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পেটেন্ট, শিল্প-নকশা ও ট্রেডমার্কস অধিদপ্তর
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নং-৩৬.০৮.০০০০.২০০.১৬.০০১.২২. ৮০৪১ তারিখঃ ১৮/১২/২০২৫ খ্রি.

বিষয়ঃ দাখিলকৃত পেটেন্ট আবেদনসমূহ ওয়েবসাইটে প্রকাশ।

বাংলাদেশ পেটেন্ট আইন, ২০২৩ এর ধারা ১৭(৪) অনুযায়ী ডিপিডিটিতে ২০২৫ সালের পেটেন্ট আবেদন নং ১১৩, ১৫৪, ১৯২, ১৯৪, ২০৩, ২১২, ২১৭-২২১, ২২৭-২২৯, ২৪৫-২৪৬, ২৫২-২৫৩, ২৫৫, ২৭৬, ২৮৯-২৯১, ২৯৫-২৯৭, ৩০৮-৩১০, ৩১৬-৩১৮, ৩২৫, ৩৫৬, ৩৫৯, ৩৬৬ মোট ৩৯ (উনচল্লিশ) টি আবেদন নিম্নবর্ণিত তথ্যাদি সহ অধিদপ্তরের ওয়েবসাইটে (www.dpdt.gov.bd) প্রকাশ করা হল।

(ক) উদ্ভাবনের শিরোনাম;
(খ) পেটেন্ট আবেদনকারী ও উদ্ভাবকের নাম;
(গ) আবেদন দাখিলের তারিখ ও নম্বর;
(ঘ) অগ্রাধিকার নম্বর ও তারিখ, যদি থাকে;
(ঙ) পেটেন্ট এর শ্রেণিবিন্যাস;
(চ) উদ্ভাবনের মূল উপাদান চিত্রায়িত করে এইরূপ অংকন, যদি থাকে;
(ছ) বিষয়বস্তুর সার-সংক্ষেপ।

সংযুক্তিঃ ৩৯ (উনচল্লিশ) পাতা।

১৮/১২/২৫
মোঃ হাবিবুর রহমান
উপ-পরিচালক (পেটেন্ট)

অনুলিপিঃ
১। পরিচালক (সকল), পেটেন্ট, শিল্প-নকশা ও ট্রেডমার্কস অধিদপ্তর, ঢাকা।
২। সিস্টেম এনালিস্ট, পেটেন্ট, শিল্প-নকশা ও ট্রেডমার্কস অধিদপ্তর। (ওয়েবসাইটে প্রকাশের জন্য)
৩। উপ-পরিচালক (পেটেন্ট) (সকল), পেটেন্ট, শিল্প-নকশা ও ট্রেডমার্কস অধিদপ্তর, ঢাকা।
৪। মহাপরিচালক মহোদয়ের ব্যক্তিগত সহকারী, পেটেন্ট, শিল্প-নকশা ও ট্রেডমার্কস অধিদপ্তর, ঢাকা।

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-113
(22) Filed: 19/03/2025

(23) Priority Data:
United Kingdom, Number :24039018, Date : 19-03-2024.

(71) Applicant: Alchemie Technology Limited of The Flight Sergeants Mess, Duxford Business Park, Hurdles Way, Duxford, Cambridge CB22 4PA, Nationality -United Kingdom

(72) Inventors: (1) Alan Lionel HUDD of The Flight Sergeants Mess, Duxford Business Park, Hurdles Way, Duxford, Cambridge, United Kingdom, CB22 4PA, United Kingdom Nationality -United Kingdom, (2) Henry Francis ROLT of The Flight Sergeants Mess, Duxford Business Park, Hurdles Way, Duxford, Cambridge, United Kingdom, CB22 4PA, United Kingdom Nationality -United Kingdom, (3) Thomas Whitney BLYTHE of The Flight Sergeants Mess, Duxford Business Park, Hurdles Way, Duxford, Cambridge, United Kingdom, CB22 4PA, United Kingdom Nationality -United Kingdom

(74) Agent : MentorIP , {app_representative_address}, Bangladesh

(51) INT. CL. : B41J 3/407

(54) Invention Title: Improvements in or relating to a digital printing system

(57) Abstract
A digital printing system for applying a dispensing fluid to a textile, the digital printing system comprising: a reservoir for retaining the dispensing fluid; a dispenser in fluid communication with the reservoir and configured to apply the dispensing fluid to the textile; a processor configured to control the dispenser to optimise the application of dispensing fluid to the textile; and an integral 5 cleaning device configured to eject a cleaning fluid for cleaning a component of the digital printing system.

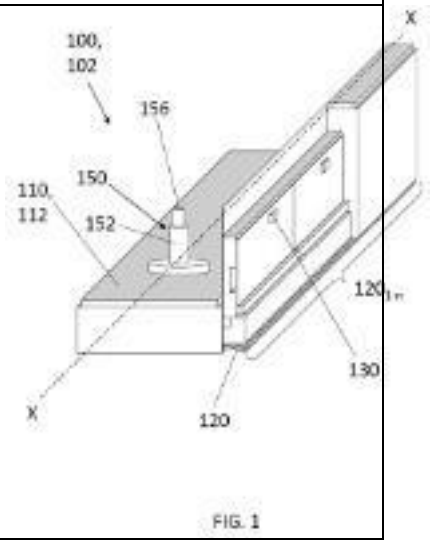

FIG. 1

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-154
(22) Filed: 22/04/2025

(23) Priority Data:

(71) Applicant: Redmin Industries limited of The Pearl Trade Centre, Level-10, Cha-90/3, Pragati Sarani, Dhaka-1212, Nationality -Bangladesh

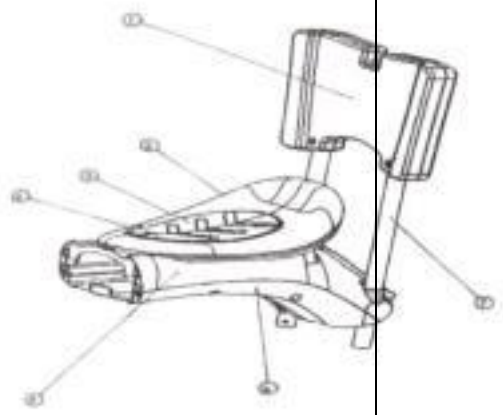
(72) Inventors: (1) Kazi Md. Nahid Kabir of The Pearl Trade Centre, Level-10, Cha-90/3, Pragati Sarani, Dhaka-1212, Bangladesh Nationality -Bangladesh

(51) INT. CL. : B62J 1/00

(54) Invention Title: Adjustable Seating Mechanism for Tricycles

(57) Abstract

The present invention relates to an improved tricycle seat mechanism designed to offer enhanced economic comfort, adaptability, and safety for users of varying sizes and age groups. The mechanism comprises a top body and a seat assembly that is longitudinally adjustable along a predefined axis via an adjustable seating position mechanism. This mechanism enables smooth translational movement of the seat and allows positioning at multiple, evenly spaced, predefined locking locations to provide a continuous range of adjustments. A screw-type locking system, incorporating threaded fasteners and inserts, secures the seat at selected positions and ensures stability during operation. Additional features include a guide slot for translational movement, a seat cover that can be opened for easy adjustment or replacement, and compatibility with an optional backrest for improved back support without interfering with seat mobility. The seat mechanism is designed with a dual-locking feature and reinforced locking elements such as rectangular grooves and locking components to prevent slippage and withstand external impacts or vibrations. Visual indicators are provided to guide users in choosing the appropriate seating position. The frame is constructed from lightweight, high-strength polymeric material to balance durability and weight, while increased rib thickness and robust locking dimensions ensure long-term structural integrity. The overall design enables convenient seat replacement without structural modification and supports a broad user weight range, making the mechanism suitable for versatile applications in personal mobility solutions.



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-192
(22) Filed: 19/06/2025

(23) Priority Data:
India, Number :202441050711, Date : 02-07-2024.

(71) Applicant: TVS MOTOR COMPANY LIMITED of Chaitanya, No.12, Khader Nawaz Khan Road, , Nungambakkam, Chennai 600 006, Nationality -India

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(74) Agent : bd_islamco70744, {app_representative_address}, Bangladesh

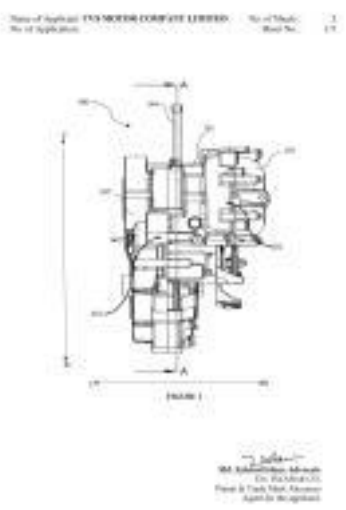
(51) INT. CL. : F16H 57/00

(54) Invention Title: A TRANSMISSION ASSEMBLY AND A VEHICLE

(57) Abstract

A TRANSMISSION ASSEMBLY AND A VEHICLE

The present subject matter relates generally to avehicle and a transmission assembly (100) thereof. The transmission assembly (100) comprises a first chamber (201), a second chamber (202), and a breather circuit (303). The first chamber (201) comprises a first breather chamber (301), disposed in an upper portion of the first chamber (201). The upper portion is configured to mount the transmission assembly (100) on the vehicle. The second chamber (202) comprises a second breather chamber (302).The breather circuit (303) is formed inside first housing member (101) andis configured to connect the second breather chamber (302) to the first breather chamber (301).



