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October 2006

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Introduction

Several thousand inventions result each year from research supported by the National Aeronautics and Space Administration. NASA seeks patent protection on inventions to which it has title if the invention has important use in government programs or significant commercial potential. These inventions cover a broad range of technologies and include many that have useful and valuable commercial application.

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The *NASA Patent Abstracts Bibliography* is an annual NASA publication containing comprehensive abstracts of NASA-owned inventions covered by U.S. patents. The citations included were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

The citations published in this issue cover the period July 2005 through September 2006. The range of subjects covered includes the *NASA Scope and Subject Category Guide's* 10 broad subject divisions separated further into 76 specific categories. However, not all categories contain citations during the dates covered for this issue; therefore, the Table of Contents does not include all divisions and categories. This scheme was devised in 1975 and last revised in 2005 in lieu of the 34 category divisions which were utilized in supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry consists of a citation accompanied by an abstract and, when appropriate, a key illustration taken from the patent or application for patent. Entries are arranged by subject category in ascending order. When available, citations contain a link to the full-text document online.

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Table of Contents

Subject Divisions/Categories

Document citations are grouped by division and then by category, according to the *NASA Scope and Coverage Category Guide*.

Aeronautics

04 Aircraft Communications and Navigation	1
05 Aircraft Design, Testing and Performance	1

Astronautics

15 Launch Vehicles and Launch Operations	2
18 Spacecraft Design, Testing and Performance	3

Chemistry and Materials

23 Chemistry and Materials (General)	4
24 Composite Materials	4
25 Inorganic, Organic and Physical Chemistry	6
26 Metals and Metallic Materials	9

Engineering

31 Engineering (General)	10
33 Electronics and Electrical Engineering	11
34 Fluid Mechanics and Thermodynamics	17
35 Instrumentation and Photography	17
37 Mechanical Engineering	18

Geosciences

42 Geosciences (General)	29
43 Earth Resources and Remote Sensing	30
44 Energy Production and Conversion	31
45 Environment Pollution	32

Life Sciences

51 Life Sciences (General)	33
54 Man/System Technology and Life Support	34

Mathematical and Computer Sciences

61 Computer Programming and Software	35
64 Numerical Analysis	35

Physics

70	Physics (General)	36
71	Acoustics	36
74	Optics	37
75	Plasma Physics	39

Indexes

Two indexes are available. You may use the find command under the tools menu while viewing the PDF file for direct match searching on any text string. You may also select either of the two indexes provided for linking to the corresponding document citation from *NASA Thesaurus* terms and personal author names.

[**Subject Term Index**](#)

[**Personal Author Index**](#)

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A Continuing Bibliography (Suppl. 67)

OCTOBER 2006

04

AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes all modes of communication with and between aircraft; air navigation systems (satellite and ground based); and air traffic control. For related information see also *06 Avionics and Aircraft Instrumentation*, *17 Space Communications, Spacecraft Communications, Command and Tracking*, and *32 Communications and Radar*.

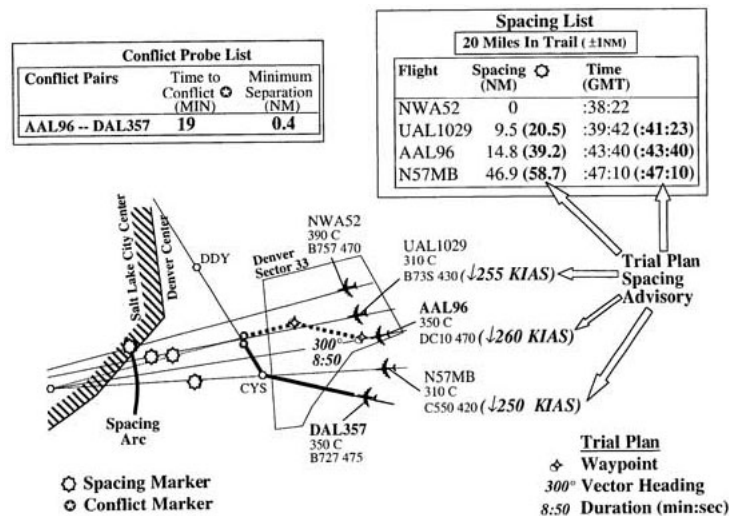
20050237962 NASA Ames Research Center, Moffett Field, CA, USA

En Route Spacing System and Method

Erzberger, Heinz, Inventor; Green, Steven M., Inventor; May 21, 2002; 25 pp.; In English
Patent Info.: Filed 31 Jul. 2000; Patent-6,393,358-B1; US-Patent-Appl-SN-629123; US-Patent-Appl-SN-146502; NASA-Case-ARC-14418-1; No Copyright; Avail: CASI; A03, Hardcopy

A method of and computer software for minimizing aircraft deviations needed to comply with an en route miles-in-trail spacing requirement imposed during air traffic control operations via establishing a spacing reference geometry, predicting spatial locations of a plurality of aircraft at a predicted time of intersection of a path of a first of said plurality of aircraft with the spacing reference geometry, and determining spacing of each of the plurality of aircraft based on the predicted spatial locations.

Official Gazette of the U.S. Patent and Trademark Office
Computer Programs; Aircraft Approach Spacing; Routes



05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes all stages of design of aircraft and aircraft structures and systems. Also includes aircraft testing, performance, and evaluation, and aircraft and flight simulation technology. For related information see also *18 Spacecraft Design, Testing and Performance*; and *39 Structural Mechanics*. For land transportation vehicles see *85 Technology Utilization and Surface Transportation*.

20050237947 NASA Dryden Flight Research Center, Edwards, CA, USA

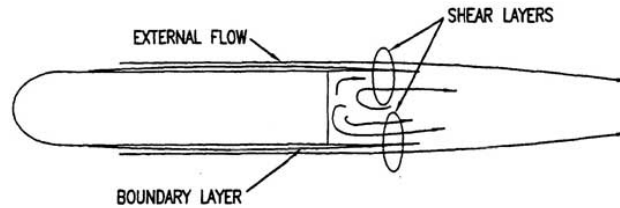
Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness

Whitmore, Stephen A., Inventor; Saltzman, Edwin J., Inventor; Moes, Timothy R., Inventor; Iliff, Kenneth W., Inventor; May 17, 2005; 7 pp.; In English

Patent Info.: Filed 29 May 2003; US-Patent-6,892,989-B1; US-Patent-Appl-SN-449905; NASA-Case-DRC-099002; No Copyright; Avail: CASI; A02, Hardcopy

A method for reducing drag upon a blunt-based vehicle by adaptively increasing forebody roughness to increase drag at the roughened area of the forebody, which results in a decrease in drag at the base of this vehicle, and in total vehicle drag. Official Gazette of the U.S. Patent and Trademark Office

Forebodies; Surface Roughness; Blunt Bodies; Adaptive Control



20050237956 NASA Ames Research Center, Moffett Field, CA, USA

Identification of a typical flight patterns

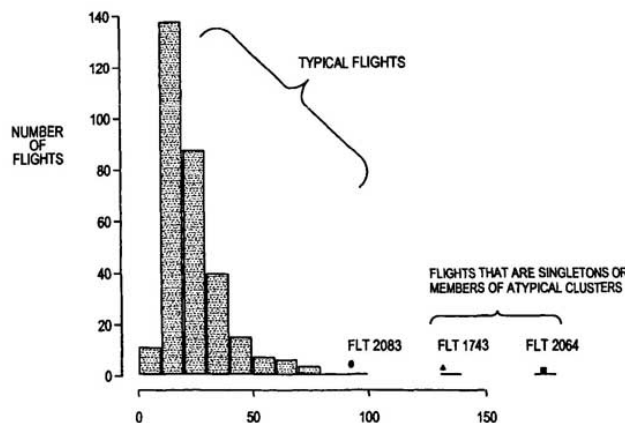
Statler, Irving C., Inventor; Ferryman, Thomas A, Inventor; Amidan, Brett G., Inventor; Whitney, Paul D., Inventor; White, M., Inventor; Willse, Alan R., Inventor; Cooley, Scott K., Inventor; Jay, Joseph Griffith, Inventor; Lawrence, Robert E., Inventor; Mosbrucker, Chris, Inventor, et al.; August 30, 2005; 13 pp.; In English

Patent Info.: Filed 21 May 2004; US-Patent-6,937,924-B1; US-Patent-Appl-SN-857376; NASA-Case-ARC-15041-1; No Copyright; Avail: CASI; A03, Hardcopy

Method and system for analyzing aircraft data, including multiple selected flight parameters for a selected phase of a selected flight, and for determining when the selected phase of the selected flight is atypical, when compared with corresponding data for the same phase for other similar flights. A flight signature is computed using continuous-valued and discrete-valued flight parameters for the selected flight parameters and is optionally compared with a statistical distribution of other observed flight signatures, yielding a typicality scores for the same phase for other similar flights. A cluster analysis is optionally applied to the flight signatures to define an optimal collection of clusters. A level of atypicality for a selected flight is estimated, based upon an index associated with the cluster analysis.

Author

Flight Characteristics; Numerical Analysis; Cluster Analysis



LAUNCH VEHICLES AND LAUNCH OPERATIONS

Includes all classes of launch vehicles, launch/space vehicle systems, and boosters; and launch operations. For related information see also *18 Spacecraft Design, Testing and Performance*; and *20 Spacecraft Propulsion and Power*.

20060009006 NASA Marshall Space Flight Center, Huntsville, AL, USA

AXISYMMETRIC, THROTTLEABLE NON-GIMBALLED ROCKET ENGINE

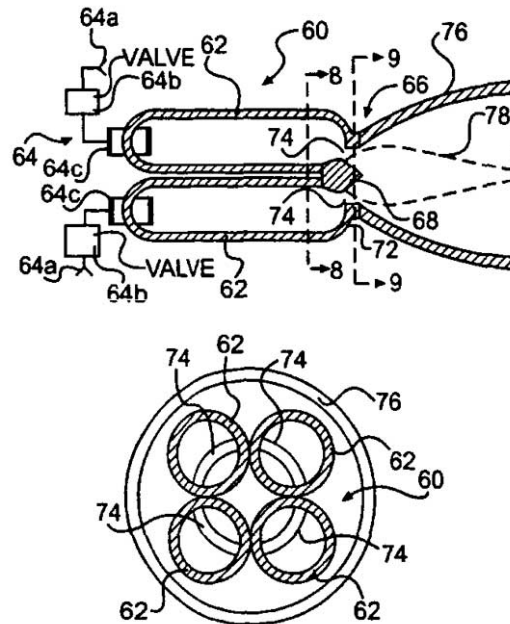
Sackheim, Robert L., Inventor; Hutt, John J., Inventor; Anderson, William E., Inventor; Dressler, Gordon A., Inventor; November 15, 2005; 9 pp.; In English

Patent Info.: Filed 11 Mar. 2003; US-Patent-6,964,154; US-Patent-Appl-390253; NASA-Case-MSF-31689; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009006>; Avail: CASI; A02, Hardcopy

A rocket engine assembly is provided for a vertically launched rocket vehicle. A rocket engine housing of the assembly includes two or more combustion chambers each including an outlet end defining a sonic throat area. A propellant supply for the combustion chambers includes a throttling injector, associated with each of the combustion chambers and located opposite to sonic throat area, which injects the propellant into the associated combustion chamber. A modulator, which may form part of the injector, and which is controlled by a controller, modulates the flow rate of the propellant to the combustion chambers so that the chambers provide a vectorable net thrust. An expansion nozzle or body located downstream of the throat area provides expansion of the combustion gases produced by the combustion chambers so as to increase the net thrust.

Official Gazette of the U.S. Patent and Trademark Office

Rocket Engines; Throttling; Symmetry



18

SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and spacecraft control and stability characteristics. For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance*; *39 Structural Mechanics*; and *16 Space Transportation and Safety*.

20050237933 NASA Marshall Space Flight Center, Huntsville, AL, USA

Thermal Insulating Coating for Spacecrafts

Kaul, Raj K., Inventor; September 06, 2005; 8 pp.; In English

Patent Info.: Filed 31 Jul. 2002; US-Patent-6,939,610-B1; US-Patent-Appl-SN-212564; NASA-Case-MSF-31593; No Copyright; Avail: CASI; A02, Hardcopy

To protect spacecraft and their contents from excessive heat thermal protection system are essential. For such thermal protection, metal coatings, ceramic materials, ablative materials, and various matrix materials have all been tried, but none have been found entirely satisfactory. The basis for this thermal protection system is the fact that the heat required to melt a substance is 80 to 100 times larger than the heat required to raise its temperature one degree. This led to the use herein of solid-liquid phase change materials. Unlike conventional heat storage materials, when phase change materials reach the temperature at which they change phase they absorb large amounts of heat without getting hotter. By this invention, then, a coating composition is provided for application to substrates subjected to temperatures above 100 F. The coating composition includes a phase change material.

Official Gazette of the U.S. Patent and Trademark Office

Thermal Protection; Metal Coatings; Heat Storage; Ceramics; Thermal Insulation

CHEMISTRY AND MATERIALS (GENERAL)

Includes general research topics related to the composition, properties, structure, and use of chemical compounds and materials as they relate to aircraft, launch vehicles, and spacecraft. For specific topics in chemistry and materials see *categories 25 through 29*. For astrochemistry see category *90 Astrophysics*.

20060009299 NASA Kennedy Space Center, Cocoa Beach, FL, USA

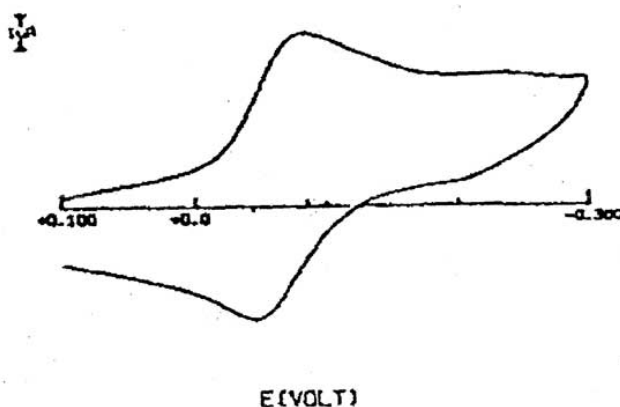
CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE

Viswanathan, Tito, Inventor; December 06, 2005; 9 pp.; In English

Patent Info.: Filed 11 Jul. 2001; US-Patent-6,972,098; US-Patent-Appl-SN-903260; US-Patent-Appl-217493; NASA-Case-KSC-122191; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009299>; Avail: CASI; A02, Hardcopy

The invention provides coatings useful for preventing corrosion of metals. The coatings comprise a film-forming resin and conductive polymers comprising linearly conjugated pi-systems and residues of sulfonated lignin or a sulfonated polyflavonoid or derivatives of sulfonated lignin or a sulfonated polyflavonoid. The invention also provides a latex formulation of the coatings, and articles of manufacture comprising a metal substrate and a coating in contact with the metal substrate. Official Gazette of the U.S. Patent and Trademark Office

Corrosion Prevention; Metal Coatings; Resins; Doped Crystals; Steels; Cold Rolling



20060017040 NASA Kennedy Space Center, Cocoa Beach, FL, USA

Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs

Reinhart, Debra R., Inventor; Clausen, Christian, Inventor; Gelger, Cherie L., Inventor; Quinn, Jacqueline, Inventor; Brooks, Kathleen, Inventor; May 02, 2006; 9 pp.; In English

Patent Info.: Filed 31 Oct. 2003; US-Patent-7,037,946; US-Patent-Appl-SN-701412; US-Patent-Appl-SN-972296; US-Patent-Appl-SN-6664298; NASA-Case-KSC-12246-2; No Copyright; ONLINE:

<http://hdl.handle.net/2060/20060017040>; Avail: CASI; A02, Hardcopy

A zero-valent metal emulsion is used to dehalogenate solvents, such as pooled dense non-aqueous phase liquids (DNAPLs), including trichloroethylene (TCE). The zero-valent metal emulsion contains zero-valent metal particles, a surfactant, oil and water. The preferred zero-valent metal particles are nanoscale and microscale zero-valent iron particles. Official Gazette of the U.S. Patent and Trademark Office

Metal Particles; Solvents; Trichloroethylene; Emulsions; Iron; Surfactants

COMPOSITE MATERIALS

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

20050237934 NASA Langley Research Center, Hampton, VA, USA

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers

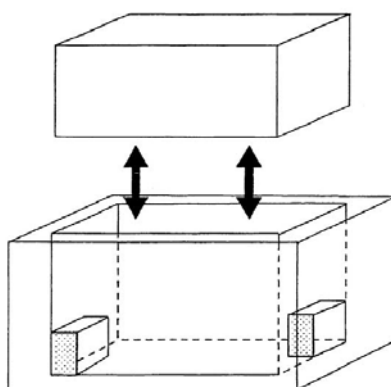
Dingemans, Theodorus J., Inventor; Weiser, Erik S., Inventor; SaintClair, Terry L., Inventor; September 06, 2005; 18 pp.; In English

Patent Info.: Filed 5 Jan. 2001; US-Patent-6,939,940-B2; US-Patent-Appl-SN-757398; US-Patent-Appl-SN-232504; NASA-Case-LAR-16079-1; No Copyright; Avail: CASI; A03, Hardcopy

Main chain thermotropic liquid crystal esters, ester-imides, and ester-amides were prepared from AA, BB, and AB type monomeric materials and were end-capped with phenylacetylene, phenylmaleimide, or nadimide reactive end-groups. The resulting reactive end-capped liquid crystal oligomers exhibit a variety of improved and preferred physical properties. The end-capped liquid crystal oligomers are thermotropic and have, preferably, molecular weights in the range of approximately 1000-15,000 grams per mole. The end-capped liquid crystal oligomers have broad liquid crystalline melting ranges and exhibit high melt stability and very low melt viscosities at accessible temperatures. The end-capped liquid crystal oligomers are stable for up to an hour in the melt phase. These properties make the end-capped liquid crystal oligomers highly processable by a variety of melt process shape forming and blending techniques including film extrusion, fiber spinning, reactive injection molding (RIM), resin transfer molding (RTM), resin film injection (RFI), powder molding, pultrusion, injection molding, blow molding, plasma spraying and thermo-forming. Once processed and shaped, the end-capped liquid crystal oligomers were heated to further polymerize and form liquid crystalline thermosets (LCT). The fully cured products are rubbers above their glass transition temperatures. The resulting thermosets display many properties that are superior to their non-end-capped high molecular weight analogs.

Official Gazette of the U.S. Patent and Trademark Office

Liquid Crystals; Esters; Glass Transition Temperature; Resin Transfer Molding; Amides; Imides; Forming Techniques; Resins; Oligomers



20050237944 NASA Marshall Space Flight Center, Huntsville, AL, USA

Pressure Vessel with Impact and Fire Resistant Coating and Method of Making Same

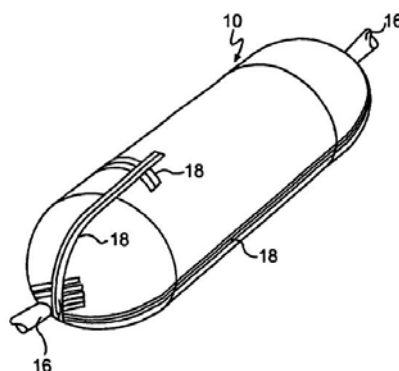
DeLay, Thomas K., Inventor; October 11, 2005; 5 pp.; In English

Patent Info.: Filed 27 Aug. 2002; US-Patent-6,953,129-B2; US-Patent-Appl-SN-231428; NASA-Case-MSF-31727-1; No Copyright; Avail: CASI; A01, Hardcopy

An impact and fire resistant coating laminate is provided which serves as an outer protective coating for a pressure vessel such as a composite overwrapped vessel with a metal lining. The laminate comprises a plurality of fibers (e.g., jute twine or other, stronger fibers) which are wound around the pressure vessel and an epoxy matrix resin for the fibers. The epoxy matrix resin including a plurality of microspheres containing a temperature responsive phase change material which changes phase in response to exposure thereof to a predetermined temperature increase so as to afford increased insulation and heat absorption.

Official Gazette of the U.S. Patent and Trademark Office

Pressure Vessels; Flammability; Protective Coatings



20060017034 NASA Glenn Research Center, Cleveland, OH, USA

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites

Chuang, CHun-Hua, Inventor; March 21, 2006; 7 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 23 Jul. 2004; US-Patent-7,015,304; US-Patent-Appl-SN-897279; NASA-Case-LEW-17618-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017034>; Avail: CASI; A02, Hardcopy

This invention relates to the composition and a solvent-free process for preparing novel imide oligomers and polymers specifically formulated with effective amounts of a dianhydride such as 2,3,3',4-biphenyltetra carboxylic dianhydride (a-BPDA), at least one aromatic diamine' and an endcapped of 4-phenylethynylphthalic anhydride (PEPA) or nadic anhydride to produce imide oligomers that possess a low-melt viscosity of 1-60 poise at 260-280° C. When the imide oligomer melt is cured at about 371 C. in a press or autoclave under 100-500 psi, the melt resulted in a thermoset polyimide having a glass transition temperature (T(sub g)) equal to and above 310 C. A novel feature of this process is that the monomers; namely the dianhydrides, diamines and the endcaps, are melt processable to form imide oligomers at temperatures ranging between 232-280 C. (450-535 F) without any solvent. These low-melt imide oligomers can be easily processed by resin transfer molding (RTM), vacuum-assisted resin transfer molding (VARTM) or the resin infusion process with fiber preforms e.g. carbon, glass or quartz preforms to produce polyimide matrix composites with 288-343C (550-650 F) high temperature performance capability.

Official Gazette of the U.S. Patent and Trademark Office

Glass Transition Temperature; Anhydrides; Carboxylic Acids; Viscosity; Resin Transfer Molding; Polyimides; Oligomers; High Temperature

25

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

Includes the analysis, synthesis, and use of inorganic and organic compounds; combustion theory; electrochemistry; and photochemistry. For related information see category *34 Fluid Dynamics and Thermodynamics*. For astrochemistry see category *90 Astrophysics*.

