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**Taiwan Innotech Expo**

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**2022-2024**

**Platinum Awards 鉑金獎**

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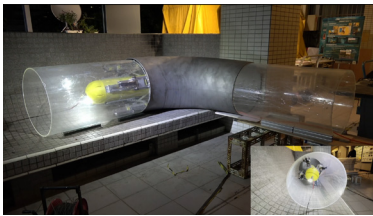
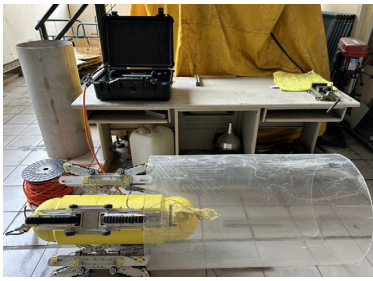
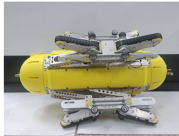
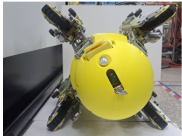
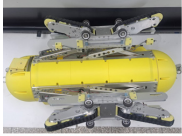
專利技術名稱

## 大型管道機器人 LARGE PIPELINE ROBOT

Patent No.: (R.O.C. 優先) 專利申請案號 113121700 號

專利權人：正修學校財團法人正修科技大學 / CHENG SHIU UNIVERSITY

發明人：張法憲、張泰源、向川澤、賴文彬、蘇上祺、盧冠群、蔡逸承、吳駿翔 / FA-SHIAN CHANG、  
TAI-YUAN CHANG、CHUAN-TSE HSIANG、WEN-BIN LAI、SHANG-CHI, SU、GUAN-QUN LU、YI-  
CHENG, TSAI、JUN-XIANG, WU



### 專利技術介紹：

本發明係為一種大型管道機器人，尤指一種透過創新的移動裝置，以在大型管道內獲得最大的行走接觸面積，並且可配合各種大型管道內部之特殊環境變化，可調整的在各種大型管道內順暢的進行移動攀爬及跨越障礙物之機器人結構。至少包含機架、外殼、至少三組伸展裝置與至少三組移動裝置。伸展裝置係環繞間隔設置於機架之外圍，外殼係設置於前述相鄰之兩組伸展裝置之間，透過伸展裝置即可將移動裝置向外推伸或向內收縮。每組移動裝置係設置有一連接支架、兩組頂撐輪組、一伸縮機構及兩組履帶機構。頂撐輪組係設置在連接支架之外側，該頂撐輪組係為具有彈性緩衝功能之被動輪機構，其係用於迫緊抵住管道之內壁，以增加所有履帶機構與管壁之間的接觸面積及正向力。本機器人可用於 24~30 吋之直管及彎管內進行水平和垂直的穩定爬行。具有旋轉機構及折收式機械手臂，可透過更換模組化作業設備以於管道內進行環境檢測、精準定位清潔、焊接、即時影像監控等功能。

### Patented technology introduction:

This invention is a large-scale pipeline robot designed for smooth movement, climbing, and obstacle-crossing within pipelines. It includes a frame, housing, at least three extension devices, and three movement devices. The extension devices, spaced around the frame, enable the movement devices to expand outward or retract inward. Each movement device has a connecting bracket, top support wheels with elastic cushioning, a telescopic mechanism, and track mechanisms that press tightly against the pipe's inner wall, maximizing contact area and stability. Suitable for 24 to 30-inch straight and curved pipes, this robot also features a rotating mechanism and foldable robotic arm, allowing it to perform environmental detection, cleaning, welding, and real-time video monitoring.

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專利技術名稱

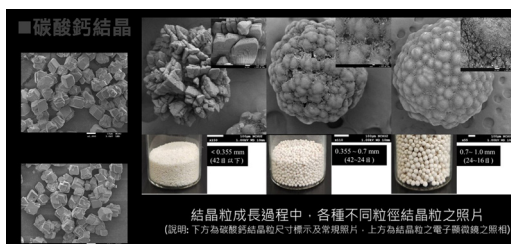
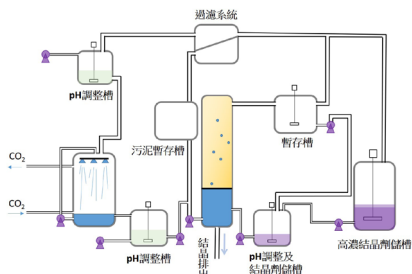
# 以吸收及均質結晶技術回收二氧化碳之方法及其設備

## Method and equipment for recovering carbon dioxide using absorption and homogeneous crystallization technology

Patent No.: (R.O.C. 優先) I839793

專利權人：國立中興大學 / National Chung Hsing University

發明人：盧明俊 / Ming-Chun Lu



### 專利技術介紹：

本發明技術先用鹼液捕集煙道氣中二氧化碳，再導入獨步全球的流體化床結晶槽，以均質結晶技術合成碳酸鈣均質結晶顆粒。所產生之高品質輕質碳酸鈣結晶粒，含水量小於 5% 且純度高於 99.5%，可回收做為各種製程之添加劑，例如：造紙橡膠、塑料、塗料等工業之用途。本技術除應用在一般廠址外，更可再利用海水淡化後之含高鈣之滷水做為鈣來源，將火力發電廠產生之二氧化碳淋洗吸收後，導入均質結晶槽生產碳酸鈣及碳酸鎂，同時為兩廠解決減碳排之問題。取得的碳酸鈣均質結晶產物，其純度在 99.5% 以上，可轉售給造紙、塑料、橡膠等相關產業做原料替代，解決產物處理的問題。本發明技術是在常溫常壓下進行，不會額外增加排碳量，能實現真正高效率之減碳排。

### Patented technology introduction:

This invention first captures carbon dioxide from flue gas using an alkaline solution and then introduces it into an advanced fluidized-bed crystallization reactor, the only one of its kind in the world, to synthesize calcium carbonate crystals using homogeneous crystallization technology. The high-quality calcium carbonate crystals produced have a moisture content of less than 5% and a purity exceeding 99.5%, making them suitable for reuse as additives in various manufacturing processes, such as in the paper, rubber, plastic, and coating industries. This technology can be applied not only at general industrial sites but also by reusing calcium-rich brine from seawater desalination as a calcium source. After carbon dioxide from thermal power plants is absorbed and washed, it is introduced into the homogeneous crystallization reactor to produce calcium carbonate, simultaneously addressing the carbon reduction issues of both plants. The calcium carbonate crystals obtained have a purity of over 99.5% and can be resold to industries such as paper, plastic, and rubber as a substitute for raw materials, resolving the issue of product disposal. This technology operates under ambient temperature and pressure, does not increase carbon emissions, and achieves truly high-efficiency carbon reduction.

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專利技術名稱

# 光收發系統

## OPTICAL TRANSCEIVER SYSTEM

Patent No.: (R.O.C. 優先) 第 I848295 號 / 特許第 7438286 號 (Japan)

專利權人：中華電信股份有限公司 / Chunghwa Telecom Co., Ltd.

發明人：胡晉誠、洪裕涵、廖虹惠、胡秀芳、游幼蘋、賴國祥 / Chin-Cheng Hu、Yu-Han Hung、Hung-Huei Liao、Hsiu-fang Hu、Yu-Ping Yu、Kuo-Hsiang Lai

### 專利技術介紹：

時間同步是控制及電信網路中的關鍵技術，惟透過全球衛星系統 (GNSS) 接收器獲取世界標準時間有極大的風險，利用光傳輸網 (OTN) 配送精確時間協定 (PTP) 時間信號更為穩定。然而，設備間大多採用雙光纖收送資料，這種實體架構無法得知接收與傳送 (如：多餘的) 光纖長度不同，成為光傳輸網配送時間信號但無法改善 PTP 時間誤差的盲點。為解決此問題並滿足 5G 網路對高精度時間同步 ( $\pm 10\text{ns}$ ) 的要求，本專利創新研發一種配送 PTP 時間信號的光收發系統，結合光學雙向器 (Optical Duplexer) 除了將設備之間的雙光纖轉換為單光纖同時接收與傳送封包，有效避免光纖長度不同造成的 PTP 時間誤差，還能節省一半的光纖資源，尤其使用傳統的單光纖雙向 BiDi 光模組同樣地也會造成無法改善的 PTP 時間誤差。



### Patented technology introduction:

Time synchronization is a critical technology in control and communication networks. However, obtaining the Universal Time Coordinated (UTC) through Global Navigation Satellite System (GNSS) receivers poses significant risks. Using optical transport networks (OTN) to distribute Precision Time Protocol (PTP) time signals is more stable. Nevertheless, most devices use dual-fiber systems for timestamp transmission, and this physical architecture makes the difficulty to find differences in fiber lengths between receiving and sending, which will lead to larger PTP time errors in optical transport networks.

To solve this problem and meet the high-precision time synchronization requirements ( $\pm 10\text{ns}$ ) of 5G networks, this patent innovatively develops an optical transceiver system for distributing PTP time signals. By integrating an Optical Duplexer, it converts dual-fiber connections between devices into a single-fiber system for simultaneous packet transmission and reception. This effectively avoids PTP time errors caused by differences in fiber lengths and saves half of the fiber costs. Traditional single-fiber bidirectional (BiDi) optical module has a blind spot when it also leads to larger PTP time errors.

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專利技術名稱

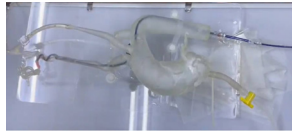
## 血管介入微創手術教學模擬裝置之影像平台及教學方法

### 3D-print vascular simulator and real-time infrared imaging system

Patent No : (R.O.C. 優先) 發明第 I797654 號

專利權人：奇美醫療財團法人奇美醫院 / Chi-Mei Medical Center

發明人：吳德昌、郭進榮、王志中、李健達、陳志成、翁瑞侑 / Te-Chang Wu, Jinn-Rung Kuo, Jhi-Joung Wang, Chien-Feng Li, Zhih-Cherng Chen, Jui-yu Weng



#### 專利技術介紹：

本團隊利用 3D 列印及三維影像血管資料庫，建立了不同難易程度且能反覆在血管攝影機下操作的“擬真”全身性血管模具，以做為初學者熟悉神經血管介入手術的訓練平台。這二年來更進一步利用 3D 列印材料選擇、機械工程和光學影像技術來建立一個完整的血管模具操作平台，目前已達成以下二個具體目標：

- (1) 使用軟性材質列印顱內血管模具，提供類似血管的彈性及柔軟度的中空血管模具。另可延伸結合顱外血管模具（頸動脈、主動脈、股動脈），提供完整的神經血管介入手術體驗。
- (2) 紅外線操作平台：利用紅外線光源及攝影機的即時導管介入影像，可模擬 x-ray 情境下的血管攝影影像，讓血管導引訓練可以在無輻射的環境下進行。平台設計為可移動式，可在任何場域做訓練與教學，不需局限在血管攝影室內。

#### Patented technology introduction:

Using 3D printing technology and the 3D vascular database, we had fabricated patient-specific extracranial and intracranial vascular simulators with different vascular tortuosity. A continuous pulsatile pump was also incorporated into the vascular simulator. It could provide an efficient platform for neurovascular intervention training and pre-operation simulation while dealing with challenging vascular lesions.

To diminish the radiation dose while training procedures, a real-time infrared imaging system with rotatory C-arm could be applied for imaging guidance instead of the traditional fluoroscope in the angio-suite. With infrared imaging system, the heavy protective apron is no longer necessary for the participants. The simulation procedure could be held in a meeting room and no longer confined to the angio-room. The infrared imaging system could be a practical demonstration platform for endovascular devices manufacturers.