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-194
(22) Filed: 19/06/2025

(23) Priority Data:
India, Number :202441059175, Date : 05-08-2024.

(71) Applicant: TVS MOTOR COMPANY LIMITED of Chaitanya, No.12, Khader Nawaz Khan Road, , Nungambakkam, Chennai 600 006, Nationality -India

(72) Inventors: (1) OBED ABISHEK RAMESH of TVS MOTOR COMPANY LIMITED, Chaitanya, No.12, Khader Nawaz Khan Road,, Nungambakkam, Chennai 600 006, India Nationality -India, (2) MANDIKAN ARIPORUL of TVS MOTOR COMPANY LIMITED, Chaitanya, No.12, Khader Nawaz Khan Road,, Nungambakkam, Chennai 600 006, India Nationality -India, (3) GANESH RAO PADUBIDRI of TVS MOTOR COMPANY LIMITED, Chaitanya, No.12, Khader Nawaz Khan Road,, Nungambakkam, Chennai 600 006, India Nationality -India, (4) MOSALI NAGARJUN REDDY of TVS MOTOR COMPANY LIMITED, Chaitanya, No. 12, Khader Nawaz Khan Road, , Nungambakkam, Chennai 600006, India Nationality -India

(74) Agent : bd_islamco70744, {app_representative_address}, Bangladesh

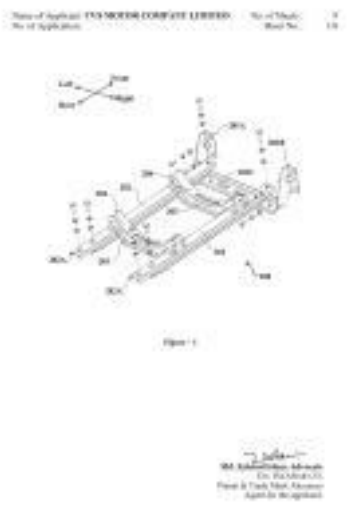
(51) INT. CL. : B60R 9/00

(54) Invention Title: A MOUNTING ASSEMBLY FOR MOUNTING AT LEAST ONE STORAGE UNIT IN A VEHICLE

(57) Abstract

A MOUNTING ASSEMBLY FOR MOUNTING AT LEAST ONE STORAGE UNIT IN A VEHICLE

A mounting assembly (200) for mounting at least one storage unit (101) in a vehicle (100). The mounting assembly (200) comprises at least one mounting member (201), a plurality of long members (202), one or more holding members (203), and a plurality of securing members (205, 206). The at least one mounting member (201) is configured to be connected to a frame assembly (102) of the vehicle (100). The plurality of long members (202) is mounted on the at least one mounting member (201). The one or more holding members (203) are connected to the plurality of long members (202). The plurality of securing members (205, 206) is movably connected to the one or more holding members (203), and is configured to secure the at least one storage unit (101) on the one or more holding members (203).



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-203
(22) Filed: 30/06/2025

(23) Priority Data:
United Kingdom, Number :24115966, Date : 07-08-2024.

(71) Applicant: Johnson Matthey Public Limited Company of 5th Floor, 2 Gresham Street, London EC2V 7AD, Nationality -United Kingdom

(72) Inventors: (1) Martin Lucas SMIDT of c/o Johnson Matthey, 10 Eastbourne Terrace, London, W2 6LG, United Kingdom Nationality -Sint Maarten (Dutch part)

(74) Agent : bd_islamco70744, {app_representative_address}, Bangladesh

(51) INT. CL. : C07C 17/38

(54) Invention Title: Process For Separating Vinyl Chloride Monomer From Incondensables

(57) Abstract

Abstract

The specification describes a process for separating vinyl chloride monomer (VCM) from incondensables. The process involves the steps of compression, separation of an incondensables stream and a condensed VCM stream in one or more condensation stages, followed by further separation of VCM from the condensed VCM stream in a lights column. The lights column is equipped with a lights column condenser which produces a VCM-depleted lights column overheads stream and a recovered VCM stream which is returned to the lights column. The VCM-depleted lights column overheads stream is depressurised by a valve and then combined with the incondensables stream.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-212
(22) Filed: 23/07/2025

(23) Priority Data:

(71) Applicant: Daffodil International University of Daffodil Smart City, Birulia, Savar, Dhaka-1216, 1216, Bangladesh

(72) Inventors: (1) Marium Akter Eshika of Department of Nutrition and Food Engineering, FHLS, DIU, Birulia, Savar, Dhaka-1216, Bangladesh Nationality -Bangladesh, (2) Md Daiyan UI Islam, Student Associate of Department of Nutrition and Food Engineering, FHLS, DIU, Bangladesh Nationality -Bangladesh, (3) Md Daiyan Ul Islam, Department of Nutrition and Food Engineering, FHLS, DIU of Department of Nutrition and Food Engineering, FHLS, DIU, Bangladesh Nationality -Bangladesh

(74) Agent : bd_daffodilinternationaluniversity9ba14, {app_representative_address}, Bangladesh

(51) INT. CL. : A23L 33/105

(54) Invention Title: Mineral-rich Cookies with PumpkinSeed, Chickpea, and Oat Flour

(57) Abstract
The Mineral-Rich Cookies are a nutritious and innovative snack designed to combat common nutrient deficiencies, particularly among vulnerable populations in developing countries. Formulated from whole pumpkin seed flour, chickpea flour, and oats, these cookies are rich in essential minerals such as zinc, iron, and magnesium, along with high-quality protein and dietary fiber.
These cookies serve as a convenient and delicious way to enhance dietary intake, addressing critical nutritional needs while also being gluten-free. The inclusion of locally sourced ingredients not only promotes sustainability but also helps reduce post-harvest losses, making the cookies an environmentally friendly option.
Nutritionally, each cookie is packed with antioxidants and beneficial compounds that support overall health, including improved cardiovascular and digestive function. The formulation has been carefully crafted to ensure sensory appeal, achieving favorable scores in taste, aroma, and overall acceptability, thus ensuring consumer enjoyment alongside health benefits.
With a focus on practicality and flavor, the Mineral-Rich Cookies are an ideal solution for those seeking a healthy snack that meets dietary requirements. This product aims to significantly contribute to improved public health and food security by providing a readily accessible, nutrient-dense option for diverse consumer groups.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-217
(22) Filed: 28/07/2025

(23) Priority Data:

(71) Applicant: Md. Masud Rana of Department of Fishing and Post-Harvest Technology Faculty of Fisheries and Marine Science Sher-e-Bangla Agricultural University Dhaka-1207, Nationality -Bangladesh

(72) Inventors: (0) Md. Masud Rana of Department of Fishing and Post-Harvest Technology Faculty of Fisheries and Marine Science Sher-e-Bangla Agricultural University Dhaka-1207, Bangladesh Nationality -Bangladesh

(74) Agent : Md. Masud Rana, {app_representative_address}, Bangladesh

(51) INT. CL. : B63G 8/00;H04L 67/12

(54) Invention Title: AN IOT ENABLED UNDERWATEWR SURVEILLANCE DRONE, SAU ROBOT FISH, FOR REAL TIME MONITORING OF FISH GROWTH, HEALTH AND WATER QUALITY PARAMETERS

(57) Abstract

The present invention features the SAU Robot Fish, a bioinspired, IoT-enabled underwater surveillance drone developed for continuous, real-time monitoring of fish health, growth, and aquatic environmental conditions. Mimicking the form and movement of a real fish, the device integrates multiple subsystems to support both autonomous and remotely operated missions, with primary applications in aquaculture, research, and ecological monitoring. Its fish-like design includes a buoyancy control system composed of a reversible ballast pump and a syntactic foam block, which enables stable depth control and neutral buoyancy by modulating water intake. Movement and maneuverability are achieved through four high-thrust brushless DC thrusters and carbon-fiber fins, providing precise three-dimensional navigation (surge, heave, yaw) and minimizing roll and pitch disturbances. The electronics are protected inside a pressure-resistant aluminum hull with an acrylic viewing port and dual Buna-N O-rings, capable of withstanding deep-water conditions. The system is powered by a 22.2V 6-cell lithium-ion battery with a smart BMS, offering approximately two hours of runtime with built-in safety protocols. A dual computing architecture a Raspberry Pi 5 running ROS 2 and an STM32F765 microcontroller manages mission control, data processing, and sensor integration. Imaging is performed by a 4K UHD Sony IMX477 camera in an IP68-rated enclosure, paired with a high-CRI LED floodlight array to ensure clear visibility underwater. The integrated environmental sensor suite captures real-time data on pH, dissolved oxygen, temperature, ammonia, and optionally, turbidity and conductivity. Data is stored locally or transmitted via RS-485/Modbus and IoT protocols. Connectivity options include a 100-meter tethered Gigabit Ethernet and a short-range acoustic modem for untethered operation. Supporting tools include pressure-testing equipment, sensor calibration rigs, leak detectors, and safety gear. The SAU Robot Fish serves as a versatile, intelligent platform for sustainable, data-driven aquaculture and aquatic research.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-218
(22) Filed: 28/07/2025

