1.	System for Integrated Financial and Legal Risk Management using Neuro-symbolic AI and Blockchain Based Compliance Infrastructure	DR. MURUGESAN SELVAM DR. GENGATHARAN RAMESH DR. ANTHONISAMY ANANTH DR.MARIAPPAN RAJA DR. R. RAJESH RAMKUMAR PROF DR GEETHA SUBRAMANIAM	Granted and Published	International (South Africa- Patent)

REPUBLIC OF SOUTH AFRICA

REPUBLIEK VAN SUID AFRIKA

PATENTS ACT, 1978

PATENT

In accordance with section 44 (1) of the Patents Act, No. 57 of 1978, it is hereby certified that

DR. MURUGESAN SELVAM; DR. GENGATHARAN RAMESH; DR. ANTHONISAMY ANANTH; DR. MARIAPPAN RAJA; DR. R. RAJESH RAMKUMAR; PROF DR GEETHA SUBRAMANIAM

has been granted a patent for an invention as disclosed and claimed in the complete specification entitled

SYSTEM FOR INTEGRATED FINANCIAL AND LEGAL RISK MANAGEMENT USING NEURO-SYMBOLIC AI AND BLOCKCHAIN-BASED COMPLIANCE INFRASTRUCTURE

deposited at the Patent Office and assigned patent number:

2025/03918

Form P2 is annexed, together with a declaration, disclaimer and information page.

In testimony thereof, the seal of the Patent Office has been affixed to this patent at Pretoria with effect from the **28th** day of **January 2026.**

Signed and sealed at Pretoria, this 4th day of February 2026

p.p

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JANUARY 2026 VOL 59 ● No. 01

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Part II of II

ISSUED MONTHLY DATE OF ISSUE: 28 JANUARY 2026

ISSN 2223-4837

PATENT JOURNAL

INCLUDING TRADE MARKS, DESIGNS AND COPYRIGHT IN CINEMATOGRAPH FILMS

VOL. 59 No. 01 **Date of Issue: 28 JANUARY 2026**

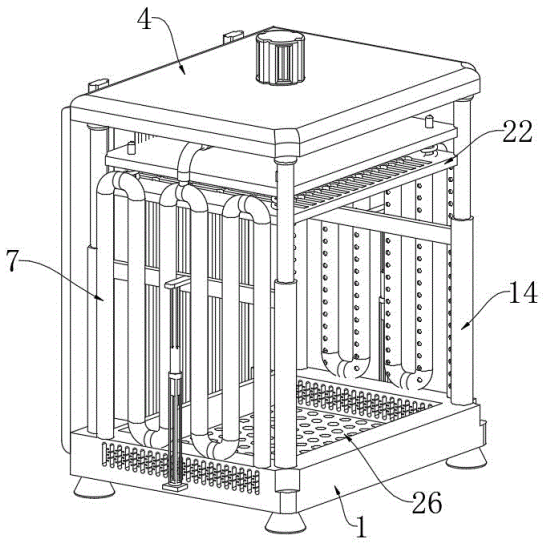
PATENTS, TRADE MARKS, DESIGNS AND COPYRIGHT OFFICE

Official notices of proceedings under:

The Patents Act, 1978
The Designs Act, 1993
The Trade Marks Act, 1963
The Trade Marks Act, 1993
The Registration of Copyright in Cinematograph Films Act, 1977

Registrar of Patents, Trade Marks, Designs and Copyright

72: Zang Shengkun, Sun Haoyu
33: CN 31: 2025105430447 32: 2025-04-28
54: WATER-COOLING HEAT DISSIPATION DEVICE FOR COMPUTER
00: -
The present invention belongs to the technical field of computer heat dissipation, and specifically to a water-cooling heat dissipation device for a computer. A bottom frame is included, a periphery of an upper surface of the bottom frame is fixedly connected to regulating mechanisms, a back face of the bottom frame is fixedly connected to a supporting plate, sliding grooves are disposed on a surface of the supporting plate, and interiors of the sliding grooves are slidably connected to sliding blocks. Through a heat dissipation mechanism fitted with the above structures, a flow rate of internal liquid can be slowed down by utilizing the coordinated action of internal sliding balls and A springs during water cooling. Reducing the flow rate can increase the contact time of cooling liquid with a water-cooled head and a radiator, allowing the coolant to more fully absorb heat from a central processing unit (CPU), and improving heat exchange efficiency. At low flow rates, the noise generated by the water pump and water flow is typically minimal, which is convenient for noise reduction. Combined with the regulating mechanisms, the contact gap between a top plate and a computer can be adjusted, which is convenient for adjusting the space size of the internal air circulation, ensuring efficient heat dissipation.



