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Journal of Power Sources

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LEAD ACID

5738956

AGENT FOR MAINTAINING AND RECOVERING THE FUNCTION OF LEAD STORAGE BATTERY AND ELECTROLYTE FOR LEAD STORAGE BATTERY USING THE SAME

Komoda Katsuichi Toyonaka, JAPAN assigned to Kyowa Hakko Kogyo; K-Tec Co Ltd

The present invention relates to an agent for maintaining and recovering the function of a lead storage battery, comprising as active ingredients a metal sulfate and at least one of an amino acid and a salt thereof, as well as an electrolyte for use in a lead storage battery comprising the above agent and a basal electrolyte. According to the present invention, there is provided a highly effective agent or electrolyte for maintaining the function of a lead storage battery over a long period and recovering the function of a lead storage battery whose storage capacity has been lowered.

FUEL CELL

5732463

METHOD OF PREPARING A FUEL CELL ELECTRODE

Breault Richard D; Donahue John; Haven Robert L Coventry, CT, UNITED STATES assigned to International Fuel Cells Corporation

The present invention discloses a method for preparing a catalyst to be applied to an electrode substrate, the method incorporates cooling the catalyst material to a temperature below a critical temperature and grinding the cooled catalyst to produce a catalyst material which will create a uniform catalytic layer on an electrode substrate. The finished electrode having significantly fewer particles than the electrode prepared by the prior art method.

5733347

COMPACT FUEL GAS REFORMER ASSEMBLAGE

Lesieur Roger R Enfield, CT, UNITED STATES assigned to International Fuel Cells Corporation

A fuel gas reformer assemblage for use in a fuel cell power plant is formed from a composite plate assembly which includes spaced-apart divider plates with interposed columns of individual gas passages. The reformer assemblage is constructed from a series of repeating sub-assemblies, each of which includes a core of separate regenerator/heat exchanger gas passages. The core in each sub-assembly is sandwiched between a pair of reformer gas passage skins, which complete the sub-assembly. Adjacent reformer gas/regenerator/reformer gas passage sub-assemblies in the composite plate assembly are separated from each other by burner gas passages. The regenerator/heat exchanger gas passages and the reformer gas passages in each sub-assembly are connected by gas flow return manifolds which form a part of each sub-assembly. The fuel gases flow in one end of the assemblage, through the reformer gas passages, and then reverse their direction of flow in the return manifolds so as to exit the reformer assemblage through the regenerator gas flow passages. The burner gases flow in one end of the reformer assemblage and out the other end. The walls of the burner and reformer gas flow passages are selectively catalyzed after the assemblage has been constructed.

5733421

HYDROGEN-OXYGEN FUEL CELL

Pettigrew J W; Monette Gregory; Hirsch David H Anchorage, AK, UNITED STATES

A hydrogen-oxygen fuel cell that uses an electrolysis unit that is sealed and has protection from explosions and corrosion. It has a plate structure that produces maximum efficiency of hydrogen production and can adjust the output to better match the needs of a given engine. The unit has an automatic fill system to keep the electrolyte solution at the proper levels for efficient hydrogen production, and the temperature of the electrolysis chamber remains low, thereby reducing the problems of cooling the chamber and the risk of melting

the chamber. The device has an extraction chamber that is baffled to prevent backwash of electrolyte solution out of the electrolyte chamber. The device has an explosion preventer that reduces the explosion risk by working the produced gasses through a neutral fluid.

5733675

ELECTROCHEMICAL FUEL CELL GENERATOR HAVING AN INTERNAL AND LEAK TIGHT HYDROCARBON FUEL REFORMER

Dederer Jeffrey T; Hager Charles Valencia, PA, UNITED STATES assigned to Westinghouse Electric Corporation

An electrochemical fuel cell generator configuration is made having a generator section which contains a plurality of axially elongated fuel cells, each cell containing a fuel electrode, air electrode, and solid oxide electrolyte between the electrodes, in which axially elongated dividers separate portions of the fuel cells from each other, and where at least one divider also reforms a reformable fuel gas mixture prior to electricity generation reactions, the at least one reformer-divider is hollow having a closed end and an open end entrance for a reformable fuel mixture to pass to the closed end of the divider and then reverse flow and pass back along the hollowed walls to be reformed, and then finally to pass as reformed fuel out of the open end of the divider to contact the fuel cells, and further where the reformer-divider is a composite structure having a gas diffusion barrier of metallic foil surrounding the external walls of the reformer-divider except at the entrance to prevent diffusion of the reformable gas mixture through the divider, and further housed in an outer insulating jacket except at the entrance to prevent short-circuiting of the fuel cells by the gas diffusion barrier.

5733678

POLYMER FUEL CELL

Ledjeff Konstantin; Nolte Roland Bad Krozingen, GERMANY assigned to Fraunhofer-Gesellschaft Zur Forderung Der Angewandten Forschung E V

PCT No. PCT/DE94/00458 Sec. 371 Date Nov. 24, 1995 Sec. 102(e) Date Nov. 24, 1995 PCT Filed Apr. 22, 1994 PCT Pub. No. WO94/25995 PCT Pub. Date Nov. 10, 1994. The invention relates to a fuel cell with a current collector, polymeric solid electrolyte in the form of membranes, gas distributor rings and currents distributor as components, all components being made from a thermoplastic basic polymer soluble in a solvent, and in that this basic polymer is so modified for the individual components that the current collectors are electrically conductive, the membranes are ion-conductive, the current distributors are gas-permeable and electrically conductive, and the gas distributor rings are made of unmodified and/or electrically conductive basic polymer, and in that the components are combined by a bonding process without seals.