(23) Priority Data:

(71) Applicant: Md. Masud Rana of Department of Fishing and Post-Harvest Technology Faculty of Fisheries and Marine Science Sher-e-Bangla Agricultural University Dhaka-1207, Nationality -Bangladesh

(72) Inventors: (0) Md. Masud Rana of Department of Fishing and Post-Harvest Technology Faculty of Fisheries and Marine Science Sher-e-Bangla Agricultural University Dhaka-1207, Bangladesh Nationality -Bangladesh

(74) Agent : Md. Masud Rana, {app_representative_address}, Bangladesh

(51) INT. CL. : A23K 50/80

(54) Invention Title: A METHOD FOR PRODUCING THE SAU GROW FAST BIO-BASED GROWTH PROMOTER TO ENHANCE GROWTH PERFORMANCE IN FISH AND POULTRY

(57) Abstract

This invention presents a sustainable solution for enhancing animal productivity through a naturally derived growth-promoting agent called SAU Grow Fast, intended for use in fish and poultry nutrition. Unlike conventional methods, the production technique employs a specialized blend of botanical ingredients and microbial agents, processed under optimal biochemical conditions to generate a functional feed additive. The formulation delivers nutritional and physiological benefits that contribute to improved animal metabolism and resilience. By minimizing reliance on synthetic inputs and utilizing cost-efficient raw materials, the innovation supports environmentally responsible practices while lowering operational costs for farmers. Its versatility across two major livestock sectors broadens its industrial relevance, offering a strategic advantage in markets seeking antibiotic-free and health-oriented animal products. Additionally, the production model is designed for seamless integration into existing agricultural systems, supporting both large-scale operations and smallholder adoption. SAU Grow Fast promoter improves feed efficiency and growth rates, which leads to a shorter production cycle and faster market readiness for livestock, enhancing overall farm profitability. Its bioactive components also help improve immune function, reducing the incidence of disease and thereby lowering dependency on veterinary interventions. This contributes to healthier stock and improved product quality, addressing growing consumer demand for safe and naturally raised animal protein. The innovation also aligns with global regulatory shifts toward the restriction of antibiotic use in animal agriculture, positioning it as a timely and compliant solution for future-focused farming. This invention offers a comprehensive approach to sustainable livestock management by improving performance outcomes, reducing environmental burden, and supporting economic viability in aqua and poultry industry.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-219
(22) Filed: 28/07/2025

(23) Priority Data:

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(51) INT. CL. : A23K 10/26

(54) Invention Title: METHOD FOR PRODUCING ECONOMICAL SAU FISH FEED FROM BOVINE AND CAPRINE HIDES FOR SUSTAINABLE RESOURCE MANAGEMENT

(57) Abstract
The present invention introduces a method for processing of affordable and sustainable fish feed derived from bovine (cow) and caprine (goat) hides, aimed at fostering resource conservation and improving aquaculture efficiency. This innovative process utilizes collagen-rich hides, a by-product of the meat industry, and converts them into high-quality protein sources suitable for various fish species. The process involves several stages, starting with the preparation of the hides, followed by enzymatic or chemical hydrolysis to break down collagen and other proteins, resulting in a digestible protein concentrate. The final product is then dried, powdered, and processed into a nutritionally balanced fish feed, rich in essential amino acids and proteins vital for the growth and health of farmed fish. This invention emphasizes the sustainable use of bovine and caprine hides, which are typically discarded as waste, providing a method to repurpose these materials into a valuable resource. This not only alleviates the environmental impact of hide disposal but also supports the circular economy by turning waste into a useful product. Moreover, the fish feed produced by this method is cost-effective compared to traditional fish feed, offering a more affordable alternative to conventional protein ingredients like fishmeal and soy. By integrating this fish feed into aquaculture systems, there is an opportunity to enhance the sustainability of the industry by decreasing reliance on resource-intensive feed materials. Additionally, the production process is designed to be scalable, efficient, and adaptable to regional differences in the availability of bovine and caprine hides, making it a flexible solution for sustainable resource management in global aquaculture. Ultimately, this method promotes a more sustainable and economically feasible fish farming industry, benefiting both the environment and fish farmers.

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Publication of Filed Patent Application
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(11) Patent registration No and date ,
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(51) INT. CL. : A23K 10/26

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The present invention introduces a method for processing of affordable and sustainable fish feed derived from bovine (cow) and caprine (goat) hides, aimed at fostering resource conservation and improving aquaculture efficiency. This innovative process utilizes collagen-rich hides, a by-product of the meat industry, and converts them into high-quality protein sources suitable for various fish species. The process involves several stages, starting with the preparation of the hides, followed by enzymatic or chemical hydrolysis to break down collagen and other proteins, resulting in a digestible protein concentrate. The final product is then dried, powdered, and processed into a nutritionally balanced fish feed, rich in essential amino acids and proteins vital for the growth and health of farmed fish. This invention emphasizes the sustainable use of bovine and caprine hides, which are typically discarded as waste, providing a method to repurpose these materials into a valuable resource. This not only alleviates the environmental impact of hide disposal but also supports the circular economy by turning waste into a useful product. Moreover, the fish feed produced by this method is cost-effective compared to traditional fish feed, offering a more affordable alternative to conventional protein ingredients like fishmeal and soy. By integrating this fish feed into aquaculture systems, there is an opportunity to enhance the sustainability of the industry by decreasing reliance on resource-intensive feed materials. Additionally, the production process is designed to be scalable, efficient, and adaptable to regional differences in the availability of bovine and caprine hides, making it a flexible solution for sustainable resource management in global aquaculture. Ultimately, this method promotes a more sustainable and economically feasible fish farming industry, benefiting both the environment and fish farmers.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-221
(22) Filed: 28/07/2025

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(51) INT. CL. : H04L 67/12

(54) Invention Title: SYSTEM FOR IOT-ENABLED SAU SMART SECURITY GUARD FOR REAL TIME MONITORING AND AGRICULTURAL FARM PROTECTION

(57) Abstract

Bangladesh embraces the era of digital transformation, the agricultural sector, being a cornerstone of the nation's economy, demands innovative solutions to address the challenges associated with security and surveillance. This innovation "SAU Smart Security Guard," a cutting-edge smart security device designed specifically for safeguarding agricultural projects. The device leverages advanced technologies such as Internet of Things (IoT), artificial intelligence, and machine learning to create a comprehensive and intelligent security system tailored to the unique needs of the agricultural landscape. SAU Smart Security Guard is equipped with a network of sensors, including infrared motion detectors, image sensors, and environmental sensors, to detect and respond to potential threats in real-time. The device employs machine learning algorithms to analyze data patterns, distinguishing between normal agricultural activities and suspicious events. Through seamless integration with a centralized control system, the device ensures swift and accurate alerts to farmers and relevant authorities in case of security breaches. The system's user-friendly interface allows farmers to monitor their agricultural projects remotely, providing a holistic view of the farm's security status through a dedicated mobile application or web portal. Additionally, the SAU Smart Security Guard incorporates responsive features such as automated lighting, alarms, and voice warnings to deter potential intruders effectively. This smart security solution not only enhances the protection of agricultural assets but also contributes to the overall efficiency and productivity of farming practices in Bangladesh. By addressing security concerns with a tailored and intelligent approach, the SAU Smart Security Guard represents a pivotal step towards achieving a Smart Bangladesh, where technology is harnessed to secure and optimize vital sectors such as agriculture, laying the foundation for sustainable growth and prosperity.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-227
(22) Filed: 03/08/2025

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(51) INT. CL. : A61B 5/01

(54) Invention Title: IoT-Based Fever Monitoring and Control Device with Antipyretic Functionality

(57) Abstract

This invention presents a smart, IoT-based healthcare device that continuously monitors body temperature and automatically initiates cooling when fever is detected. The system incorporates a digital thermometer for real-time temperature tracking and a pulse oximeter to measure blood oxygen saturation. When the body temperature exceeds a predefined threshold, an antipyretic mechanism is activated, consisting of a submersible water pump that sprays water onto the patient's forehead. A servo motor adjusts the position of the spray pipe to ensure uniform cooling. All functions are managed via a smartphone application, enabling remote monitoring, control, and data visualization. This invention offers a practical, automated solution for fever management, especially useful in home quarantine, rural healthcare, and emergency or pandemic situations where medical supervision may be limited.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-228
(22) Filed: 03/08/2025