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專利技術名稱

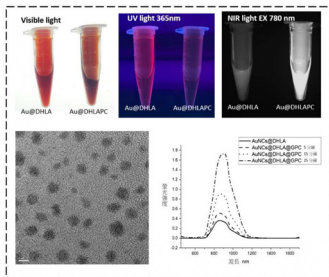
# 近紅外二區螢光複合材及其製備方法與用途

## NEAR-INFRARED-II FLUORESCENT COMPOSITE, ITS PREPARATION METHOD AND USES THEREOF

Patent No.: (R.O.C. 優先) 中華民國發明專利第 I810117 號

專利權人：中原大學 / CHUNG YUAN CHRISTIAN UNIVERSITY

發明人：林政鞍、孫翊堂、陳民樺 / CHENG-AN LIN、YI-TANG SUN、MIN-HUA CHEN

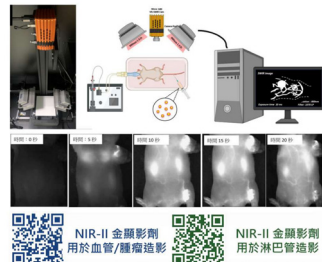


### 專利技術介紹：

前哨淋巴結是癌症轉移的前哨站，由於前哨淋巴結位於皮下深處，搭配放射性同位素與藍色顯影劑是常見前哨淋巴結的定位與活檢策略，本專利技術提出一種非輻射螢光金奈米團簇顯影劑，控制金奈米團簇落於 2 奈米之量子侷限尺度並應發出高亮度近紅外光，光譜涵蓋 800-1200nm，表面修飾天然甘油磷酸膽鹼與高生物相容性的聚乙二醇高分子，再透過近紅外二區錮鎢相機（五鈴光學 / 產學合作）可取的深層血管與淋巴管即時造影影像，金顯影劑亦可進入腫瘤微環境進行造影，本專利技術近紅外二區螢光顯影劑不僅可提供更清晰的深度造影，更可直接應用於現有臨床螢光造影的醫療儀器上，未來更有機會應用於臨床手術術中組織定位、前哨淋巴結活檢與腫瘤切除等生醫應用，極具臨床醫用應用的潛力。

### Patented technology introduction:

The sentinel lymph node serves as a primary site for cancer metastasis. Due to its location deep within the subcutaneous layer, traditional localization and biopsy methods for sentinel lymph nodes often rely on radioactive isotopes and blue dyes. This patented technology introduces a non-radioactive fluorescent gold nanocluster contrast agent, with nanoclusters precisely engineered to approximately two nanometers, falling within the quantum confinement scale, to emit high-intensity near-infrared (NIR) light in the 800–1200 nm range. The nanocluster surfaces are modified with natural glycerophosphorylcholine and highly biocompatible polyethylene glycol polymers, ensuring compatibility with biological environments. By employing a near-infrared II (NIR-II) InGaAs camera (developed by ISUZU OPTICS), this technology enables real-time imaging of deep-seated blood vessels and lymphatic structures. Additionally, the NIR-II fluorescent gold contrast agent can penetrate the tumor microenvironment, enhancing imaging resolution in these regions. This NIR-II fluorescent contrast agent provides clearer deep-tissue imaging and can be easily integrated into existing clinical fluorescence imaging equipment. It holds considerable promise for applications in intraoperative tissue localization, sentinel lymph node biopsy, and tumor resection, underscoring its significant potential in biomedical and clinical settings.



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專利技術名稱

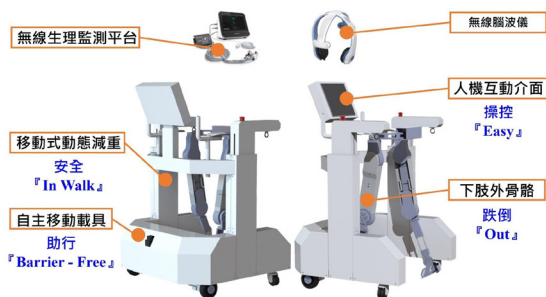
## 移動式多功能智能步態訓練機

Mobile Multi-Functional Intelligent Gait Training Machine

Patent No : (R.O.C. 優先 ) 發明第 1836688 號

專利權人：國立中興大學、高雄醫學大學 / National Chung Hsing University, Kaohsiung Medical University

發明人：李聯旺、陳嘉忻 / Lee Lian-Wang, Chen Chia-Hsin



### 專利技術介紹：

本技術結合動態減重步態訓練系統、下肢外骨骼、即時生理監測與腦機介面，為中風患者提供有效且全面的復健方案，以解決因腦損傷導致的步態控制能力下降問題。該系統具備強度可調、外骨骼輔助、移動式動態減重、人機協同及生理參數即時監測功能，能夠靈活適應不同患者的需求。即時生理監測可以確保訓練過程的安全性，動態減重功能則有效減輕患者負擔，提升復健的舒適性與效果。這項技術的創新之處在於結合腦機介面，使患者能更主動參與復健，促進腦神經功能重塑，加速肢體功能恢復，有助於提升患者心肺功能與整體訓練效果，進而減輕患者的家庭與社會負擔。

### Patented technology introduction:

This technology integrates a dynamic body weight support gait training system, lower limb exoskeleton, real-time physiological monitoring, and a brain-computer interface to provide effective rehabilitation solutions for stroke patients. It addresses the decline in gait control ability caused by brain injuries. Compared to traditional bulky equipment, this system features adjustable intensity, exoskeleton assistance, mobile dynamic body weight support, human-machine collaboration, and physiological monitoring functions. These features allow it to adapt flexibly to patient needs and enhance training effectiveness. This innovative technology helps improve patients' cardiopulmonary function, promotes neural remodeling in the brain, accelerates limb recovery, and increases patient engagement, significantly reducing the burden on families and society.

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專利技術名稱

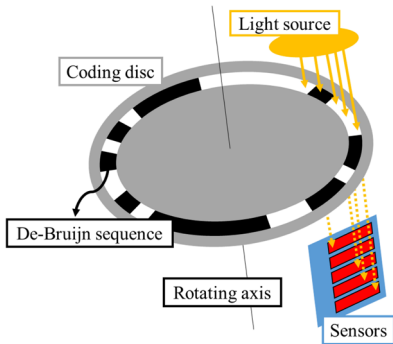
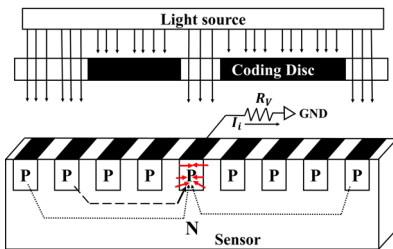
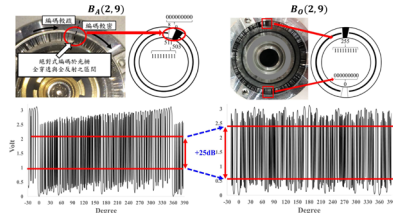
## 旋轉式碼盤及其設計方法

Rotary code disk and method for designing the same

Patent No : (R.O.C. 優先 ) 中華民國發明專利第 I722886 號

專利權人：國立陽明交通大學 / National Yang Ming Chiao Tung University

發明人：歐陽盟、王廷峰、顏永哲、廖俊傑 / OU-YANG, MANG / WANG, TING-FENG / YAN, YUNG-JHE / LIAO, CHUN-CHIEH



### 專利技術介紹：

對於高精度絕對式光學旋轉編碼器，當碼盤半徑固定時，越高的解析度代表更高密度的感測器陣列，使光電流餘暈雜訊加劇影響編碼器準確率。絕對編碼使用的是連續環形德布魯因數列，不同數列將造成不同程度餘暈雜訊，進而影響編碼準確率。以 9 位元絕對編碼為例，其數列解存在約 1075 個，如何從大量的數列解中，找出能降低餘暈雜訊影響的數列，進而提升編碼讀取正確率是鮮少有人探討的問題。因此本專利提供一種快速且有效的篩選方法，能夠找出較佳的德布魯因數列用於環形絕對編碼。在不改變硬體架構、軟體演算法、感測器設計與製程的情況下，僅透過改變編碼，就能有效提升編碼準確率。與傳統 M-Code 比較，位元錯誤率由 262.76ppm 減至 0.82ppm，有效提升 25dB 的訊雜比。

### Patented technology introduction:

High-precision absolute rotary optical encoders use a high-density sensor array, which leads to significant photocurrent blooming noise, reducing the encoder accuracy. Absolute encoding in rotary encoders is based on a type of De-Brujin sequence, with different sequences producing varying levels of photocurrent blooming noise that affect encoder accuracy. For a 9-bit absolute encoder, there is an impressive total of 1075 possible sequences. Finding sequences from the vast number of possibilities that can reduce the impact of the blooming noise, thereby improving encoder accuracy, is a topic that has rarely been explored. This patent provides a quick and effective method for identifying optimal De-Brujin sequences for rotary absolute encoding. The encoders can enhance accuracy by applying these sequences without changing the hardware, software, sensor design, or sensor fabrication process. Experiments showed that by using the encoding provided by this patent, the bit error rate of the encoder was reduced from 262.76 ppm to 0.82 ppm. This approach effectively improved the signal-to-noise ratio by 25 dB compared to an encoder using traditional M-Code.

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專利技術名稱

## 智能飲品調製設備

Smart beverage preparation equipment

Patent No.: (R.O.C. 優先) TW I842581

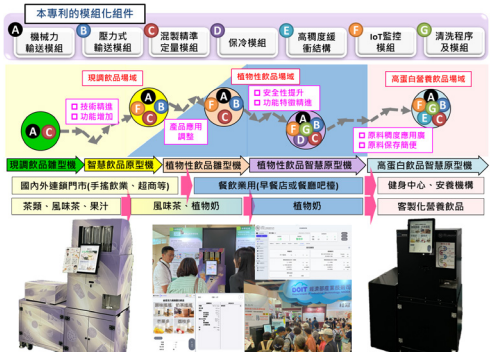
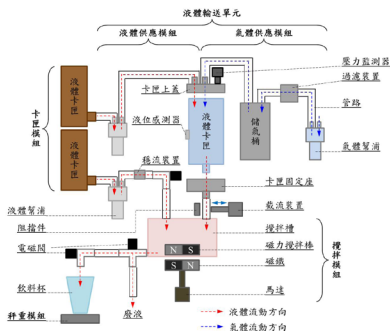
專利權人：財團法人食品工業發展研究所 / Food Industry Research and Development Institute

發明人：侯佳延、劉峰齊 / HOU, JIA-YAN、LIU, FENG-CHI



## 專利技術介紹：

本專利為一種可自動調製飲品的設備，整合氣壓與機械力之複合式原料輸送技術，透過幫浦進行物料之補充，使用氣壓進行定量充填，搭配非接觸式截流裝置，以降低作動時機械結構接觸之風險，內建混製機構，可快速且均勻的混製飲品，並導入重量監測技術控制充填至飲料杯內的飲料量。智能飲品調製設備能依使用端的需求進行模組化之擴充組裝，且透過 IoT 之整合，可即時進行設備資訊更新、監控和運算分析。另，可依消費者需求自動調製適合飲品配比，亦可兼顧個人營養，達到操作與調製程序標準化、定量充填精準化和營養調配智能化。



## Patented technology introduction:

This patent is an equipment that can automatically prepare beverages. It integrates pneumatic and mechanical liquid conveying technology. It replenishes materials through a pump, uses air pressure for quantitative filling, and is equipped with a non-contact cut-off device to reduce the risk of mechanical structure contact during operation. It has a built-in mixing mechanism that can mix beverage quickly and evenly. It also has weight monitoring technology to control the amount of beverage filled into the drink cup. Smart beverage preparation equipment can expand the module according to the needs of the user, and through the integration of IoT, equipment information can be updated, monitored and analyzed in real time. In addition, it can intelligently prepare suitable beverage proportions and personal nutrition according to consumer needs, achieving standardization of operation and preparation procedures, precise quantitative filling, and intelligent nutrition preparation.

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專利技術名稱

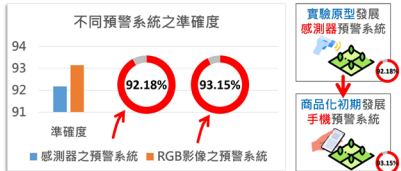
## 預測水稻用水需求的系統及方法

### SYSTEM AND METHOD FOR FORECASTING WATER DEMAND OF RICE

Patent No : (R.O.C. 優先 ) I821719

專利權人：國立中興大學 / NATIONAL CHUNG HSING UNIVERSITY

發明人：朱彥煒、詹永寬、賀端華、余淑美、羅舜芳、梁育臺、陳俊傑、簡靖軒 / CHU, YEN-WEI, CHAN, YUNG-KUAN, HO, TUAN-HUA, YU, SU-MAY, LO, SHUEN-FANG, LIANG, YU-TAI, CHEN, CHUNCHIEH, CHIEN, CHING-HSUAN



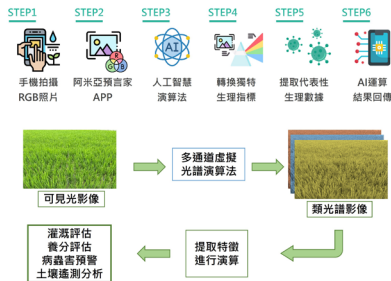
#### 專利技術介紹：

本發明結合感測器偵測水稻葉溫、株高及葉綠素含量，開發出智慧灌溉預警系統。與傳統依賴環境感測器不同，本系統直接監測水稻的生理狀態，並考慮方便性、成本效益與性別友善性，基於此技術開發出智慧手機拍攝作物影像即可進行預測，轉換為類光譜作物生理訊號進行預測，於實際場域驗證系統準確度達 93-96%。該技術可提供即時灌溉建議，提高水資源利用效率，減少甲烷排放，降低農業碳足跡。每公頃可節省水約 7,000 噸，若擴展至全台 22 萬公頃稻田，可節省約 15.4 億噸的用水，節水量相當於 4.16 座翡翠水庫，約為全台半年生活用水。此系統在水稻及其他作物管理中應用廣泛，並推動農業可持續發展，已在國內成功應用並擴展至印尼等東南亞國家。



#### Patented technology introduction:

The invention combines sensors to monitor rice leaf temperature, plant height, and chlorophyll, creating a smart irrigation warning system. Unlike traditional methods relying on environmental data, it directly assesses crop physiology, is convenient, cost-effective, and gender-inclusive. Smartphone-captured crop images are converted into pseudo-spectral signals, achieving a 93-96% prediction accuracy in field tests. The system provides real-time irrigation advice, boosting water efficiency, reducing methane emissions, and lowering the agricultural carbon footprint. It saves about 7,000 tons of water per hectare; if applied to Taiwan's 220,000 hectares of rice paddies, it would save 1.54 billion tons—equal to 4.16 Feitsui Reservoirs or half of Taiwan's annual household water use. Widely applicable to the management of rice and other crops, the system supports sustainable agriculture and has been successfully implemented in Taiwan and extended to Indonesia.