20050237942 NASA Glenn Research Center, Cleveland, OH, USA

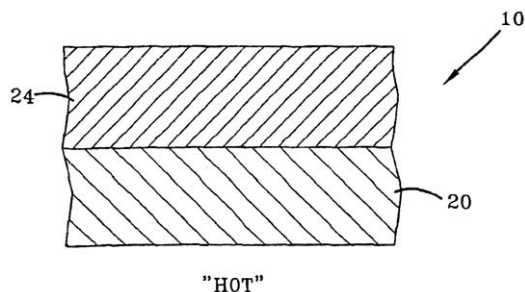
NiAl-Based Approach For Rocket Combustion Chambers

Nathal, Michael V., Inventor; Gayda, John, Inventor; Noebe, Ronald D., Inventor; May 03, 2005; 6 pp.; In English
Patent Info.: Filed 22 Jul. 2003; US-Patent-6,886,327-B1; US-Patent-Appl-SN-627107; US-Patent-Appl-SN-105110; NASA-Case-LEW-17093-2; No Copyright; Avail: CASI; A02, Hardcopy

A multi-layered component, such as a rocket engine combustion chamber, includes NiAl or NiAl-based alloy as a structural layer on the hot side of the component. A second structural layer is formed of material selected from Ni-based superalloys, Co-based alloys, Fe-based alloys, Cu, and Cu-based alloys. The second material is more ductile than the NiAl and imparts increased toughness to the component. The second material is selected to enhance one or more predetermined physical properties of the component. Additional structural layers may be included with the additional material(s) being selected for their impact on physical properties of the component.

Author

Combustion Chambers; Rocket Engines; Nickel Aluminides



20050237952 NASA Kennedy Space Center, Cocoa Beach, FL, USA

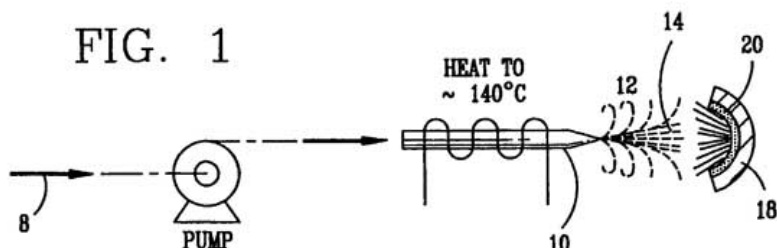
High temperature decomposition of hydrogen peroxide

Parrish, Clyde F., Inventor; October 18, 2005; 7 pp.; In English; Provisional US-Patent-Appl-SN-276260, filed 8 Mar. 2001; Continuation-in-part of US-Patent-Appl-SN-014140, filed 6 Dec. 2001
Patent Info.: Filed 12 Aug. 2004; US-Patent-6,955,799-B1; US-Patent-Appl-SN-923152; US-Patent-Appl-SN-276260; US-Patent-Appl-SN-014140; NASA-Case-KSC-12235-2; No Copyright; Avail: CASI; A02, Hardcopy

Nitric oxide (NO) is oxidized into nitrogen dioxide (NO₂) by the high temperature decomposition of a hydrogen peroxide solution to produce the oxidative free radicals, hydroxyl and hydroperoxyl. The hydrogen peroxide solution is impinged upon a heated surface in a stream of nitric oxide where it decomposes to produce the oxidative free radicals. Because the decomposition of the hydrogen peroxide solution occurs within the stream of the nitric oxide, rapid gas-phase oxidation of nitric oxide into nitrogen dioxide occurs.

Author

Vapor Phases; Nitrogen Dioxide; Nitric Oxide; High Temperature Gases



20050237953 NASA Ames Research Center, Moffett Field, CA, USA

Secondary polymer layered impregnated tile

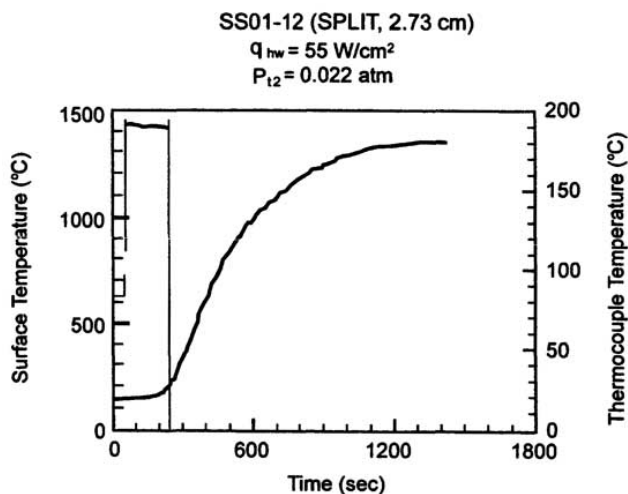
Tran, Huy K., Inventor; Rasky, Daniel J., Inventor; Szalai, Christine E., Inventor; Carroll, Joseph A., Inventor; Hsu, Ming-ta S., Inventor; October 18, 2005; 14 pp.; In English

Patent Info.: Filed 9 Jun. 2004; US-Patent-6,955,853-B1; US-Patent-Appl-SN-868450; NASA-Case-ARC-14165-1; No Copyright; Avail: CASI; A03, Hardcopy

A low density organic polymer impregnated preformed fibrous ceramic article includes a plurality of layers. A front layer includes ceramic fibers or carbon fibers or combinations of ceramic fibers and carbon fibers, and is impregnated with an effective amount of at least one organic polymer. A middle layer includes polymer impregnated ceramic fibers. A back layer includes ceramic fibers or carbon fibers or combinations of ceramic fibers and carbon fibers, and is impregnated with an effective amount of at least one low temperature pyrolyzing organic polymer capable of decomposing without depositing residues.

Author

Carbon Fibers; Organic Compounds; Ceramic Fibers; Tiles



20050237954 NASA Langley Research Center, Hampton, VA, USA

Polyimide Foams

Vazquez, Juan M., Inventor; Cano, Roberto J., Inventor; Jensen, Brian J., Inventor; Weiser, Erik S., Inventor; October 18, 2005; 9 pp.; In English

Patent Info.: Filed 11 Feb. 2004; US-Patent-6,956,066-B2; US-Patent-Appl-SN-779552; US-Patent-Appl-SN-446355; NASA-Case-LAR-16115-1; No Copyright; Avail: CASI; A02, Hardcopy

A fully imidized, solvent-free polyimide foam having excellent mechanical, acoustic, thermal, and flame resistant

properties is produced. A first solution is provided, which includes one or more aromatic dianhydrides or derivatives of aromatic dianhydrides, and may include one or more aromatic diamines, dissolved in one or more polar solvents, along with an effective amount of one or more blowing agents. This first solution may also advantageously include effective amounts respectively of one or more catalysts, one or more surfactants, and one or more fire retardants. A second solution is also provided which includes one or more isocyanates. The first and second solutions are rapidly and thoroughly mixed to produce an admixture, which is allowed to foam in an open container, or in a closed mold under ambient conditions to completion produce a foamed product. This foamed product is then cured by high frequency electromagnetic radiation, thermal energy, or a combination thereof. Alternatively, the process is adapted for spraying or extrusion.

Official Gazette of the U.S. Patent and Trademark Office

Polyimides; Foams; Flame Retardants

2006008999 NASA Glenn Research Center, Cleveland, OH, USA

Polyimides by Photochemical Cyclopolymerization

Meador, Michael A., Inventor; December 13, 2005; 13 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 8 Jul. 2003; US-Patent-6,974,755; US-Patent-Appl-SN-617447; US-Patent-Appl-SN-827140; NASA-Case-LEW-17133-3; No Copyright; ONLINE: <http://hdl.handle.net/2060/2006008999>; Avail: CASI; A03, Hardcopy

The novel polyimides of this invention are derived from Diels-Alder cyclopolymerization of photochemically generated bisdienes with dienophiles, such as bismaleimides, trismaleimides and mixtures thereof with maleimide endcaps. Irradiation of one or more diketones produces two distinct hydroxy o-quinodimethane (photoenol) intermediates. These intermediates are trapped via Diels-Alder cycloaddition with appropriate dienophiles, e.g., bismaleimide and/or trismaleimides to give the corresponding polyimides in quantitative yields. When bismaleimides, trismaleimides or mixtures thereof with maleimide end-caps are used as the dienophile, the resulting polyimides have glass transition temperatures (T_g) as high as 300 C. Polyimide films can be prepared by ultraviolet irradiation of high solids content varnishes of the monomers in a small amount of solvent, e.g., cyclohexanone, dimethyl formamide, N-methylpyrrolidone and the like. These novel polyimides are characterized as having high glass transition temperatures, good mechanical properties and improved processing in the manufacture of adhesives, electronic materials and films.

Official Gazette of the U.S. Patent and Trademark Office

Cyclic Compounds; Polyimides; Polymerization

2006009009 NASA Glenn Research Center, Cleveland, OH, USA

Substituted Cyclohexene Endcaps for Polymers with Thermal-Oxidative Stability

December 27, 2005; 11 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 23 Oct. 2003; US-Patent-6,979,721; US-Patent-Appl-693852; NASA-Case-LEW-17429-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/2006009009>; Avail: CASI; A03, Hardcopy

This invention relates to polyimides having improved thermal-oxidative stability, to the process of preparing said polyimides, and the use of polyimide prepolymers in the preparation of prepregs and composites. The polyimides are particularly useful in the preparation of fiber-reinforced, high-temperature composites for use in various engine parts including inlets, fan ducts, exit flaps and other parts of high speed aircraft. The polyimides are derived from the polymerization of effective amounts of at least one tetracarboxylic dianhydride, at least one polyamine and a novel dicarboxylic endcap having the formula presented.

Official Gazette of the U.S. Patent and Trademark Office

Polyimides; Polymerization; Thermal Stability; Hexenes; Cyclic Compounds

20060010033 NASA Kennedy Space Center, Cocoa Beach, FL, USA

Polyimides from 2,3,3',4'-Biphenyltetracarboxylic Dianhydride and Aromatic Diamines

Hergenrother, Paul M., Inventor; Smith, Joseph G., Inventor; Connell, John W., Inventor; Watson, Kent A., Inventor; October 25, 2005; 18 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 7 Apr. 2003; US-Patent-6,958,192; US-Patent-Appl-SN-414562; US-Patent-Appl-SN-373342; NASA-Case-KSC-12209; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060010033>; Avail: CASI; A03, Hardcopy

The present invention relates generally to polyimides. It relates particularly to novel polyimides prepared from 2,3, 3',4'-biphenyltetracarboxylic dianhydride and aromatic diamines. These novel polyimides have low color, good solubility, high thermal emissivity, low solar absorptivity and high tensile strength.

Official Gazette of the U.S. Patent and Trademark Office

Anhydrides; Diamines; Polyimides; Aromatic Compounds; Phenyls; Carboxyl Group

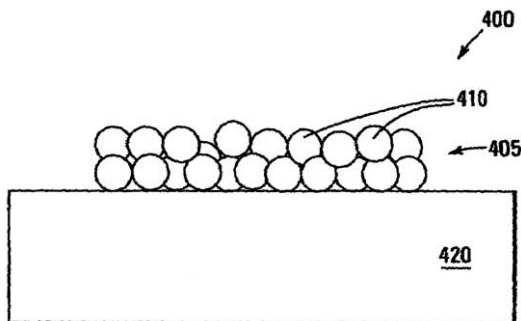
20060010034 NASA Kennedy Space Center, Cocoa Beach, FL, USA

High Performance Immobilized Liquid Membrane for Carbon Dioxide Separations

Parrish, Clyde F., Inventor; October 25, 2005; 9 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 17 Sep. 2003; US-Patent-6,958,085; US-Patent-Appl-666821; US-Patent-Appl-458874;
NASA-Case-KSC-12540; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060010034>; Avail: CASI; A02, Hardcopy

An immobilized liquid membrane has a substrate. A plurality of capsules is disposed on the substrate. Each of the capsules is permeable to a first gas of a mixture of gases comprising the st gas and a second gas. Each of the capsules is substantially impermeable to the second gas. A liquid is disposed in each of the capsules that is permeable to the first gas and substantially impermeable to the second gas.

Official Gazette of the U.S. Patent and Trademark Office
Carbon Dioxide; Gas Mixtures; Membranes



26

METALS AND METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals and metallic materials; and metallurgy.

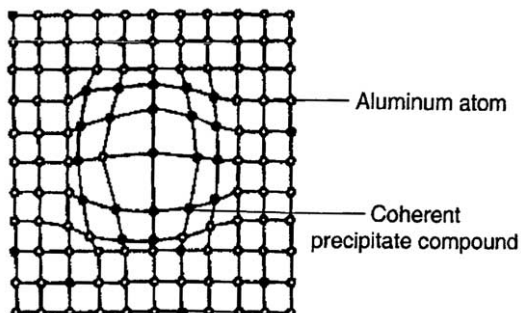
20050237966 NASA Marshall Space Flight Center, Huntsville, AL, USA

High Strength Aluminum Alloy For High Temperature Applications

Lee, Jonathan A., Inventor; Chen, Po-Shou, Inventor; July 19, 2005; 9 pp.; In English
Patent Info.: Filed 10 Apr. 2002; US-Patent-6,918,970; US-Patent-Appl-SN-120226; NASA-Case-MSF-31858-1; No Copyright; Avail: CASI; A02, Hardcopy

A cast article from an aluminum alloy has improved mechanical properties at elevated temperatures. The cast article has the following composition in weight percent: Silicon 6.0-25.0, Copper 5.0-8.0, Iron 0.05-1.2, Magnesium 0.5-1.5, Nickel 0.05-0.9, Manganese 0.05-1.2, Titanium 0.05-1.2, Zirconium 0.05-1.2, Vanadium 0.05-1.2, Zinc 0.05-0.9, Strontium 0.001-0.1, Phosphorus 0.001-0.1, and the balance is Aluminum, wherein the silicon-to-magnesium ratio is 10-25, and the copper-to-magnesium ratio is 4-15. The aluminum alloy contains a simultaneous dispersion of three types of Al₃X compound particles (X=Ti, V, Zr) having a LI₂ crystal structure, and their lattice parameters are coherent to the aluminum matrix lattice. A process for producing this cast article is also disclosed, as well as a metal matrix composite, which includes the aluminum alloy serving as a matrix containing up to about 60% by volume of a secondary filler material.

Official Gazette of the U.S. Patent and Trademark Office
Aluminum Alloys; High Strength Alloys; High Temperature



20060009000 NASA Glenn Research Center, Cleveland, OH, USA

Nickel Base Superalloy Turbine Disk

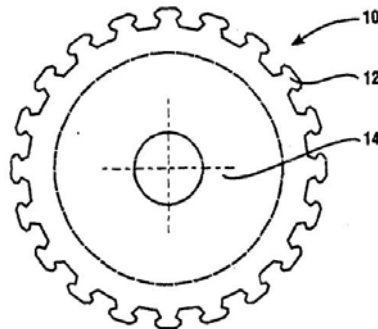
Gabb, Timothy P., Inventor; Gauda, John, Inventor; Telesman, Ignacy, Inventor; Kantzos, Pete T., Inventor; December 13, 2005; 17 pp.; In English

Patent Info.: Filed 29 Oct. 2002; US-Patent-6,974,508; US-Patent-Appl-SN-283220; NASA-Case-LEW-17318-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009000>; Avail: CASI; A03, Hardcopy

A low solvus, high refractory alloy having unusually versatile processing mechanical property capabilities for advanced disks and rotors in gas turbine engines. The nickel base superalloy has a composition consisting essentially of, in weight percent, 3.0-4.0 N, 0.02-0.04 B, 0.02-0.05 C, 12.0-14.0 Cr, 19.0-22.0 Co, 2.0-3.5 Mo, greater than 1.0 to 2.1 Nb, 1.3 to 2.1 Ta, 3.04-4.1 to 5.0 W, 0.03-0.06 Zr, and balance essentially Ni and incidental impurities. The superalloy combines ease of processing with high temperature capabilities to be suitable for use in various turbine engine disk, impeller, and shaft applications. The Co and Cr levels of the superalloy can provide low solvus temperature for high processing versatility. The W, Mo, Ta, and Nb refractory element levels of the superalloy can provide sustained strength, creep, and dwell crack growth resistance at high temperatures.

Official Gazette of the U.S. Patent and Trademark Office

Heat Resistant Alloys; Refractory Metal Alloys; Nickel Alloys; Rotors; Gas Turbine Engines; Mechanical Properties



31

ENGINEERING (GENERAL)

Includes general research topics related to engineering and applied physics, and particular areas of vacuum technology, industrial engineering, cryogenics, and fire prevention. For specific topics in engineering see *categories 32 through 39*.

20060017024 NASA Johnson Space Center, Houston, TX, USA

Sensor And Method For Detecting A Superstrate

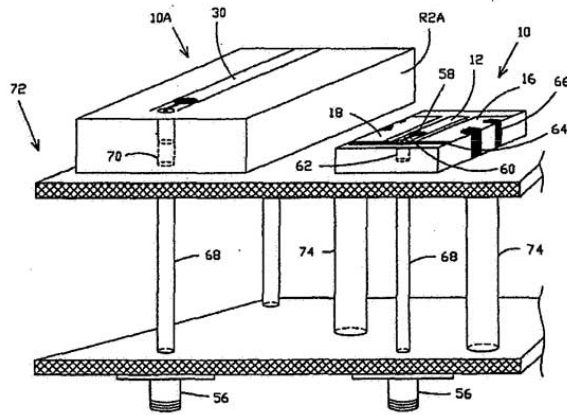
Arndt, G. Dickey, Inventor; Cari, James R., Inventor; Ngo, Phong H., Inventor; Fink, Patrick W., Inventor; Siekierski, James D., Inventor; February 07, 2006; 27 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 5 Mar. 2001; US-Patent-6,995,572; US-Patent-Appl-SN-803613; NASA-Case-MSF-23153-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017024>; Avail: CASI; A03, Hardcopy

Method and apparatus are provided for determining a superstrate on or near a sensor, e.g., for detecting the presence of an ice superstrate on an airplane wing or a road. In one preferred embodiment, multiple measurement cells are disposed along a transmission line. While the present invention is operable with different types of transmission lines, construction details for a presently preferred coplanar waveguide and a microstrip waveguide are disclosed. A computer simulation is provided as part of the invention for predicting results of a simulated superstrate detector system. The measurement cells may be physically partitioned, nonphysically partitioned with software or firmware, or include a combination of different types of partitions. In one embodiment, a plurality of transmission lines are utilized wherein each transmission line includes a plurality of measurement cells. The plurality of transmission lines may be multiplexed with the signal from each transmission line being applied to the same phase detector. In one embodiment, an inverse problem method is applied to determine the superstrate dielectric for a transmission line with multiple measurement cells.

Official Gazette of the U.S. Patent and Trademark Office

Transmission Lines; Phase Detectors; Planar Structures; Multiplexing; Computerized Simulation; Ice



33

ELECTRONICS AND ELECTRICAL ENGINEERING

Includes development, performance, and maintainability of electrical/electronic devices and components; related test equipment; and microelectronics and integrated circuitry. for related information see also *60 Computer Operations and Hardware*; and *76 Solid-State Physics*. For communications equipment and devices see *32 Communications and Radar*.

20050237888 NASA Johnson Space Center, Houston, TX, USA

Feed Structure For Antennas

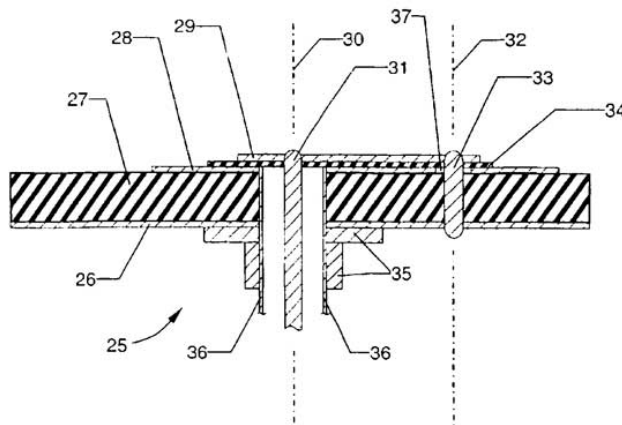
Fink, Patrick W., Inventor; Chu, Andrew W., Inventor; Dobbins, Justin A., Inventor; Lin, Greg Y., Inventor; June 07, 2005; 19 pp.; In English

Patent Info.: Filed 29 May 2003; US-Patent-6,903,687; US-Patent-Appl-SN-449905; NASA-Case-MS-23549-1; No Copyright; Avail: CASI; A03, Hardcopy

A novel feed structure, for an antenna having a resonant electric field structure, comprising a patch element, an integrated circuit attached to the patch element, at least one inner conductor electrically connected to and terminating at the integrated circuit on a first end of the at least one inner conductor, wherein the at least one inner conductor extends through and is not electrically connected to the patch element, and wherein the at least one inner conductor is available for electrical connectivity on a second end of the at least one inner conductor, and an outer conductor electrically connected to and terminating at the patch element on a first end of the outer conductor, wherein the outer conductor is available for electrical connectivity on a second end of the outer conductor, and wherein the outer conductor concentrically surrounds the at least one inner conductor from the second end of the at least one inner conductor available for electrical connectivity to the first end of the outer conductor terminating at the patch element.

Official Gazette of the U.S. Patent and Trademark Office

Antenna Design; Electric Conductors; Electrical Engineering



20050237938 NASA Johnson Space Center, Houston, TX, USA

Wide Bandwidth Phase-Locked Loop Circuit

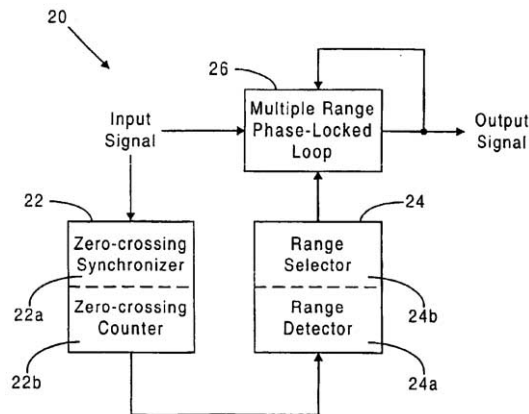
Koudelka, Robert David, Inventor; February 22, 2005; 16 pp.; In English

Patent Info.: Filed 4 Feb. 2000; US-Patent-6,859,509-B1; US-Patent-Appl-SN-500607; NASA-Case-MS-C-22875-1; No Copyright; Avail: CASI; A03, Hardcopy

A PLL circuit uses a multiple frequency range PLL in order to phase lock input signals having a wide range of frequencies. The PLL includes a VCO capable of operating in multiple different frequency ranges and a divider bank independently configurable to divide the output of the VCO. A frequency detector detects a frequency of the input signal and a frequency selector selects an appropriate frequency range for the PLL. The frequency selector automatically switches the PLL to a different frequency range as needed in response to a change in the input signal frequency. Frequency range hysteresis is implemented to avoid operating the PLL near a frequency range boundary.