(23) Priority Data:

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(51) INT. CL. : A23C 9/133

(54) Invention Title: Production of Healthy Watermelon Yogurt

(57) Abstract
In summary, the developed healthy watermelon yogurt represents an innovative fusion of hydration, nutrition, and flavor. With a moisture content of 87.08% and 3.72% protein per serving, it offers excellent hydration and muscle support. Rich in antioxidants, it contains 16.46 mg of vitamin C, which enhances immune function and combats oxidative stress. Additionally, its low-fat content of 3.62% makes it an ideal choice for health-conscious consumers.
The yogurt also supports digestive health through probiotics, promoting a healthy gut microbiome. With a consumer acceptability score of 7.27, there is significant potential for further sensory enhancements. Lasting 7 days unopened, it provides a convenient, refreshing option for busy lifestyles. Overall, watermelon yogurt is poised to become a staple for those seeking a nourishing and enjoyable addition to their diets, combining health benefits with a delicious taste.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-229
(22) Filed: 03/08/2025

(23) Priority Data:

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(51) INT. CL. : A23L 33/17

(54) Invention Title: Development of Shidol as a functional food prepared from dried marine fish and plant-based proteins

(57) Abstract

This invention relates to the formulation and enhancement of *Shidol*, a traditional fermented dried fish product widely consumed in northern and northeastern Bangladesh. Traditionally prepared using small indigenous fish such as *Puntius ticto* (Ticto barb), Shidol is an important source of protein and essential micronutrients for low-income and rural populations. Despite its nutritional significance, conventional Shidol production faces challenges including unsanitary sun-drying practices, microbial contamination, and over-reliance on unsustainably harvested fish species. To address these concerns, this patent presents a novel approach for improving both the nutritional profile and food safety of Shidol by integrating high-protein plant-based ingredients—specifically lentils (*Lens culinaris*), chickpeas (*Cicer arietinum*), and taro (*Colocasia esculenta*)—into the traditional fish-based formulation.

The improved Shidol is developed through a standardized process involving cleaning, grinding, and blending of fish and plant-based components, followed by shaping, hygienic sun-drying, and controlled storage. Modern drying techniques and vacuum packaging are recommended to enhance microbial safety and shelf life. Sensory and nutritional evaluations demonstrated that the modified products offer improved taste, texture, protein quality, amino acid balance, dietary fiber, and omega-3 fatty acid content—particularly when using *Bombay duck (Harpadon nehereus)* alongside plant proteins. Additionally, the incorporation of plant-based ingredients contributes antimicrobial and antioxidant benefits, environmental sustainability, and broader market appeal by mitigating strong odors often associated with traditional Shidol.

This formulation not only preserves the cultural value of Shidol but also aligns with global trends toward sustainable, functional, and health-conscious foods. It holds potential for commercial-scale production and provides an eco-friendly, nutritionally enhanced alternative that supports food security and innovation in traditional Bangladeshi cuisine.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-245
(22) Filed: 20/08/2025

(23) Priority Data:
Germany, Number :2024080467, Date : 28-10-2024.

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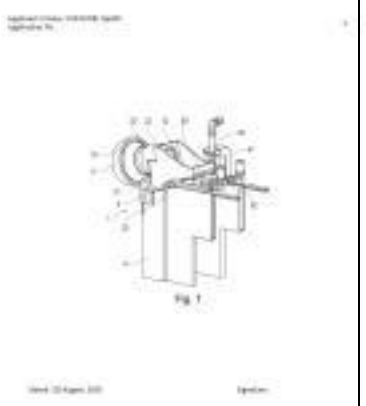
(51) INT. CL. : B02C 15/00

(54) Invention Title: ROLLER MILL AND METHOD FOR OPERATING SAME

(57) Abstract

Roller mill, in particular vertical roller mill, with a rotatable grinding bowl and several grinding roller units (1) arranged around a grinding track of the grinding bowl, each of which carries a grinding roller (10) in such a way that the grinding roller (10) is assigned to the grinding track in a working position, forming a grinding gap. Each of the grinding roller units (1) has a bearing lever, in particular a rocker lever (20), on which the grinding roller (10) is mounted so as to be rotatable about an axis of rotation (12) thereof. The bearing lever, in particular the rocker lever (20), is movable via a bearing block/bearing housing (21) on a roller stand (2), in particular pivotable mounted about a pivot axis (3), in such a way that the grinding roller (10) can be moved, in particular is pivoted, into the working position assigned to the grinding track. The bearing lever, in particular the rocker lever (20), can be selectively mechanically set/fixed by a support mechanism (30) in order to hold the grinding roller (10) in the set working position, at least against a grinding pressure exerted on the grinding roller (10) by a grinding bed during the grinding process.



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-246
(22) Filed: 21/08/2025

(23) Priority Data:
China, Number :2024112281531, Date : 03-09-2024.

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(51) INT. CL. : D04B 15/00

(54) Invention Title: NEEDLE PLATE AND KNITTING NEEDLE COMBINATION MECHANISM, NEEDLE PLATE MECHANISM AND FLAT KNITTING MACHINE

(57) Abstract

ABSTRACT

Provided are a needle plate and knitting needle combination mechanism, a needle plate mechanism and a flat knitting machine. The needle plate and knitting needle combination mechanism and the needle plate mechanism both include needle plates, multiple needle grooves on the needle plates, multiple sinkers, and separating pieces. The separating piece is arranged at a rear section of the needle groove and divides the needle groove into two needle channels arranged left and right. The needle plate and knitting needle combination mechanism further includes knitting needles and control stitch elements. Two knitting needles are arranged at a front section of the needle groove that is not divided by the separating piece in such a manner that at least adjacent front surfaces of the two knitting needles are in contact with each other. The movement of one of the two knitting needles is guided by an adjacent surface of the other adjacent knitting needle and a groove wall of a corresponding side of the front section of the needle groove. Each of the rear parts of the two knitting needles is connected with a control stitch element. At least the rear parts of the two control stitch elements are respectively located in the two needle channels. The movement of the control stitch element is guided by the needle channel where the control stitch element is located. The flat knitting machine includes a needle plate and knitting needle combination mechanism or a needle plate mechanism. Because of the needle plate and knitting needle combination mechanism or the needle plate mechanism, the flat knitting machine can arbitrarily select one of two knitting needles in a needle groove to meet some special fabric requirements.

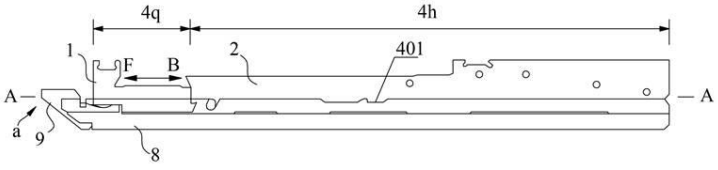

FIG. 1

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-252
(22) Filed: 28/08/2025

(23) Priority Data:

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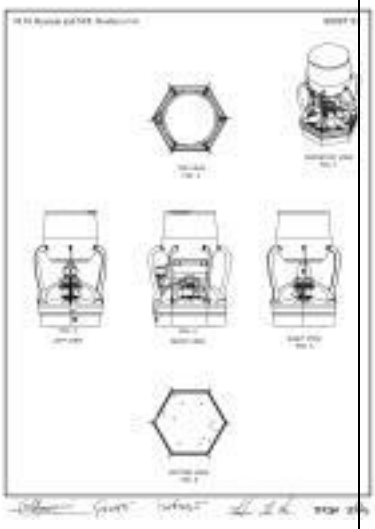
(51) INT. CL. : A01K 39/012

(54) Invention Title: Smart Poultry Feeder (SPF)

(57) Abstract

The Smart Poultry Feeder (SPF) system is basically an automation-based mechatronics machinery system that ensures to achieve improvement in food supply efficiency by reducing wastage and maintaining biosecurity in poultry farming. Infrared proximity sensors (SharpIR) sensors of the feeder system are used for poultry detection, while the multiplexer mechanism acts to dispense feed only in specific cells in need. The light-dependent resistors (LDR) sensors have served to monitor the level of feed for dispensing on demand. The application of the dual-direction auger in pulse mode in the core system ensures to remove food supply-obstructions in the food supply channel and offer even feed distribution. The feed is contained within an airtight container; this maintains its freshness and prevents feed contamination. Biosecurity will also be enhanced by minimizing human contact with the feed. This Smart Poultry Feeder (SPF) system works on real-time detection of chicken in specific feeding cell areas. The feeder dispenses food only when a chicken is detected in front of a specific cell optimizing the use of food and ensuring more precise control over the feeding process. The innovated Smart Poultry Feeder (SPF) system assures mega benefits when compared to traditional methods, as it offers pinpointed sensor-driven automation, quality feed preservation, and reduced labor costs, hence ideal for small and large poultry farms alike.



