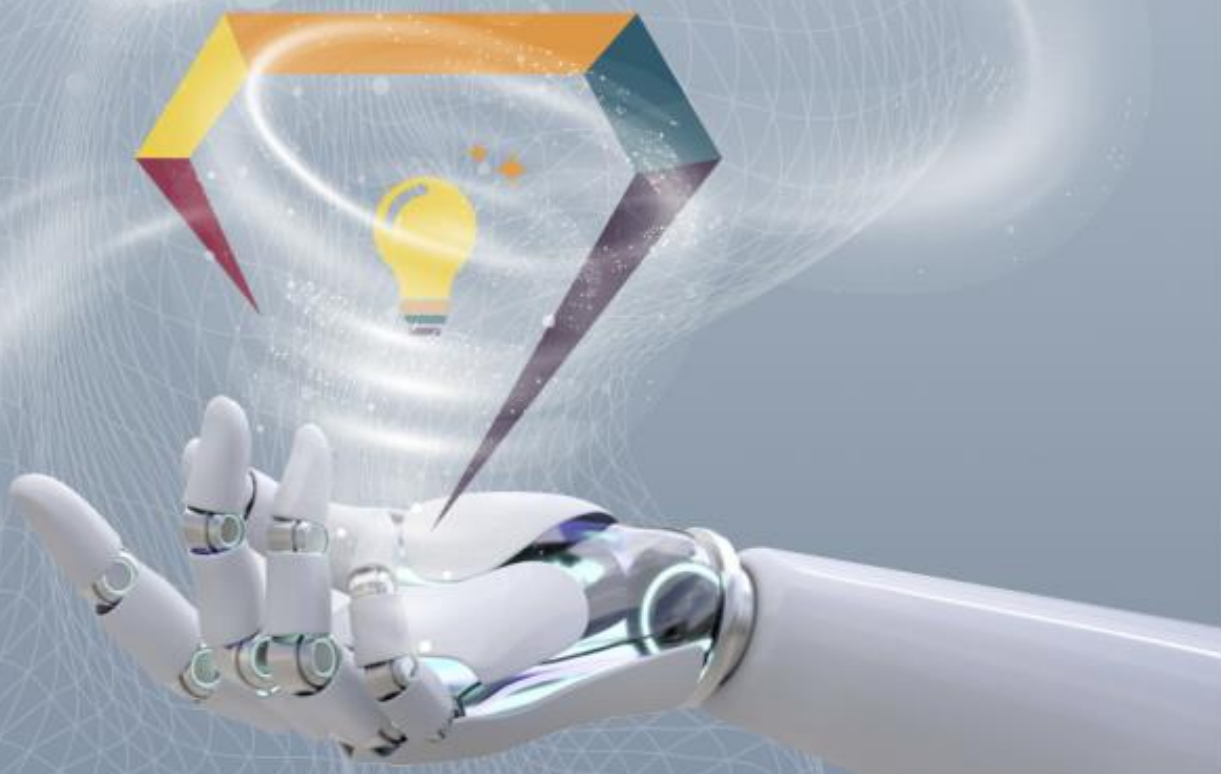

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Introduction

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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