Official Gazette of the U.S. Patent and Trademark Office

Bandwidth; Circuits; Phase Locked Systems; Electrical Engineering



20050237965 NASA Kennedy Space Center, Cocoa Beach, FL, USA

Current Signature Sensor

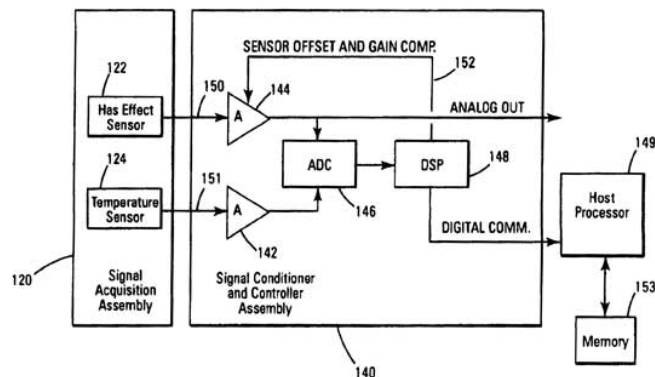
Perotti, Jose M., Inventor; Lucena, Angel, Inventor; Ihlefeld, Curtis, Inventor; Burns, Bradley, Inventor; Bassignani, Mario, Inventor; Bassignani, Karin E., Inventor; July 12, 2005; 13 pp.; In English

Patent Info.: Filed 29 Aug. 2002; US-Patent-6,917,203-B1; US-Patent-Appl-SN-235020; US-Patent-Appl-SN-318095; No Copyright; Avail: CASI; A03, Hardcopy

A solenoid health monitoring system uses a signal conditioner and controller assembly in one embodiment that includes analog circuitry and a DSP controller. The analog circuitry provides signal conditioning to the low-level raw signal coming from a signal acquisition assembly. Software running in a DSP analyzes the incoming data (recorded current signature) and determines the state of the solenoid whether it is energized, de-energized, or in a transitioning state. In one embodiment, the software identifies key features in the current signature during the transition phase and is able to determine the health of the solenoid.

Official Gazette of the U.S. Patent and Trademark Office

Solenoids; Systems Health Monitoring; Signal Processing; Electric Current; Sensors



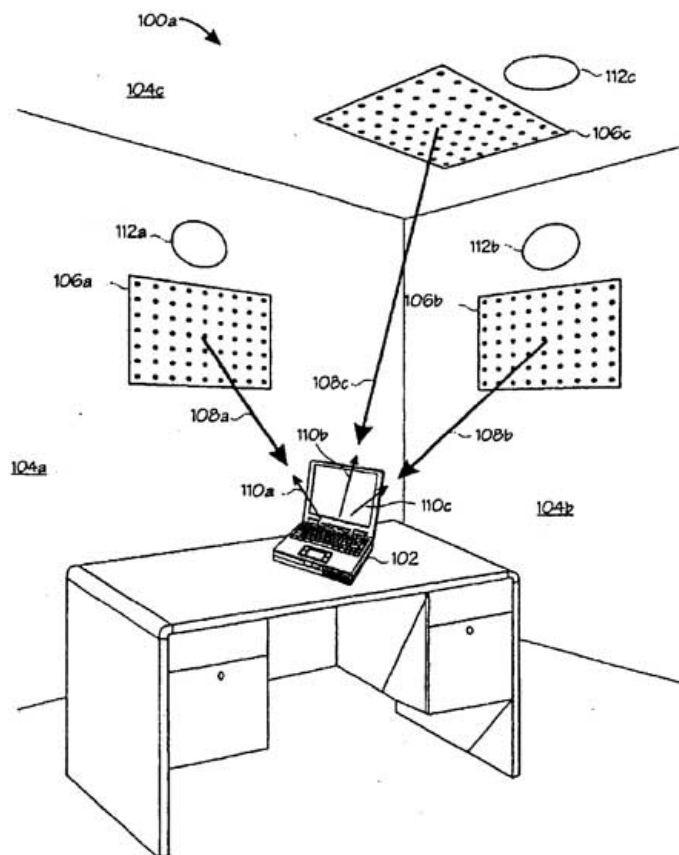
20060009004 NASA Glenn Research Center, Cleveland, OH, USA
CHARGING of DEVICES BY MICROWAVE POWER BEAMING

Landis, Geoffrey A., Inventor; November 22, 2005; 10 pp.; In English
Patent Info.: Filed 5 Jun. 2003; US-Patent-6,967,462; US-Patent-Appl-SN-455139; NASA-Case-LEW-17383-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009004>; Avail: CASI; A02, Hardcopy

A system for providing wireless, charging power and/or primary power to electronic/electrical devices is described whereby microwave energy is employed. Microwave energy is focused by a power transmitter comprising one or more adaptively-phased microwave array emitters onto a device to be charged. Rectennas within the device to be charged receive and rectify the microwave energy and use it for battery charging and/or for primary power. A locator signal generated by the device to be charged is analyzed by the system to determine the location of the device to be charged relative to the microwave array emitters, permitting the microwave energy to be directed specifically towards the device to be charged. Backscatter detectors respond to backscatter energy reflected off of any obstacle between the device to be charged and the microwave array emitters. Power to any obstructed microwave array emitter is reduced until the obstruction is removed. Optionally, data can be modulated onto microwave energy beams produced by the array emitter and demodulated by the device, thereby providing means of data communication from the power transmitter to the device. Similarly, data can be modulated onto the locator signal and demodulated in the power transmitter, thereby providing means of data communication from the device to the power transmitter.

Official Gazette of the U.S. Patent and Trademark Office

Microwave Power Beaming; Transmitters; Microwave Transmission; Backscattering; Electric Batteries; Communication Equipment; Emitters



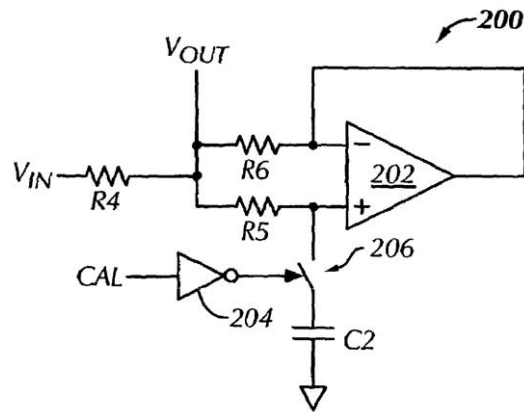
20060009010 NASA Johnson Space Center, Houston, TX, USA
Practical Active Capacitor Filter

Shuler, Robert L., Jr., Inventor; September 13, 2005; 12 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 21 May 2003; US-Patent-6,943,619; US-Patent-Appl-443233; NASA-Case-MS-C-23538-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009010>; Avail: CASI; A03, Hardcopy

A method and apparatus is described that filters an electrical signal. The filtering uses a capacitor multiplier circuit where

the capacitor multiplier circuit uses at least one amplifier circuit and at least one capacitor. A filtered electrical signal results from a direct connection from an output of the at least one amplifier circuit.

Official Gazette of the U.S. Patent and Trademark Office
Capacitors; Circuits; Multipliers; Signal Transmission



20060017021 NASA Pasadena Office, CA, USA

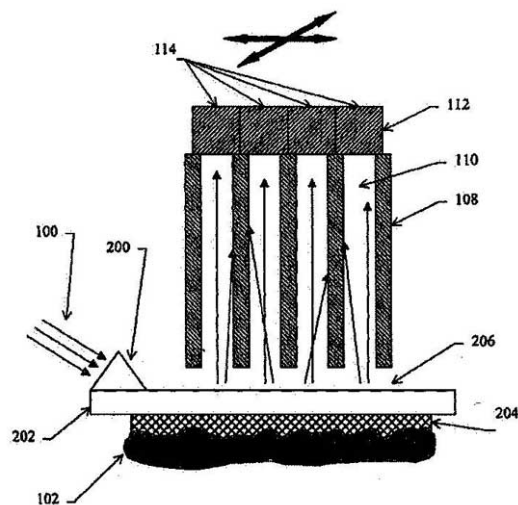
Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples

Wang, Yu, Inventor; February 14, 2006; 16 pp.; In English; Original contains black and white illustrations
 Patent Info.: Filed 30 Jun. 2003; US-Patent-6,998,600; US-Patent-Appl-SN-612442; NASA-Case-NPO-20821; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017021>; Avail: CASI; A03, Hardcopy

A miniature, ultra-high resolution, and color scanning microscope using microchannel and solid-state technology that does not require focus adjustment. One embodiment includes a source of collimated radiant energy for illuminating a sample, a plurality of narrow angle filters comprising a microchannel structure to permit the passage of only unscattered radiant energy through the microchannels with some portion of the radiant energy entering the microchannels from the sample, a solid-state sensor array attached to the microchannel structure, the microchannels being aligned with an element of the solid-state sensor array, that portion of the radiant energy entering the microchannels parallel to the microchannel walls travels to the sensor element generating an electrical signal from which an image is reconstructed by an external device, and a moving element for movement of the microchannel structure relative to the sample. Discloses a method for scanning samples whereby the sensor array elements trace parallel paths that are arbitrarily close to the parallel paths traced by other elements of the array.

Official Gazette of the U.S. Patent and Trademark Office

Microchannels; Microscopes; Scanning; Radiant Flux Density; Illuminating; High Resolution



20060017027 NASA Langley Research Center, Hampton, VA, USA

Marking Electrical Wiring With Condition Indicators

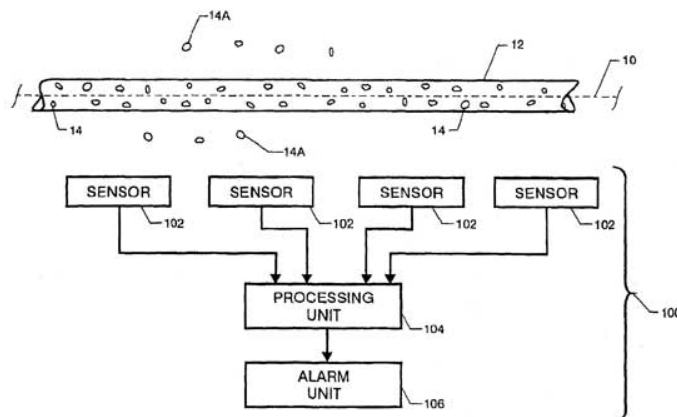
Yost, William T., Inventor; Perey, Daniel F., Inventor; Cramer, K. Elliott, Inventor; January 10, 2006; 10 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 21 Apr. 2003; US-Patent-6,985,083; US-Patent-Appl-SN-419424; US-Patent-Appl-SN-453337; US-Patent-Appl-SN-376364; NASA-Case-LAR-16576-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017027>; Avail: CASI; A02, Hardcopy

A method is provided for marking electrical Wiring with condition indicators. One or more markers are added to one or both of the insulative material and a surface of an electrical conductor such that it bonds thereto. Each marker is capable of emanating into a surrounding atmospheric environment as a gaseous effluent in response to a specific condition experienced by the electrical conductor.

Official Gazette of the U.S. Patent and Trademark Office

Wiring; Markers; Bonding; Conductors



20060017033 NASA Langley Research Center, Hampton, VA, USA

Non-Uniform Thickness Electroactive Device

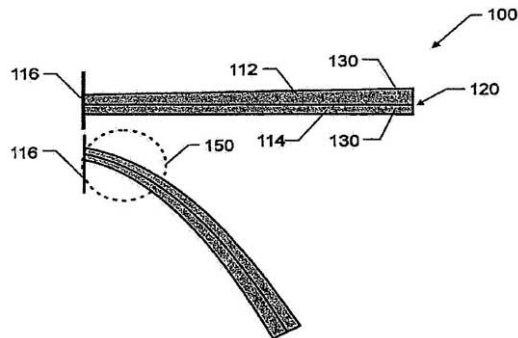
Su, Ji, Inventor; Harrison, Joycelyn S., Inventor; March 21, 2006; 11 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 23 Oct. 2000; US-Patent-7,015,624; US-Patent-Appl-SN-696526; US-Patent-Appl-SN-161113; NASA-Case-LAR-16039-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017033>; Avail: CASI; A03, Hardcopy

An electroactive device comprises at least two layers of material, wherein at least one layer is an electroactive material and wherein at least one layer is of non-uniform thickness. The device can be produced in various sizes, ranging from large structural actuators to microscale or nanoscale devices. The applied voltage to the device in combination with the non-uniform thickness of at least one of the layers (electroactive and/or non-electroactive) controls the contour of the actuated device. The effective electric field is a mathematical function of the local layer thickness. Therefore, the local strain and the local bending/torsion curvature are also a mathematical function of the local thickness. Hence the thinnest portion of the actuator offers the largest bending and/or torsion response. Tailoring of the layer thicknesses can enable complex motions to be achieved.

Official Gazette of the U.S. Patent and Trademark Office

Electric Potential; Actuators; Electric Fields; Insulation; Laminates



20060017036 NASA Marshall Space Flight Center, Huntsville, AL, USA

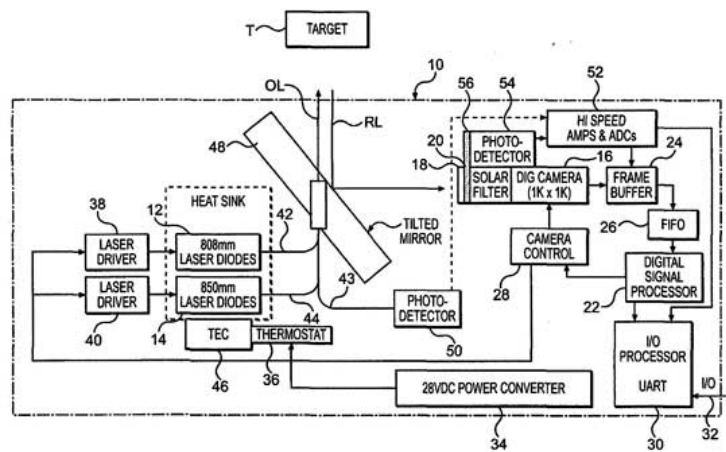
Video Guidance Sensor System With Integrated Rangefinding

Book, Michael L., Inventor; Bryan, Thomas C., Inventor; Howard, Richard T., Inventor; Roe, Fred Davis, Jr., Inventor; Bell, Joseph L., Inventor; February 28, 2006; 7 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 21 Aug. 2003; US-Patent-7,006,203; US-Patent-Appl-SN-646000; NASA-Case-MSF-31785; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017036>; Avail: CASI; A02, Hardcopy

A video guidance sensor system for use, p.g., in automated docking of a chase vehicle with a target vehicle. The system includes an integrated rangefinder sub-system that uses time of flight measurements to measure range. The rangefinder sub-system includes a pair of matched photodetectors for respectively detecting an output laser beam and return laser beam, a buffer memory for storing the photodetector outputs, and a digitizer connected to the buffer memory and including dual amplifiers and analog-to-digital converters. A digital signal processor processes the digitized output to produce a range measurement.

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Guidance Sensors; Signal Processing; Signal Analyzers; Rangefinding; Analog to Digital Converters; Digital Systems; In-Flight Monitoring



20060017039 NASA Langley Research Center, Hampton, VA, USA

Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer

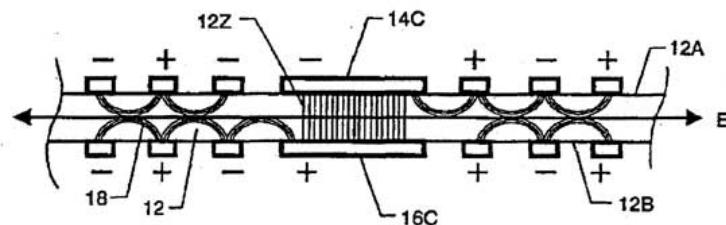
Bryant, Robert G., Inventor; Fox, Robert L., Inventor; May 02, 2006; 16 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 16 Jan. 2003; US-Patent-7,038,358; US-Patent-Appl-SN-347563; US-Patent-Appl-SN-364652; NASA-Case-LAR-16289-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017039>; Avail: CASI; A03, Hardcopy

An electro-active transducer includes a ferroelectric material sandwiched by first and second electrode patterns. When the device is used as an actuator, the first and second electrode patterns are configured to introduce an electric field into the ferroelectric material when voltage is applied to the electrode patterns. When the device is used as a sensor, the first and second electrode patterns are configured to introduce an electric field into the ferroelectric material when the ferroelectric material experiences deflection in a direction substantially perpendicular thereto. In each case, the electrode patterns are designed to cause the electric field to: i) originate at a region of the ferroelectric material between the first and second electrode patterns, and ii) extend radially outward from the region of the ferroelectric material (at which the electric field originates) and substantially parallel to the ferroelectric material's plane.

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Actuators; Electric Fields; Electric Potential; Transducers; Ferroelectric Materials



FLUID MECHANICS AND THERMODYNAMICS

Includes fluid dynamics and kinematics and all forms of heat transfer; boundary layer flow; hydrodynamics; hydraulics; fluidics; mass transfer and ablation cooling. For related information see also *02 Aerodynamics*.

20050237939 NASA Johnson Space Center, Houston, TX, USA

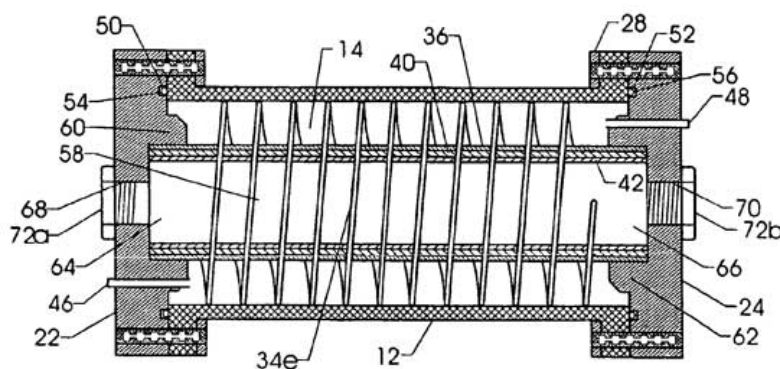
Fluid Bubble Eliminator

Gonda, Steve R., Inventor; Tsao, Yow-Min, Inventor; Lee, Wenshan, Inventor; March 08, 2005; 11 pp.; In English; US-Patent-6,863,712-B1; US-Patent-Appl-SN-263284; NASA-Case-MS-C-22996-1; No Copyright; Avail: CASI; A03, Hardcopy

A gas-liquid separator uses a helical passageway to impart a spiral motion to a fluid passing therethrough. The centrifugal force generated by the spiraling motion urges the liquid component of the fluid radially outward which forces the gas component radially inward. The gas component is then filtered through a gas-permeable, liquid-impermeable membrane and discharged through a central passageway.

Official Gazette of the U.S. Patent and Trademark Office

Bubbles; Elimination; Fluid Flow



INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography. For aerial photography see *43 Earth Resources and Remote Sensing*. For related information see also *06 Avionics and Aircraft Instrumentation*; and *19 Spacecraft Instrumentation and Astrionics*.

20060017037 NASA Glenn Research Center, Cleveland, OH, USA

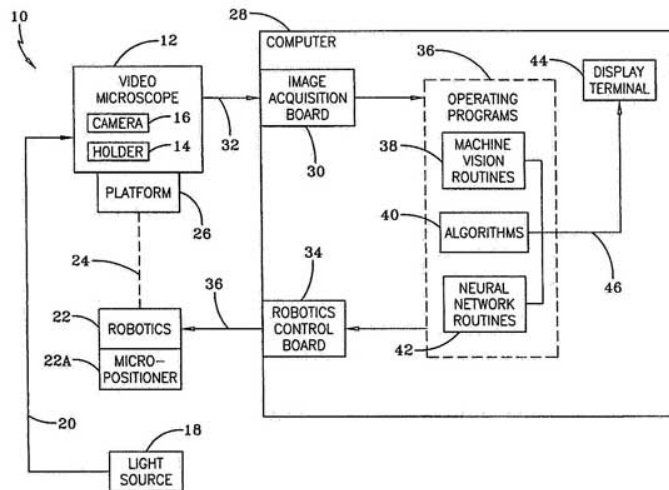
Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls

McDowell, Mark, Inventor; May 09, 2006; 36 pp.; In English; Original contains black and white illustrations
Patent Info.: Filed 4 Feb. 2005; US-Patent-7,042,639; US-Patent-Appl-SN-053760; NASA-Case-LEW-17484-3;
US-Patent-Appl-SN-645999; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017037>; Avail: CASI; A03, Hardcopy

A Microscope Imaging System (CMIS) with intelligent controls is disclosed that provides techniques for scanning, identifying, detecting and tracking microscopic changes in selected characteristics or features of various surfaces including, but not limited to, cells, spheres, and manufactured products subject to difficult-to-see imperfections. The practice of the present invention provides applications that include colloidal hard spheres experiments, biological cell detection for patch clamping, cell movement and tracking, as well as defect identification in products, such as semiconductor devices, where surface damage can be significant, but difficult to detect. The CMIS system is a machine vision system, which combines intelligent image processing with remote control capabilities and provides the ability to autofocus on a microscope sample, automatically scan an image, and perform machine vision analysis on multiple samples simultaneously.

Author

Microscopy; Image Processing; Cells (Biology); Spheres; Semiconductor Devices; Detection; Control Systems Design



37

MECHANICAL ENGINEERING

Includes mechanical devices and equipment; machine elements and processes. For cases where the application of a device or the host vehicle is emphasized see also the specific category where the application or vehicle is treated. For robotics see 63 *Cybernetics, Artificial Intelligence, and Robotics*; and 54 *Man/System Technology and Life Support*.