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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-253
(22) Filed: 28/08/2025

(23) Priority Data:

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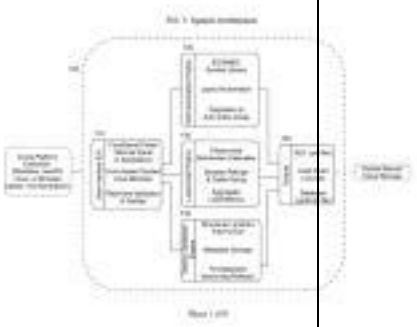
(51) INT. CL. : G06F 16/00;G06F 30/00;G06F 7/00;G06F 16/93

(54) Invention Title: GridInk X: Computer-Implemented Method and System for Automated Generation of Single Line Diagrams and Load-Charts from Structured Data via a Guided User Interface with Unified Session Database Capability

(57) Abstract

The invention relates to a computer-implemented method and system for automated generation of Single Line Diagrams (SLDs) and Load-Charts from structured data entered via a guided user interface. User inputs describing project metadata, panel circuits, sources, and parameters are stored in a unified session database, ".gridinkx" file, supporting versioning, rollback, and collaborative sharing. From the same dataset, the system generates: (i) SLDs using IEC/BNBC-compliant vector symbols with dynamic layout, pagination, and an index sheet; and (ii) Load-Charts with phase balancing, breaker ratings, cable sizing, and aggregate load calculations. The interface enforces standards compliance through conditional fields, placeholders, and real-time validation. Outputs include vector-based PDFs for SLDs, structured CSV/XLSX for Load-Charts, and the session database file, all without requiring conventional CAD tools. The invention reduces design time, eliminates manual drafting errors, and enhances compliance and audit readiness in industrial and commercial electrical documentation.



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-255
(22) Filed: 01/09/2025

(23) Priority Data:

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(51) INT. CL. : H02J 15/00

(54) Invention Title: The Formulation and Development of a Functional Pickle: Chloro Marine Blend

(57) Abstract

Traditional South Asian pickles are highly valued for their flavor and cultural significance, but their conventional preparation methods often involve high levels of sodium, refined oils, and synthetic preservatives. These ingredients can pose health risks such as hypertension and gastrointestinal issues, making traditional pickles less suitable for health-conscious consumers and vulnerable groups like pregnant women, children, and the elderly. To address this, the Chloro Marine Blend has been developed as a novel plant-based, functional pickle. This innovative condiment incorporates nutrient-dense ingredients such as broccoli, moringa leaves, and red seaweed (*Hypnea musciformis*), which provide a rich source of fiber, essential minerals (including calcium, iron, potassium, and phosphorus), antioxidants, and beneficial phytochemicals.

Unlike conventional pickles, the Chloro Marine Blend utilizes natural preservatives like tamarind pulp, vinegar, molasses, and mustard oil, ensuring both product safety and stability without compromising its nutritional integrity. The result is a shelf-stable, vibrant green pickle with a balanced tangy-sweet-spicy flavor and a pleasant texture. This makes it a healthier alternative suitable for a broad spectrum of consumers, including those with dietary restrictions such as pregnant women, children, diabetics, and hypertensive patients. The development of the Chloro Marine Blend represents a successful effort to modernize traditional foods, aligning them with contemporary health demands, promoting sustainable plant-based diets, and supporting public health while preserving culinary heritage.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-276
(22) Filed: 27/09/2025

(23) Priority Data:

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(51) INT. CL. : A23F 3/00

(54) Invention Title: A PROCESS FOR THE PRODUCTION OF ANTI-OXIDANT ENRICHED HERBAL TEA

(57) Abstract

A new polyherbal tea formulation has been developed using five key ingredients: Trigonella foenum-graecum (methi), curcumin (derived from Curcuma longa), Zingiber officinale (ginger), Foeniculum vulgare (Mouri), Nigella sativa (kalojira), and cardamom (alach). The proportion of each ingredient and the water extracts has been standardized. This herbal tea is rich in antioxidants, making it an important option for healthy functional beverages.
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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-286
(22) Filed: 05/10/2025
(23) Priority Data:

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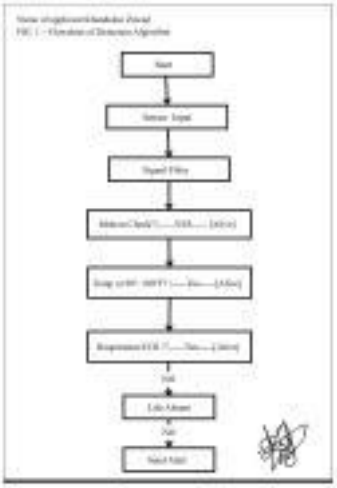
(51) INT. CL. : G08B 21/24

(54) Invention Title: Non-Contact Room-Based Human Life Detection and Alert System

(57) Abstract

The present invention discloses a non-contact, room-based human life detection and alert system designed to identify the presence or absence of human life in enclosed spaces such as residences, healthcare facilities, and hotels. The system integrates multiple environmental sensors including motion detectors, thermal cameras, temperature sensors, respiration analyzers, and CO_2 concentration monitors, whose signals are processed by an intelligent unit applying sensor fusion, adaptive thresholds, and optional machine learning. When motion, body temperature, and respiration data fall outside life-indicating thresholds for a predetermined duration, the system automatically transmits alerts via SMS, email, mobile applications, cloud services, or equivalent communication technologies. Unlike conventional monitoring systems that require wearable devices, the invention operates entirely non-invasively, offers sensor redundancy, integrates communication fallback mechanisms, and provides extensibility for future sensor modalities and AI enhancements. This invention addresses critical needs in elderly care, patient monitoring, unattended death prevention, and public safety, thereby offering a robust and future-proof life detection platform.



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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-287
(22) Filed: 06/10/2025

(23) Priority Data:

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(51) INT. CL. : G16H 50/50;G09B 23/28;G06T 17/00;G16H 40/63

(54) Invention Title: A Device-Based Integrated Medical Education and Simulation System with Dynamic Digital Twin Environments

(57) Abstract

An integrated system and method for enhancing medical education and simulation are disclosed. The system comprises a central server housing a simulation engine and a digital twin module. A user accesses the system via a client device running a dedicated application. The system generates interactive medical simulations, including surgical and operational procedures, by integrating 3D anatomical models with physics-based rules. Concurrently, the digital twin module constructs a navigable, virtual replica of a real-world medical facility. A key innovation is the dynamic linking module, which contextually links elements within the digital twin (e.g., an MRI machine in the virtual radiology room) to its corresponding simulation module (e.g., an MRI operation and diagnosis simulation). This creates a seamless, immersive learning environment where users can explore a virtual hospital and directly engage with contextually relevant, high-fidelity training simulations, thereby improving knowledge retention and practical skill acquisition.

Technical Field:

This invention pertains to medical education technology and healthcare simulation systems, specifically a device-integrated AI-driven platform for digital learning and medical procedure training.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-288
(22) Filed: 06/10/2025

(23) Priority Data:

(71) Applicant: Labaid Cancer Hospital & Super Speciality Centre Ltd. of 26, Green Road, Dhanmondi, Kalabagan, 1205, Bangladesh

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(51) INT. CL. : G09B 23/28;G02B 27/01;G16H 50/50;G06T 19/00

(54) Invention Title: A Device-Based Augmented Reality Enabled Digital Medical Education System

(57) Abstract

The present invention discloses a digital learning platform system and method for medical education. The system comprises a server system housing a database of medical educational content and three-dimensional (3D) anatomical models, and a client device operated by a user. The platform provides structured access to medical knowledge across multiple disciplines. A key innovation is an Augmented Reality (AR) mode module that is configured to retrieve a 3D anatomy model from the server and superimpose it onto a real-world environment captured by the client device's camera. This allows the user to interact with, manipulate, and examine the 3D model in an immersive, spatially-aware context, thereby enhancing both theoretical understanding and practical, visual-spatial comprehension of human anatomy. The invention bridges the gap between traditional 2D learning resources and physical cadaveric dissection.

Technical Field:

This invention pertains to medical education technology, specifically to a device-based digital learning system integrating augmented reality (AR) for enhanced visualization and interaction.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-289
(22) Filed: 06/10/2025

(23) Priority Data:

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(51) INT. CL. : G16H 50/20;G06F 40/30;G16H 30/40

(54) Invention Title: A Device-Based Process Specialized Medical Large Language Model (LLM) System for Clinical Reference, Image Analysis, and Diagnostic Support.