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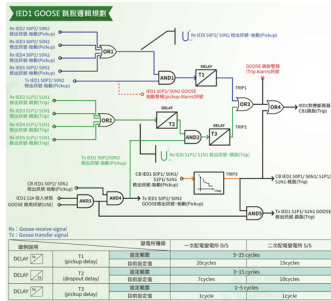


專利技術名稱

# 導入 GOOSE 應用策略的保護邏輯規劃及供電系統

## PROTECTION LOGIC PLANNING BASED ON GOOSE APPLICATION STRATEGY AND POWER SUPPLY SYSTEM

Patent No. : (R.O.C. 優先 ) 中華民國專利號 I838902 (2024, April 11)  
專利權人：台灣電力股份有限公司 / Taiwan Power Company  
發明人：洪永輝、吳立成、蔡隆田、陳炯彰、周瑞年、劉哲良、陳仁忠、吳維山、彭怡雯 /  
HONG, YOUNG-HUEI, WU, LEE-CHENG, TSAI, LUNG-TIEN, CHEN, JIONG-ZHANG, CHOU,  
JUI-NIEN, LIU, CHEH-LIANG, CHEN, JEN-CHUNG, WU, WEI-SHAN, PENG, YI -WEN

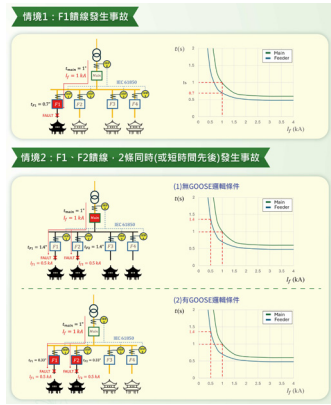


### 專利技術介紹：

配電級保護系統多為放射狀網絡，當兩條或兩條以上饋線同時（或短時間內先後）發生事故，會破壞原本的保護協調性，導致主斷路器提前跳脫，造成其他非故障配電饋線也全部停電。

變電所智慧化過程中，IEC 61850 通訊標準可讓不同廠家的智慧型電子裝置 (IED) 實現互操作，使訊息傳送更自由及彈性。其中，IEC 61850 的 GOOSE 透過光纖快速傳輸 IED 相關資訊，有效節省 IED 所需的輸入 / 輸出 (I/O) 點，並減少現場實體線配置，達到更快速、穩定的保護。

本發明專利導入 GOOSE 應用策略的保護邏輯，可以將兩條或兩條以上故障饋線加速跳脫，以確保該協調性正常運作，並已運用於台電的供電系統中。



### Patented technology introduction:

The distribution level protection systems are mostly radial networks. When faults occur simultaneously (or within a short interval) on two or more feeders, the original coordination breaks down. It results in premature tripping of the main circuit breaker and a power outage that can affect other feeders without faults.

In the process of substation intelligence, interoperability among Intelligent Electronic Devices (IEDs) from different manufacturers and protocols is enabled by IEC 61850, which enhances flexibility in message transmission. Furthermore, the Generic Object Oriented Substation Event (GOOSE) protocol in IEC61850 rapidly transmits IED status through optical fiber, reducing the number of required I/O points for IEDs and minimizes site hard wiring. It thereby achieves faster and more reliable protection.

This patent discloses a protection logic based on a GOOSE application strategy, ensuring the correct coordination when two or more feeders have faults and trip previously before the upstream circuit breaker. This approach has been successfully implemented and demonstrated in the power supply system in Taiwan.

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專利技術名稱

## CLEANING DEVICE OF AIR SUCTION TYPE SENSOR

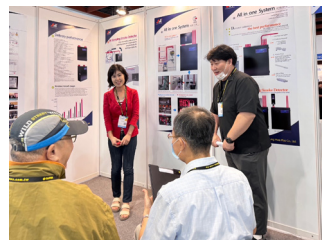
Patent No : 10-2023-0027141

Patentee : SUNGWHA PLUS

Inventor's Name : SHIN HYUNHO

### Patented technology introduction:

The Sunghwa Plus Co., Ltd. has been awarded the Platinum Prize at the Taiwan Inno-Tech Expo for its air-suction smoke detector equipped with an automatic maintenance system (All-in-One) which has received high acclaim. The air-suction smoke detector is an advanced detection system that continuously intakes air to detect microscopic particles, enabling early fire detection. Its fine particle analysis capabilities allow it to detect fires at an early stage. However, it also has limitations, as it can be triggered by other environmental factors such as humidity or smoke. Sunghwa Plus's self-developed automatic maintenance system addresses these issues effectively. When air is drawn into the detector, a cyclone hopper dust collector filters fine dust particles and discharges them downwards. A water trap removes any water that may have formed from humidity or condensation. The system also vacuums impurities and hardened substances from pipe holes in real-time, functioning similarly to a vacuum cleaner's dust disposal system. With dual filtration, the risk of false alarms is minimized, according to Sunghwa Plus. Notably, Sunghwa Plus has independent subsidiaries in Indonesia and Vietnam, and this award from the Taiwan Inno-Tech Expo is expected to strengthen its export efforts. The company aims to promote its air-suction smoke detectors globally.



### SUNGWHA PLUS

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專利技術名稱

## One-piece polarizing interferometer and snapshot spectro-polarimetry applying the same

Patent No : 10-1812608

Patentee : Jeonbuk National University Industrial Cooperation Foundation

Inventor's Name : Daesuk Kim



### Patented technology introduction:

Snapshot-type high-speed spectroscopic polarization information analysis device used for semiconductor inspection, etc.

Existing technology uses mechanical rotating mechanisms or electrical modulation devices and has precise measurement capabilities, but the measurement speed is slow, measured in seconds. Existing snapshot technology is vulnerable to disturbances and difficult to implement due to the limitations of spectral and resolution when obtaining the Stokes vector through complex spectra.

By utilizing an integrated polarization interferometer, multi-wavelength information can be measured with high precision and high speed using only interference spectral information acquired at one time. When applied to semiconductor process lines, the entire thin film patterning non-uniformity can be measured within 1 hour through line scanning rather than point measurement.

Technology Readiness level is TRL 4: Working Model Development.

Thin film process fields such as semiconductors, displays, solar cells, and secondary batteries.

Spectroscopic ellipsometers provide more precise measurements and a larger range of applications than conventional single-wavelength ellipsometers. Spectroscopic ellipsometers are predicted to become more widely used in a number of industries, including semiconductors, photovoltaics, and biomaterials, as the technology advances and costs come down.

This is a technology that can quickly detect the uniformity or micro-defects of nano-patterns or nano-films during semiconductor inspection.

### Jeonbuk National University Industrial Cooperation Foundation

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# 2023 鉑金獎

Platinum Awards



專利技術名稱

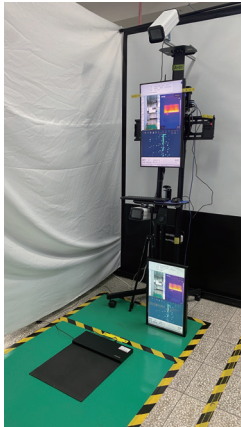
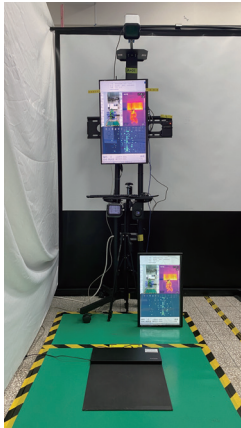
## 人因參數量測系統

### Human parameters measurement system

Patent No : (R.O.C. 優先 ) M644082

專利權人：正修學校財團法人正修科技大學 / CHENG SHIU UNIVERSITY

發明人：張法憲、蘇上祺、陳政方、盧冠群、謝尚祐、顏敬哲 / CHANG, FA-SHIAN / SU, SHANG-CHI / CHEN, CHENG-FANG / LU, GUAN-QUN / XIE, SHANG-YOU / YAN, JING-ZHE



#### 專利技術介紹：

人因參數量測系統的組成包含一機台、一伺服器、一影像識別模組、一熱顯像偵測儀、一足壓偵測儀、一生理偵測儀及複數自我檢測螢幕。伺服器結合機台上連接影像識別模組、熱顯像偵測儀、足壓偵測儀、生理偵測儀及自我檢測螢幕，整合設備可以檢測數據並進行身分識別、數據分析及資料庫建置，透過自我檢測螢幕播放即時檢測影像及數據。本系統作為一數位教練或數位教官使用，以高效率的獲得軍人、警員、消防員、運動員等各種專業項目人員或團體的訓練數據、生理數據、動作數據及姿態數據，讓每個人員皆可清楚的了解自己在訓練、生理、動作及姿態上的缺失及問題，並能夠快速的進行改正或調整裝備，使每個人員皆能夠以最佳的狀態來進行各項任務。

#### Patented technology introduction:

The composition of the human factors parameter measurement system includes a machine, a server, an image recognition module, a thermal imaging detector, a foot pressure sensor, a physiological sensor, and multiple self-monitoring screens. The server is integrated with the machine and connected to the image recognition module, thermal imaging detector, foot pressure sensor, physiological sensor, and self-monitor.

This integrated equipment is capable of data collection, identity recognition, data analysis, and database establishment, and it can display real-time monitoring images and data on the self-monitoring screens.

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專利技術名稱

## 用於執行全內反射散射量測的裝置與方法

### DEVICE AND METHOD FOR PERFORMING TOTAL INTERNAL REFLECTION SCATTERING MEASUREMENTS

Patent No.: (R.O.C. 優先) 中華民國發明專利第 1798041 號

專利權人：中原大學 / Chung Yuan Christian University

發明人：林政鞍、侯姿吟、李祐璋、蔡育秀、王明誠 / Cheng-An Lin / Tzu-Yin Hou / You-Wei Li /  
Yuh-Show Tsai / Ming-Cheng Wang

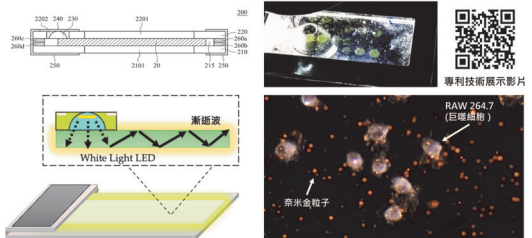
#### 專利技術介紹：

微奈米生醫檢測須在微米尺度下提供單一奈米粒子解析，可作為生醫外泌體檢測、病毒感測、癌細胞與奈米載體交互作用提供最直接的光學檢測資訊。暗視野顯微技術是目前可提供觀測奈米世界的重要工具，本研究團隊創新研發之寬場暗視野全內反射光學模組專利技術，突破傳統暗視野技術，經由改良後的邊緣光路結構，在無需聚光鏡輔助下便能提供傳統顯微鏡微奈米的觀測視野，讓奈米生醫材料可以更容易被觀測，甚至與細胞的交互作用，都能更方便被觀察與紀錄，從奈米等級影像至微米等級影像，皆能於本專利技術實現。故本專利「用於執行全內反射散射量測的裝置與方法」可將光學模組整合至各種顯微鏡上，升級成為微奈米生醫顯微鏡，更可應用於奈米生物晶片檢測，有機會成為未來臨床檢測技術新工具。

#### Patented technology introduction:

Microscale & nanoscale biomedical detection required the wide surveillance field down to single nanoparticle resolution, which can provide the comprehensive bio-information for biomedical exosome detection, virus sensing, and the interaction between cancer cells with nanocarriers etc. Dark-field microscopy is the key methodology to visualize the nanoworld.

However, complicated optical design and operating procedures limit the development of this dark-field technology. The dark-field total internal reflection optical module via edge illumination is a groundbreaking innovation compared to traditional dark-field technology. Through an innovative optical module, it completely replaces the need for a condenser lens in dark-field microscopy. Consequently, this patented technology enables the observation of various nano-biomedical materials, including targeted gold nanoparticles, clinically relevant exosomes, and even single nanometer-scale biomedical materials. Furthermore, dark-field microscopy offers the advantage of observing cells without the need for staining. This allows for the observation of living cell activities and provides clearer visualization of the internal structures compared to bright-field microscopy. In conclusion, this patent "DEVICE AND METHOD FOR PERFORMING TOTAL INTERNAL REFLECTION SCATTERING MEASUREMENTS" can adapt to all kinds of microscope to become advanced nanobio microscopy. It is potential to apply to inspection tools of nano-biochip as well as future clinical test.