20050237883 NASA Ames Research Center, Moffett Field, CA, USA

Controlled Patterning and Growth of Single Wall and Multi-wall Carbon Nanotubes

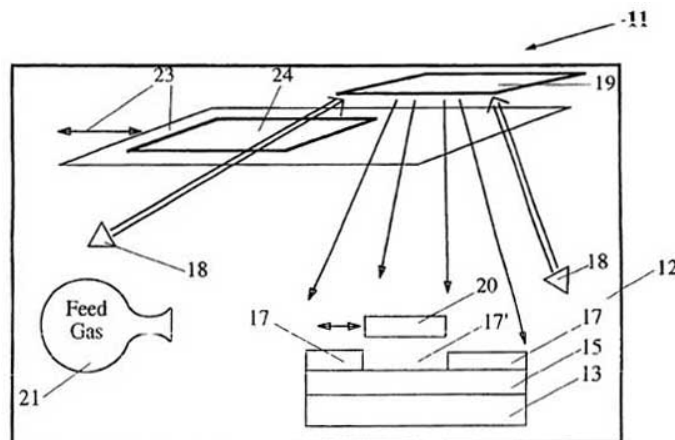
Delzeit, Lance D., Inventor; February 22, 2005; 20 pp.; In English

Patent Info.: Filed 22 Feb. 2005; US-Patent-6,858,197; US-Patent-Appl-SN-099247; NASA-Case-ARC-14613-1; No Copyright; Avail: CASI; A03, Hardcopy

Method and system for producing a selected pattern or array of at least one of a single wall nanotube and/or a multi-wall nanotube containing primarily carbon. A substrate is coated with a first layer (optional) of a first selected metal (e.g., Al and/or Ir) and with a second layer of a catalyst (e.g., Fe, Co, Ni and/or Mo), having selected first and second layer thicknesses provided by ion sputtering, arc discharge, laser ablation, evaporation or CVD. The first layer and/or the second layer may be formed in a desired non-uniform pattern, using a mask with suitable aperture(s), to promote growth of carbon nanotubes in a corresponding pattern. A selected heated feed gas (primarily CH₄ or C₂H_n with n=2 and/or 4) is passed over the coated substrate and forms primarily single wall nanotubes or multiple wall nanotubes, depending upon the selected feed gas and its temperature. Nanofibers, as well as single wall and multi-wall nanotubes, are produced using plasma-aided growth from the second (catalyst) layer. An overcoating of a selected metal or alloy can be deposited, over the second layer, to provide a coating for the carbon nanotubes grown in this manner.

Official Gazette of the U.S. Patent and Trademark Office

Carbon Nanotubes; Nanostructure Growth



20050237885 NASA Johnson Space Center, Houston, TX, USA

Passive Tracking System and Method

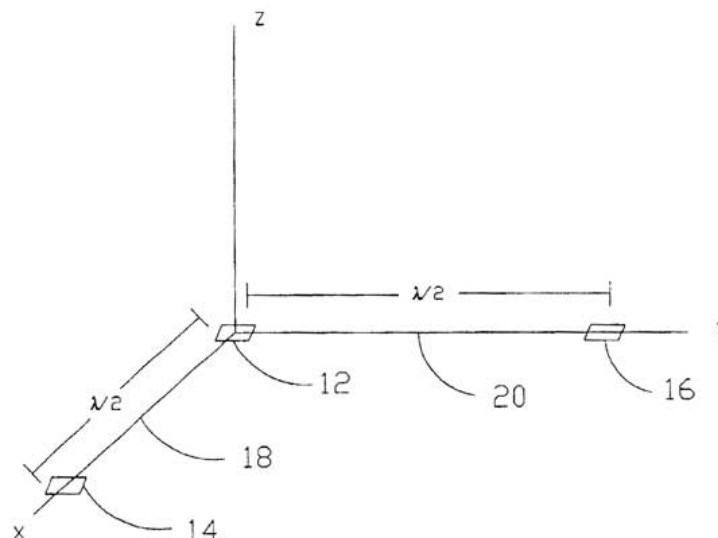
Arndt, G. Dickey, Inventor; Ngo, Phong H., Inventor; Chen, Henry A., Inventor; Phan, Chau T., Inventor; Bourgeois, Brian A., Inventor; Dusl, John, Inventor; Hill, Brent W., Inventor; June 07, 2005; 25 pp.; In English

Patent Info.: Filed 1 Jul. 2003; US-Patent-6,903,685; US-Patent-Appl-SN-612562; US-Patent-Appl-SN-994989; No Copyright; Avail: CASI; A03, Hardcopy

System and methods are disclosed for passively determining the location of a moveable transmitter utilizing a pair of phase shifts at a receiver for extracting a direction vector from a receiver to the transmitter. In a preferred embodiment, a phase difference between the transmitter and receiver is extracted utilizing a noncoherent demodulator in the receiver. The receiver includes antenna array with three antenna elements, which preferably are patch antenna elements placed apart by one-half wavelength. Three receiver channels are preferably utilized for simultaneously processing the received signal from each of the three antenna elements. Multipath transmission paths for each of the three receiver channels are indexed so that comparisons of the same multipath component are made for each of the three receiver channels. The phase difference for each received signal is determined by comparing only the magnitudes of received and stored modulation signals to determine a winning modulation symbol.

Official Gazette of the U.S. Patent and Trademark Office

Transmitter Receivers; Tracking (Position); Systems Engineering



20050237932 NASA Marshall Space Flight Center, Huntsville, AL, USA

Releasable Locking Mechanisms

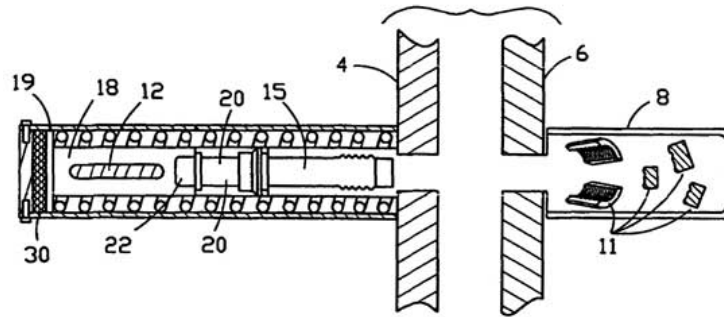
Ahmed, Rafiq, Inventor; Wingate, Robert J., Inventor; September 06, 2005; 8 pp.; In English

Patent Info.: Filed 26 Aug. 2003; US-Patent-6,939,073-B1; US-Patent-Appl-SN-652083; NASA-Case-MSF-31906; No Copyright; Avail: CASI; A02, Hardcopy

In the aerospace field spacecraft components are held together by separation systems until a specific time when they must be separated or deployed. Customarily a threaded joining bolt engages one of the components to be joined, and a threaded nut is placed on that bolt against the other component so they can be drawn together by a releasable locking assembly. The releasable locking assembly herein includes a plunger having one end coupled to one end of a plunger bolt. The other end is flanged to abut and compress a coil spring when the plunger is advanced toward the interface plane between the two components. When the plunger is so advanced toward the interface plane, the end of the plunger bolt can be connected to the joining bolt. Thus during retraction the joining bolt is drawn to one side of the interface plane by the force of the expanding spring.

Official Gazette of the U.S. Patent and Trademark Office

Locking; Spacecraft Components; Mechanical Engineering; Releasing



20050237935 NASA Ames Research Center, Moffett Field, CA, USA

Method and System For an Automated Tool for En Route Traffic Controllers

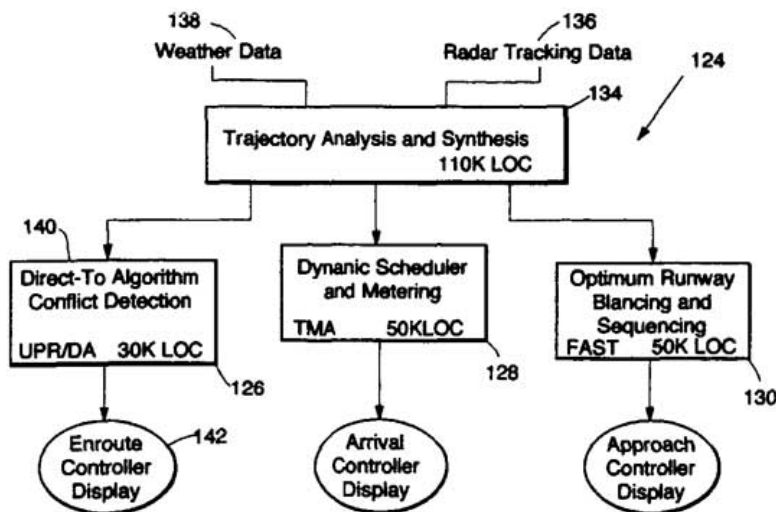
Erzberger, Heinz, Inventor; McNally, B. David, Inventor; November 06, 2001; 14 pp.; In English

Patent Info.: Filed 2 Feb. 2000; US-Patent-6,314,362-B1; US-Patent-Appl-SN-498123; US-Patent-Appl-SN-118401; NASA-Case-ARC-14359-1; No Copyright; Avail: CASI; A03, Hardcopy

A method and system for a new automation tool for en route air traffic controllers first finds all aircraft flying on inefficient routes, then determines whether it is possible to save time by bypassing some route segments, and finally whether the improved route is free of conflicts with other aircraft. The method displays all direct-to eligible aircraft to an air traffic controller in a list sorted by highest time savings. By allowing the air traffic controller to easily identify and work with the highest pay-off aircraft, the method of the present invention contributes to a significant increase in both air traffic controller and aircraft productivity. A graphical computer interface (GUI) is used to enable the air traffic controller to send the aircraft direct to a waypoint or fix closer to the destination airport by a simple point and click action.

Official Gazette of the U.S. Patent and Trademark Office

Air Traffic Controllers (Personnel); Automatic Control; Systems Engineering



20050237936 NASA Johnson Space Center, Houston, TX, USA

Portable Catapult Launcher For Small Aircraft

Rosenbaum, Bernard J., Inventor; Petter, George E., Inventor; Gessler, Joseph A., Inventor; Hughes, Michael G., Inventor; February 08, 2005; 23 pp.; In English

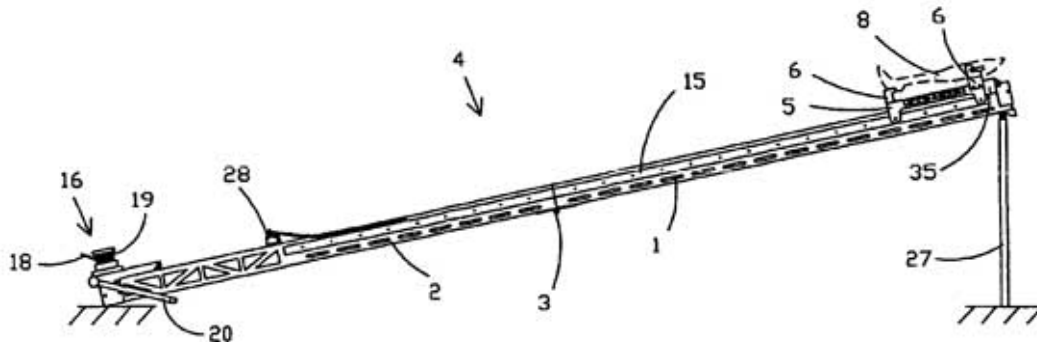
Patent Info.: Filed 3 Apr. 2003; US-Patent-6,851,647-B1; US-Patent-Appl-SN-417377; NASA-Case-MS-C-23510-1; No Copyright; Avail: CASI; A03, Hardcopy

An apparatus for launching an aircraft having a multiplicity of interconnected elongated tracks of rigid material forming a track system and wherein each elongated track has a predetermined elongated track cross-sectional design, a winch system connected to the track system wherein the winch system has a variable mechanical advantage, one or more elongated elastic members wherein one end of each of the one or more elongated elastic members is adjustably connected to the track system,

and a carrier slidably mounted to the track system wherein the carrier is connected to the winch system and to the other end of each of the one or more elongated elastic members.

Official Gazette of the U.S. Patent and Trademark Office

Catapults; Portable Equipment; Mechanical Engineering; Aircraft Launching Devices



20050237943 NASA Marshall Space Flight Center, Huntsville, AL, USA

Single Ball Bearing Lubricant and Material Evaluator

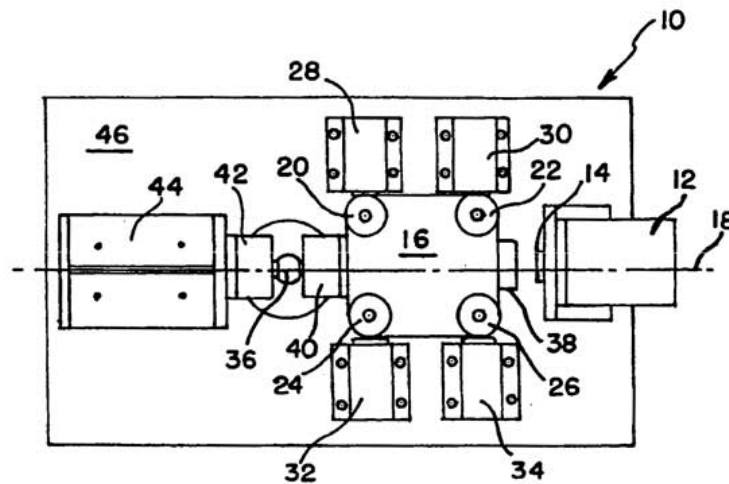
Hall, Philip B., Inventor; Novak, Howard L., Inventor; May 03, 2005; 6 pp.; In English

Patent Info.: Filed 17 Jul. 2003; US-Patent-6,886,392-B1; US-Patent-Appl-SN-622174; NASA-Case-MSF-31706; No Copyright; Avail: CASI; A02, Hardcopy

A test apparatus provides an applied load to a monoball through a trolley which moves along a loading axis. While applying the load to the monoball, the torque meter is in communication with the spherical monoball, and a load cell senses the application of applied force to the monoball. Meanwhile, a rotary actuary imports rotary oscillating motion to the monoball which is sensed by a position sensor and a torque meter. Accordingly, a processor can determine the coefficient of friction in substantially real time along with a cycles per second rate.

Official Gazette of the U.S. Patent and Trademark Office

Ball Bearings; Lubricants; Mechanical Engineering



20050237945 NASA Langley Research Center, Hampton, VA, USA

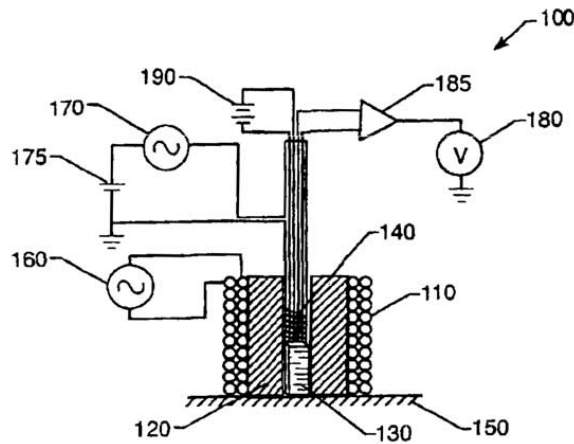
Magneto-resistive Flux Focusing Eddy Current Flaw Detection

Wincheski, Russell A., Inventor; Namkung, Min, Inventor; Simpson, John W., Inventor; May 03, 2005; 28 pp.; In English
 Patent Info.: Filed 28 Nov. 2001; US-Patent-6,888,346-B2; US-Patent-Appl-SN-021683; US-Patent-Appl-SN-253352; No Copyright; Avail: CASI; A03, Hardcopy

A giant magneto-resistive flux focusing eddy current device effectively detects deep flaws in thick multilayer conductive materials. The probe uses an excitation coil to induce eddy currents in conducting material perpendicularly oriented to the coil's longitudinal axis. A giant magneto-resistive (GMR) sensor, surrounded by the excitation coil, is used to detect generated fields. Between the excitation coil and GMR sensor is a highly permeable flux focusing lens which magnetically separates the

GMR sensor and excitation coil and produces high flux density at the outer edge of the GMR sensor. The use of feedback inside the flux focusing lens enables complete cancellation of the leakage fields at the GMR sensor location and biasing of the GMR sensor to a location of high magnetic field sensitivity. In an alternate embodiment, a permanent magnet is positioned adjacent to the GMR sensor to accomplish the biasing. Experimental results have demonstrated identification of flaws up to 1 cm deep in aluminum alloy structures. To detect deep flaws about circular fasteners or inhomogeneities in thick multi-layered conductive materials, the device is mounted in a hand-held rotating probe assembly that is connected to a computer for system control, data acquisition, processing and storage.

Official Gazette of the U.S. Patent and Trademark Office
Magnetoresistivity; Eddy Currents; Nondestructive Tests



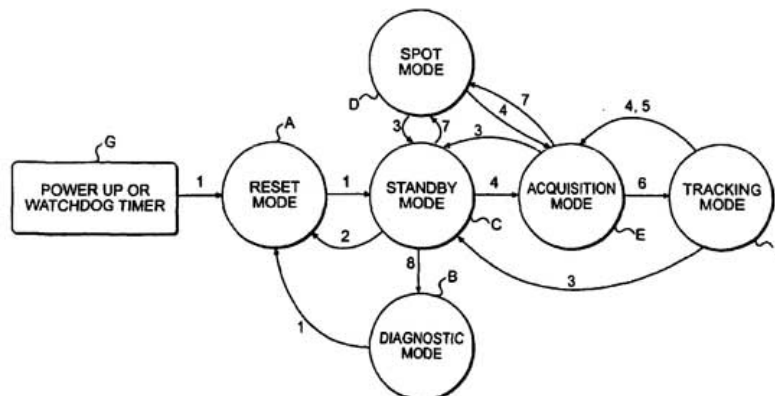
20050237946 NASA Marshall Space Flight Center, Huntsville, AL, USA

Control Method for Video Guidance Sensor System

Howard, Richard T., Inventor; Book, Michael L., Inventor; Bryan, Thomas C., Inventor; May 03, 2005; 8 pp.; In English
 Patent Info.: Filed 3 Jul. 2003; US-Patent-6,888,476-B1; US-Patent-Appl-SN-615369; NASA-Case-MSF-31865; No
 Copyright; Avail: CASI; A02, Hardcopy

A method is provided for controlling operations in a video guidance sensor system wherein images of laser output signals transmitted by the system and returned from a target are captured and processed by the system to produce data used in tracking of the target. Six modes of operation are provided as follows: (i) a reset mode; (ii) a diagnostic mode; (iii) a standby mode; (iv) an acquisition mode; (v) a tracking mode; and (vi) a spot mode wherein captured images of returned laser signals are processed to produce data for all spots found in the image. The method provides for automatic transition to the standby mode from the reset mode after integrity checks are performed and from the diagnostic mode to the reset mode after diagnostic operations are commands is permitted only when the system is in the carried out. Further, acceptance of reset and diagnostic standby mode. The method also provides for automatic transition from the acquisition mode to the tracking mode when an acceptable target is found.

Official Gazette of the U.S. Patent and Trademark Office
Guidance Sensors; Video Communication; Automatic Control



20050237955 NASA Glenn Research Center, Cleveland, OH, USA

High-speed electromechanical chutter for imaging spectrographs

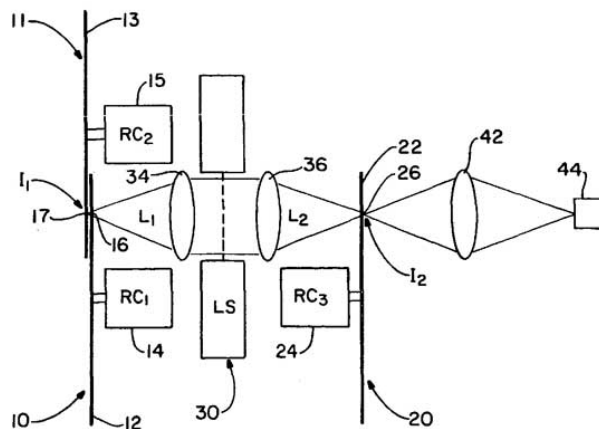
Nguyen, Quang-Viet, Inventor; August 30, 2005; 20 pp.; In English

Patent Info.: Filed 30 Jan. 2003; US-Patent-6,937,331-B1; US-Patent-Appl-SN-356932; NASA-Case-LEW-17175-1; No Copyright; Avail: CASI; A03, Hardcopy

The present invention presents a high-speed electromechanical shutter which has at least two rotary beam choppers that are synchronized using a phase-locked loop electronic control to reduce the duty cycle. These choppers have blade means that can comprise discs or drums, each having about 60 (+/- 15) slots which are from about 0.3 to about 0.8 mm wide and about 5 to about 20 nun long (radially) which are evenly distributed through out 360 deg, and a third rotary chopper which is optically aligned has a small number of slots, such as for example, 1 to 10 slots which are about 1 to about 2 mm wide and about 5 to about 20 mm long (radially). Further the blade means include phase slots that allow the blade means to be phase locked using a closed loop control circuit. In addition, in a preferred embodiment, the system also has a leaf shutter. Thus the invention preferably achieves a gate width of less than about 100 microseconds, using motors that operate at 3000 to 10,000 rpm, and with a phase jitter of less than about 1.5 microseconds, and further using an aperture with more than about 75% optical transmission with a clear aperture of about 0.8 -10 nun. The system can be synchronized to external sources at 0 6 kHz lasers, data acquisition systems, and cameras.

Author

Electromechanics; Electronic Control; Feedback Control; High Speed; Light Transmission; Phase Locked Systems



20050237963 NASA Marshall Space Flight Center, Huntsville, AL, USA

Multiple Layer Identification Label Using Stacked Identification Symbols

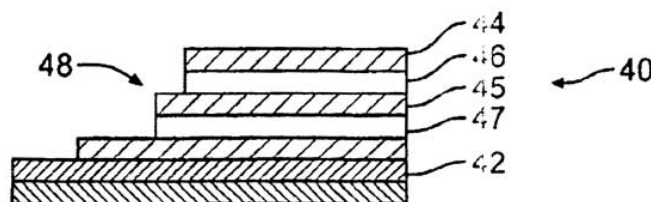
Schramm, Harry F., Inventor; May 31, 2005; 13 pp.; In English

Patent Info.: Filed 18 Apr. 2001; Patent-6,899,275; US-Patent-Appl-SN-837744; NASA-Case-MSF-31464-1; No Copyright; Avail: CASI; A03, Hardcopy

An automatic identification system and method are provided which employ a machine readable multiple layer label. The label has a plurality of machine readable marking layers stacked one upon another. Each of the marking layers encodes an identification symbol detectable using one or more sensing technologies. The various marking layers may comprise the same marking material or each marking layer may comprise a different medium having characteristics detectable by a different sensing technology. These sensing technologies include x-ray, radar, capacitance, thermal, magnetic and ultrasonic. A complete symbol may be encoded within each marking layer or a symbol may be segmented into fragments which are then divided within a single marking layer or encoded across multiple marking layers.

