

U.S. PATENTS PENDING

“Pressure Activated Fluid Supply Valve”

Inventor: Jose F. Makk

Abstract: A fluid pressure sensitive fluid flow control valve. The fluid flow control valve is normally locked in a closed position to block fluid flow. When a pre-selected pressure is reached, the valve is unlocked and the fluid pressure opens the valve. When pressure falls below a second pre-selected value, the valve closes and automatically relocks.

“Eliminating the Use of Anti-Aliasing Filters in Digital Relays by Oversampling”

Inventors: Sukumar Brahma, Phillip De Leon, and Rajesh Kavasseri

Abstract: A digital relay and concomitant method comprising employing an analog-to-digital converter, and via control logic providing over sampled output of the converter to determine likely digital values corresponding to the output and wherein the control logic substantially eliminates aliasing resulting from waveform transients in input to the converter, and wherein no anti-aliasing filter is employed providing the input. Also, a digital relay and concomitant method comprising employing an analog-to-digital converter, and via control logic providing **over** sampled output of the computer to determine via Fourier transform likely digital values corresponding to the output, and wherein the control logic substantially eliminates aliasing resulting from waveform transients in input to the converter.

“Apparatus and Method for Reduced-Gravity Simulation”

Inventor: Ou Ma and Jiegao Wang

Abstract: The invention comprises an apparatus and a method for gravity-based apparatuses for training humans for space exploration and other applications. The embodiment of the simulation apparatus is less expensive to build and safe to operate and adaptable to numerous applications, including but not limited to theme parks, museums, training facilities, educational/research labs, and others, for people to experience walking and other perambulations in lower or zero gravity environments. The invention is statically-balanced and comprises a spring apparatus that is easily adjusted. An embodiment of the invention provides an apparatus and method for simulating walking in a zero-gravity or reduced-gravity environment.

“Method for Production of Antibody Mimic Libraries to Identify Binding Reagents”

Inventor: Stephen F. Hanson and David Garcia-Ibilcieta

Abstract: A novel simplified single step method for synthesizing recombinant libraries and constructing antibody-like molecules.

5. **“Introduction of Small Inhibitory Ribonucleic Acid (siRNA) into Plants”**

Inventors: Kristina Trujillo, Antonia Dominguez, Salvador Lopez, Jr., Savannah A. Benally, Alex Louie, Murphy Hollie, and Glenn D. Kuehn

Abstract: The invention provides for the rapid and facile introduction of small inhibitory ribonucleic acid (siRNA) into an intact plant system or plant cells.

“List-Based Detection in Fading Channels with Long Intersymbol Interference”

Inventor: Sai Ramesh Nammi and Deva K. Borah

Abstract: An apparatus, computer software, and method for data detection in channels suffering from intersymbol interference comprising receiving a signal representative of a binary digit of data, computing a reliability score for that binary digit of data via windowed Chase equalization, and based on the reliability score, causing a signal to be output that the binary digit is a zero or one.

“Method and Apparatus for Membrane-Based Two Stage Gas Production from Solid Materials”

Inventors: Nagamany Nirmalakhandan, Shuguang Deng, and Geoffrey Smith

Abstract: Embodiments of the present invention preferably relate to a method and apparatus for a two-stage membrane-based production of gas,, preferably hydrogen gas or the like, from solid biological materials, preferably organic waste materials or the like, comprising anaerobic hydrolysis and fermentation and photo-fermentation using microorganisms.

“Apparatus and Method for Interpreting Frequencies in Environment Noise”

Inventors: Nadipuram R. Prasad and Jason C. King

Abstract: Methods and Apparatuses for at least partially detecting, monitoring and identifying coded messages present in environmental noise.

“Detection and Notification of Radio Frequency Identification Equipment”

Inventor: Tracy B. Hooker and Eric E. Johnson

Abstract: The invention relates to a method and apparatus for the detection of Radio Frequency Identification (RFID) reader and for providing an alert of the detection to the user of the potentially surreptitious interception of the user’s RFID tag or smart card information.

“Sensing Hybridization Through a Nanoporous Electrode”

Inventors: Sergei Smirnov, Ivan Vlassiuk, and Pavel Takmakov

Abstract: The invention provides for the detection of biochemical analytes by measuring variations in ionic conductance resulting from the hybridization of a target biological object (e. g.) oligonucleotides) with a capturing element immobilized on a filter substrate having Nano-sized pores.

“Apparatus and Method for Diagnosis, Monitoring, and Treatment of the Extremities of the Equidae Family”

Inventor: Joel A. Diemer

Abstract: The invention provides an apparatus and method of monitoring symptoms or conditions of interest, stabilizing, and reinforcing extremities, supplying diagnostic services, and supplying therapeutics such as medication delivered in a sealed, clean environment in order to speed healing for animals of the equidae family. The invention is an apparatus that preferably comprises a sleeve integrally attached to a first horseshoe-like platform. The first platform incorporates modular fastening system for the purpose of attaching a second horseshoe-like platform which preferably incorporates an array of specialized sensors, thus providing veterinarians and other equidae family health care professionals, owners, and handlers with an easily applied, multifunctional platform by which to monitor, diagnose, and treat the subject animals of the equidae family. The invention may also function in the place

of a conventional horseshoe.

“Method and System for Manufacturing a Cascade Solar Cell Using Bundled Fibers”

Inventors: Seamus A. Curran and James L. Dewald

Abstract: The invention provides system and method for fabricating coated optical fibers for organic solar cells.

“Nasal Medication Dispensing Apparatus and Method”

Inventors: Joel A. Diemer

Abstract: A nasal medication dispensing apparatus and method comprises at least one insert member that is sized to be placed into at least one nostril of a user and is operable to allow air for dispensing a medicinal substance into at least one nasal passage of the user at a predetermined rate.