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專利技術名稱

## 可換裝紗網的紗窗及其捲紗裝置

Screen window with replaceable screen and screen winding apparatus thereof

Patent No : (R.O.C. 優先 ) I708888

專利權人：良展新科技股份有限公司 / Onwell Curtain & Screen Co., Ltd.

發明人：樊秋蘭、郭勁佑 / Fan, Chiu-Lan / Kuo, Chin-Yu



### 專利技術介紹：

一種可換裝紗網的紗窗及其捲紗裝置，安裝在一窗框，且適用於捲收及拉張一紗網，包含可卸離地連接於該窗框且連接於該紗網一邊緣的一捲紗單元、滑行於該窗框間的一拉張單元，及連接於該紗網的另一邊緣的一組合單元。該拉張單元界定有一收納槽。該組合單元在一安裝模態與一換裝模態間變化，在安裝模態時，該組合單元被收納在該拉張單元的收納槽內，且與該拉張單元形成連動，並用於拉張該紗網，在該換裝模態時，該組合單元脫離該拉張單元。藉此，使連接該紗網的捲紗單元與組合單元形成一個獨立且能夠分離的模組，進而提升換裝紗網時的方便性與簡易性。

### Patented technology introduction:

Disclosed are a screen window with a replaceable screen and a screen winding apparatus thereof. The screen window is mounted on a window frame and is suitable for winding and tensioning a screen. The screen window includes a screen winding unit detachably connected to the window frame and connected to one edge of the screen, a tensioning unit sliding between the window frames and a combination unit connected to the other edge of the screen. The tensioning unit defines a storage groove. The combination unit is changed between a mounting state and a replacing state. When the combination unit being in the mounting state, the combination unit is stored in the storage groove of the tensioning unit, is linked with the tensioning unit and is used for tensioning the screen. When the combination unit being in the replacing state, the combination unit is separated from the tensioning unit. Therefore, the screen winding unit connected with the screen forms an independent and separable module together with the combination unit, and furthermore, the convenience and simplicity when the screen is replaced are improved.

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專利技術名稱

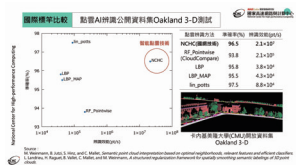
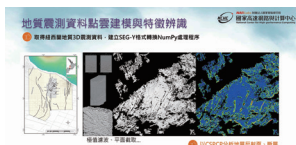
# 校正異常點雲資料之方法

METHOD FOR CORRECTING ABNORMAL POINT CLOUD

Patent No.: (R.O.C. 優先) 發明第 802827 號

專利權人: 財團法人國家實驗研究院 / NATIONAL APPLIED RESEARCH LABORATORIES

發明人: 王志維、賴傳霖、郭嘉真、吳毅成 / WANG, CHIH WEI / LAI, CHUAN LIN / KUO, CHIA CHEN / WU, I CHEN



## 專利技術介紹:

光達等掃描器能取得精準空間資訊，結合相機以獲得彩色點雲。但光達與相機間會有對位誤差或不同時等問題，拼接多個掃描時還可能遇到光照差異，常使點雲出現難以人工修復的錯誤色彩對應或明顯拼接痕跡。本專利結合點雲辨識分割、局部掃描分析、色彩空間分割、顏色迴歸等模組，針對點雲錯誤色彩問題，以機器學習達成自動辨識分類、異常顏色偵測及顏色校正，相比人工修復時間由 6 個月縮減為 1 個月。其中，點雲辨識分割模組於點雲 AI 辨識公開資料集 Oakland 3-D 測試，準確率超過 95% 達國際頂尖水準，其輕量化的特徵設計，辨識速率與各一流演算法相比有 100 倍的提升。本專利於 2021 年獲 R&D 100 Awards、2023 年獲 TIE 鉅金獎，可廣泛應用於建築、自動駕駛、3D 地質、文物、生醫顱顏與足部建模等。

## Patented technology introduction:

Lidar technology captures precise spatial data, combined with RGB cameras which captures color data. However, challenges such as registration deviation, sensor asynchrony, and illumination disparities can introduce color defects to the point cloud.

This patent presents an innovative approach that leverages point cloud semantic segmentation, local scanning analysis, color quantization, and regression modules. These modules enable automatic recognition, classification, color defect detection, and correction through machine learning techniques. This process significantly reduces the restoration time from six months to just one.

The point cloud semantic segmentation module stands out with an impressive overall accuracy exceeding 95%. This accuracy was benchmarked against the Oakland 3-D Point Cloud Dataset and operates at speeds over a hundred times faster than existing top-notch algorithms. This patent has advantages that can be widely applied in fields such as architecture, autonomous driving, 3D geology, cultural heritage, craniofacial and podiatric modeling, and more.

## 財團法人國家實驗研究院國家高速網路與計算中心 / National Center for High-performance Computing, NARLabs

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專利技術名稱

# 根據路面摩擦特性的煞車控制方法

## BRAKING CONTROL METHOD ACCORDING TO FRICTION OF ROAD SURFACE

Patent No.: (R.O.C. 優先) I718672

專利權人：財團法人車輛研究測試中心 / Automotive Research &amp; Testing Center

發明人：林信全、魏嘉樂 / Hsin-Chuan Lin, Jia-Le Wei



### 專利技術介紹：

防鎖死煞車系統 (Anti-lock Braking System, ABS)，使車輪滾動並提供最大減速、維持轉向可控性，提升車輛煞車穩定性，具備本專利技術之國產化 ABS 性能媲美世界大廠。

#### ● 精準車速估測技術

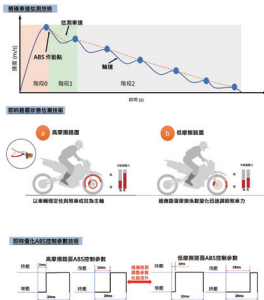
ABS 需要精準的車速計算、控制車輪打滑程度，本專利由輪速精準估測車速，甚至可提供給車身動態穩定系統與自駕車電控煞車系統進行煞車控制。

#### ● 即時路面狀態估測技術

使 ABS 根據路面狀態快速反應，在行經乾燥路面與潮濕路面變換的路面都能加速反應，提高煞車反應能力。

#### ● 即時優化調整 ABS 控制參數技術

根據上述估測結果，ABS 微調煞車壓力的變化幅度，讓 ABS 在濕滑路面以車輛煞車穩定性略高最大減速成效為優先；在乾燥路面則考量車輛煞車穩定性與減速成效，藉以提高在各路面之煞車效率與車輛穩定性。



### Patented technology introduction:

Commercially available vehicles cannot directly measure the vehicle speed but only estimate from the wheel speed, which is required for the ABS control when a vehicle brakes in an emergency. Therefore, this patent provides a method that can accurately estimate the vehicle speed to calculate the wheel slip and control the degree of wheel slip.

This patent includes road friction coefficient estimation technology, which can provide the current road friction coefficient to the vehicle computer and electronically controlled braking system. It allows the electronically controlled braking control system to make immediate responses based on current road conditions, such as allowing ABS to quickly respond to various road surfaces.

A method for real-time optimization and adjustment of ABS control parameters is also included in this patent by the combination of the above-mentioned accurate vehicle speed estimation technology and real-time road friction coefficient estimation technology. It allows the ABS to finely adjust the braking pressure and braking force of each wheel through varying the parameters. That technology improves braking efficiency and vehicle stability on various road surfaces.



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專利技術名稱

# 處理廢水中污染物離子的流體化床均質結晶方法及其設備

Fluidized bed homogeneous crystallization method and equipment for treating pollutant ions in wastewater

Patent No.: (R.O.C. 優先) 專利申請案號: 111137701 號

專利權人: 國立中興大學 / National Chung Hsing University

發明人: 盧明俊 / LU, MING-CHUN

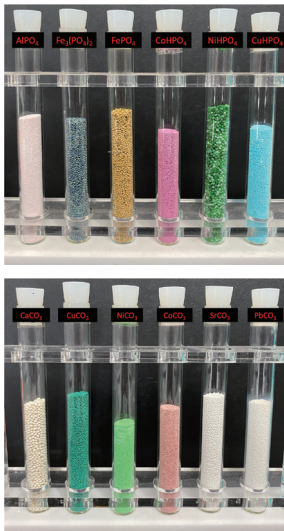


## 專利技術介紹:

本程序適於水中金屬及非金屬離子回收，本發明之創新處除均質結晶外，另有晶種迴流及處理水再提升功能，因此整體處理回收程序無污泥產生，回收率近 100%，同時由於結晶槽所流出之處理廢水再提昇，因此，處理水品質可達回收再利用之標準，達到零排放之目的。本發明所獲得結晶物純度高於 99.5 % 以上，可回收做為原料出售，沒有處理後續有害廢棄污泥之問題。即使不回收當做廢棄物處理，也因為含水量低 (<5%)，相對於傳統沉澱法所獲得之污泥，即使是在壓濾脫水後，含水量仍達 70 % 左右，所以處理費只有原來的三分之一，節省鉅額污泥處理費。同樣的優點也會出現在含陰離子 (例如磷酸根、硫酸根、草酸根、硫離子、鉍離子及氟離子等等) 廢水處理上。

## Patented technology introduction:

This process is suitable for the recovery of metal and non-metal ions in water. In addition to homogeneous crystallization, the innovation of this invention also has the functions of reflux and treated water upgrading. Therefore, the overall treatment and recovery process does not produce sludge, and the recovery ratio is nearly 100%. At the same time, because the treated wastewater flowing out of the crystallization tank is further improved, the quality of the treated water can meet the standards for recycling and reuse, achieving the purpose of zero discharge. The purity of the crystals obtained by the present invention is higher than 99.5%, can be recycled and sold as raw materials. It is unnecessary to have the subsequent treatment of harmful waste sludge. Even if it is not recycled and treated as waste, the treatment fee for the crystals is only one-third for the sludge, saving huge sludge treatment fees.



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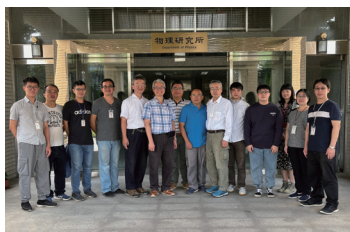
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## 綠色環保除溼輪製作方法

發明人：楊昇府、王多美、徐啟振、李恆毅 / Sheng-Fu Yang / To-Mei Wang / Chi-Tzeng Hsu / Heng-Yi Li



本專利技術開發綠色製程自煉鋁產業廢棄物提取鋁元素，製作成氫氧化鋁原料，輔以電漿精煉生產活性氧化鋁及氧化鋁，減少礦物開採，增加材料生命週期，落實循環經濟及節能減碳。循環再生氫氧化鋁、活性氧化鋁及氧化鋁純度  $\geq 99.9\%$ ，除了可以直接販售外，並可依用途以專利技術進行加工，製作成節能吸附材料、環保除溼輪和蓄熱元件，綠色環保除溼輪系統整合乾燥除黑潔淨設備已經驗證可行，目前正在開發揮發性有機物吸附濃縮處理系統，有望可應用於空汙防制領域。此技術解決事業廢棄物處理難題，產業及人民皆有感，材料及其衍生性產品、設備和系統販售，降低成本，再創新商機。

The patent technology develops a process for extracting aluminum elements from waste in the aluminum industry, producing aluminum hydroxide, complemented by plasma refining to produce activated alumina or alumina. It reduces mineral extraction, extends material life cycles, and implements a circular economy and energy conservation to reduce carbon emissions. The purity of recycled products exceed 99.9%. They can not only be directly sold but also be processed for specific applications using patented technology to create energy-efficient adsorbents, eco-friendly dehumidification wheels, and heat storage components. The integrated green and eco-friendly dehumidification wheel system has been proven feasible in clean equipment. Currently, a volatile organic compound adsorption and desorption concentration treatment system is under development, with potential applications in the field of air pollution control. This technology addresses the challenge of industrial waste treatment, benefiting both industries and the public. Materials and their derivative products, equipment, and systems are available for sale, reducing costs and creating new business opportunities.