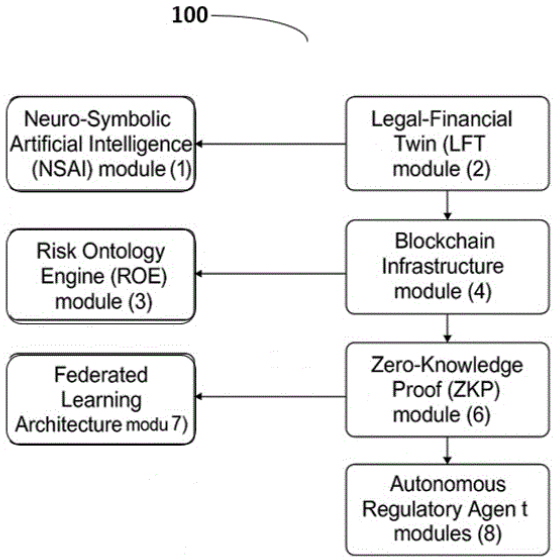
21: 2025/03917. 22: 2025/05/08. 43: 2025/12/09
51: C12M
71: HAYAT ALI ALZAHRANI, MOHAMMED ALJUWAYD, ABIDA KHAN, MD AFROZ BAKHT, SYED MOHAMMED BASHEERUDDIN ASDAQ, TAFADZWA DZINAMARIRA, MATHIAS DZOBO, MOHD IMRAN
72: HAYAT ALI ALZAHRANI, MOHAMMED ALJUWAYD, ABIDA KHAN, MD AFROZ BAKHT, SYED MOHAMMED BASHEERUDDIN ASDAQ, TAFADZWA DZINAMARIRA, MATHIAS DZOBO, MOHD IMRAN
54: APPARATUS FOR QUANTITATIVE ASSESSMENT OF BACTERIAL BIOFILM FORMATION ON BIOMEDICAL SURFACES
00: -
The present invention relates to an apparatus and method for the quantitative assessment of bacterial biofilm formation on biomedical surfaces. The apparatus incorporates a multi-modal sensing system that utilizes optical, electrochemical, and mechanical detection techniques to monitor biofilm growth in real-time. The system includes a biofilm surface interaction chamber designed to mimic physiological conditions, enabling controlled exposure of biomedical surfaces to bacterial cultures. A data acquisition system processes and stores sensor data, which is then displayed through an intuitive user interface that allows for the real-time monitoring of biofilm formation over time. The system further includes a control system for real-time adjustment of experimental parameters, such as bacterial concentration and environmental conditions. Machine learning-based techniques are used to analyze and predict biofilm growth patterns, while the system is capable of differentiating between different stages of biofilm formation.

21: 2025/03918. 22: 2025/05/08. 43: 2025/12/09
51: G06Q
71: Dr. Murugesan Selvam, Dr. Gengatharan Ramesh, Dr. Anthonisamy Ananth, Dr. Mariappan Raja, Dr. R. Rajesh Ramkumar, Prof Dr Geetha Subramaniam
72: Dr. Murugesan Selvam, Dr. Gengatharan Ramesh, Dr. Anthonisamy Ananth, Dr. Mariappan Raja, Dr. R. Rajesh Ramkumar, Prof Dr Geetha Subramaniam
54: SYSTEM FOR INTEGRATED FINANCIAL AND LEGAL RISK MANAGEMENT USING NEURO-

SYMBOLIC AI AND BLOCKCHAIN-BASED COMPLIANCE INFRASTRUCTURE

00: -

The present invention relates to an integrated system for financial and legal risk management that employs neuro-symbolic artificial intelligence, legal-financial digital twin modeling, semantic risk ontology, blockchain, smart contracts, zero-knowledge proof protocols, federated learning, and autonomous regulatory agents. The system enables real-time interpretation of legal documents and financial datasets, simulation of risk scenarios, and automated enforcement of compliance rules. A neuro-symbolic AI module analyzes legal and financial data; a digital twin replicates legal-financial dependencies; an ontology engine maps statutes to financial indicators; and a blockchain infrastructure ensures auditability through smart contracts and privacy-preserving proofs. Federated learning facilitates decentralized model training without exposing sensitive data, while autonomous agents monitor and respond to risk events. The system ensures intelligent, explainable, and cross-jurisdictional compliance, offering secure, auditable, and automated risk mitigation across regulated domains.



21: 2025/03919. 22: 2025/05/08. 43: 2025/12/09
51: G06Q
71: VISHWAKARMA INSTITUTE OF TECHNOLOGY
72: CHAUDHARI, Archana, BARVE, Tasmay, UPGANLAWAR, Ved, VAIDYA, Ram, SHELKE, Dheeraj

54: AN INTELLIGENT MEDICAL BOOTH SYSTEM WITH TELEMEDICINE AND ON-SITE MEDICAL CAPABILITIES FOR RURAL AND UNDER-SERVED AREAS

00: -

The present invention is related to an intelligent medical booth system with telemedicine and on-site medical capabilities for rural and under-served areas. Getting immediate medical help in remote or underserved areas is a big challenge. Many places around the world, especially in developing countries, don't have enough healthcare facilities or doctors. This often means that people don't get diagnosed or treated quickly, which can make their health problems worse and sometimes even lead to preventable deaths. This invention presents the design and implementation of an intelligent medical booth that provides on-demand video connection to healthcare professionals, automatic location sharing to the nearest hospital, a medication dispenser for first aid, and integrated sensors for vital signs monitoring. The system is built using a Raspberry Pi, and demonstrates a scalable solution for remote healthcare, particularly useful in rural or under-served areas.

21: 2025/03920. 22: 2025/05/08. 43: 2025/12/09
51: G06Q
71: VISHWAKARMA INSTITUTE OF TECHNOLOGY
72: CHAUDHARI, Archana, RANE, Shreyash, PATIL, Vaishnavi, PATIL, Anjali, GAIKWAD, Jitendra, POL, Praveen

54: AN ARTIFICIAL INTELLIGENCE (AI) BASED LEAF HEALTH PREDICTION SYSTEM FOR HOME GARDENING AND FARMING

00: -

The present invention is related to an artificial intelligence (AI) based leaf health prediction system for home gardening and farming. Leaf health prediction using AI techniques has emerged as a critical tool in modern agriculture for early detection and management of plant diseases. This invention presents a comprehensive approach to leaf health prediction leveraging AI algorithms and computer vision technologies. By employing convolutional neural networks (CNNs) trained on labelled