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Automatic Control; System Identification



20050237964 NASA Langley Research Center, Hampton, VA, USA

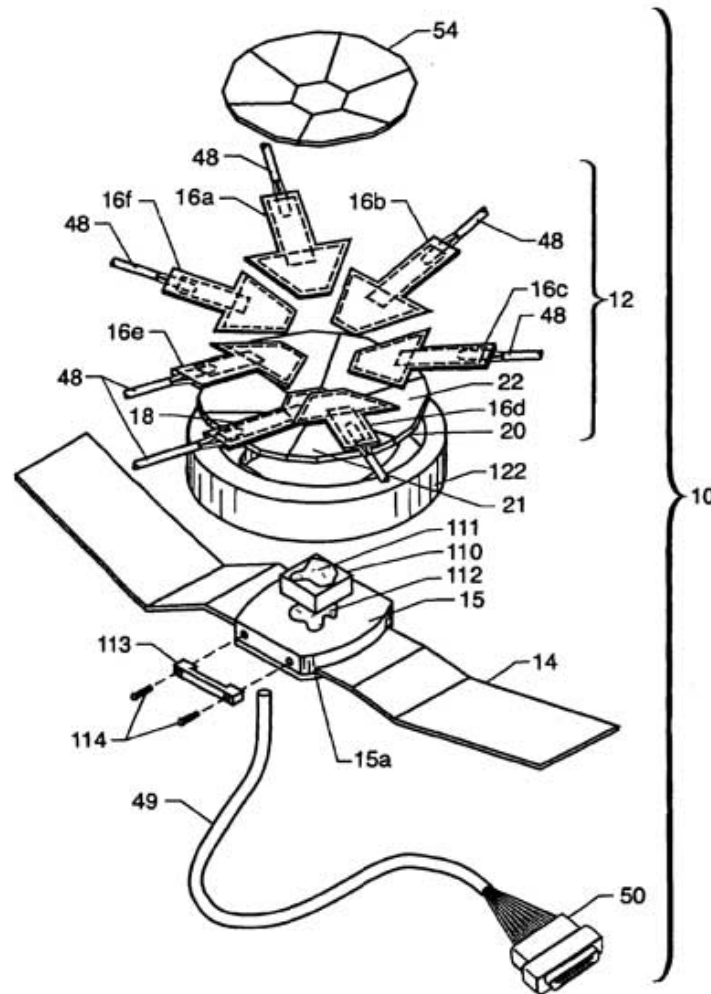
Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements

Bryant, Timothy D.; Wynkoop, Mark W.; Holloway, Nancy M. H.; Zuckerwar, Allan J.; October 18, 2005; 28 pp.; In English; US-Patent-6,954,971-B1; US-Patent-Appl-SN-267107; US-Patent-Appl-SN-784414; US-Patent-Appl-SN-182344; NASA-Case-LAR-15602-2; No Copyright; Avail: CASI; A03, Hardcopy

A fetal heart monitoring system preferably comprising a backing plate having a generally concave front surface and a generally convex back surface, and at least one sensor element attached to the concave front surface for acquiring acoustic fetal heart signals produced by a fetus within a body. The sensor element has a shape that conforms to the generally concave back surface of the backing plate. In one embodiment, the at least one sensor element comprises an inner sensor, and a plurality of outer sensors surrounding the inner sensor. The fetal heart monitoring system can further comprise a web belt, and a web belt guide movably attached to the web belt. The web belt guide being is to the convex back surface of the backing plate.

Official Gazette of the U.S. Patent and Trademark Office

Fetuses; Heart; Sound Waves; Mechanical Engineering



20060009005 NASA Kennedy Space Center, Cocoa Beach, FL, USA

THERMAL INSULATION SYSTEMS

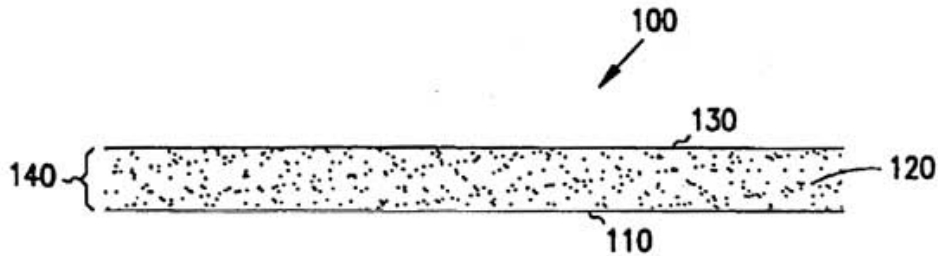
Augustynowicz, Stanislaw D., Inventor; Fesmire, James E., Inventor; November 22, 2005; 15 pp.; In English Patent Info.: Filed 20 Aug. 2001; US-Patent-6,967,051; US-Patent-Appl-939286; US-Patent-Appl-302315; NASA-Case-KSC-1202-2; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009005>; Avail: CASI; A03, Hardcopy

Thermal insulation systems and with methods of their production. The thermal insulation systems incorporate at least one reflection layer and at least one spacer layer in an alternating pattern. Each spacer layer includes a fill layer and a carrier layer.

The fill layer may be separate from the carrier layer, or it may be a part of the carrier layer, i.e., mechanically injected into the carrier layer or chemically formed in the carrier layer. Fill layers contain a powder having a high surface area and low bulk density. Movement of powder within a fill layer is restricted by electrostatic effects with the reflection layer combined with the presence of a carrier layer, or by containing the powder in the carrier layer. The powder in the spacer layer may be compressed from its bulk density. The thermal insulation systems may further contain an outer casing. Thermal insulation systems may further include strips and seams to form a matrix of sections. Such sections serve to limit loss of powder from a fill layer to a single section and reduce heat losses along the reflection layer.

Official Gazette of the U.S. Patent and Trademark Office

Thermal Insulation; Systems Engineering



20060009012 NASA Johnson Space Center, Houston, TX, USA

Flexible Multi-Shock Shield

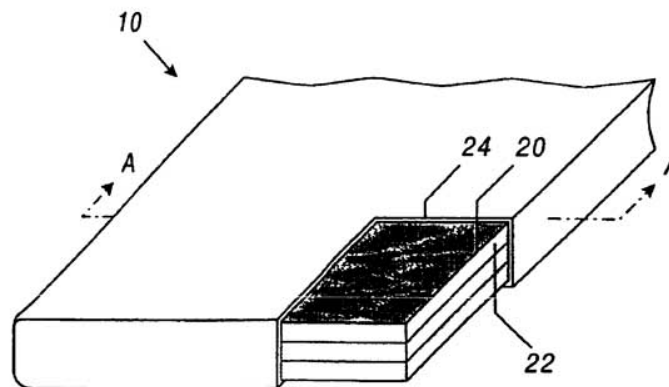
Christiansen, Eric L., Inventor; Crews, Jeanne L., Inventor; May 31, 2005; 11 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 16 Jun. 2001; US-Patent-6,899,009; US-Patent-Appl-892355; NASA-Case-MS-C-23314-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009012>; Avail: CASI; A03, Hardcopy

Flexible multi-shock shield system and method are disclosed for defending against hypervelocity particles. The flexible multi-shock shield system and method may include a number of flexible bumpers or shield layers spaced apart by one or more resilient support layers, all of which may be encapsulated in a protective cover. Fasteners associated with the protective cover allow the flexible multi-shock shield to be secured to the surface of a structure to be protected.

Official Gazette of the U.S. Patent and Trademark Office

Shock Waves; Flexibility; Shielding



20060009014 NASA Johnson Space Center, Houston, TX, USA

Auto-Routable, Configurable, Daisy Chainable Data Acquisition System

Shuler, Robert L., Inventor; September 13, 2005; 19 pp.; In English; Original contains black and white illustrations

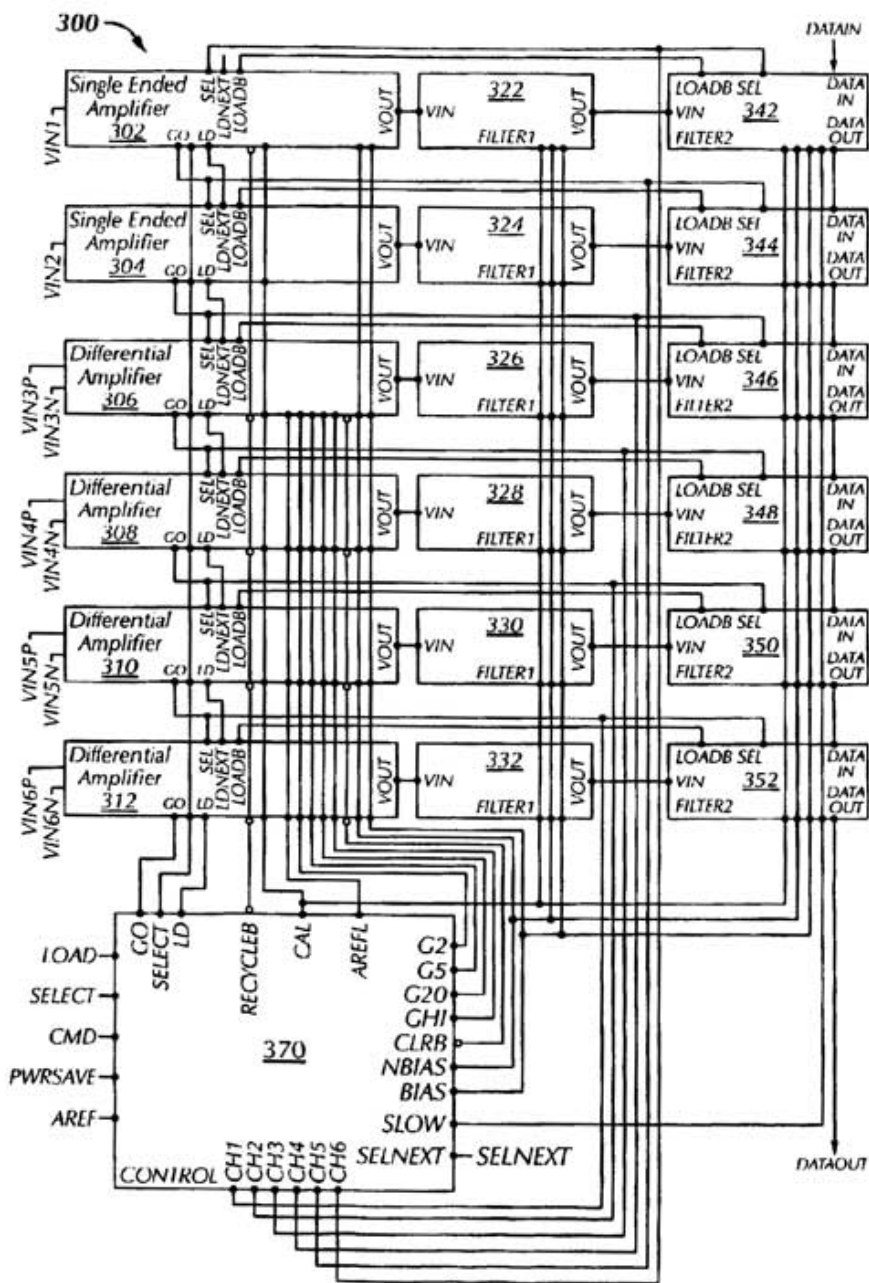
Patent Info.: Filed 21 May 2003; US-Patent-6,943,621; US-Patent-Appl-443234; NASA-Case-MS-C-23539-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009014>; Avail: CASI; A03, Hardcopy

A method and apparatus for an acquisition system includes a plurality of sensor input signal lines. At least one of the

plurality of sensor input signal lines operatively connects to at least one of a plurality of amplifier circuits. At least one of the plurality of amplifier circuits operatively connects to at least one of a plurality of filter circuits.

Official Gazette of the U.S. Patent and Trademark Office

Data Acquisition; Sensors; Mechanical Engineering



2006009150 NASA Ames Research Center, Moffett Field, CA, USA

Carbon Nanotube Purification

Delzeit, Lance D., Inventor; Delzeit, Clement J., Inventor; December 06, 2005; 11 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 25 Apr. 2002; US-Patent-6,972,056; US-Patent-Appl-SN-135013; NASA-Case-ARC-14733-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/2006009150>; Avail: CASI; A03, Hardcopy

A method for cleaning or otherwise removing amorphous carbon and other residues that arise in growth of a carbon

nanotube (CNT) array. The CNT array is exposed to a plurality of hydroxyls or hydrogen, produced from a selected vapor or liquid source such as H₂O or H₂O₂. and the hydroxyls or hydrogen (neutral or electrically charged) react with the residues to produce partly or fully dissolved or hydrogenated or hydroxylized products that can be removed or separated from the CNT array. The hydroxyls or hydrogen can be produced by heating the CNT array, residue and selected vapor or liquid source or by application of an electromagnetic excitation signal with a selected frequency or range of frequencies to dissociate the selected vapor or liquid. The excitation frequency can be chirped to cover a selected range of frequencies corresponding to dissociation of the selected vapor or liquid. Sonication may be used to supplement dissociation of the H₂O and/or H₂O₂.

Official Gazette of the U.S. Patent and Trademark Office

Carbon Nanotubes; Purification

20060010035 NASA Marshall Space Flight Center, Huntsville, AL, USA

Resistive Exercise Device

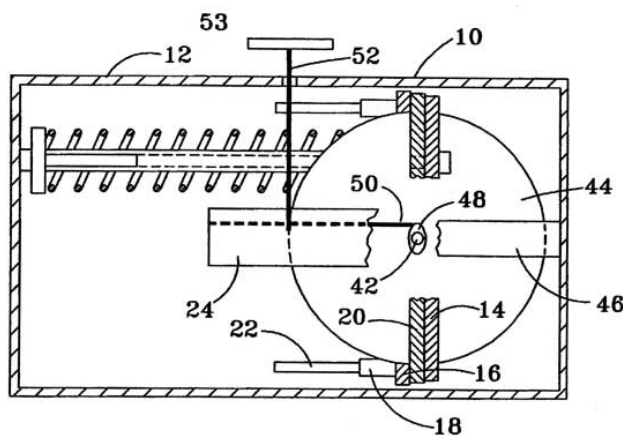
Smith, Damon C., Inventor; October 25, 2005; 21 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 26 Sep. 2002; US-Patent-6,958,032; US-Patent-Appl-263288; NASA-Case-MS-C-23196-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060010035>; Avail: CASI; A03, Hardcopy

An exercise device 10 is particularly well suited for use in low gravity environments, and includes a frame 12 with plurality of resistance elements 30,82 supported in parallel on the frame. A load transfer member 20 is moveable relative to the frame for transferring the applied force to the free end of each captured resistance element. Load selection template 14 is removably secured both to the load transfer member, and a plurality of capture mechanisms engage the free end of corresponding resistance elements. The force applying mechanism 53 may be a handle, harness or other user interface for applying a force to move the load transfer member.

Official Gazette of the U.S. Patent and Trademark Office

Physical Exercise; Mechanical Engineering; Resistance



20060010036 NASA Marshall Space Flight Center, Huntsville, AL, USA

Microwave Medical Treatment Apparatus and Method

Arndt, G. Dickey, Inventor; Ngo, Phong H., Inventor; Carl, James R., Inventor; George, W. Riffoul, Inventor; September 13, 2005; 19 pp.; In English; Original contains black and white illustrations

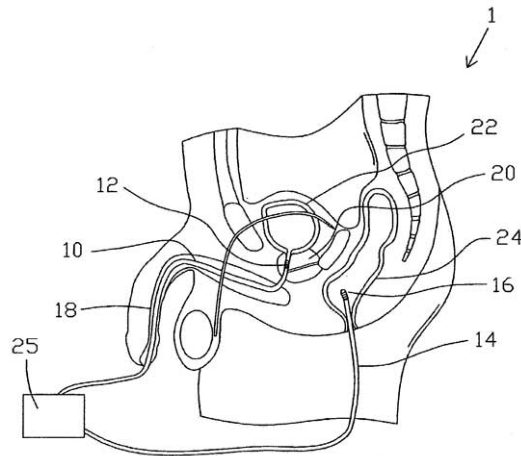
Patent Info.: Filed 29 Nov. 2002; US-Patent-6,944,504; US-Patent-Appl-302323; US-Patent-Appl-746533; US-Patent-6,675,050; US-Patent-Appl-511961; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060010036>; Avail: CASI; A03, Hardcopy

Methods, simulations, and apparatus are provided that may be utilized for medical treatments which are especially suitable for treatment of benign prostatic hyperplasia (BPH). In a preferred embodiment, a plurality of separate microwave antennas are utilized to heat prostatic tissue to promote necrosing of the prostatic tissue that relieves the pressure of the prostatic tissue against the urethra as the body reabsorbs the necrosed or dead tissue. By utilizing constructive and destructive interference of the microwave transmission, the energy can be deposited on the tissues to be necrosed while protecting other tissues such as the urethra. Saline injections to alter the conductivity of the tissues may also be used to further focus the energy deposits. A computer simulation is Provided that can be used to Predict the resulting temperature profile produced in the prostatic tissue. By changing the various control features of one or more catheters and the methods of applying microwave

energy, a temperature profile can be predicted and produced that is similar to the temperature profile desired for the particular patient.

Official Gazette of the U.S. Patent and Trademark Office

Medical Equipment; Microwave Transmission; Computerized Simulation



20060017023 NASA Johnson Space Center, Houston, TX, USA

Deceleration-Limiting Roadway Barrier

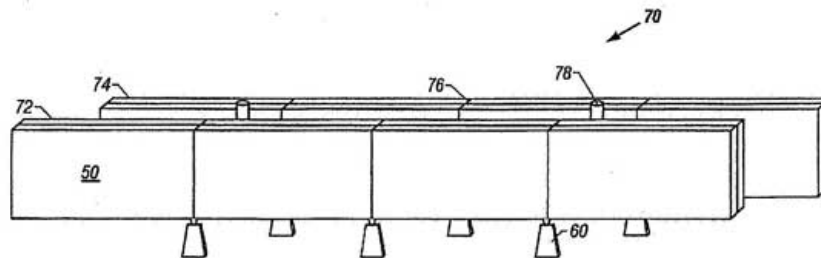
Schneider, William C., Inventor; Locke, P. James, Inventor; February 14, 2006; 17 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 4 Dec. 2001; US-Patent-6,997,637; US-Patent-Appl-005820; NASA-Case-MSF-23178-1; US-Patent-Appl-254285; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017023>; Avail: CASI; A03, Hardcopy

Roadway barrier system and method are disclosed for decelerating a moving vehicle in a controlled manner and for retaining the decelerated vehicle. A net or mesh of the roadway barrier system receives and captures the moving vehicle. The net or mesh is secured to anchors by energy absorbing straps. The energy absorbing straps deploy under a tensional load to decelerate the moving vehicle, the straps providing a controlled resistance to the tensional load over a predefined displacement or stroke to bring the moving vehicle to rest. Additional features include a sacrificial panel or sheet in front of the net that holds up the net or mesh while deflecting vehicles that collide only tangentially with the roadway barrier system.

Official Gazette of the U.S. Patent and Trademark Office

Deceleration; Loads (Forces); Displacement; Barriers; Deflection; Roads



20060017041 NASA Glenn Research Center, Cleveland, OH, USA

System for Controlling a Magnetically Levitated Rotor

Morrison, Carlos R., Inventor; April 04, 2006; 17 pp.; In English; Original contains black and white illustrations

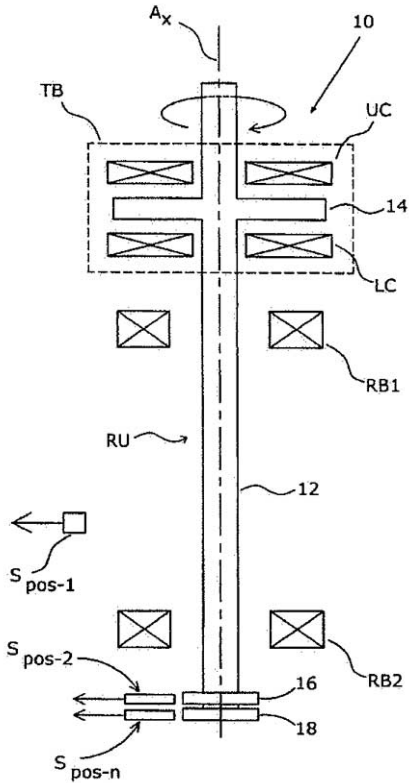
Patent Info.: Filed 12 Mar. 2003; US-Patent-7,023,118; US-Patent-Appl-SN-390256; US-Patent-Appl-SN-364002; NASA-Case-LEW-17293-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017041>; Avail: CASI; A03, Hardcopy

In a rotor assembly having a rotor supported for rotation by magnetic bearings, a processor controlled by software or firmware controls the generation of force vectors that position the rotor relative to its bearings in a 'bounce' mode in which

the rotor axis is displaced from the principal axis defined between the bearings and a 'tilt' mode in which the rotor axis is tilted or inclined relative to the principal axis. Waveform driven perturbations are introduced to generate force vectors that excite the rotor in either the 'bounce' or 'tilt' modes.

Official Gazette of the U.S. Patent and Trademark Office

Magnetic Suspension; Rotors; Perturbation; Firmware; Magnetic Bearings; Control



42

GEOSCIENCES (GENERAL)

Includes general research topics related to the Earth sciences, and the specific areas of petrology, mineralogy, and general geology. For other specific topics in geosciences see *categories 42 through 48*.

20050237941 NASA Johnson Space Center, Houston, TX, USA

Method for Controlling a Producing Zone of a Well in a Geological Formation

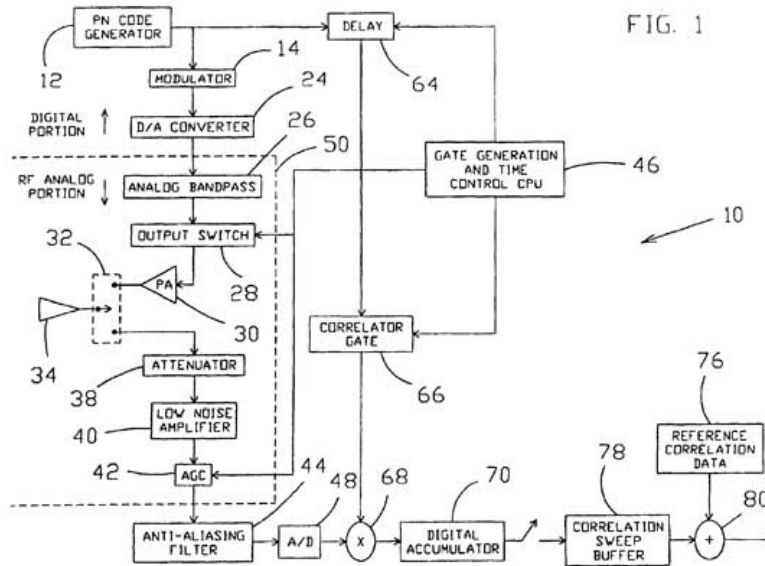
Arndt, G. Dickey, Inventor; Carl, James R., Inventor; Byerly, Kent A., Inventor; Amini, B. Jon, Inventor; March 15, 2005; 18 pp.; In English

Patent Info.: Filed 30 Oct. 2002; US-Patent-6,866,098-B1; US-Patent-Appl-SN-288799; US-Patent-Appl-SN-793817; NASA-Case-MS-C-23029-3; No Copyright; Avail: CASI; A03, Hardcopy

System and methods for transmitting and receiving electromagnetic pulses through a geological formation. A preferably programmable transmitter having an all-digital portion in a preferred embodiment may be operated at frequencies below 1 MHz without loss of target resolution by transmitting and over sampling received long PN codes. A gated and stored portion of the received signal may be correlated with the PN code to determine distances of interfaces within the geological formation, such as the distance of a water interfaces from a wellbore. The received signal is oversampled preferably at rates such as five to fifty times as high as a carrier frequency. In one method of the invention, an oil well with multiple production zones may be kept in production by detecting an approaching water front in one of the production zones and shutting down that particular production zone thereby permitting the remaining production zones to continue operating.