## 綠色環保除濕輪製作方法

### Method of Fabricating Green Desiccant Wheel

中國發明專利第 1675812 號

**技術摘要**

一種以聚碳酸酯(100份/分)氯化聚乙烯、氯化聚丙烯及氯化環氧樹脂等(共重>99.9%)、綠化材料為原料，配以多種化學反應，經 設備等製成。

綠化材料製成環保型除濕輪原料      氯化聚乙烯及氯化環氧樹脂原料

原料與製品製成型除濕輪(厚度20mm)吸水(吸附能力22 g/g(結晶) 建立本土化自製能力(重95.02分厚度40公分) 進行性能測試及環境試驗。

除濕輪材料製成環保型除濕輪      美國專家及意大利專家指導加工      環保化除濕輪除濕輪元件

原料及製品製成型除濕輪(厚度20mm)吸水(吸附能力22 g/g(結晶) 建立本土化自製能力(重95.02分厚度40公分) 進行性能測試及環境試驗。

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Fax : +886-3-4711408





專利技術名稱

## 管線內部清潔機器人 IN-TUBE CLEANING ROBOT

Patent No : (R.O.C. 優先 ) I805920

專利權人：正修學校財團法人正修科技大學 / CHENG SHIU UNIVERSITY

發明人：張法憲、許仕 / Fa-Shian Chang / Shi Xu

### 專利技術介紹：

本發明係為一種管線內部清潔機器人，其組成包括一載具本體與一偵查清潔模組。在偵查清潔模組中有一個鏡頭與感測器的偵查裝置與裝置有管線所需要的清潔裝置。本發明可以在水平管線或垂直管線中運行。前述載具本體皆可預先搭載前述偵查裝置以進行管線之檢測，尋找需進行加強清潔之位置並記錄其坐標位置。操作人員可以依照任務需要更換為清潔裝置，利用該清潔裝置之即時影像監控定位清潔功能與創新之旋轉刷毛裝置以進行管線特定位置之清潔操作，達到精準定位清潔之目的。此外，具備可變升降調整運動機構、多功能工具模組化設計，適應不同管徑應用，具備提升工作效能、確保品質安全、高安全性、高精確性與低成本之工程方法，提升工程技術與品質。



### Patented technology introduction:

This invention is for an internal pipeline cleaning robot, consisting of a vehicle body and an inspection-cleaning module. Within the inspection-cleaning module, there is a detection device with a camera and sensors, as well as a cleaning apparatus designed for pipeline cleaning. This invention can operate in both horizontal and vertical pipelines.

Furthermore, it features an adjustable lifting and lowering motion mechanism, a modular design for multifunctional tools, and adaptability to various pipeline diameters. It possesses an engineering approach that enhances work efficiency, ensures quality and safety, offers high security, high precision, and low-cost options, ultimately advancing engineering technology and quality.

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專利技術名稱

## 彈性導電纖維的製備方法及彈性導電纖維

### Method of Preparing Flexible Conductive Fibers and Flexible Conductive Fibers

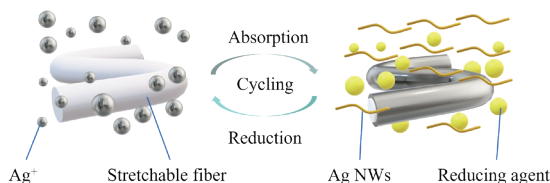
Patent No.: (R.O.C. 優先) I878871

專利權人：南臺學校財團法人南臺科技大學 / Southern Taiwan University of Science and Technology

發明人：周盈年、洪聯強 / Chou Ying-Nien / Hung Lien-Chung

#### 專利技術介紹：

穿戴電子設備是快速興起的研究領域，適用於各種應用，如個人化的健康監測、軟體機器人和人體運動檢測。本技術開發可應用在纖維應變傳感器的材料，使用非電鍍化學鍍層將金屬奈米顆粒沉積在表面，可應用於複雜的基材和幾何形狀。銀奈米線是受到廣泛關注的一維銀奈米結構材料，具有優異的光電性能、熱性能和機械性能。不僅具有一維材料的特性，還擁有高電導率（6.39 S/m）和優異的熱導率（429 W/(m·K)）。以原位聚合改質方法，包覆銀奈米線並固定在導電層中，以新型可拉伸和導電的銀奈米粒子 / 聚氨酯 (Ag NPs/PU) 並提出 Ag NPs/PU 的可逆導電性機制，具有的低初始電阻、寬廣的應變傳感範圍、高靈敏度、並且對重複拉伸具有高穩定性（1000 次的循環），可有效應用在各種紡織品。



#### Patented technology introduction:

Wearable electronic devices are a rapidly emerging research field with various applications, such as personalized health monitoring, soft robotics, and human motion detection. This technique develops a material for fiber strain sensors, using electroless chemical plating to deposit metal nanoparticles on the surface, which can be applied to complex substrates and geometries. Silver nanowires are a one-dimensional silver nanostructure material with excellent optoelectronic, thermal, and mechanical properties. They have not only the characteristics of one-dimensional materials, but also high conductivity (6.39 S/m) and excellent thermal conductivity (429 W/(m·K)). By using an in situ polymerization modification method, the silver nanowires are coated and fixed in the conductive layer. With a novel stretchable and conductive silver nanoparticle/polyurethane (Ag NPs/PU) and a reversible conductivity mechanism of Ag NPs/PU, they have low initial resistance, wide strain sensing range, high sensitivity, and high stability for repeated stretching (1000 cycles), which can be effectively applied to various textiles.

南臺學校財團法人南臺科技大學 / Southern Taiwan University of Science and Technology

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專利技術名稱

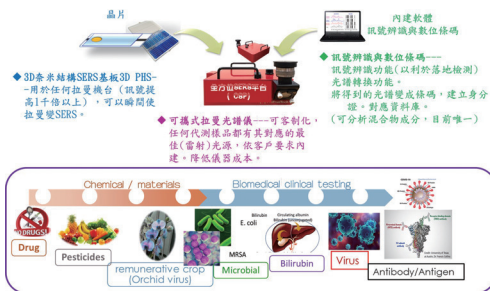
## 增強訊號之結構及其製作方法

### Signal Enhancement Structure and Manufacturing Method Thereof

Patent No.: (R.O.C. 優先) 發明第 1750718 號

專利權人：國立中興大學、佐信科技有限公司 / NATIONAL CHUNG HSING UNIVERSITY、PROTRUSTECH CO., LTD

發明人：張健忠、黃俊達 / Chien-Chung Chang / Chun-Ta Huang



#### 專利技術介紹：

團隊設計一個具有三維電漿熱點 3D-PHS 的奈米晶片。此晶片可同時增強待測物的拉曼訊號至 1000 倍以上的感度。並且具有以下優勢：(1) 無須樣品前處理、不需破壞樣品 (2) 樣品用量極少 (20ul) (3) 檢測時間極短 (< 5min)；(4) 生醫檢測無須抗體 (antibody-free)；(4) 晶片正常條件與環境可以保超過 80 天；(5) 任何拉曼光譜儀皆可使用。目前已成功應用於兩大檢測項目：農業檢測（農藥、蘭花病毒）及生醫檢測（膽紅素、癌細胞、病毒、DNA、抗體及抗原以及冠狀病毒）等。最近更完成 Covid-19 antibody /antigen 的檢測。結合與佐信科技公司共同研發之可攜式拉曼光譜儀，配合以 AI 方式建立的條碼與資料庫，結合成全方位 SERS 偵測平台 CSDP。其可以加速快篩的應用效率。儀器輕便可攜的特性可將儀器帶入實際場域，因此無須將樣品帶回實驗室即可進行檢測。

#### Patented technology introduction:

We developed a three-dimensional plasmonic hot-spot rich (3D-PHS) nanochip, which was constructed based on a random crossed-wire silver nanowire woodpile structure. The advantages of 3D-RCW are as follows: (1) No sample pretreatment and no need to destroy the sample; (2) The amount of sample used is very small (20  $\mu$ L); (3) The detection time is extremely short (< 5min); (4) Antibody-free for biomedical detection; (4) The chip can be kept for more than 80 days under normal condition and environment; (5) Not limited by hardware devices (any Raman spectrometer can be used). Furthermore, we have also developed a portable spectrometer with ProTruS Tech (PPT) company to fit CSDP and eventually, it becomes a powerful rapid screening detection system. At this stage, CSDP has been successfully applied to two items: agriculture (pesticides, orchid virus) and biomedical testing (drugs, bilirubin, bacteria, cancer cells, antibodies and antigens, and coronaviruses). Among them, pesticides have reached the farm test; bilirubin has successfully cooperated with NTU Hospital and clinical data collection. Covid-19 virus and antibody information has also been established. Such biosensing technology can be used by healthcare units for effective Point of Care Testing (POCT).

#### 國立中興大學、佐信科技有限公司 /

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Tel：+886-4-22840733 #640



專利技術名稱

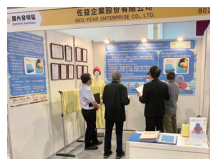
## 環保花式紗及其製作方法

### Recycled Fancy Yarn and Manufacturing Method Thereof

Patent No : (R.O.C. 優先 ) I 695100

專利權人：王彰慶 / Wang, Chang-Ching

發明人：王彰慶 / Wang, Chang-Ching

Green  
Product  
Award  
Selection  
2019

#### 專利技術介紹：

本專利「環保花式紗及其製作方法」是以「永續時尚」為理念，在環保永續的前提下，設計兼具美觀時尚與舒柔觸感的紗線原料，可廣泛應用於毛衣、帽、毛毯、圍巾等紡織品，以取代高汙染的「快時尚／一次性時尚」紡織品。本產品主要具備以下特點：

- 專利紗線結構，改良傳統紡紗方式，有效提高飾線佔比
- 立體結構設計，使織物柔軟、保暖且透氣不悶熱
- 寶特瓶回收原料，具有韌性佳、輕量、耐水、耐油特點
- 紗線呈現豐厚柔軟手感，提升紡織品立體時尚感與耐用度
- 可廣泛應用於個人、家居、戶外、嬰幼兒等紡織品
- 本紗線採用環保回收原料符合全球回收系統標準認證
- 本產品檢測通過國際紡織品最高等級安全要求
- 本設計取得德國綠色產品獎、經濟部中小企業創新研究獎等殊榮

#### Patented technology introduction:

The patent "Recycled Fancy Yarn and Manufacturing Method Thereof" is designed with the concept of "sustainable fashion," aiming to create a type of yarn material that is both aesthetically pleasing and fashionable, while offering a soft, comfortable textile, all while prioritizing environmental sustainability.

The yarn can be widely used in knitting products such as sweaters, hats, blankets, scarves, etc., to replace high-pollution "fast fashion/disposable fashion" textiles. The key features of this patent are listed below.

- Patent yarn structure, improving the traditional spinning method, effectively increasing the decorative thread ratio.
- Three-dimensional design, making the fabric soft, warm, and breathable without feeling stuffy.
- Made from recycled PET bottles, it has excellent toughness, is lightweight, and is water and oil-resistant.
- The yarn exhibits a rich, soft texture, enhancing the three-dimensional fashion and durability of textiles.
- The yarn can be widely used in personal, home-use, outdoor, baby, and toddler textiles.
- This yarn is made from recycled materials and complies with global recycling system standards (GRS).
- This product has been tested to meet the highest international textile safety requirements.
- This design has won awards such as the German Green Product Award and the Taiwan SMEs Innovation Award.

#### 佐益企業股份有限公司 / GEO-YEAR ENTERPRISE CO., LTD.

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專利技術名稱

## 雙靶向碳酸酐酶第九型複合物及造影劑

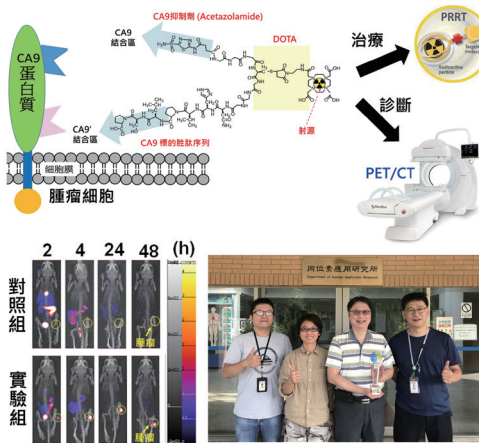
Dual-targeted carbonic anhydrase ix complex and a contrast agent thereof

Patent No.: (R.O.C. 優先) I765195

專利權人：國家原子能科技研究院 / NATIONAL ATOMIC RESEARCH INSTITUTE

發明人：官孝勳、羅彩月、廖澤蓉、彭正良、林昆諒 / Guan, Siao-Syun / Luo, Tsai-Yueh /

Liao, Tse-Zung / Peng, Cheng-Liang / Lin, Kun-Liang



### 專利技術介紹：

腫瘤缺氧是導致放射療法或化學療法效果不佳的重要因素。若醫師能正確的診斷或評估腫瘤缺氧狀態，就能執行對應的治療策略，在黃金治療時期控制患者病情惡化，亦能避免後續照護的社會成本。因此，本專利設計以腫瘤缺氧生物標記（碳酸酐酶第九型蛋白質）為標的位置的探針，並攜帶放射性核種，作為腫瘤缺氧造影診斷之核醫藥物使用，使醫師能透過影像立即辨識腫瘤缺氧情形與位置，達到精準醫學之目的。本專利改善目前腫瘤缺氧造影劑的缺點，包括提升對腫瘤缺氧的親和力與辨識力、減少肝臟吸收、不引起免疫反應，診斷效果已優於現有黃金標準藥物。

### Patented technology introduction:

Tumor hypoxia is an essential factor contributing to the ineffectiveness of radiation therapy or chemotherapy. Suppose a physician can correctly diagnose or assess the hypoxic status of a tumor. In that case, he or she can implement appropriate therapeutic strategies to control the deterioration of the patient's condition during the golden treatment period and avoid the social cost of follow-up care. Therefore, this patent design uses a tumor hypoxia biomarker (carbonic anhydrase type IX protein) as the target location of the probe and carries radioactive nuclei, which can be used as a nuclear medicine drug for tumor hypoxia diagnosis so that doctors can immediately identify the tumor hypoxia situation and location through the image, and thus achieve the purpose of precision medicine. This patent improves the shortcomings of the current tumor hypoxia contrast agents, including improving the affinity and recognition of tumor hypoxia, reducing liver absorption, and not inducing immune response. The diagnostic effect is already better than the existing gold standard drugs.