(57) Abstract

The present invention discloses a system and method for a specialized Large Language Model (LLM) purposed-built for the medical field, termed "Labaid GPT." The system overcomes the limitations of general-purpose LLMs which are prone to inaccuracies and lack medical domain specificity. It comprises a foundational LLM that has been specifically pre-trained and fine-tuned on a curated corpus of medical literature, clinical guidelines, and anonymized regional health data. The system integrates a multi-modal analysis engine capable of processing both textual data (e.g., patient notes, research queries) and medical images (e.g., X-rays, MRI scans). Key functionalities include generating differential diagnoses, interpreting medical reports and prescriptions, providing evidence-based research assistance, and offering AI-driven second opinions. The invention provides a decision-support tool that enhances diagnostic accuracy, improves research efficiency, and supports clinical workflows for medical professionals in Bangladesh and similar regions.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-290
(22) Filed: 06/10/2025

(23) Priority Data:

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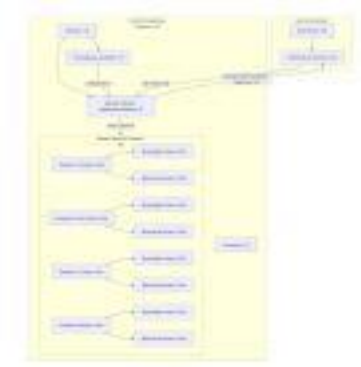
(51) INT. CL. : G06F 40/30;G06N 20/00;G06Q 10/10;G09B 7/00

(54) Invention Title: “Luna: A Device-Based Omni-Domain Conversational Artificial Intelligence System for Adaptive Multi-Sector Communication and Service Automation”

(57) Abstract

An omni-domain conversational artificial intelligence (AI) system is disclosed. The system comprises a computing platform with a processor and memory storing a foundational AI model. The system is characterized by a dynamic domain adaptation module that reconfigures the foundational AI model in real-time for operation within a plurality of distinct professional sectors. A unified user interface receives user inputs and presents sector-specific responses. The domain adaptation module applies a sector-specific knowledge corpus and a set of behavioral parameters corresponding to a selected domain, such as education, customer service, legal, or finance, thereby transforming the generic AI into a domain-specific expert. This enables a single, unified system to automate communication, provide expert-level assistance, and enhance user support across multiple, unrelated industries without requiring separate, dedicated AI implementations for each sector.



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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-291
(22) Filed: 06/10/2025

(23) Priority Data:

(71) Applicant: Labaid Cancer Hospital & Super Speciality Centre Ltd. of 26, Green Road, Dhanmondi, Kalabagan, 1205, Bangladesh

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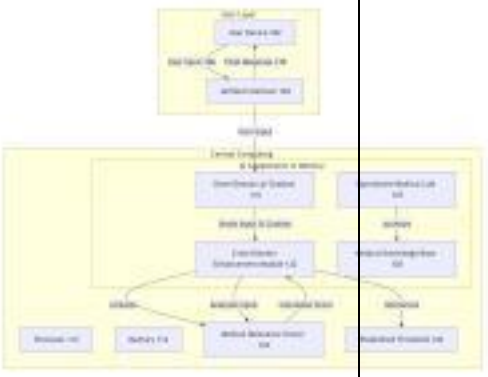
(51) INT. CL. : G06Q 10/10;G16H 50/00;G06N 20/00;G09B 7/00;G16H 10/60;G06F 40/30

(54) Invention Title: “Labaid AI: A Device-Based Artificial Intelligence System for Medical and Multi-Domain Conversational Applications”

(57) Abstract

A system and method for enhancing an omni-domain conversational AI with specialized medical intelligence is disclosed. The system comprises a computing platform hosting a foundational, omni-domain AI chatbot and a specialized medical large language model (LLM) trained on a verified medical corpus. A cross-domain enhancement module operatively connects the two AI models. The process involves receiving a user input at the omni-domain chatbot. The cross-domain enhancement module analyzes the input for potential medical relevance. If a threshold of medical relevance is met, the input, along with contextual data, is routed to the specialized medical LLM. The medical LLM generates a medically-grounded response, which is then integrated and formatted by the omni-domain chatbot into a final, cohesive output for the user. This process allows a single AI system to provide general assistance across multiple industries while ensuring expert-level, reliable medical guidance when required, without requiring separate systems.



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-295
(22) Filed: 13/10/2025

(23) Priority Data:

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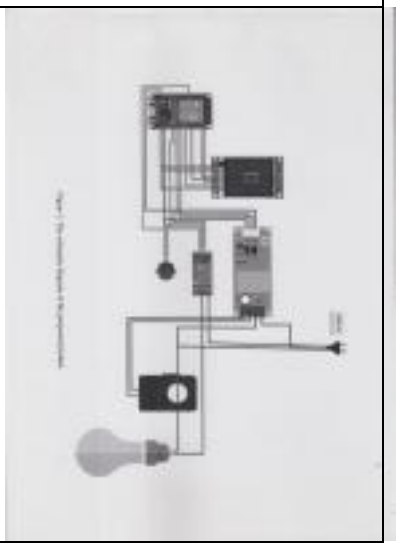
(51) INT. CL. : G01R 22/06

(54) Invention Title: IoT based prepaid Energy Meter with Power Monitoring and Web Control.

(57) Abstract
The present invention discloses a smart prepaid energy metering system utilizing an ESP32 microcontroller and a PZEM004T energy monitoring module. The system enables real-time measurement of voltage, current, power, and energy consumption, and implements a prepaid billing mechanism by deducting energy credits based on actual usage. Upon exhaustion of the prepaid balance, the system automatically disconnects the electrical load using a relay-controlled mechanism. A user interface, accessible via web or mobile application, facilitates credit top-up and monitoring. The invention further includes non-volatile memory for storing residual credits during power outages and an alert system for low-balance notifications. This energy meter offers a low-cost, scalable, and remotely accessible solution for efficient electricity management in residential and commercial applications.



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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-296
(22) Filed: 13/10/2025

(23) Priority Data:

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(74) Agent : bd_daffodilinternationaluniversity9ba14, {app_representative_address}, Bangladesh

(51) INT. CL. : A23L 33/00;A23L 33/105

(54) Invention Title: Fortified Instant Soup with Plant Extracts for Immune Support in Malnourished Populations

(57) Abstract

The Fortified Instant Soup with Plant Extracts for Immune Support represents an innovative functional food product developed to address the nutritional needs of malnourished, elderly, and immunocompromised populations, as well as those recovering from infectious diseases. Unlike conventional instant soups that often lack nutritional density, this product integrates dehydrated vegetables, legume protein, whole grains, plant extracts, and fortified micronutrients into a single, convenient formulation. The inclusion of turmeric, ginger, moringa, and tulsi provides synergistic antioxidant, anti-inflammatory, and immunomodulatory effects, while the addition of Vitamin C, Vitamin D, Zinc, and Iron ensures optimal immune resilience and recovery support. The soup is clean-label, free from artificial preservatives or flavors, shelf-stable for 12–18 months, and ready in under 3 minutes, making it ideal for households, hospitals, elderly care facilities, and nutrition assistance programs. This innovation provides a palatable, safe, and nutritionally robust solution to combat immunity-related health challenges. It also has commercial potential in both domestic and international functional food markets, with an additional impact on public health nutrition by addressing malnutrition and supporting recovery in vulnerable populations.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-297
(22) Filed: 13/10/2025
(23) Priority Data:

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(51) INT. CL. : A23L 33/135

(54) Invention Title: Probiotic-Enriched Cereal Bar with High Fiber Integration

(57) Abstract
The present invention discloses a Probiotic-Enriched Cereal Bar with High Fiber Integration, developed as a functional food designed to promote gut health, enhance immunity, and provide balanced nutrition in a convenient snack format. Unlike conventional cereal bars, this formulation combines probiotics (Lactobacillus and Bifidobacterium strains) with high fibers (inulin, resistant starch, and soluble oat fiber), establishing a synbiotic effect that ensures both viability of beneficial bacteria and stimulation of gut microbiota activity. The product is carefully formulated with a base of rolled oats, wheat crispies, dried fruits, nuts, honey, and natural fruit paste serving as binders and natural sweeteners. This composition eliminates the need for refined sugars and artificial preservatives, thereby making the bar a clean- label, health-oriented product. The processing technology includes selective roasting for flavor enhancement, blending for uniform nutrient distribution, incorporation of probiotics at safe temperatures to protect cell viability, and nitrogen-flushed moisture-proof packaging to maintain freshness and extend shelf life. Nutritionally, each 100 g serving of the cereal bar provides approximately 380 kcal of energy, 12 g of protein (24% DV), 55 g of carbohydrates (18% DV), 10 g of healthy fats (15% DV), and 8 g of dietary fiber (32% DV). The micronutrient content includes iron (3 mg, 20% DV), calcium (80 mg, 8% DV), zinc (2 mg, 15% DV), and vitamin C (5 mg, 6% DV), contributing to immunity, bone health, and metabolic function. The high fiber content ensures satiety, improves bowel regularity, and supports cholesterol and glucose regulation. Probiotic survival is guaranteed at ≥1×10^8 CFU/g at the point of consumption, ensuring clinical effectiveness in gut health improvement. Sensory evaluation through a hedonic rating scale demonstrated strong consumer acceptance, with average scores ranging from 8.0 to 8.5/10 across color, flavor, taste, aroma, and texture, yielding an overall acceptability of 8.35/10. Panelists particularly appreciated the natural roasted aroma, balanced sweetness, chewy-crunchy texture, and clean-label appeal of the product. In summary, this invention represents a novel functional cereal bar that integrates probiotics and fibers in a scientifically balanced formulation, offering nutritional, therapeutic, and sensory advantages over conventional cereal bars. It is suitable for health-conscious consumers, elderly populations, and individuals seeking convenient dietary solutions for digestive wellness and immunity support.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-308
(22) Filed: 20/10/2025