“Detection Via Fluorescence of a Biological Target in Nanopores”

Inventors: Sergei Smirnov, Ivan Vlassiouk, and Pavel Takmakov

Abstract: The invention relates to the use of anodized aluminum films in the detection of biological targets or analytes.

“Using Language Variants for Focused Information Retrieval”

Inventors: Ahmed Abdelali and James Cowie

Abstract: Computer software for and a method of automatically classifying documents in a given natural language by regional variation of that natural language comprising selecting a plurality of regional variations, for each selected regional variation, selecting a set of texts as seed documents, calculating probabilistic distributions of words in each set to construct a language model for the corresponding regional variation, and classifying a new text as to regional variation based upon the probabilistic distribution of words in the new text and the calculated language models.

“Method and Apparatus for Treating Tissue”

Inventor: Joel A. Diemer

Abstract: A method and apparatus for treating tissue of a patient with an implantable material comprising a plurality of electrodes for providing controlled microcurrent stimulation.

“Apparatus and Method for Passively Reducing coherence of a Laser Beam”

Inventors: Qingsong Wang and Michael K. Giles

Abstract: A method and apparatus which passively reduces temporal and/or spatial coherence of a laser beam in a quick and effective manner.

“All-Optical Nanoscale Read/Write Bit Formation”

Inventors: Seamus A. Curran, James L. Dewald, and David L. Carroll

Abstract: This invention provides a method and material for using near-field optics such as near-field scanning microscopy (“NSOM”) to write information onto a nanosubstrate.

“Nanocomposite for High Efficiency Organic Solar Cells”

Inventor: Seamus A. Curran

Abstract: The invention provides for nanocomposite, semiconducting materials useable for fabricating high efficiency organic solar cells. The material comprises a mixture of a conjugated polymer, a functionalized fullerene, and a functionalized carbon nanotube.

“Sensing Hybridization Via Ionic Conductance Through a Nanoporous Electrode”

Inventors: Sergei Smirnov, Ivan Vlassiuk, and Pavel Takmakov

Abstract: The invention provides for the detection of variations in ionic conductance resulting from the hybridization of target biological objects (e.g. oligonucleotides) on filter substrates having nano-sized pores in which biological objects complementary to the target biological objects are immobilized.

“Self-Fed Ruminant Supplement”

Inventors: Mark K. Petersen, Jason E. Sawyer, Rachel L. Endecott, and Shad. H. Cox

Abstract: A ruminant protein supplement and delivery process wherein adequate animal or plant protein is delivered in an efficient and cost-effective manner, minimizing weight loss.

“Fluid Purification System”

Inventors: Daniel R. Cunniff, William M. Gutman, and Robert J. Silver

Abstract: A system and method for the separation of fluid substances based on the relative mass difference between the constituents of a fluid, particularly for water desalination.

“DNA-Based Amplified Detection of Target”

Inventors: Joseph Wang, Guodong Liu, Bernard Munge, and Lin Lin

Abstract: The invention relates to detection of the presence or absence of a target in a sample with a coded probe complex to amplify the binding event for electrochemical detection, wherein the probe complex is coded with a bio barcode that is resolved into individual nucleobases which serves as a signal for amplified electrochemical detection of the probe/target interaction.

“Monitoring Device and Security System”

Inventor: Joel A. Diemer

Abstract: The invention provides for an integrated global biological activity detection, traffic tracking and scheduling, and boundary/border security system. Detection apparatuses of the system are preferably placed in a stream of currency such as financial institutions and other sites of currency exchange, and are placed in or about transportation vehicles and linked into a data collection, analysis, and graphical information to provide early warning for security activities. Detection apparatuses located in and about transportation vehicles are combined with a system for routing vehicles into security corridors and with a system of notification, scheduling, and monitoring to enhance the capacity to insure security and efficient trade movement particularly as it approaches boundaries and borders.

“Thiation of Carbon Nanotubes and Composite Formation”

Inventors: Seamus A. Curran and Amanda V. Ellis

Abstract: The invention comprises nanotube structures comprising nanotubes covalently bonded via chemically reactive groups on the outer walls of the nanotubes and methods for

forming the covalently bonded nanotube structures. It also comprises materials comprising the functionalized nanotubes covalently bonded to organic based monomers and/or polymers, and materials for their formation.

“Smooth Phase Interpolated Keying”

Inventors: Deva Borah and Phillips DeLeon

Abstract: A constant envelope modulation technique called the *Smooth Phase Interpolated Keying (SPIK)* is investigated. The phase values of the symbols are computed to obtain a smooth phase function. A method to efficiently compute the phase function is described. An optimal receiver structure is presented. The bit error rate (BER) performance of SPIK is characterized analytically. It is observed that SPIK provides BER performance close to ideal QPSK, 8-PSK and 16-PSK constellations while providing better spectral and BER performance than enhanced Feher QPSK (EFQPSK).

26. **“Ultrasensitive Electrical Biosensing of Proteins and DNA: Carbon-Nanotube Derived Amplification of the Recognition and Transduction Events”**

Inventors: Joseph Wang, Guodong Liu, and M. Rasul Jan

Abstract: This invention demonstrates the use of carbon -nanotubes (CNT) for dramatically amplifying enzyme-based bioaffinity electrical sensing of proteins and DNA. The unique electronic, chemical, and mechanical properties of CNT make them extremely attractive for electrochemical sensors. In the new bioaffinity assays, CNT play a dual amplification role in both the recognition and transduction events, namely as carriers for numerous enzyme tags and for accumulating the product of the enzymatic reaction.