### 國家原子能科技研究院 / National Atomic Research Institute

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Department of isotope application research (052 Bldg.), No. 1000, Wenhua Rd., Longtan Dist., Taoyuan City 325207, Taiwan (R.O.C.)

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2022  
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專利技術名稱

# 以水系膠鑄成型製作氧化鋯陶瓷之方法

## METHOD FOR FABRICATING ZIRCONIA CERAMICS BY AQUEOUS GEL-CASTING TECHNOLOGY

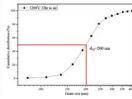
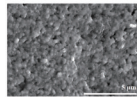
Patent No : (R.O.C. 優先 ) I747694

專利權人：遠東科技大學 / Far East University

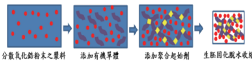
發明人：陳智成、詹景翔、呂郁琦、向性一 / CHEN, CHIH CHENG / JHAN, JING SIANG / LU, YU CHI / HSIANG, HSING I

特性	氧化鋯	氧化鋁	氧化矽	陶瓷
用途	基板、陶瓷	基板、陶瓷	基板、陶瓷	基板、陶瓷
重量	厚度高，質輕	厚度低，質輕	厚度高，質輕	厚度高，質輕
耐厚度	高	中	中	高
成本	低	中	高	低
試驗手段	無	有	有	有

性質	氧化鋯(氧化鋁)	氧化鋁	氧化矽
密度(g/cm <sup>3</sup> )	3.97	6	2.63
硬度(GPa)	22	12-13.5	7
彈性模量(GPa)	380	210	65
彈性係數(Pa·m <sup>-1</sup> )	2-3	5-10	0.7
抗彎強度(MPa)	800	600-1000	600
抗拉強度	無	有	有



性質	氧化鋯	氧化鋁	氧化矽
抗彎強度 (MPa)	5.4	762	12.9
抗拉強度 (MPa)	3.5	543	10.6
抗壓強度 (MPa)	5.8	821	12.5



### 專利技術介紹：

手機通訊已邁向 5G 時代，原有之金屬手機背板因為訊號穿透能力弱、不能無線充電，因而被淘汰。目前適用於 5G 手機背板材料，以氧化鋯陶瓷最佳，具有高韌性、高硬度、5G 信號穿透度好，是最理想的 5G 手機背板材料。但是陶瓷背板生產時，採用的乾壓成型無法製作形狀複雜之陶瓷體，其他成型法又無法大量生產，導致 5G 手機仍採用玻璃材質背板，雖然玻璃熔融成型容易，但強度、硬度不足，易摔碎磨損，不是理想之 5G 手機背板。因此優質的成型方法仍是目前最熱門的研究課題。本發明專利採用水系膠鑄成形法及兩段式燒結法的創新製程，可以解決陶瓷背板生產上的問題，製造性質優良之手機背板，符合手機背板品質及量產之要求。

### Patented technology introduction:

Mobile communication has entered the 5G era, and the original metal mobile phone housing rear has been eliminated because of its weak signal penetration capability and inability to wirelessly charge. Currently suitable for 5G mobile phone housing rear materials, zirconia ceramics are the best, with high toughness, high hardness, and good 5G signal penetration. It is the most ideal 5G mobile phone housing rear material. However, in the production of ceramic housing rear, the dry-press molding used cannot produce ceramic bodies with complex shapes, and other molding methods cannot be mass-produced. As a result, 5G mobile phones still use glass housing rear. Although glass is easy to melt and form, its strength and hardness are insufficient. It is easy to break and wear, and it is not an ideal 5G mobile phone housing rear. Therefore, high-quality molding methods are still the most popular research topics.

The patent of the present invention adopts the innovative process of water-based glue casting method and two-stage sintering method, which can solve the problems in the production of ceramic housing rear, and manufacture mobile phone housing rear with excellent properties, which meet the requirements of mobile phone housing rear quality and mass production.

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專利技術名稱

## 用於助眠的光供應方法

### LIGHT SUPPLY METHOD FOR SLEEP AID

Patent No : (R.O.C. 優先 ) I721845

專利權人：國立臺灣科技大學 / National Taiwan University of Science and Technology

發明人：陳建宇 / Chien-Yue Chen



#### 專利技術介紹：

本專利技術所提出之光源，與市面上抑制褪黑激素的強白光照明機轉完全不同，本專利技術，可以通過對光線的動態變化去改善睡眠效率，讓使用者可以更快的自然入睡，獲得更好的休息和睡眠效率。通過睡眠實驗的設計，於午休時間，照射動態光對睡眠效果之驗證。並於 2021 至 2022 年發表了三篇國際期刊 [1-3]，通過臨床人因實驗，與客觀生理監測儀器 MP150(Bipac system)，分析受測者心律變異度的活性變化，研究結果受測者的交感神經活性都有明顯的降低放鬆，睡眠監測手環的睡眠效率、睡眠時長，都有明顯的成長。下列是本專利技術的六大創新特點：

1. 利用多頻譜動態光源系統，去製作微型化動態助眠燈，並且配合特定變化程度的光源參數，去輔助睡眠，加快使用者入睡。
2. 特殊動態光源配方誘發腦波產生睡眠驅力
3. 幫助各種需求的客戶，在任何時間皆能助眠
4. 有學術基礎依據可佐證助眠效果
5. 以色異譜方式降低藍光比例，並能維持準確的頻譜
6. 降低藍光可避免抑制褪黑激素

- [1] Chien-Yu Chen, You-Kwang Wang\*, and Zhi-Wei Wang. "Research on the Application of the Dynamic Assisted Sleep Light to Smart Mobile Devices." Applied Sciences 12.10 (2022): 5191.(SCI)
- [2] Chien-Yu Chen,\*, and Hung-Wei Chen. The Effect of Dynamic Lighting for Working Shift People on Clinical Heart Rate Variability and Human Slow Wave Sleep. Applied Sciences, 2022, 12(5), 2284.(SCI).
- [3] Chien-Yu Chen, Pei-Jung Wu, Yu-Jen Hsiao, and Yu-Wen Tai. (2021). Changes in Humans' Autonomic Nervous System under Dynamic Lighting Environment During A Short Rest. Journal of Healthcare Engineering, 2021.(SCI)

#### Patented technology introduction:

The light source proposed by this patented technology is completely different from the strong white light illuminator that suppresses melatonin on the market. This patented technology can improve sleep efficiency through dynamic changes in light, allowing users to fall asleep naturally faster. Get better rest and sleep efficiency. Through the design of the sleep experiment, during the lunch break, the effect of dynamic light on sleep was verified. And published three international journals from 2021 to 2022 [1-3], through clinical human factors experiments, and the objective physiological monitoring instrument MP150 (Bipac system), to analyze the activity changes of the subjects' heart rhythm variability, and the research results were tested. The sympathetic nerve activity of the patients has been significantly reduced and relaxed, and the sleep efficiency and sleep duration of the sleep monitoring bracelet have increased significantly.

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專利技術名稱

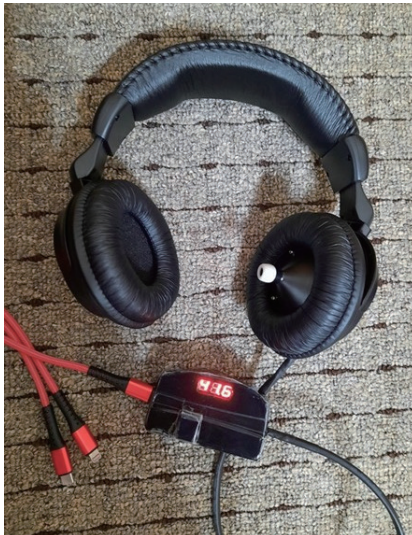
## 用於改善人體小腔體血液微循環之遠紅外線照射裝置

FAR INFRARED ILLUMINATION DEVICE FOR IMPROVING BLOOD MICRO-CIRCULATION OF A HUMAN SMALL CAVITY

Patent No : (R.O.C. 優先 ) I 753218

專利權人：元培醫事科技大學 / YUANPEI UNIVERSITY OF MEDICAL TECHNOLOGY

發明人：郭宗德 / KUO, TSUNG-TER



### 專利技術介紹：

本專利「用於改善人體小腔體血液微循環之遠紅外線照射裝置」，是因國際期刊論文研究發現，聽力損失很大部份是耳蝸的微血循環不良導致，本發明設計了促進血液循環的微波，將之以光學技術把強度放大並聚焦，再以導波管技巧導入內耳，促進微血液微循環。高效率的光能放大並聚焦導入耳腔，解決一般只能照射表面的困境。完成的雛型品，已完成電性安規、溫升、生物相容測試，風險評估及功能性試驗，在台北榮總進行臨床試驗，有相當好的功效。

### Patented technology introduction:

This patent "far-infrared irradiation device for improving blood microcirculation in small cavities of the human body" is due to the research of SCI journal papers that hearing loss is mainly caused by poor microcirculation of the cochlea. Micro-wavelength waves are shaped and amplified then induced into the inner ear by waveguide technology to promote microcirculation. The high-efficiency energy is amplified and focused into the ear cavity, solving the dilemma that only the surface was irradiated. The prototypes has completed electrical safety test, temperature rise, biocompatibility testing, risk assessment and functional testing, and has undergone good results of clinical trials in Taipei Veterans General Hospital.

### 元培醫事科技大學 / YUANPEI UNIVERSITY OF MEDICAL TECHNOLOGY

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專利技術名稱

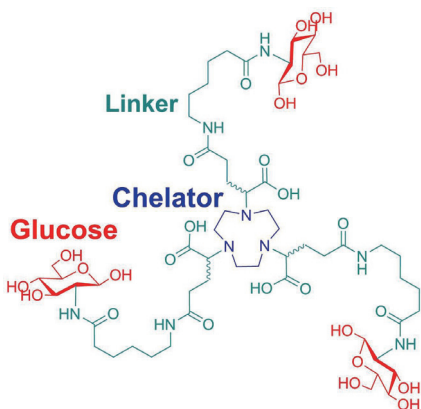
## 多鏈醣複合物、放射性多鏈醣造影劑及其用途

### Multivalent glyco-complex, imaging agent and uses thereof

Patent No.: (R.O.C. 優先) 發明第 I650138 號

專利權人：行政院原子能委員會核能研究所 / Institute of Nuclear Energy Research, Atomic Energy Council, Executive Yuan, R. O. C.

發明人：于鴻文、林武智、王美惠、曾俊豪 / Hung-Wen Yu / Wu-Jyh Lin / Mei-Hui Wang / Chun-Hao Tseng



#### 專利技術介紹：

本發明含有螯合劑 (chelator)、連接基 (linker) 及三個醣分子，為利用惡性腫瘤具高葡萄糖使用率的特性，使其能夠快速進入腫瘤細胞，提升與週邊正常組織的訊號對比度，增加偵測效率。有別於臨床使用的 [ $^{18}\text{F}$ ]FDG，本發明於正常腦部及心臟攝取明顯降低，能夠加強訊號對比度。本發明也能夠應用於癌症療效評估，監測治療方式或藥物是否適當。

本發明使用正子同位素鎵-68 (Ga-68)，能夠以發生器 (generator) 取得射源，無需依賴昂貴複雜的迴旋加速器。本發明為凍晶製劑，直接注入鎵-68，於室溫即可完成快速標註 (15 分鐘)，無需進行純化，因此臨床使用及藥物製備上十分方便，能夠降低藥物成本及減少操作人員輻射劑量。凍晶製劑不含放射性物質，能夠長時間保存，大幅提升產品的使用方便性及推廣潛力。

#### Patented technology introduction:

This invention contains a chelator, a linker and three sugar molecules, it takes advantage of the high glucose utilization rate of malignant tumors, can quickly enter the tumor cells, improve the signal contrast with surrounding normal tissues, and increase the detection efficiency. Different from the clinically used [ $^{18}\text{F}$ ]FDG, this invention significantly reduces the uptake in the normal brain and heart, and can enhance the signal contrast. This invention can also be applied to assess the efficacy of cancer, and to monitor the appropriateness of treatment modalities or drugs.

This invention uses the positron-emitting isotope gallium-68 which can be obtained with a generator, without relying on an expensive and complicated cyclotron. This invention is a lyophilized formulation. The radiolabeling can be completed by injecting gallium-68 at room temperature (15 minutes) without purification, so it is very convenient for clinical use and drug preparation, and can reduce the cost of drugs and the radiation dose of operators. Lyophilized kit do not contain radioactive substances and can be stored for a long time, greatly improving the convenience of use and promotion potential of the product.