Official Gazette of the U.S. Patent and Trademark Office

Boreholes; Geology; Wells; Regions



43

EARTH RESOURCES AND REMOTE SENSING

Includes remote sensing of earth features, phenomena and resources by aircraft, balloon, rocket, and spacecraft; analysis of remote sensing data and imagery; development of remote sensing products; photogrammetry; and aerial photography. For related instrumentation see 35 *Instrumentation and Photography*.

20060017026 NASA Johnson Space Center, Houston, TX, USA

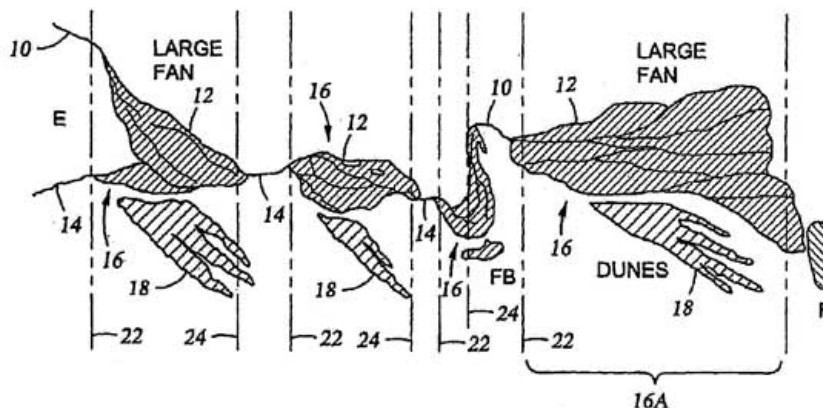
Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration

Wilkinson, Murray Justin, Inventor; January 10, 2006; 16 pp.; In English; Original contains black and white illustrations Patent Info.: Filed 1 Aug. 2002; US-Patent-6,985,606; US-Patent-Appl-SN-212579; NASA-Case-MSF-23424-1; US-Patent-Appl-SN-362670; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017026>; Avail: CASI; A03, Hardcopy

A method is disclosed for identifying a sediment accumulation from an image of a part of the earth's surface. The method includes identifying a topographic discontinuity from the image. A river which crosses the discontinuity is identified from the image. From the image, paleocourses of the river are identified which diverge from a point where the river crosses the discontinuity. The paleocourses are disposed on a topographically low side of the discontinuity. A smooth surface which emanates from the point is identified. The smooth surface is also disposed on the topographically low side of the point.

Official Gazette of the U.S. Patent and Trademark Office

Rivers; Sediments; Discontinuity; Identifying; Topography; Mineral Exploration



20060017035 NASA, Washington, DC, USA

Contaminant Removal From Natural Resources

Clausen, Christian A., Inventor; Quinn, Jacqueline W., Inventor; Geiger, Cheri L., Inventor; Reinhart, Debra, Inventor; Fillpek, Laura B., Inventor; Coon, Christina, Inventor; Devor, Robert, Inventor; March 07, 2006; 8 pp.; In English
Patent Info.: Filed 28 May 2003; US-Patent-7,008,964; US-Patent-Appl-SN-449907; NASA-Case-KSC-12399; US-Patent-Appl-SN-441275; US-Patent-Appl-SN-385435; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017035>;
Avail: CASI; **A02**, Hardcopy

A zero-valent metal emulsion containing zero-valent metal particles is used to remediate contaminated natural resources, such as groundwater and soil. In a preferred embodiment, the zero-valent metal emulsion removes heavy metals, such as lead (pb), from contaminated natural resources. In another preferred embodiment, the zero-valent metal emulsion is a bimetallic emulsion containing zero-valent metal particles doped with a catalytic metal to remediate halogenated aromatic compounds, such as polychlorinated biphenyls (PCBs), from natural resources.

Official Gazette of the U.S. Patent and Trademark Office

Contaminants; Ground Water; Metal Particles; Soils; Bimetallics; Earth Resources

44

ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells; and solar, geothermal, windpower, and waterwave conversion systems; energy storage; and traditional power generators. For technologies related to nuclear energy production see *73 Nuclear Physics*. For related information see also *07 Aircraft Propulsion and Power*; *20 Spacecraft Propulsion and Power*, and *28 Propellants and Fuels*.

20060009297 NASA Glenn Research Center, Cleveland, OH, USA

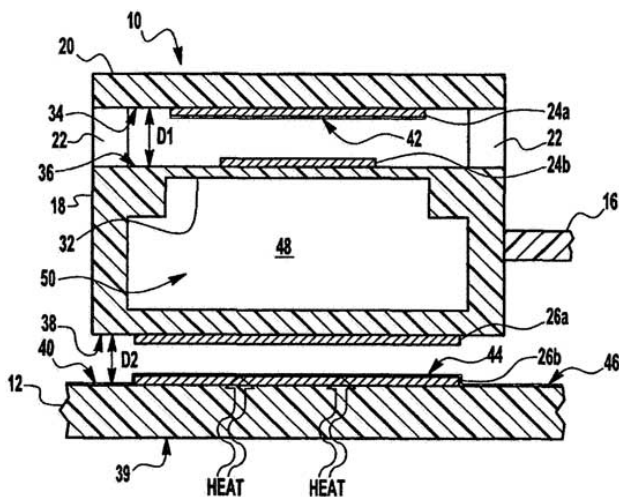
MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR

Landis, Geoffrey A., Inventor; December 27, 2005; 18 pp.; In English
Patent Info.: Filed 16 Sep. 2003; US-Patent-6,978,611; US-Patent-Appl-SN-453251; NASA-Case-LEW-17391-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009297>; Avail: CASI; **A03**, Hardcopy

A heat engine, preferably combined with an electric generator, and advantageously implemented using micro-electromechanical system (MEMS) technologies as an array of one or more individual heat engine/generators. The heat engine is based on a closed chamber containing a motive medium, preferably a gas; means for alternately enabling and disabling transfer of thermal energy from a heat source to the motive medium; and at least one movable side of the chamber that moves in response to thermally-induced expansion and contraction of the motive medium, thereby converting thermal energy to oscillating movement. The electrical generator is combined with the heat engine to utilize movement of the movable side to convert mechanical work to electrical energy, preferably using electrostatic interaction in a generator capacitor. Preferably at least one heat transfer side of the chamber is placed alternately into and out of contact with the heat source by a motion capacitor, thereby alternately enabling and disabling conductive transfer of heat to the motive medium.

Official Gazette of the U.S. Patent and Trademark Office

Microelectromechanical Systems; Heat Engines; Heat Transfer; Electrostatic Generators; Thermal Energy; Temperature Effects



45
ENVIRONMENT POLLUTION

Includes atmospheric, water, soil, noise, and thermal pollution.

20060009002 NASA Kennedy Space Center, Cocoa Beach, FL, USA

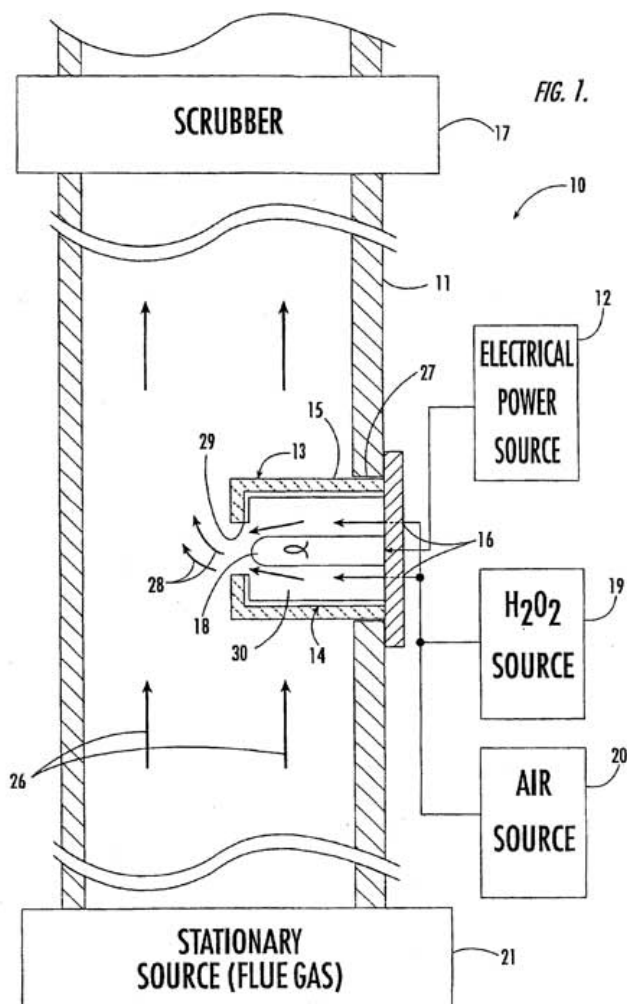
APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT

Cooper, Charles David, Inventor; Clauseu, christian Anthony, Inventor; November 29, 2005; 9 pp.; In English
Patent Info.: Filed 18 Jan. 2002; US-Patent-6,9696,486; US-Patent-Appl-SN-056842; NASA-Case-KSC-12209; No
Copyright; ONLINE: <http://hdl.handle.net/2060/20060009002>; Avail: CASI; A02, Hardcopy

An apparatus for treating pollutants in a gas may include a source of hydrogen peroxide, and a treatment injector for creating and injecting dissociated hydrogen peroxide into the flow of gas. The treatment injector may further include an injector housing having an inlet, an outlet, and a hollow interior extending there between. The inlet may be connected in fluid communication with the source of hydrogen peroxide so that hydrogen peroxide flows through the hollow interior and toward the outlet. At least one ultraviolet (UV) lamp may be positioned within the hollow interior of the injector housing. The at least one UV lamp may dissociate the hydrogen peroxide flowing through the tube. The dissociated hydrogen peroxide may be injected into the flow of gas from the outlet for treating pollutants, such as nitrogen oxides.

Official Gazette of the U.S. Patent and Trademark Office

Gas Flow; Contaminants; Hydrogen Peroxide; Injectors; Nitrogen Oxides; Ultraviolet Radiation



LIFE SCIENCES (GENERAL)

Includes general research topics related to plant and animal biology (non-human); ecology; microbiology; and also the origin, development, structure, and maintenance of animals and plants in space and related environmental conditions. For specific topics in life sciences see *categories 52 through 55*.

20060009008 NASA Marshall Space Flight Center, Huntsville, AL, USA

ORTHOPEDIC LEG BRACE

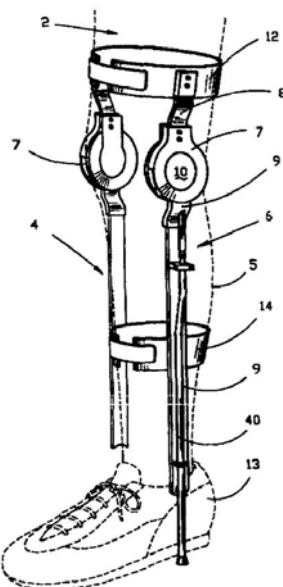
Myers, William Neil, Inventor; November 1, 2005; 8 pp.; In English

Patent Info.: Filed 22 Aug. 2003; US-Patent-6,960,175; US-Patent-Appl-652087; NASA-Case-MSF-31906-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009008>; Avail: CASI; A02, Hardcopy

Knee braces generally have been rigid in both the knee bending direction and in the knee straightening direction unless a manually operated release is incorporated in them to allow the knee to bend. Desirably a braced knee joint should effectively duplicate the compound, complex, actions of a normal knee. The key to knee braces is the knee joint housing. The housing herein carries a number of cam action pawls, with teeth adapted to engage the internal teeth of a ratchet ring mounted in the housing. Cam action return springs and the shape of the cam action pawl teeth allow rotation of the ratchet ring in a leg straightening direction while still supporting a load. The leg can then be extended during walking while at the same time being prevented by the cam action pawls from buckling in the knee bending direction.

Official Gazette of the U.S. Patent and Trademark Office

Orthopedics; Knee (Anatomy); Bending; Supports; Walking



20060010439 NASA Marshall Space Flight Center, Huntsville, AL, USA

Production of Functional Proteins: Balance of Shear Stress and Gravity

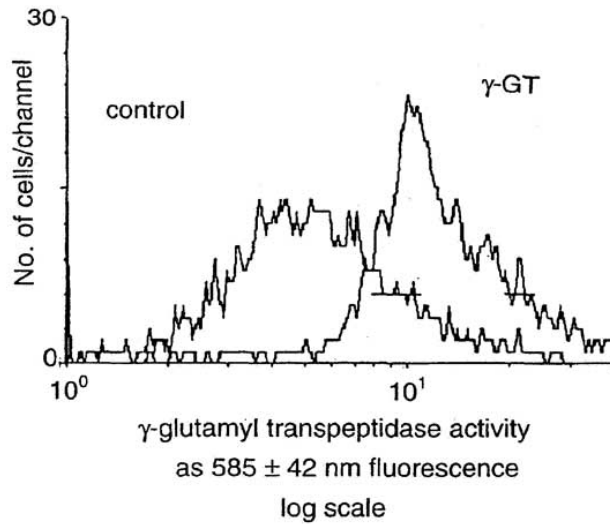
Goodwin, Thomas John, Inventor; Hammond, Timothy Grant, Inventor; Haysen, James Howard, Inventor; September 20, 2005; 28 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 21 Mar. 2000; US-Patent-6,946,246; US-Patent-Appl-532001; US-Patent-Appl-056363; US-Patent-Appl-043205; NASA-Case-MSF-22859-2; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060010439>; Avail: CASI; A03, Hardcopy

The present invention provides for a method of culturing cells and inducing the expression of at least one gene in the cell culture. The method provides for contacting the cell with a transcription factor decoy oligonucleotide sequence directed against a nucleotide sequence encoding a shear stress response element.

Official Gazette of the U.S. Patent and Trademark Office

Gravitation; Shear Stress; Proteins



54

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human factors engineering, bionics, man-machine systems, life support, space suits and protective clothing. For related information see also *16 Space Transportation and Safety* and *52 Aerospace Medicine*.

20060009298 NASA Ames Research Center, Moffett Field, CA, USA

BODY SENSING SYSTEM

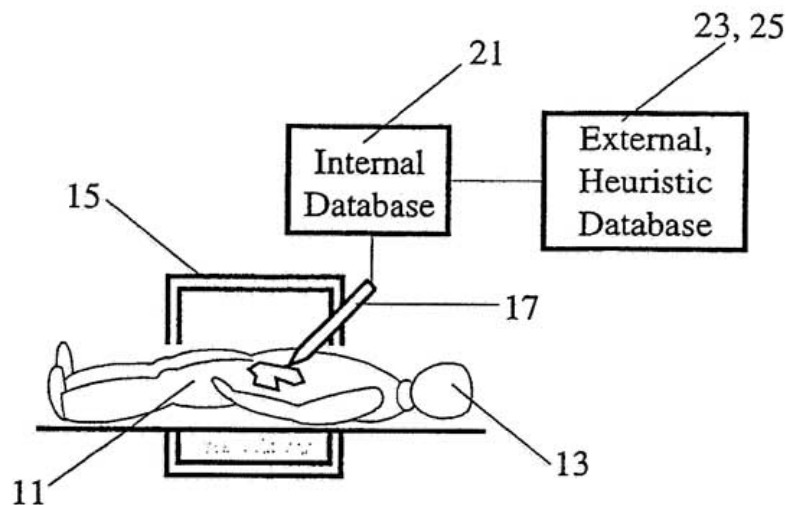
Mah, Robert W., Inventor; December 13, 2005; 15 pp.; In English

Patent Info.: Filed 16 Jan. 2004; US-Patent-6,976,013; US-Patent-Appl-SN-874003; US-Patent-Appl-SN-652,302; NASA-Case-ARC-14231-2; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009298>; Avail: CASI; A03, Hardcopy

System and method for performing one or more relevant measurements at a target site in an animal body, using a probe. One or more of a group of selected internal measurements is performed at the target site, is optionally combined with one or more selected external measurements, and is optionally combined with one or more selected heuristic information items, in order to reduce to a relatively small number the probable medical conditions associated with the target site. One or more of the internal measurements is optionally used to navigate the probe to the target site. Neural net information processing is performed to provide a reduced set of probable medical conditions associated with the target site.

Official Gazette of the U.S. Patent and Trademark Office

Detection; Targets; Neural Nets; Heuristic Methods



COMPUTER PROGRAMMING AND SOFTWARE

Includes software engineering, computer programs, routines, algorithms, and specific applications, e.g., CAD/CAM. For computer software applied to specific applications, see also the associated category.

20060009003 NASA Ames Research Center, Moffett Field, CA, USA

Extensible Database Framework for Management of Unstructured and Semi-Structured Documents

Gawdiak, Yuri O., Inventor; La, Tracy T., Inventor; Lin, Shu-Chun Y., Inventor; Malof, David A., Inventor; Tran, Khai Peter B., Inventor; November 22, 2005; 17 pp.; In English

Patent Info.: Filed 29 Aug. 2002; US-Patent-6,968,338; US-Patent-Appl-SN-232975; NASA-Case-ARC-14662-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009003>; Avail: CASI; A03, Hardcopy

Method and system for querying a collection of Unstructured or semi-structured documents to identify presence of, and provide context and/or content for, keywords and/or keyphrases. The documents are analyzed and assigned a node structure, including an ordered sequence of mutually exclusive node segments or strings. Each node has an associated set of at least four, five or six attributes with node information and can represent a format marker or text, with the last node in any node segment usually being a text node. A keyword (or keyphrase) is specified, and the last node in each node segment is searched for a match with the keyword. When a match is found at a query node, or at a node determined with reference to a query node, the system displays the context and/or the content of the query node.

Official Gazette of the U.S. Patent and Trademark Office

Data Base Management Systems; Unstructured Grids (Mathematics); Display Devices; Strings

NUMERICAL ANALYSIS

Includes iteration, differential and difference equations, and numerical approximation.

20060009007 NASA Ames Research Center, Moffett Field, CA, USA

HYBRID NEURAL NETWORK and SUPPORT VECTOR MACHINE METHOD FOR OPTIMIZATION

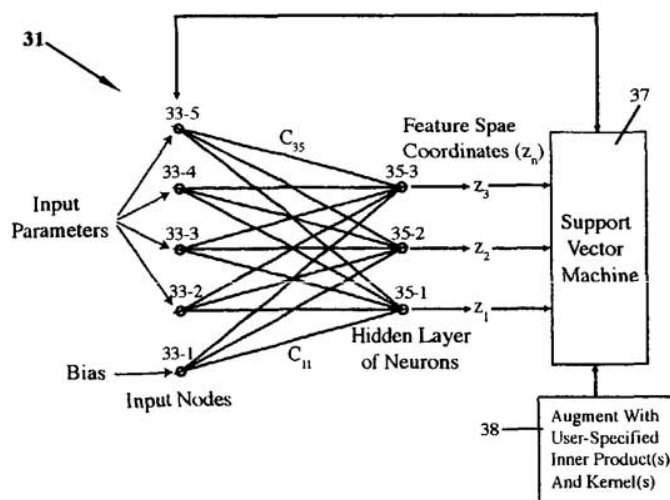
Rai, Man Mohan, Inventor; November 1, 2005; 24 pp.; In English

Patent Info.: Filed 7 Jan. 2002; US-Patent-6,961,719; US-Patent-Appl-043044; NASA-Case-ARC-14586-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009007>; Avail: CASI; A03, Hardcopy

System and method for optimization of a design associated with a response function, using a hybrid neural net and support vector machine (NN/SVM) analysis to minimize or maximize an objective function, optionally subject to one or more constraints. As a first example, the NN/SVM analysis is applied iteratively to design of an aerodynamic component, such as an airfoil shape, where the objective function measures deviation from a target pressure distribution on the perimeter of the aerodynamic component. As a second example, the NN/SVM analysis is applied to data classification of a sequence of data points in a multidimensional space. The NN/SVM analysis is also applied to data regression.

Official Gazette of the U.S. Patent and Trademark Office

Neural Nets; Optimization; Vectors (Mathematics)



70 PHYSICS (GENERAL)

Includes general research topics related to mechanics, kinetics, magnetism, and electrodynamics. For specific areas of physics see categories 71 through 77. For related instrumentation see 35 *Instrumentation and Photography*; for geophysics, astrophysics, or solar physics see 46 *Geophysics*, 90 *Astrophysics*, or 92 *Solar Physics*.

20060017025 NASA Pasadena Office, CA, USA

Ring-Interferometric Sol-Gel Bio-Sensor

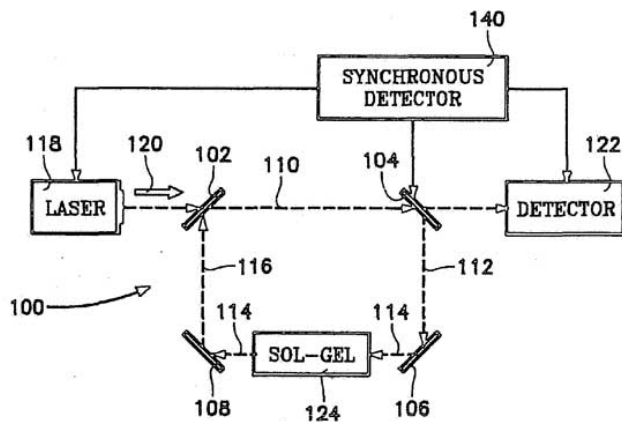
Bearman, Gregory, Inventor; Cohen, David, Inventor; March 28, 2006; 11 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 9 Dec. 2003; US-Patent-7,019,847; US-Patent-Appl-SN-750,574; NASA-Case-NPO-30807-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017025>; Avail: CASI; A03, Hardcopy

A biosensor embodying the invention includes a sensing volume having an array of pores sized for immobilizing a first biological entity tending to bind to a second biological entity in such a manner as to change an index of refraction of the sensing volume. The biosensor further includes a ring interferometer, one volumetric section of the ring interferometer being the sensing volume, a laser for supplying light to the ring interferometer, and a photodetector for receiving light from the interferometer.