(23) Priority Data:

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(51) INT. CL. : A23F 5/44

(54) Invention Title: Ready-to-Use Herbal Date Seed Coffee Powder Enriched with Ginger

(57) Abstract

The Ready-to-Use Herbal Date Seed Coffee Powder Enriched with Ginger is a novel, caffeine-free functional beverage designed for both health and sustainability. By integrating roasted date seeds and ginger powder, the product delivers antioxidants, dietary fiber, digestive support, and immune benefits in an instant, shelf-stable format. This invention not only introduces a nutritionally superior and consumer-acceptable beverage, but also promotes agro-waste valorization through the utilization of date seeds. With its balanced composition, pleasant flavor, and extended shelf life, the product is suitable for health-conscious consumers, elderly populations, and individuals requiring caffeine-free alternatives. It is therefore claimed as a unique functional food innovation with strong potential for patentability, commercialization, and global health impact.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-309
(22) Filed: 20/10/2025
(23) Priority Data:

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(51) INT. CL. : A23L 33/105

(54) Invention Title: Development of a High-Protein, Antioxidant-Rich Instant Soup from Dal and Vegetable Blends

(57) Abstract

The present invention relates to a high-protein, antioxidant-rich instant soup developed from a unique combination of sprouted pulses and functional vegetables. The formulation comprises sprout powder (mash bean), broccoli, carrot, and moringa powders, along with onion, garlic, and spice powders, corn starch, citric acid, and flavor enhancers in standardized proportions. This composition provides a protein-fortified, antioxidant-enhanced, and shelf-stable instant soup with superior nutritional and sensory qualities compared to conventional instant soups. The product is designed to deliver high-quality protein, dietary fiber, vitamins (A, C, B6, folate), minerals (iron, calcium, potassium, zinc), and bioactive compounds, contributing to muscle maintenance, digestive health, immune support, and overall wellbeing. It also exhibits significant antioxidant activity, with an estimated total phenolic content (TPC) of ~140 mg GAE/100 g and antioxidant activity of ~0.140% w/w. Processing involves selection, cleaning, sprouting, drying, and powdering of pulses and vegetables, preparation of spice blends, blending with corn starch and citric acid, sieving for uniformity, quality evaluation (protein, moisture, ash, antioxidant activity, sensory testing), and packaging in moisture-proof, airtight sachets for long-term shelf stability. A 30 g serving provides approximately 75 kcal, 1.8–2.0 g protein, 19–20 g carbohydrates, 2.0–2.5 g fiber, and 0.2–0.3 g fat, with low moisture and water activity (aw 0.35–0.40), ensuring shelf stability. Organoleptic evaluation using a 10-point hedonic scale showed high acceptability, with scores of 8.5 for color, flavor, and taste, 8 for mouthfeel, and 8.375 for overall acceptability, indicating strong consumer preference and palatability. This invention provides a convenient, nutritionally balanced, and functional instant soup, combining plant-based protein and antioxidant-rich vegetables to support health, enhance diet quality, and offer a shelf-stable, consumer-acceptable product suitable for daily consumption.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-310
(22) Filed: 21/10/2025

(23) Priority Data:

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(51) INT. CL. : B01J 41/04;A21D 13/80

(54) Invention Title: A PROCESS FOR THE PRODUCTION OF NUTRIENT ENRICHED ORGANIC CAKE USING PROCESSED JACKFRUIT PEEL

(57) Abstract
The present invention introduces a novel cake formulation that includes wheat flour, processed jackfruit peel powder, honey, eggs, edible oil, baking powder, and flavoring agents. The jackfruit peel powder acts as a functional ingredient, enhancing the cake's nutritional profile with dietary fiber, antioxidants, and micronutrients. Honey is a natural sweetener, replacing refined sugar and providing antimicrobial and antioxidant benefits. This invention offers a sustainable, nutrient-enriched, and health-promoting bakery that utilizes waste materials and delivers functional advantages in a single formulation. Additionally, a detailed process for preparing the cake, which involves pre-processing the jackfruit peel powder and optimizing baking conditions, preserves bioactive compounds and improves the cake's functional properties.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-316
(22) Filed: 26/10/2025
(23) Priority Data:

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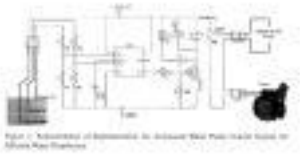
(51) INT. CL. : E03B 5/00;G05B 19/042

(54) Invention Title: Automated Water Pump Control System for Efficient Water Distribution

(57) Abstract

The increasing demand for water in households, agriculture, and industries has highlighted the limitations of conventional water distribution systems that rely heavily on manual pump operation. Manual systems are often inefficient, prone to human error, and result in problems such as water wastage, tank overflow, dry running of pumps, high energy consumption, and irregular water supply. To address these challenges, the project proposes an intelligent and automated system that monitors water levels in storage tanks and pipelines using sensors and controls pump operation through a microcontroller-based mechanism. By automating the process, the system ensures that pumps operate only when required, conserving both water and electricity, enhancing reliability, and reducing labor dependency. The system integrates sensors, relay modules, and a programmable microcontroller to make real-time decisions regarding pump operation. It automatically starts the pump when the water level falls below a minimum threshold and stops it when the tank is full, preventing overflow and pump damage. Additional safety features such as dry run protection, waterproof casing, and indicator displays enhance the robustness and usability of the system. The design is scalable and adaptable for various applications, including residential, agricultural, and municipal water distribution networks. Testing and analysis show significant improvements in water efficiency, energy savings, and operational cost reduction compared to manual systems. Overall, this project demonstrates a practical, sustainable, and cost-effective solution for modern water management, paving the way for future integration with IoT and smart city infrastructures in Figure 1.



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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-317
(22) Filed: 26/10/2025

(23) Priority Data:

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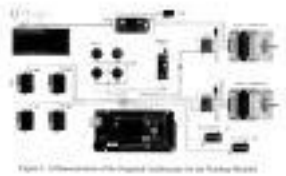
(51) INT. CL. : G07F 13/10

(54) Invention Title: A Secure and Smart Vending Machine for Ensuring Hygienic Services for Bangladeshi Women

(57) Abstract

Access to menstrual hygiene products remains a significant challenge for many women in Bangladesh, particularly in rural and underserved areas where cultural stigma, lack of privacy, and limited infrastructure restrict safe and dignified access to sanitary items. This project presents the design and development of a secure and smart vending machine aimed at ensuring hygienic, accessible, and private distribution of sanitary napkins to Bangladeshi women demonstrated in Figure 1. The machine combines hardware and software technologies, featuring a tamper-proof dispensing mechanism, secure digital payment options (including bKash, Nagad, and NFC cards), and IoT-based inventory monitoring for real-time management. The system is designed with a user-friendly interface in Bangla, ensuring usability across age groups and literacy levels. Through IoT integration, administrators can monitor stock levels, transaction histories, and operational health remotely via a web dashboard. The smart vending machine supports both online and offline operation modes, making it suitable for deployment in schools, hospitals, bus terminals, and remote clinics. Data collected during pilot testing showed high user satisfaction, consistent product usage, and strong reliability in field conditions. By addressing both technical and social barriers, this project contributes to public health, gender equity, and digital empowerment. It represents a scalable and culturally sensitive solution to menstrual hygiene management in Bangladesh. The vending machine not only serves a practical need but also encourages open dialogue and behavior change around menstrual health. Overall, this project bridges the gap between technology and women's well-being in a meaningful and sustainable way.



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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-318
(22) Filed: 26/10/2025

(23) Priority Data:

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(51) INT. CL. : B22D 27/08

(54) Invention Title: AN INNOVATIVE APPROACH TO IMPROVE THE QUALITY OF THE CASTED PRODUCTS BY VIBROTECH SAND CASTING PROCESS USING ORGANIC BINDER

(57) Abstract

Sand casting is a cornerstone of modern manufacturing, vital to the production of a wide range of products from engine components to structural elements in various industries. While it has been practiced for centuries, the quality assessment of sand-cast products remains a complex and critical challenge. Variability in casting processes, defects, and inconsistencies in the final products continue to plague manufacturers, leading to increased costs and compromised product reliability.