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專利技術名稱

# 具循環過濾污水取得淨水沖洗拖把及脫乾的拖把清洗桶

## CLEANING BUCKET STRUCTURE CAPABLE FOR AUTOMATICALLY PURIFYING FOUL WATER

Patent No : (R.O.C. 優先 ) 新型第 M626792 號

專利權人：富商國際股份有限公司 / Full Sun International Co., LTD.

發明人：吳長馨 / Wu, Chang-Hsin

### 專利技術介紹：

本專利為一款【免換水拖把桶】，桶內僅需注入 2.5 公升的水量，清潔時無須再來回倒換污水，就可以每一次在洗拖把的同時，將污水「即時快速」的轉換為淨水，得以淨水循環洗淨拖把，再也不用來回倒換水，讓拖地變得輕鬆省水，且地板清潔更乾淨！

本專利之結構設計，結合本公司所研發之濾芯，透過桶內清洗區的斜面設計，快速將清洗拖把後的污水匯流至桶內濾芯過濾污水，將毛髮、髒污、粒徑 1000 奈米以上之物質、及水中 99% 的細菌及塑膠微粒一併過濾掉，再將過濾後的淨水透過拖把桶內中柱汲水至清洗區繼續洗淨拖把，讓桶內的污水得以「即時快速」的轉換為乾淨水，不斷循環再利用，本設計得以讓過濾流速於無水壓的狀況下，以每分鐘過濾 800ml~1000ml 以上的高通量污水。



### Patented technology introduction:

The patent design is a “Self-Cleaning Mop Bucket” which is equipped with a unique structure and filter design that could require only 2.5 liters of water without changing or replacing. Our design will enable users to use the same bucket of water to rinse and clean the mop with recycled clean water. We help our users to save time and water resources while making home-cleaning tasks much easier!

The filter is equipped within the mop bucket to revert the sewage; the feature of this filter is that it can filter over 800ml -1000ml of sewage per minute without additional water pressure while sanitizing 99% of the containing germs, microplastics, and substances larger than 1000 nanometers. After filtering, the total bacteria count in the water shall be very close to zero. Our product design is industry-leading and the sewage filter speed is ten times faster than other standard products without any added water pressure. Furthermore, the filter is re-washable and under normal household conditions, it can be used repeatedly for up to one year without purchasing replacements.

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專利技術名稱

## 風扇設備及風扇座

FAN DEVICE AND FAN HOLDER

Patent No : (R.O.C. 優先 ) 新型 M600804 號 / US 11 · 268 · 539 B2

專利權人：劉佳源 / Chia-Yuan Liu

發明人：施政德 / Cheng-Yi Shih



## 專利技術介紹：

本創作公開一種風扇設備及風扇座。風扇設備包含有一風扇座及一風扇。所述風扇座包含有一支架、四個棘輪組、一座體、及一框架。支架的兩端各組接有兩個棘輪組；座體組接於支架的一端的兩個棘輪組上，使所述座體與所述支架相夾有一第一夾角；框架組接於支架的另一端的兩個棘輪組上，使框架與支架相夾有一第二夾角；其中，座體與框架能通過四個棘輪組而相對於支架於一使用位置及一收納位置之間轉動。風扇設置於框架上。據此，風扇設備通過將座體與框架轉動至收納位置，使支架能摺疊於座體上，框架摺疊於支架上，以減少整體體積。

## Patented technology introduction:

The present invention discloses a fan device and a fan base. The fan device includes a fan base and a fan. The fan base includes a bracket, four ratchet groups, a body, and a frame. The two ends of the bracket are each assembled with two ratchet groups; the seat body is assembled on the two ratchet groups at one end of the bracket, so that the seat body and the bracket are sandwiched by a first angle; the frame is assembled on the bracket. On the two ratchet sets at the other end, the frame and the bracket are sandwiched by a second angle; wherein, the base and the frame can rotate relative to the support between a use position and a storage position through the four ratchet sets. The fan is arranged on the frame. Accordingly, the fan device can reduce the overall volume by rotating the base and the frame to the storage position, so that the bracket can be folded on the base and the frame can be folded on the support.

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專利技術名稱

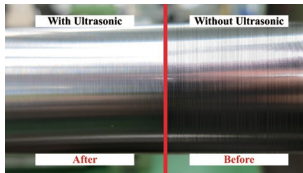
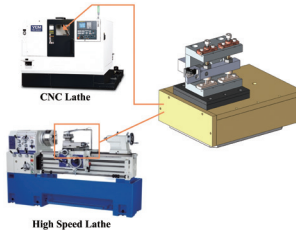
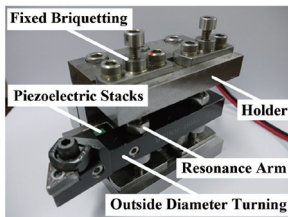
## 振動輔助切削刀具之刀具座

Holder for vibration assisted cutting tool

Patent No : (R.O.C. 優先 ) I767719

專利權人：國立屏東科技大學 / National Pingtung University of Science and Technology

發明人：黃惟泰、陳奕翔、涂智堯 / Wei-Tai Huang, Xi-Sang Chen, and Zhi-Yao Tu



### 專利技術介紹：

本專利技術為國際上首創使用內藏式致動振動設計，有別於目前多數系統使用外部致動振動設計，突破以往超音波振動輔助車刀體積龐大、不易架設、頻率與刀具結構不可調整之痛點。此技術為外掛式模組化可輕易架設，可輕易結合於市售標準工具機上且可加工高硬度材料，並可調整性之高效率振動輔助切削刀具之刀具座系統。可大幅提升原有工具機加工性能與效益，並且不需要再投入大量的設備資金重新購置振動輔助切削專用工具機。本技術學理方法完整，並具產業實務應用價值，可提升在車削特殊硬質合金材料的加工效益，能幫助製造業減低碳排放達成碳中和的目標，能對相關產業綠色製造技術科技作出貢獻。

### Patented technology introduction:

This patented technology is the first in the world to use a built-in actuating vibration design, which is different from the external actuating vibration design used in most current systems. This technology makes a breakthrough in solving the problems of the previous ultrasonic vibration-assisted turning tools, which are bulky, difficult to erect, and unable to be adjusted in frequency and tool structure. This technology is an externally mounted modular tool holder system, which can be easily set up and combined with commercially available standard machine tools. It can also process high-hardness materials and be adjusted to a high-efficiency vibration-assisted cutting tool. It can greatly improve the machining performance and efficiency of the original tool. It is not necessary to invest a lot of equipment funds to repurchase a special tool for vibration-assisted cutting. This technology is complete in theory and method and has industrial practical application value. It can improve the processing efficiency of turning special cemented carbide materials, help the manufacturing industry to reduce carbon emissions and achieve the goal of carbon neutrality, and can contribute to green manufacturing technology in related industries.

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專利技術名稱

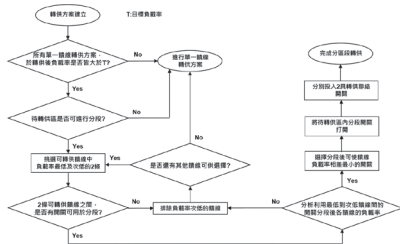
## 配電饋線分區段轉供復電策略

### DIVISIONAL SECTION TRANSFER POWER RESTORATION STRATEGY OF DISTRIBUTION FEEDER

Patent No : (R.O.C. 優先) I767864

專利權人：行政院原子能委員會核能研究所 / Institute of Nuclear Energy Research, Atomic Energy Council, Executive Yuan, R.O.C.

發明人：姜政綸、蔡佳豪、李奕德、劉力源 / Jiang, Jheng-Lun / CAI, Jia-Hao / Lee, Yih-Der / Liu, Li-Yuan



#### 專利技術介紹：

國內負載用電逐年增長，尤其都會區用電量較大，當饋線發生故障並進行轉供，若該區負載較重，且可轉供之饋線裕度不足時，將會造成聯絡饋線因超過負荷而跳脫，反而擴大停電的範圍，而面臨下游健全區的用戶無法恢復供電的窘境。本系統整合配電監控 (SCADA) 及地理圖資系統 (GIS)，以均化轉供後的各饋線負載率為目標，提出配電饋線分區段轉供復電策略。當饋線發生故障時，本系統能透過挑選適合之分段開關，將下游健全區負載較重區域，拆解成不同的小區域負載，並利用兩條 (含) 以上饋線進行轉供，使轉供後的饋線承載率更加平均，該功能可供調度員作為轉供調度決策參考依據，加速排除故障並恢復下游用戶的供電。



#### Patented technology introduction:

Domestic electricity consumption is increasing year by year, especially the power consumption in urban area is larger than that in rural area. When a fault occurs in a feeder, the feeder will be transferred. If the load in the downstream healthy area is heavy, and the capacity of the connecting feeder is not enough, the connecting feeder may trip due to overload. This problem will cause the outage area expand, and the downstream healthy area cannot be restored. This system is the integration of Supervisory Control and Data Acquisition (SCADA) system with Geographic Information System (GIS), and proposes divisional section transfer power restoration strategy of distribution feeder to make loads of all the connecting feeders are close to each other after the load transfer is performed. When a fault occurs in a feeder, the system can separate the heavy load of the downstream healthy area into two or more sections with light loads, and allocate two or more connecting feeders to support the light loads respectively. Dispatchers can take this strategy as reference for decision-making of load transfer, and speed up troubleshooting, and restore power supply to downstream area of feeder.

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專利技術名稱

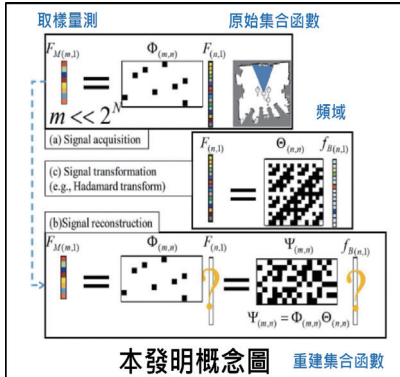
## 處理集合函數訊號的壓縮感知裝置、系統與方法

Compressed Sensing Apparatus, System and Method for Processing Signals in Set Function

Patent No : (R.O.C. 優先 ) I754921

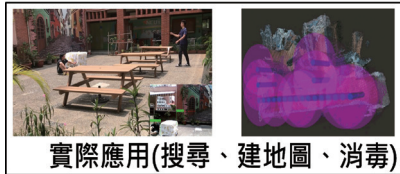
專利權人：國立中央大學 / NATIONAL CENTRAL UNIVERSITY

發明人：曾國師 / TSENG, KUO SHIH



### 專利技術介紹：

本發明關於一種壓縮感知裝置，用於壓縮感知包含複數資料之複數輸入集合的集合函數，其包含：複數感知單元，其用於獲得代表從該等輸入集中選出的複數取樣集合的複數取樣資料；壓縮運算單元，其根據基於該等輸入集合與該等取樣集合而產生的傅立葉基底集合而基於該等取樣資料而壓縮該等資料，並基於與該傅立葉基底集合有關的稀疏迴歸方法以計算傅立葉係數集合；以及重建單元，其基於該傅立葉係數集合而推估該等資料。



### Patented technology introduction:

The present invention relates to a compressed sensing apparatus for compressed sensing of a set function consisting of a plurality of input sets containing a group of data. The compressed sensing apparatus includes: a plurality of sensing units acquiring a group of sampled data representing a plurality of sampling sets selected out of the plurality of input sets; a compression and computation unit enabling a compression to the group of data based on the group of sampled data by generating a Fourier basis set based on the plurality of input sets and sampling sets, and a computation to compute a Fourier coefficient set based on a sparse regression technique which is in relation with the group of sampled data; and a reconstruction unit predicting the group of data based on the Fourier coefficient set.