Official Gazette of the U.S. Patent and Trademark Office

Bioinstrumentation; Interferometers; Sol-Gel Processes; Immobilization; Photometers; Refractivity



71 ACOUSTICS

Includes sound generation, transmission, and attenuation. For noise pollution see 45 *Environment Pollution*. For aircraft noise see also 02 *Aerodynamics* and 07 *Aircraft Propulsion and Power*.

20060017038 NASA Marshall Space Flight Center, Huntsville, AL, USA

Entertainment and Pacification System For Car Seat

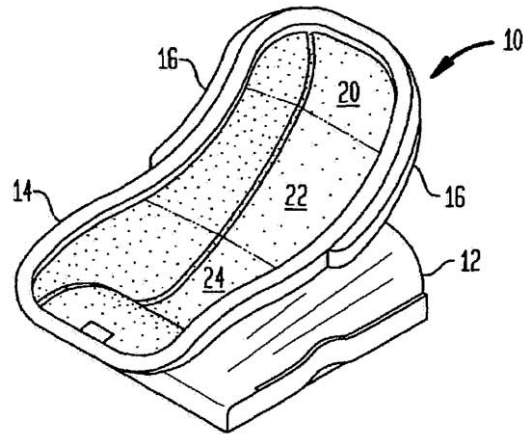
Elrod, Susan Vinz, Inventor; Dabney, Richard W., Inventor; May 02, 2006; 10 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 18 Mar. 2003; US-Patent-7,039,207; US-Patent-Appl-SN-392,488; NASA-Case-MSF-31707-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017038>; Avail: CASI; A02, Hardcopy

An entertainment and pacification system for use with a child car seat has speakers mounted in the child car seat with a plurality of audio sources and an anti-noise audio system coupled to the child car seat. A controllable switching system provides for, at any given time, the selective activation of i) one of the audio sources such that the audio signal generated thereby is coupled to one or more of the speakers, and ii) the anti-noise audio system such that an ambient-noise-canceling audio signal generated thereby is coupled to one or more of the speakers. The controllable switching system can receive commands generated at one of first controls located at the child car seat and second controls located remotely with respect to the child car seat with commands generated by the second controls overriding commands generated by the first controls.

Author

Seats; Noise (Sound); Sound Waves; Ambience; Auditory Signals



74
OPTICS

Includes light phenomena and the theory of optical devices; for specific optical devices see also *35 Instrumentation and Photography*. For lasers see *36 Lasers and Masers*.

20050237940 NASA Johnson Space Center, Houston, TX, USA

Dynamic Optical Filtration

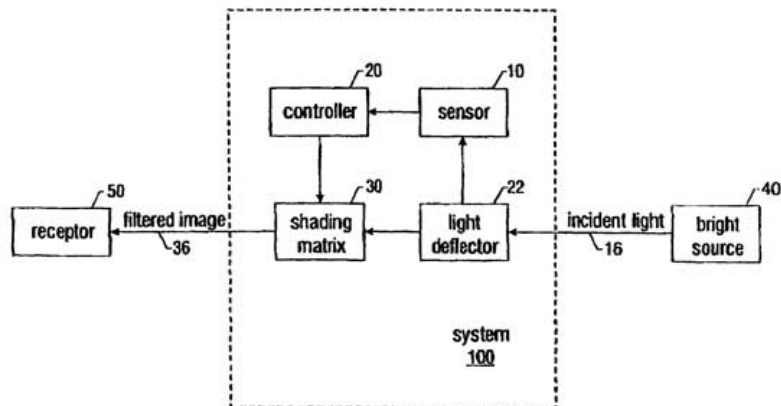
Chretien, Jean-Loup, Inventor; Lu, Edward T., Inventor; March 08, 2005; 34 pp.; In English

Patent Info.: Filed 7 Dec. 2000; US-Patent-6,864,473-B2; US-Patent-Appl-SN-988855; NASA-Case-MS-C-23037-1; No Copyright; Avail: CASI; A03, Hardcopy

A dynamic optical filtration system and method effectively blocks bright light sources without impairing view of the remainder of the scene. A sensor measures light intensity and position so that selected cells of a shading matrix may interrupt the view of the bright light source by a receptor. A beamsplitter may be used so that the sensor may be located away from the receptor. The shading matrix may also be replaced by a digital micromirror device, which selectively sends image data to the receptor.

Official Gazette of the U.S. Patent and Trademark Office

Filtration; Optical Equipment; Dynamic Control



20060009011 NASA Johnson Space Center, Houston, TX, USA

Motion Sickness Treatment Apparatus and Method

Reschke, Millard F., Inventor; Somers, Jeffrey T., Inventor; Ford, George A., Inventor; August 23, 2005; 14 pp.; In English; Original contains black and white illustrations

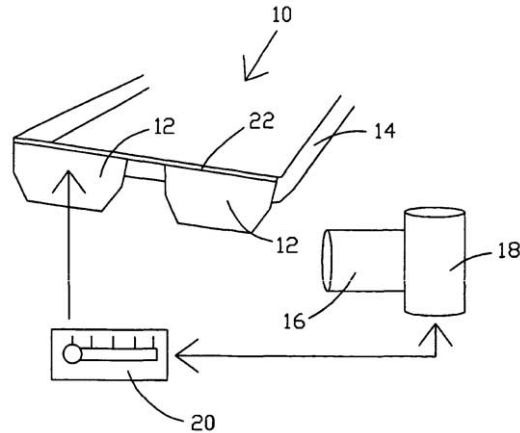
Patent Info.: Filed 6 Feb. 2003; US-Patent-6,932,090; US-Patent-Appl-361046; NASA-Case-MS-C-23444-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009011>; Avail: CASI; A03, Hardcopy

Methods and apparatus are disclosed for treating motion sickness. In a preferred embodiment a method of the invention comprises operating eyewear having shutter lenses to open said shutter lenses at a selected operating frequency ranging from

within about 3 Hz to about 50 Hz. The shutter lenses are opened for a short duration at the selected operating frequency wherein the duration is selected to prevent retinal slip. The shutter lenses may be operated at a relatively slow frequency of about 4 Hz when the user is in passive activity such as riding in a boat or car or in limited motion situations in a spacecraft. The shutter lenses may be operated at faster frequencies related to motion of the user's head when the user is active.

Official Gazette of the U.S. Patent and Trademark Office

Motion Sickness; Equipment; Eye (Anatomy)



20060017032 NASA Marshall Space Flight Center, Huntsville, AL, USA

Variable Distance Angular Symbology Reader

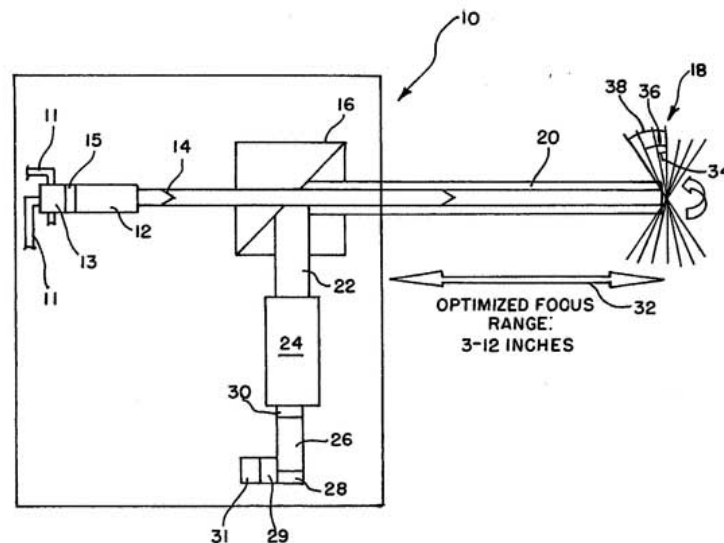
Schramm, Harry F., Jr., Inventor; Corder, Eric L., Inventor; March 28, 2006; 8 pp.; In English; Original contains black and white illustrations

Patent Info.: Filed 26 Nov. 2003; US-Patent-7,017,812; US-Patent-Appl-SN-730191; NASA-Case-MSF-31944-1; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060017032>; Avail: CASI; A02, Hardcopy

A variable distance angular symbology, reader utilizes at least one light source to direct light through a beam splitter and onto a target. A target may be angled relative to the impinging light beam up to and maybe even greater than 45deg. A reflected beam from the target passes through the beam splitter and is preferably directed 90deg relative to the light source through a telecentric lens to a scanner which records an image of the target such as a direct part marking code.

Official Gazette of the U.S. Patent and Trademark Office

Beam Splitters; Light Sources; Targets; Light Beams



75
PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion. For ionospheric plasmas see 46 *Geophysics*. For space plasmas see 90 *Astrophysics*.

20060009300 NASA Glenn Research Center, Cleveland, OH, USA
METHOD of PRODUCING and ACCELERATING AN ION BEAM

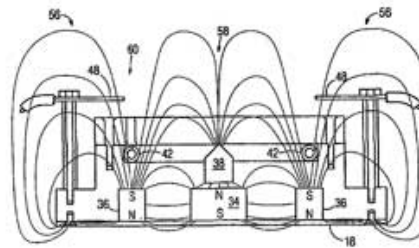
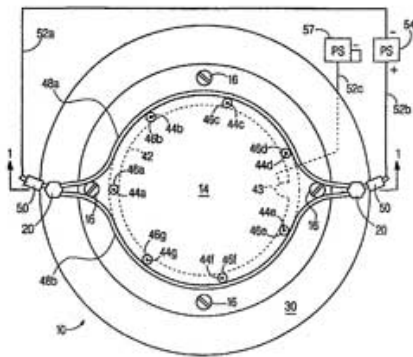
Foster, John E., Inventor; November 2005; 12 pp.; In English

Patent Info.: Filed 5 Jan. 2004; US-Patent-6,960,888; US-Patent-Appl-SN-753183; US-Patent-Appl-SN-215129; NASA-Case-LEW017230.2; No Copyright; ONLINE: <http://hdl.handle.net/2060/20060009300>; Avail: CASI; A03, Hardcopy

A method of producing and accelerating an ion beam comprising the steps of providing a magnetic field with a cusp that opens in an outward direction along a centerline that passes through a vertex of the cusp; providing an ionizing gas that sprays outward through at least one capillary-like orifice in a plenum that is positioned such that the orifice is on the centerline in the cusp, outward of the vortex of the cusp; providing a cathode electron source, and positioning it outward of the orifice and off of the centerline; and positively charging the plenum relative to the cathode electron source such that the plenum functions as an anode. A hot filament may be used as the cathode electron source, and permanent magnets may be used to provide the magnetic field.

Official Gazette of the U.S. Patent and Trademark Office

Electron Sources; Ion Beams; Cathodes; Anodes; Magnetic Fields



Subject Term Index

ACTUATORS

Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16

Non-Uniform Thickness Electroactive Device – 15

ADAPTIVE CONTROL

Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 2

AIR TRAFFIC CONTROLLERS (PERSONNEL)

Method and System For an Automated Tool for En Route Traffic Controllers – 20

AIRCRAFT APPROACH SPACING

En Route Spacing System and Method – 1

AIRCRAFT LAUNCHING DEVICES

Portable Catapult Launcher For Small Aircraft – 21

ALUMINUM ALLOYS

High Strength Aluminum Alloy For High Temperature Applications – 9

AMBIENCE

Entertainment and Pacification System For Car Seat – 36

AMIDES

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5

ANALOG TO DIGITAL CONVERTERS

Video Guidance Sensor System With Integrated Rangefinding – 16

ANHYDRIDES

Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

ANODES

METHOD of PRODUCING and ACCELERATING AN ION BEAM – 39

ANTENNA DESIGN

Feed Structure For Antennas – 11

AROMATIC COMPOUNDS

Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8

AUDITORY SIGNALS

Entertainment and Pacification System For Car Seat – 36

AUTOMATIC CONTROL

Control Method for Video Guidance Sensor System – 22

Method and System For an Automated Tool for En Route Traffic Controllers – 20

Multiple Layer Identification Label Using Stacked Identification Symbols – 23

BACKSCATTERING

CHARGING of DEVICES BY MICROWAVE POWER BEAMING – 13

BALL BEARINGS

Single Ball Bearing Lubricant and Material Evaluator – 21

BANDWIDTH

Wide Bandwidth Phase-Locked Loop Circuit – 12

BARRIERS

Deceleration-Limiting Roadway Barrier – 28

BEAM SPLITTERS

Variable Distance Angular Symbolology Reader – 38

BENDING

ORTHOPEDIC LEG BRACE – 33

BIMETALS

Contaminant Removal From Natural Resources – 31

BIOINSTRUMENTATION

Ring-Interferometric Sol-Gel Bio-Sensor – 36

BLUNT BODIES

Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 2

BONDING

Marking Electrical Wiring With Condition Indicators – 15

BOREHOLES

Method for Controlling a Producing Zone of a Well in a Geological Formation – 29

BUBBLES

Fluid Bubble Eliminator – 17

CAPACITORS

Practical Active Capacitor Filter – 14

CARBON DIOXIDE

High Performance Immobilized Liquid Membrane for Carbon Dioxide Separations – 9

CARBON FIBERS

Secondary polymer layered impregnated tile – 7

CARBON NANOTUBES

Carbon Nanotube Purification – 27

Controlled Patterning and Growth of Single Wall and Multi-wall Carbon Nanotubes – 18

CARBOXYL GROUP

Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8

CARBOXYLIC ACIDS

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

CATAPULTS

Portable Catapult Launcher For Small Aircraft – 21

CATHODES

METHOD of PRODUCING and ACCELERATING AN ION BEAM – 39

CELLS (BIOLOGY)

Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17

CERAMIC FIBERS

Secondary polymer layered impregnated tile – 7

CERAMICS

Thermal Insulating Coating for Spacecrafts – 3

CIRCUITS

Practical Active Capacitor Filter – 14

Wide Bandwidth Phase-Locked Loop Circuit – 12

CLUSTER ANALYSIS

Identification of a typical flight patterns – 2

COLD ROLLING

CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4

COMBUSTION CHAMBERS

NiAl-Based Approach For Rocket Combustion Chambers – 6

COMMUNICATION EQUIPMENT

CHARGING of DEVICES BY MICROWAVE POWER BEAMING – 13

COMPUTER PROGRAMS

En Route Spacing System and Method – 1

COMPUTERIZED SIMULATION

Microwave Medical Treatment Apparatus and Method – 28

Sensor And Method For Detecting A Superstrate – 10

CONDUCTORS

Marking Electrical Wiring With Condition Indicators – 15

CONTAMINANTS

APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32

- Contaminant Removal From Natural Resources – 31
- CONTROL SYSTEMS DESIGN**
Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17
- CONTROL**
System for Controlling a Magnetically Levitated Rotor – 29
- CORROSION PREVENTION**
CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4
- CYCLIC COMPOUNDS**
Polyimides by Photochemical Cyclopolymerization – 8
Substituted Cyclohexene Endcaps for Polymers with Thermal-Oxidative Stability – 8
- DATA ACQUISITION**
Auto-Routable, Configurable, Daisy Chainable Data Acquisition System – 26
- DATA BASE MANAGEMENT SYSTEMS**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- DECELERATION**
Deceleration-Limiting Roadway Barrier – 28
- DEFLECTION**
Deceleration-Limiting Roadway Barrier – 28
- DETECTION**
BODY SENSING SYSTEM – 34
Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17
- DIAMINES**
Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8
- DIGITAL SYSTEMS**
Video Guidance Sensor System With Integrated Rangefinding – 16
- DISCONTINUITY**
Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30
- DISPLACEMENT**
Deceleration-Limiting Roadway Barrier – 28
- DISPLAY DEVICES**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- DOPED CRYSTALS**
CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4
- DYNAMIC CONTROL**
Dynamic Optical Filtration – 37
- EARTH RESOURCES**
Contaminant Removal From Natural Resources – 31
- EDDY CURRENTS**
Magnetoresistive Flux Focusing Eddy Current Flaw Detection – 22
- ELECTRIC BATTERIES**
CHARGING of DEVICES BY MICRO-WAVE POWER BEAMING – 13
- ELECTRIC CONDUCTORS**
Feed Structure For Antennas – 11
- ELECTRIC CURRENT**
Current Signature Sensor – 12
- ELECTRIC FIELDS**
Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16
Non-Uniform Thickness Electroactive Device – 15
- ELECTRIC POTENTIAL**
Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16
Non-Uniform Thickness Electroactive Device – 15
- ELECTRICAL ENGINEERING**
Feed Structure For Antennas – 11
Wide Bandwidth Phase-Locked Loop Circuit – 12
- ELECTROMECHANICS**
High-speed electromechanical chutter for imaging spectrographs – 23
- ELECTRON SOURCES**
METHOD of PRODUCING and ACCELERATING AN ION BEAM – 39
- ELECTRONIC CONTROL**
High-speed electromechanical chutter for imaging spectrographs – 23
- ELECTROSTATIC GENERATORS**
MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31
- ELIMINATION**
Fluid Bubble Eliminator – 17
- EMITTERS**
CHARGING of DEVICES BY MICRO-WAVE POWER BEAMING – 13
- EMULSIONS**
Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4
- EQUIPMENT**
Motion Sickness Treatment Apparatus and Method – 38
- ESTERS**
Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5
- EYE (ANATOMY)**
Motion Sickness Treatment Apparatus and Method – 38
- FEEDBACK CONTROL**
High-speed electromechanical chutter for imaging spectrographs – 23
- FERROELECTRIC MATERIALS**
Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16
- FETUSES**
Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24
- FILTRATION**
Dynamic Optical Filtration – 37
- FIRMWARE**
System for Controlling a Magnetically Levitated Rotor – 29
- FLAME RETARDANTS**
Polyimide Foams – 8
- FLAMMABILITY**
Pressure Vessel with Impact and Fire Resistant Coating and Method of Making Same – 5
- FLEXIBILITY**
Flexible Multi-Shock Shield – 25
- FLIGHT CHARACTERISTICS**
Identification of a typical flight patterns – 2
- FLUID FLOW**
Fluid Bubble Eliminator – 17
- FOAMS**
Polyimide Foams – 8
- FOREBODIES**
Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 2
- FORMING TECHNIQUES**
Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5
- GAS FLOW**
APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32
- GAS MIXTURES**
High Performance Immobilized Liquid Membrane for Carbon Dioxide Separations – 9
- GAS TURBINE ENGINES**
Nickel Base Superalloy Turbine Disk – 10
- GEOLOGY**
Method for Controlling a Producing Zone of a Well in a Geological Formation – 29
- GLASS TRANSITION TEMPERATURE**
Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5
Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

GRAVITATION

Production of Functional Proteins: Balance of Shear Stress and Gravity – 33

GROUND WATER

Contaminant Removal From Natural Resources – 31

GUIDANCE SENSORS

Control Method for Video Guidance Sensor System – 22

Video Guidance Sensor System With Integrated Rangefinding – 16

HEART

Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24

HEAT ENGINES

MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31

HEAT RESISTANT ALLOYS

Nickel Base Superalloy Turbine Disk – 10

HEAT STORAGE

Thermal Insulating Coating for Spacecrafts – 3

HEAT TRANSFER

MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31

HEURISTIC METHODS

BODY SENSING SYSTEM – 34

HEXENES

Substituted Cyclohexene Endcaps for Polymers with Thermal-Oxidative Stability – 8

HIGH RESOLUTION

Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14

HIGH SPEED

High-speed electromechanical chutter for imaging spectrographs – 23

HIGH STRENGTH ALLOYS

High Strength Aluminum Alloy For High Temperature Applications – 9

HIGH TEMPERATURE GASES

High temperature decomposition of hydrogen peroxide – 7

HIGH TEMPERATURE

High Strength Aluminum Alloy For High Temperature Applications – 9

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

HYDROGEN PEROXIDE

APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32

ICE

Sensor And Method For Detecting A Superstrate – 10

IDENTIFYING

Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30

ILLUMINATING

Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14

IMAGE PROCESSING

Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17

IMIDES

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5

IMMOBILIZATION

Ring-Interferometric Sol-Gel Bio-Sensor – 36

IN-FLIGHT MONITORING

Video Guidance Sensor System With Integrated Rangefinding – 16

INJECTORS

APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32

INSULATION

Non-Uniform Thickness Electroactive Device – 15

INTERFEROMETERS

Ring-Interferometric Sol-Gel Bio-Sensor – 36

ION BEAMS

METHOD of PRODUCING and ACCELERATING AN ION BEAM – 39

IRON

Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4

KNEE (ANATOMY)

ORTHOPEDIC LEG BRACE – 33

LAMINATES

Non-Uniform Thickness Electroactive Device – 15

LIGHT BEAMS

Variable Distance Angular Symbology Reader – 38

LIGHT SOURCES

Variable Distance Angular Symbology Reader – 38

LIGHT TRANSMISSION

High-speed electromechanical chutter for imaging spectrographs – 23

LIQUID CRYSTALS

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5

LOADS (FORCES)

Deceleration-Limiting Roadway Barrier – 28

LOCKING

Releasable Locking Mechanisms – 19

LUBRICANTS

Single Ball Bearing Lubricant and Material Evaluator – 21

MAGNETIC BEARINGS

System for Controlling a Magnetically Levitated Rotor – 29

MAGNETIC FIELDS

METHOD of PRODUCING and ACCELERATING AN ION BEAM – 39

MAGNETIC SUSPENSION

System for Controlling a Magnetically Levitated Rotor – 29

MAGNETORESISTIVITY

Magnetoresistive Flux Focusing Eddy Current Flaw Detection – 22

MARKERS

Marking Electrical Wiring With Condition Indicators – 15

MECHANICAL ENGINEERING

Auto-Routable, Configurable, Daisy Chainable Data Acquisition System – 26

Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24

Portable Catapult Launcher For Small Aircraft – 20

Releasable Locking Mechanisms – 19

Resistive Exercise Device – 27

Single Ball Bearing Lubricant and Material Evaluator – 21

MECHANICAL PROPERTIES

Nickel Base Superalloy Turbine Disk – 10

MEDICAL EQUIPMENT

Microwave Medical Treatment Apparatus and Method – 28

MEMBRANES

High Performance Immobilized Liquid Membrane for Carbon Dioxide Separations – 9

METAL COATINGS

CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4

Thermal Insulating Coating for Spacecrafts – 3

METAL PARTICLES

Contaminant Removal From Natural Resources – 31

Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4

MICROCHANNELS

Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14

MICROELECTROMECHANICAL SYSTEMS

MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31

MICROSCOPES

Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14

MICROSCOPY

Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17

MICROWAVE POWER BEAMING

CHARGING of DEVICES BY MICROWAVE POWER BEAMING – 13

MICROWAVE TRANSMISSION

CHARGING of DEVICES BY MICROWAVE POWER BEAMING – 13

Microwave Medical Treatment Apparatus and Method – 27

MINERAL EXPLORATION

Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30

MOTION SICKNESS

Motion Sickness Treatment Apparatus and Method – 38

MULTIPLEXING

Sensor And Method For Detecting A Superstrate – 10

MULTIPLIERS

Practical Active Capacitor Filter – 14

NANOSTRUCTURE GROWTH

Controlled Patterning and Growth of Single Wall and Multi-wall Carbon Nanotubes – 18