Many research works have been conducted to improve the casted quality products considering the different process parameters improvement, using different types of molds, binders variation, using AI optimization techniques etc. Considering all the aspects, an efficient and effective approach needs to be adopted to improve the quality of the casted products. This invention has been made to adopt VibroTech Techniques for applying the VibroMech assisted effects applied in the form of longitudinal and transverse vibration to the mold and Voice activated Ultrasonic vibration applied to the molten materials in the sand-casting process to improve the quality of the casted product for ensuring reliability.

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www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-325
(22) Filed: 04/11/2025
(23) Priority Data:

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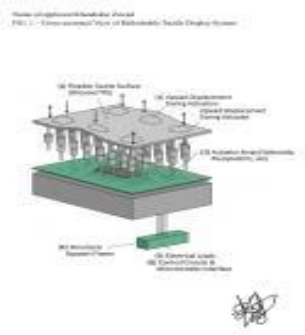
(51) INT. CL. : G09B 21/00
(54) Invention Title: Refreshable Tactile Display System with Flexible Rubber Surface for Visually Impaired Users

(57) Abstract



The present invention relates to a **refreshable tactile display system and associated web-based control platform** designed to render text, images, and graphical data in a **tactilely perceivable format** for visually impaired users. The system comprises a **flexible, elastic tactile surface layer** positioned above a **densely arranged actuator array** capable of individually and selectively elevating discrete surface regions to form tactile representations corresponding to alphanumeric characters, braille cells, or graphical shapes. Each actuator within the array is operatively connected to a control circuit configured to receive electronic signals from a microcontroller or embedded computing unit, wherein said control unit converts digital content data into actuator control commands through a sequence of **preprocessing, rasterization, grid mapping, and binary signal encoding steps**.

The flexible tactile surface may be composed of **silicone, thermoplastic elastomer, or an equivalent polymeric material** having a hardness within the range of 20–30 Shore A, permitting repeatable deformation and rapid restoration to a planar state. The actuator mechanisms may include **solenoids, piezoelectric transducers, pneumatic cells, or microelectromechanical (MEMS) elements**, enabling high-resolution tactile rendering across the surface. The system further includes a **reset mechanism** for deactivating or retracting actuators after each tactile display cycle, thereby returning the surface to a flat configuration for subsequent page display.

An integrated **control electronics assembly** comprises driver circuits, power management components, and feedback sensors arranged on a printed circuit board beneath the actuator array, operably connected to a **microcontroller unit (MCU)** or equivalent processing hardware. The MCU executes firmware that interprets tactile display instructions generated by a **software engine** hosted locally or remotely through a **web-based interface**. Said web interface enables content upload, conversion, and real-time synchronization between the tactile display device and a remote **content management system (CMS)** via wireless or wired data transmission (e.g., USB, Wi-Fi, Bluetooth, or WebSocket protocol).

The system is capable of dynamically rendering multiple sequential tactile “pages” of content on the same physical surface, supporting **literary text, educational graphics, and three-dimensional data visualization**. The invention optionally incorporates **multi-sensory feedback mechanisms**, including auditory or haptic outputs, for enhanced interactivity. The tactile output resolution and actuation parameters are programmable, allowing customization for braille, text, or image-based applications. The associated website or online platform enables user authentication, library access, and AI-based content translation into tactile or braille-ready formats, thereby forming an **end-to-end ecosystem** for accessible learning and digital literacy for the blind or visually impaired.

This invention thus provides a **novel, reusable, and highly adaptive tactile display architecture** integrated with modern software infrastructure, achieving scalability, cost efficiency, and universal accessibility far beyond the limitations of conventional braille readers or static embossed materials.

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date , **(21) Appl. No.** BD-P-2025-356 **(22) Filed:** 23/11/2025
(23) Priority Data:
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(51) INT. CL. : C12M 1/00;C12N 1/20
(54) Invention Title: Large-Volume Growth Chamber for Endophytic Bacteria with Biofertilizer and Biopesticide Potential

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Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-359
(22) Filed: 25/11/2025

(23) Priority Data:

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(51) INT. CL. : E01C 21/00;C04B 28/04

(54) Invention Title: PROCESS FOR CONSTRUCTION OF ROAD BASE AND SUBBASE LAYERS USING CEMENT-STABILIZED SAND

(57) Abstract

The invention relates to a process, composition, and production system for constructing pavement base and sub-base layers using cement-stabilized sand as an alternative to crushed stone and brick aggregates in regions characterized by alluvial soils, scarce stone resources, high groundwater levels, and monsoon climates. The process includes classifying fine sand into engineering types based on particle passing percentage and fineness modulus, controlling gradation, and blending dredged sand, Coarse sand, and coarse materials to achieve a suitable particle-size distribution. Ordinary silicate or Portland cement meeting 42.5-grade performance criteria is incorporated with water of controlled chemical purity, and optimum moisture content and maximum dry density are determined by heavy compaction methods. Cement dosage, allowable delay time, mixing uniformity, and strength targets are established through laboratory mix design and field verification. The invention further provides a cement-stabilized sand composition meeting specified gradation, moisture, and strength requirements, as well as a mixing-plant system equipped with automated feed-bin blending, calibrated cement dosing, moisture regulation, continuous mixing, and real-time quality monitoring. The resulting pavement layers exhibit high stiffness, slab integrity, durability, water stability, and fatigue resistance, enabling cost-effective and long-lasting road construction in regions with abundant fine sand resources.

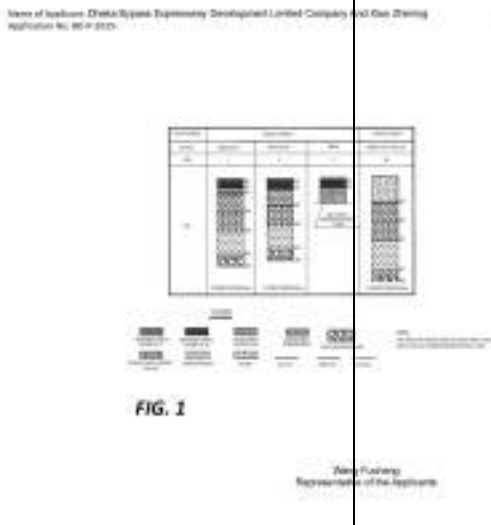

FIG. 1

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পেটেন্ট, শিল্প-নকশা ও ট্রেডমার্কস অধিদপ্তর
শিল্প মন্ত্রণালয়
৯১, মতিঝিল বা/এ, ঢাকা-১০০০
www.dpdt.gov.bd

Publication of Filed Patent Application
Publication No: 27 & Date: 18 December 2025

(11) Patent registration No and date ,
(21) Appl. No. BD-P-2025-366
(22) Filed: 02/12/2025

(23) Priority Data:

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(51) INT. CL. : C05F 17/60;C05F 17/50

(54) Invention Title: Hydrothermal treatment process for making cow dung compost

(57) Abstract
The present invention discloses a novel hydrothermal-treated composting process for efficient, large-scale management of cattle manure, transforming raw cow dung and biodegradable farm residues into stable, nutrient-rich, pathogen-free compost within a significantly shortened timeframe. Unlike conventional hydrothermal systems that terminate with solid–liquid separation, this innovation integrates hydrothermal pre-treatment with direct microbial composting, allowing treated manure to exit the chamber as a homogeneous semi-solid mass, ready for immediate composting. Fresh cow dung mixed with straw bedding is conveyed and mechanically treated in a specially designed hydrothermal chamber equipped with single-screw extruders while being exposed to pressurized steam at 150–220 °C and 150 psi for 15 minutes, effectively breaking down complex lignocellulose fibers, proteins, and fats into simpler, biodegradable forms. Following thermal treatment, the material is cooled uniformly, inoculated with Indigenous Microorganisms (IMOs) adapted from the local soil environment, and formed into windrows under a roofed shed. Daily mechanical turning ensures uniform aeration, microbial activity, and temperature regulation. The process induces an immediate thermophilic phase, reaching 90–100 °C within the first seven days, enabling rapid pathogen reduction, accelerated organic matter decomposition, and reduced composting time from 90 days to 21–30 days. The resulting compost exhibits a C: N ratio of 10–15:1, near-neutral pH (~7.1), Germination Index (GI) > 120%, enhanced nitrogen retention, increased phosphorus solubility, and safe heavy metal levels, confirming maturity and agronomic suitability. This hydrothermal composting system is already scalable, capable of handling 30 tons of cow dung per month and 360 tons annually, making it suitable for both industrial-scale and on-farm manure management. The innovation addresses the challenges of conventional manure handling, including long processing times, nutrient loss, pathogen load, and environmental pollution, while producing a high-quality, nutrient-enriched organic fertilizer that supports sustainable agriculture, soil fertility improvement, and the circular bio economy.