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## 專利技術名稱

## 腹腔異常游離氣體深度學習檢測方法及腹腔異常游離氣體深度學習檢測系統

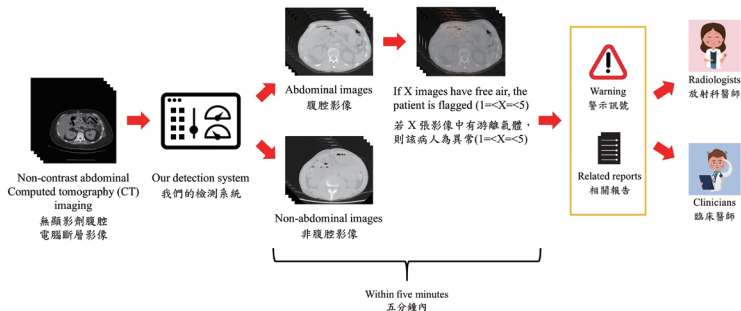
### A deep learning-powered novel artificial intelligence algorithm and system to assist in the identification of pneumoperitoneum on abdominal computed tomography

Patent No.: (R.O.C. 優先) 發明專利申請案號第 111123914 號

專利權人：新北市立土城醫院（委託長庚醫療財團法人興建經營）/ New Taipei Municipal Tucheng Hospital  
發明人：薛承君、郭昶甫、陳嶽鵬、范佐搖、王俐人、張光甫、李格恩、王翊峰 / Julian Seak Chen June / Chang-Fu Kuo / Yueh-Peng Chen / Tzu-Yau Fan / Li-Jen Wang / Kuang-Fu Chang / Ker-En Lee / Yi-Feng Wang

## 專利技術介紹：

氣腹 (Pneumoperitoneum) 的定義為腹腔內有游離氣體 (Free air)；腹痛病人若在影像學上產生氣腹，臨床上通常代表器官/腸子破裂，屬於高危險性，需緊急手術以挽救生命，延誤診斷將導致敗血性休克及多重器官衰竭，造成病人死亡。臨床上，電腦斷層已被證實是診斷氣腹最敏感最準確的影像工具。本技術的優勢為 5 分鐘內可即時自動檢測病人之無顯劑劑電腦斷層影像上，腹腔異常游離氣體存在與否，協助醫師們快速診斷氣腹，有效降低病人死亡率。系統成效相當於臨床經驗豐富的放射診斷科醫師般精準、快速且判讀標準具有一致性，尤其以多張 (4 張以上) 有游離氣體的影像驗證氣腹檢測結果，可取得 100% 準確度 (臨床上氣腹病人最可能之情形)。本技術之潛在全球市場年收益可達 156 億新台幣。



## Patented technology introduction:

Pneumoperitoneum refers to the presence of free air in the peritoneal cavity. The detection of pneumoperitoneum on imaging in a patient presenting with abdominal pain is highly indicative of a perforated intraperitoneal viscus. This life-threatening condition requires emergency surgery with delay, failing which the patient may develop septic shock, multiple organ failure, and even death. Computed tomography (CT) is the best imaging modality in identifying pneumoperitoneum. Our developed artificial intelligence system is capable of rapid identification of pneumoperitoneum on CT within 5 minutes, with accuracy and consistency on par with an experienced board-certified radiologist. This is especially so if there are multiple image slices (4 or more) with evidence of pneumoperitoneum, yielding a 100% accuracy rate. We estimate the global market revenue of this technology to be NT\$15.6 billion.

## 薛承君 / Julian Seak Chen June

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專利技術名稱

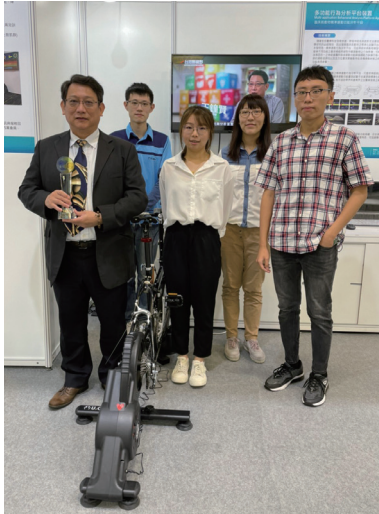
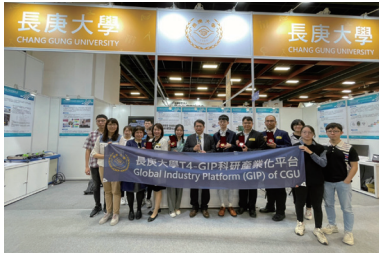
## 運動器材循環運行方法及其應用

Circuit Exercise System and its application

Patent No.: (R.O.C. 優先) 發明第 I727737 號

專利權人：長庚大學、昌祐科技國際股份有限公司、必和創意設計有限公司 / Chang Gung University、CHANG YOW TECHNOLOGIES INTERNATIONAL CO., LTD.、UNITE CREATIVE DESIGN CO., LTD.

發明人：王鐘賢 / Wang, Zhong-Xian



### 專利技術介紹：

智能環狀運動系統以有氧運動器材作為硬體載具、藍芽傳輸系統之控板作為韌體、搭配具有運動訓練排程的軟體建立安全的運動環境。使用者透過精準評估工具得到個人化的「運動處方」，再以環狀運動系統之標準化運動流程記錄每次的運動成效；結合穿戴式裝置偵測生理數值的設計並給予運動計劃建議，完成有效益的運動訓練。尤其執行常壓低氧的運動訓練可有效改善心肌收縮力及增加骨骼肌之氣體灌注和氧氣利用率，提升肺部換氣效率和有氧適應，而非藉由調節中樞血流系統。因此，本項技術主張與環境氧氣濃度多寡有關之運動訓練對心肺功能的強化，更可以加強全身性肌肉訓練、有氧 / 無氧運動代謝，降低使用者局部肌肉使用過度以及運動疲勞程度。

### Patented technology introduction:

The circuit exercise system establishes a safe and efficient exercise environment via aerobic exercise equipment as hardware, Bluetooth transmission panel as firmware, and the software which arranges exercise training session. Users acquire their personalized exercise prescription through accurate assessment, then record each of the training outcomes with standardized process which the system provides. The system integrates wearable devices to detect vital signs, assessing risky conditions during exercise and give some advice for exercise to complete beneficial training. Normal pressure and hypoxic exercise training, especially improves cardiac contractility, gas perfusion, and oxygen extraction in skeletal muscle, enhancing pulmonary air exchange efficiency and aerobic fitness. Therefore, this technique claims that exercise training related to the amount of oxygen concentration optimizes cardiopulmonary function, and can also increase systemic muscle strength, aerobic/anaerobic metabolism, decrease one's local muscle overuse and fatigue level.

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專利技術名稱

# 導電聚合物之綠色製造方法

Green manufacturing method of conductive polymer

Patent No : (R.O.C. 優先 ) I732311

專利權人：東海大學 / TUNGHAI UNIVERSITY

發明人：顧野松、陳東柏、林奕辰 / GU, YESONG ; CHEN, TUNG-PO ; LIN, YI-CHEN

材料科技

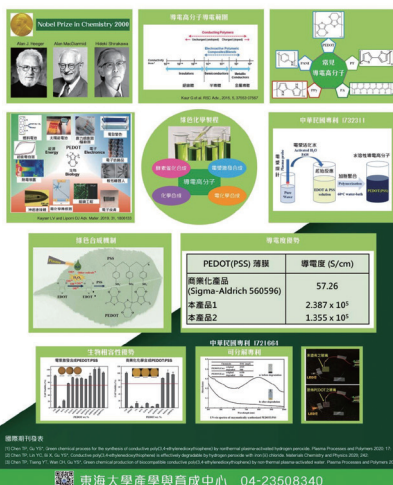


東海大學

化材系/顧野松教授

## 導電高分子PEDOT之綠色製造技術及其應用

中華民國專利 I732311



### 專利技術介紹：

本技術是利用低溫電漿活化雙氧水或水，激發產生自由基，並藉由自由基促進導電高分子 PEDOT:PSS 的合成。PEDOT:PS 具有水溶性、高透光率、高導電度、可降解性和良好的生物相容性，可應用於有機太陽能電池、電子儀器、感測電極和生醫儀器等。相反，目前市面販售之 PEDOT:PSS 為利用化學法合成，需使用到催化劑和環境不太友善的化學成份。本專利之技術符合全球響應綠色科技，降低工業生產帶給自然環境的負面影響。

### Patented technology introduction:

The current innovation is to employ cold plasma technology to activate hydrogen peroxide or just water to generate free radicals that are able to promote the synthesis of PEDOT:PSS. The water soluble PEDOT:PSS possesses the properties of good transparency, high conductivity, easy degradable, and biocompatibility, which has broad applications in organic solar cells, electric devices, sensors and biomedical instruments. On the other hand, the only commercial available product of PEDOT:PSS relies on the chemical approach that requires catalyst and possible eco-unfriendly chemicals. This innovation is a green chemical process that has minimum industrial impact on our environment.

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專利技術名稱

## 懸空置式隧道型光譜魚缸

Patent No : (R.O.C. 優先 ) I 697281

專利權人：黃志遠 / HUANG CHIH -YUAN

發明人：黃志遠 / HUANG CHIH -YUAN



### 專利技術介紹：

眾所周知魚缸是一個非常成熟的大產業，周邊產業極其發達，國內外市值相當可觀，與此同時在本發明創作之前卻無人思及開發，就本項魚缸的主体與其底座及其整體造型進行更可看性，更前瞻性等方面設計開發及往更高價值的方向進行研發創新，不過在開發設計與打樣實驗過程確實傷透腦筋，因為往往線條越單純的產品就越難設計，要在簡單中找出不簡單的區別確實不易，由其產品的用途本質為養殖水草及觀賞魚，不能做無謂的畫蛇添足設計。本人是從事水族及水舞系列產品及游泳池壓克力視窗產業已 30 多年，開發相關產品無數，繼承上述經驗及累積製造技術有鑑於此，逐再著力開發設計出此款具有現代美學及科技感而特殊的立體（漩空置式隧道型魚缸）。該產品結合聲（音響裝置），光（LED）變化 + 加上美麗的水草造景及水草燈科魚類的整體融合使之成為一完美的科技魚缸產品。

本產品製造除部份為雷射雕刻及切割外，餘 95% 完全由手工特殊黏著，聚合，烤板成形，切割，打磨，拋光等等。以上每一項生產環節都需要成熟的高精密度的手工作業，需時繁複與大型海生館之大型缸製造雷同，非一般業

界所能輕易仿造。市場前景產值可觀，目前該產品亦已完全商品化。

### Patented technology introduction:

As we all know, the fish tank is a very mature industry, the surrounding industries are extremely developed, and the market value at home and abroad is quite considerable. At the same time, no one thought about development before the creation of the present invention. Design and development in terms of visibility, more forward-looking, and R&D innovation in the direction of higher value, but the process of development, design and proofing experiments is really nerve-racking, because often the simpler the line, the more difficult it is to design. It is indeed not easy to find the difference that is not simple. The purpose of the product is for the cultivation of aquatic plants and ornamental fish, and it cannot be superfluous to design.

I have been engaged in the aquarium and water dance series products and swimming pool acrylic window industry for more than 30 years, and have developed numerous related products. In view of this, I have inherited the above experience and accumulated manufacturing technology. In view of this, I will continue to develop and design this model with modern aesthetics and sense of technology. And special three-dimensional (swirling vacant tunnel type fish tank).

The product combines sound (audio device), light (LED) changes + plus the overall integration of beautiful aquatic plants landscaping and aquatic plants and lampfish to make it a perfect technology fish tank product.

In addition to laser engraving and cutting, the rest 95% of this product is completely hand-made by special adhesion, polymerization, baking plate forming, cutting, grinding, polishing and so on. Each of the above production links requires mature and high-precision manual operations. The time and complexity are similar to the large-scale tank manufacturing in the large-scale marine aquarium, and it is not easily imitated by the general industry. The market prospect has considerable output value, and the product has been fully commercialized at present.

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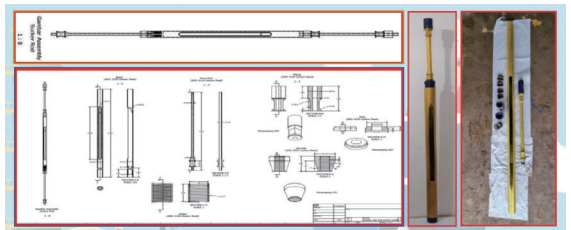
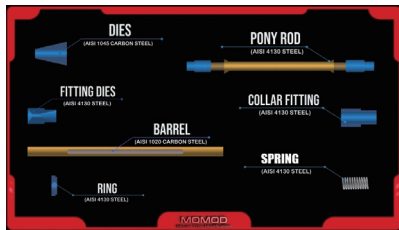
專利技術名稱

## Increasing the effectiveness of parted sucker rod fishing operation using MOMOD (Mousetrap Modification) in Pendopo Oil Field

Patent No : (R.O.C. 優先 ) S-00202210818

Patentee : Ministry of Law and Human Rights - Indonesia

Inventor's Name : Anang Arie Kuncoro, R Nova Rifika Arifien, Mario Aditya Haris Putra, Muhammad Rasyid, Utuh Khair, Sucipto



### Patented technology introduction:

The Sucker rod pump is one of the artificial lifts installed in oil wells that commonly used in oil and gas industries. Sucker rod pump consist of surface and downhole components. The surface drive is connected to the downhole pump at the bottom of the well by a series of interconnected sucker rods. The common issue of sucker rod pump is parted sucker rod while operated due to lifetime and workload. Parted sucker rod causes pump off, the pump unable to lift the liquid from the subsurface to the surface. The fishing tool that usually used to catch the sucker rod fish (left in the downhole) is overshot. The fishing operation use overshot has low success ratio, only about 33%.

MOMOD (Mousetrap Modification) is an innovative fishing tool designed to overcome the problem of fishing on a parted sucker rod body with various sizes and irregular shapes that cannot be carried out by common fishing tool available in the market. MOMOD is also easy to assemble, lightweight, easy to operate, strong, and low cost. This innovation has succeeded in accelerating and increasing the effectiveness or success ratio of fishing job compared to common fishing tools, thereby reducing non-productive time and costs.

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