NEURAL NETS

BODY SENSING SYSTEM – 34

HYBRID NEURAL NETWORK and SUPPORT VECTOR MACHINE METHOD FOR OPTIMIZATION – 35

NICKEL ALLOYS

Nickel Base Superalloy Turbine Disk – 10

NICKEL ALUMINIDES

NiAl-Based Approach For Rocket Combustion Chambers – 6

NITRIC OXIDE

High temperature decomposition of hydrogen peroxide – 7

NITROGEN DIOXIDE

High temperature decomposition of hydrogen peroxide – 7

NITROGEN OXIDES

APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32

NOISE (SOUND)

Entertainment and Pacification System For Car Seat – 36

NONDESTRUCTIVE TESTS

Magneto-resistive Flux Focusing Eddy Current Flaw Detection – 22

NUMERICAL ANALYSIS

Identification of a typical flight patterns – 2

OLIGOMERS

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

OPTICAL EQUIPMENT

Dynamic Optical Filtration – 37

OPTIMIZATION

HYBRID NEURAL NETWORK and SUPPORT VECTOR MACHINE METHOD FOR OPTIMIZATION – 35

ORGANIC COMPOUNDS

Secondary polymer layered impregnated tile – 7

ORTHOPEDICS

ORTHOPEDIC LEG BRACE – 33

PERTURBATION

System for Controlling a Magnetically Levitated Rotor – 29

PHASE DETECTORS

Sensor And Method For Detecting A Superstrate – 10

PHASE LOCKED SYSTEMS

High-speed electromechanical chutter for imaging spectrographs – 23

Wide Bandwidth Phase-Locked Loop Circuit – 12

PHENYLS

Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8

PHOTOMETERS

Ring-Interferometric Sol-Gel Bio-Sensor – 36

PHYSICAL EXERCISE

Resistive Exercise Device – 27

PLANAR STRUCTURES

Sensor And Method For Detecting A Superstrate – 10

POLYIMIDES

Polyimide Foams – 8

Polyimides by Photochemical Cyclopolymerization – 8

Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

Substituted Cyclohexene Endcaps for Polymers with Thermal-Oxidative Stability – 8

POLYMERIZATION

Polyimides by Photochemical Cyclopolymerization – 8

Substituted Cyclohexene Endcaps for Polymers with Thermal-Oxidative Stability – 8

PORTABLE EQUIPMENT

Portable Catapult Launcher For Small Aircraft – 21

PRESSURE VESSELS

Pressure Vessel with Impact and Fire Resistant Coating and Method of Making Same – 5

PROTECTIVE COATINGS

Pressure Vessel with Impact and Fire Resistant Coating and Method of Making Same – 5

PROTEINS

Production of Functional Proteins: Balance of Shear Stress and Gravity – 33

PURIFICATION

Carbon Nanotube Purification – 27

RADIANT FLUX DENSITY

Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14

RANGEFINDING

Video Guidance Sensor System With Integrated Rangefinding – 16

REFRACTIVITY

Ring-Interferometric Sol-Gel Bio-Sensor – 36

REFRACTORY METAL ALLOYS

Nickel Base Superalloy Turbine Disk – 10

REGIONS

Method for Controlling a Producing Zone of a Well in a Geological Formation – 29

RELEASING

Releasable Locking Mechanisms – 19

RESIN TRANSFER MOLDING

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 5

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6

RESINS

CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4

Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 4

RESISTANCE

Resistive Exercise Device – 27

RIVERS

Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30

ROADS

Deceleration-Limiting Roadway Barrier – 28

ROCKET ENGINES

AXISYMMETRIC, THROTTLEABLE
NON-GIMBALLED ROCKET ENGINE – 3

NiAl-Based Approach For Rocket Combustion Chambers – 6

ROTORS

Nickel Base Superalloy Turbine Disk – 10

System for Controlling a Magnetically Levitated Rotor – 28

ROUTES

En Route Spacing System and Method – 1

SCANNING

Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14

SEATS

Entertainment and Pacification System For Car Seat – 36

SEDIMENTS

Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30

SEMICONDUCTOR DEVICES

Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17

SENSORS

Auto-Routable, Configurable, Daisy Chainable Data Acquisition System – 26

Current Signature Sensor – 12

SHEAR STRESS

Production of Functional Proteins: Balance of Shear Stress and Gravity – 33

SHIELDING

Flexible Multi-Shock Shield – 25

SHOCK WAVES

Flexible Multi-Shock Shield – 25

SIGNAL ANALYZERS

Video Guidance Sensor System With Integrated Rangefinding – 16

SIGNAL PROCESSING

Current Signature Sensor – 12

Video Guidance Sensor System With Integrated Rangefinding – 16

SIGNAL TRANSMISSION

Practical Active Capacitor Filter – 14

SOILS

Contaminant Removal From Natural Resources – 31

SOLENOIDS

Current Signature Sensor – 12

SOL-GEL PROCESSES

Ring-Interferometric Sol-Gel Bio-Sensor – 36

SOLVENTS

Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4

SOUND WAVES

Entertainment and Pacification System For Car Seat – 36

Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24

SPACECRAFT COMPONENTS

Releasable Locking Mechanisms – 19

SPHERES

Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17

STEELS

CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4

STRINGS

Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35

SUPPORTS

ORTHOPEDIC LEG BRACE – 33

SURFACE ROUGHNESS

Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 2

SURFACTANTS

Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4

SYMMETRY

AXISYMMETRIC, THROTTLEABLE
NON-GIMBALLED ROCKET ENGINE – 3

SYSTEM IDENTIFICATION

Multiple Layer Identification Label Using Stacked Identification Symbols – 23

SYSTEMS ENGINEERING

Method and System For an Automated Tool for En Route Traffic Controllers – 20

Passive Tracking System and Method – 19

THERMAL INSULATION SYSTEMS – 24

SYSTEMS HEALTH MONITORING

Current Signature Sensor – 12

TARGETS

BODY SENSING SYSTEM – 34

Variable Distance Angular Symbology Reader – 38

TEMPERATURE EFFECTS

MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31

THERMAL ENERGY

MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31

THERMAL INSULATION

Thermal Insulating Coating for Spacecrafts – 3

THERMAL INSULATION SYSTEMS – 24

THERMAL PROTECTION

Thermal Insulating Coating for Spacecrafts – 3

THERMAL STABILITY

Substituted Cyclohexene Endcaps for Polymers with Thermal-Oxidative Stability – 8

THROTTLING

AXISYMMETRIC, THROTTLEABLE
NON-GIMBALLED ROCKET ENGINE – 3

TILES

Secondary polymer layered impregnated tile – 7

TOPOGRAPHY

Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30

TRACKING (POSITION)

Passive Tracking System and Method – 19

TRANSDUCERS

Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16

TRANSMISSION LINES

Sensor And Method For Detecting A Superstrate – 10

TRANSMITTER RECEIVERS

Passive Tracking System and Method – 19

TRANSMITTERS

CHARGING OF DEVICES BY MICROWAVE POWER BEAMING – 13

TRICHLOROETHYLENE

Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4

ULTRAVIOLET RADIATION

APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32

UNSTRUCTURED GRIDS (MATHEMATICS)

Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – [35](#)

VAPOR PHASES

High temperature decomposition of hydrogen peroxide – [7](#)

VECTORS (MATHEMATICS)

HYBRID NEURAL NETWORK and SUPPORT VECTOR MACHINE METHOD FOR OPTIMIZATION – [35](#)

VIDEO COMMUNICATION

Control Method for Video Guidance Sensor System – [22](#)

VISCOSITY

Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – [6](#)

WALKING

ORTHOPEDIC LEG BRACE – [33](#)

WELLS

Method for Controlling a Producing Zone of a Well in a Geological Formation – [29](#)

WIRING

Marking Electrical Wiring With Condition Indicators – [15](#)

Personal Author Index

- Ahmed, Rafiq**
Releasable Locking Mechanisms – 19
- Amidan, Brett G.**
Identification of a typical flight patterns – 2
- Amini, B. Jon**
Method for Controlling a Producing Zone of a Well in a Geological Formation – 29
- Anderson, William E.**
AXISYMMETRIC, THROTTLEABLE
NON-GIMBALLED ROCKET ENGINE – 2
- Arndt, G. Dickey**
Method for Controlling a Producing Zone of a Well in a Geological Formation – 29
Microwave Medical Treatment Apparatus and Method – 27
Passive Tracking System and Method – 19
Sensor And Method For Detecting A Superstrate – 10
- Augustynowicz, Stanislaw D.**
THERMAL INSULATION SYSTEMS – 24
- Bassignani, Karin E.**
Current Signature Sensor – 12
- Bassignani, Mario**
Current Signature Sensor – 12
- Bearman, Gregory**
Ring-Interferometric Sol-Gel Bio-Sensor – 36
- Bell, Joseph L.**
Video Guidance Sensor System With Integrated Rangefinding – 16
- Book, Michael L.**
Control Method for Video Guidance Sensor System – 22
Video Guidance Sensor System With Integrated Rangefinding – 16
- Bourgeois, Brian A.**
Passive Tracking System and Method – 19
- Brooks, Kathleen**
Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4
- Bryan, Thomas C.**
Control Method for Video Guidance Sensor System – 22
Video Guidance Sensor System With Integrated Rangefinding – 16
- Bryant, Robert G.**
Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16
- Bryant, Timothy D.**
Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24
- Burns, Bradley**
Current Signature Sensor – 12
- Byerly, Kent A.**
Method for Controlling a Producing Zone of a Well in a Geological Formation – 29
- Cano, Roberto J.**
Polyimide Foams – 7
- Cari, James R.**
Sensor And Method For Detecting A Superstrate – 10
- Carl, James R.**
Method for Controlling a Producing Zone of a Well in a Geological Formation – 29
Microwave Medical Treatment Apparatus and Method – 27
- Carroll, Joseph A.**
Secondary polymer layered impregnated tile – 7
- Chen, Henry A.**
Passive Tracking System and Method – 19
- Chen, Po-Shou**
High Strength Aluminum Alloy For High Temperature Applications – 9
- Chretien, Jean-Loup**
Dynamic Optical Filtration – 37
- Christiansen, Eric L.**
Flexible Multi-Shock Shield – 25
- Chu, Andrew W.**
Feed Structure For Antennas – 11
- Chuang, CHun-Hua**
Solvent Free Low-Melt Viscosity Imide Oligomers And Thermosetting Polyimide Composites – 6
- Clausen, Christian A.**
Contaminant Removal From Natural Resources – 31
- Clausen, Christian**
Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4
- Clauseu, christian Anthony**
APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32
- Cohen, David**
Ring-Interferometric Sol-Gel Bio-Sensor – 36
- Connell, John W.**
Polyimides from 2,3,3',4'-Biphenyltetracarboxylic Dianhydride and Aromatic Diamines – 8
- Cooley, Scott K.**
Identification of a typical flight patterns – 2
- Coon, Christina**
Contaminant Removal From Natural Resources – 31
- Cooper, Charles David**
APPARATUS and METHOD FOR TREATING POLLUTANTS IN A GAS USING HYDROGEN PEROXIDE and UV LIGHT – 32
- Corder, Eric L.**
Variable Distance Angular Symbology Reader – 38
- Cramer, K. Elliott**
Marking Electrical Wiring With Condition Indicators – 15
- Crews, Jeanne L.**
Flexible Multi-Shock Shield – 25
- Dabney, Richard W.**
Entertainment and Pacification System For Car Seat – 36
- DeLay, Thomas K.**
Pressure Vessel with Impact and Fire Resistant Coating and Method of Making Same – 5
- Delzeit, Clement J.**
Carbon Nanotube Purification – 26
- Delzeit, Lance D.**
Carbon Nanotube Purification – 26
Controlled Patterning and Growth of Single Wall and Multi-wall Carbon Nanotubes – 18
- Devor, Robert**
Contaminant Removal From Natural Resources – 31
- Dingemans, Theodornus J.**
Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 4
- Dobbins, Justin A.**
Feed Structure For Antennas – 11
- Dressler, Gordon A.**
AXISYMMETRIC, THROTTLEABLE
NON-GIMBALLED ROCKET ENGINE – 2
- Dusl, John**
Passive Tracking System and Method – 19
- Elrod, Susan Vinz**
Entertainment and Pacification System For Car Seat – 36
- Erzberger, Heinz**
En Route Spacing System and Method – 1
Method and System For an Automated Tool for En Route Traffic Controllers – 20

- Ferryman, Thomas A**
Identification of a typical flight patterns – 2
- Fesmire, James E.**
THERMAL INSULATION SYSTEMS – 24
- Fillpek, Laura B.**
Contaminant Removal From Natural Resources – 31
- Fink, Patrick W.**
Feed Structure For Antennas – 11
Sensor And Method For Detecting A Superstrate – 10
- Ford, George A.**
Motion Sickness Treatment Apparatus and Method – 37
- Foster, John E.**
METHOD OF PRODUCING and ACCELERATING AN ION BEAM – 39
- Fox, Robert L.**
Electro-Active Transducer Using Radial Electric Field To Produce/Motion Sense Out-Of-Plane Transducer – 16
- Gabb, Timothy P.**
Nickel Base Superalloy Turbine Disk – 10
- Gauda, John**
Nickel Base Superalloy Turbine Disk – 10
- Gawdiak, Yuri O.**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- Gayda, John**
NiAl-Based Approach For Rocket Combustion Chambers – 6
- Geiger, Cheri L.**
Contaminant Removal From Natural Resources – 31
- Gelger, Cherie L.**
Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4
- George, W. Riffoul**
Microwave Medical Treatment Apparatus and Method – 27
- Gessler, Joseph A.**
Portable Catapult Launcher For Small Aircraft – 20
- Gonda, Steve R.**
Fluid Bubble Eliminator – 17
- Goodwin, Thomas John**
Production of Functional Proteins: Balance of Shear Stress and Gravity – 33
- Green, Steven M.**
En Route Spacing System and Method – 1
- Hall, Philip B.**
Single Ball Bearing Lubricant and Material Evaluator – 21
- Hammond, Timothy Grant**
Production of Functional Proteins: Balance of Shear Stress and Gravity – 33
- Harrison, Joycelyn S.**
Non-Uniform Thickness Electroactive Device – 15
- Haysen, James Howard**
Production of Functional Proteins: Balance of Shear Stress and Gravity – 33
- Hergenrother, Paul M.**
Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8
- Hill, Brent W.**
Passive Tracking System and Method – 19
- Holloway, Nancy M. H.**
Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24
- Howard, Richard T.**
Control Method for Video Guidance Sensor System – 22
Video Guidance Sensor System With Integrated Rangefinding – 16
- Hsu, Ming-ta S.**
Secondary polymer layered impregnated tile – 7
- Hughes, Michael G.**
Portable Catapult Launcher For Small Aircraft – 20
- Hutt, John J.**
AXISYMMETRIC, THROTTLEABLE NON-GIMBALLED ROCKET ENGINE – 2
- Ihlefeld, Curtis**
Current Signature Sensor – 12
- Iliff, Kenneth W.**
Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 1
- Jay, Joseph Griffith**
Identification of a typical flight patterns – 2
- Jensen, Brian J.**
Polyimide Foams – 7
- Kantzos, Pete T.**
Nickel Base Superalloy Turbine Disk – 10
- Kaul, Raj K.**
Thermal Insulating Coating for Spacecrafts – 3
- Koudelka, Robert David**
Wide Bandwidth Phase-Locked Loop Circuit – 12
- La, Tracy T.**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- Landis, Geoffrey A.**
CHARGING OF DEVICES BY MICROWAVE POWER BEAMING – 13
MEMS CLOSED CHAMBER HEAT ENGINE and ELECTRIC GENERATOR – 31
- Lawrence, Robert E.**
Identification of a typical flight patterns – 2
- Lee, Jonathan A.**
High Strength Aluminum Alloy For High Temperature Applications – 9
- Lee, Wenshan**
Fluid Bubble Eliminator – 17
- Lin, Greg Y.**
Feed Structure For Antennas – 11
- Lin, Shu-Chun Y.**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- Locke, P. James**
Deceleration-Limiting Roadway Barrier – 28
- Lu, Edward T.**
Dynamic Optical Filtration – 37
- Lucena, Angel**
Current Signature Sensor – 12
- Mah, Robert W.**
BODY SENSING SYSTEM – 34
- Malof, David A.**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- McDowell, Mark**
Identification Of Cells With A Compact Microscope Imaging System With Intelligent Controls – 17
- McNally, B. David**
Method and System For an Automated Tool for En Route Traffic Controllers – 20
- Meador, Michael A.**
Polyimides by Photochemical Cyclopolymerization – 8
- Moes, Timothy R.**
Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 1
- Morrison, Carlos R.**
System for Controlling a Magnetically Levitated Rotor – 28
- Mosbrucker, Chris**
Identification of a typical flight patterns – 2
- Myers, William Neil**
ORTHOPEDIC LEG BRACE – 33
- Namkung, Min**
Magnetoresistive Flux Focusing Eddy Current Flaw Detection – 21
- Nathal, Michael V.**
NiAl-Based Approach For Rocket Combustion Chambers – 6
- Ngo, Phong H.**
Microwave Medical Treatment Apparatus and Method – 27
Passive Tracking System and Method – 19

- Sensor And Method For Detecting A Superstrate – 10
- Nguyen, Quang-Viet**
High-speed electromechanical chutter for imaging spectrographs – 23
- Noebe, Ronald D.**
NiAl-Based Approach For Rocket Combustion Chambers – 6
- Novak, Howard L.**
Single Ball Bearing Lubricant and Material Evaluator – 21
- Parrish, Clyde F.**
High Performance Immobilized Liquid Membrane for Carbon Dioxide Separations – 9
High temperature decomposition of hydrogen peroxide – 6
- Perey, Daniel F.**
Marking Electrical Wiring With Condition Indicators – 15
- Perotti, Jose M.**
Current Signature Sensor – 12
- Petter, George E.**
Portable Catapult Launcher For Small Aircraft – 20
- Phan, Chau T.**
Passive Tracking System and Method – 19
- Quinn, Jacqueline W.**
Contaminant Removal From Natural Resources – 31
- Quinn, Jacqueline**
Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4
- Rai, Man Mohan**
HYBRID NEURAL NETWORK and SUPPORT VECTOR MACHINE METHOD FOR OPTIMIZATION – 35
- Rasky, Daniel J.**
Secondary polymer layered impregnated tile – 7
- Reinhart, Debra R.**
Zero-Valent Metal Emulsion for Reductive Dehalogenation of DNAPLs – 4
- Reinhart, Debra**
Contaminant Removal From Natural Resources – 31
- Reschke, Millard F.**
Motion Sickness Treatment Apparatus and Method – 37
- Roe, Fred Davis, Jr.**
Video Guidance Sensor System With Integrated Ranging – 16
- Rosenbaum, Bernard J.**
Portable Catapult Launcher For Small Aircraft – 20
- Sackheim, Robert L.**
AXISYMMETRIC, THROTTLEABLE NON-GIMBALLED ROCKET ENGINE – 2
- SaintClair, Terry L.**
Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 4
- Saltzman, Edwin J.**
Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 1
- Schneider, William C.**
Deceleration-Limiting Roadway Barrier – 28
- Schramm, Harry F., Jr.**
Variable Distance Angular Symbology Reader – 38
- Schramm, Harry F.**
Multiple Layer Identification Label Using Stacked Identification Symbols – 23
- Shuler, Robert L., Jr.**
Practical Active Capacitor Filter – 13
- Shuler, Robert L.**
Auto-Routable, Configurable, Daisy Chainable Data Acquisition System – 25
- Siekierski, James D.**
Sensor And Method For Detecting A Superstrate – 10
- Simpson, John W.**
Magnetoresistive Flux Focusing Eddy Current Flaw Detection – 21
- Smith, Damon C.**
Resistive Exercise Device – 27
- Smith, Joseph G.**
Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8
- Somers, Jeffrey T.**
Motion Sickness Treatment Apparatus and Method – 37
- Statler, Irving C.**
Identification of a typical flight patterns – 2
- Su, Ji**
Non-Uniform Thickness Electroactive Device – 15
- Szalai, Christine E.**
Secondary polymer layered impregnated tile – 7
- Telesman, Ignacy**
Nickel Base Superalloy Turbine Disk – 10
- Tran, Huy K.**
Secondary polymer layered impregnated tile – 7
- Tran, Khai Peter B.**
Extensible Database Framework for Management of Unstructured and Semi-Structured Documents – 35
- Tsao, Yow-Min**
Fluid Bubble Eliminator – 17
- Vazquez, Juan M.**
Polyimide Foams – 7
- Viswanathan, Tito**
CORROSION PREVENTION of COLD ROLLED STEEL USING WATER DISPERSIBLE LIGNOSULFONIC ACID DOPED POLYANILINE – 4
- Wang, Yu**
Multifrequency Ultra-High Resolution Miniature Scanning Microscope Using Microchannel And Solid-State Sensor Technologies And Method For Scanning Samples – 14
- Watson, Kent A.**
Polyimides from 2,3,3',4'-Biphenyl-tetracarboxylic Dianhydride and Aromatic Diamines – 8
- Weiser, Erik S.**
Liquid Crystalline Thermosets from Ester, Ester-Imide, and Ester-Amide Oligomers – 4
Polyimide Foams – 7
- White, M.**
Identification of a typical flight patterns – 2
- Whitmore, Stephen A.**
Method for Reducing the Drag of Increasing Forebody Roughness Blunt-Based Vehicles by Adaptively Increasing Forebody Roughness – 1
- Whitney, Paul D.**
Identification of a typical flight patterns – 2
- Wilkinson, Murray Justin**
Method For Identifying Sedimentary Bodies From Images And Its Application To Mineral Exploration – 30
- Willse, Alan R.**
Identification of a typical flight patterns – 2
- Wincheski, Russell A.**
Magnetoresistive Flux Focusing Eddy Current Flaw Detection – 21
- Wingate, Robert J.**
Releasable Locking Mechanisms – 19
- Wynkoop, Mark W.**
Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24
- Yost, William T.**
Marking Electrical Wiring With Condition Indicators – 15
- Zuckerwar, Allan J.**
Method for Simultaneously Making a Plurality of Acoustic Signal Sensor Elements – 24

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