5733682

METALLIC BIPOLAR PLATE FOR HIGH-TEMPERATURE FUEL CELLS AND METHOD OF MAKING SAME

Quadakkers Willem; Baumanns Ferdinand; Nickel Hubertus Wijnandsrade, NETHERLANDS assigned to Forschungszentrum Julich GmbH

PCT No. PCT/DE95/00432 Sec. 371 Date Sep. 17, 1996 Sec. 102(e) Date Sep. 17, 1996 PCT Filed Mar. 25, 1995 PCT Pub. No. WO95/26576 PCT Pub. Date Oct. 5, 1995. A metallic bipolar plate for a high-temperature fuel cell, the plate being a metal body having surfaces adapted to contact electrodes of the fuel cell and passages having walls confining gases, including fuel and oxidizing gases, for the fuel cell, the body being composed of a chromium-containing alloy oxidizable at the surfaces to form chromium oxide at interfaces between the bipolar plate and the electrodes, the alloy being enriched with aluminum at least in regions of the walls in direct contact with the gases.

5736268

HIGH TEMPERATURE FUEL CELL STACK POWER BUS

Pondo Joseph M Bolingbrook, IL, UNITED STATES assigned to M-C Power Corporation

A fuel cell stack power bus system which includes a plurality of current collectors mounted to the peripheral edge portion of a fuel cell stack end plate. The current collectors form lapped connections with a layered power bus which can be easily positioned to extend from any side of a fuel cell stack and which has improved heat transfer characteristics.

5736269

FUEL CELL STACK AND METHOD OF PRESSING TOGETHER THE SAME

Okamoto Takafumi; Kato Hideo; Kawagoe Norimasa; Yamamoto Akio; Tanaka Ichiro Wako, JAPAN assigned to Honda Giken Kogyo Kabushiki Kaisha

A fuel cell stack having unit cells and separators, in which each unit cell comprises a solid polymer electrolyte membrane having a pair of electrode catalysts attached on both surfaces, and a pair of collectors, each made of a rigid body, being in contact with respective electrode catalysts, and each of the separators comprises a pair of pressure generating plates defining therebetween a pressure chamber to which a pressurized fluid is introduced, the pressure generating plates being deformed by the pressurized fluid and pressed against the adjacent respective collectors.

5738773

FUEL CELLS

Criddle William James; Hansen Neils Richard Stewar Penarth, UNITED KINGDOM assigned to Lion Laboratories Plc

PCT No. PCT/GB94/01489 Sec. 371 Date Jan. 16, 1996 Sec. 102(e) Date Jan. 16, 1996 PCT Filed Jul. 8, 1994 PCT Pub. No. WO95/02817 PCT Pub. Date Jan. 26, 1995. A fuel cell sensor comprises a main body in which are mounted working electrodes, counter electrodes and respective contacts. The working electrodes are mounted facing each other to define a sample space between them. The electrodes are electrically interconnected in parallel as are the two counter electrodes. This arrangement makes it possible to provide a very large working electrode surface area for a small volume sample space.

5738905

PROCESS FOR THE PRODUCTION OF A COMPOSITE COMPRISING ELECTRODE MATERIAL, CATALYST MATERIAL AND A SOLID-ELECTROLYTE MEMBRANE

Bevers Dirk Boeblingen, GERMANY assigned to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e V

In order to improve a process for the production of a composite consisting of electrode material, catalyst material and a solid-electrolyte membrane for an electrochemical cell, in particular a fuel cell, with which solid-electrolyte material is brought into pore-deep contact with the electrode material and the catalyst material by softening it, such that this can be carried out as effectively and inexpensively as possible, it is suggested that a catalytic powder comprising electrode material, catalyst material and solid-electrolyte material be produced, that the catalytic powder be arranged on a surface area, that the catalytic powder be heated on a side facing away from the surface area in order to soften the solid-electrolyte material and that subsequently the catalytic powder be applied to the solid-electrolyte membrane under pressure with the side facing away from the surface area while the solid-electrolyte material is still softened in order to form a composite.

BATTERY MATERIALS

5733684

ELECTRODE SUBSTRATE FOR BATTERY AND PROCESS FOR PREPARING THE SAME

Harada Keizo; Watanabe Kenichi; Yamanaka Shosaku Itami, JAPAN assigned to Sumitomo Electric Industries Ltd

An electrode substrate, for a battery, as a support for an active material used in a collector for a battery, comprising a metallic porous structure possessing interconnecting pores with a porosity of not less than 90% and a number of pores per cm of not less than 10 and having an Fe/Ni two-layer structure wherein Fe

constitutes the interior of a skeleton of a porous body constituting the porous structure with the surface portion of the skeleton coated with Ni. Preferably, Fe constituting the interior of the skeleton has a purity of not less than 98% by weight, and the thickness of the nickel coating layer having an Fe content of not more than 10% by weight is 0.1 to 10 mum. The ratio of thickness of the Fe-diffused layer to the thickness of the Ni coating layer is regulated to not more than 0.65 by forming a metallic porous body of Fe using a porous resin as a substrate, plating the metallic porous body with Ni, heat treating the plated body.

5736274

CONJUGATED N-FLUOROPYRIDINIUM SALT-CONTAINING POLYMER AND USE OF THE SAME

Umemoto Teruo; Adachi Kenji; Tomizawa Ginjiro; Ishihara Sumi; Nagayoshi Masayuki Tsukuba, JAPAN assigned to Daikin Industries Ltd

PCT No. PCT/JP95/02172 Sec. 371 Date Apr. 18, 1997 Sec. 102(e) Date Apr. 18, 1997 PCT Filed Oct. 20, 1995 PCT Pub. No. WO96/12702 PCT Pub. Date May 2, 1996. A polymer containing a recurring unit of a conjugated N-fluoropyridinium salt and an active material for a positive electrode, an electrolyte, a battery material for the positive electrode and a battery which use such a polymer. That polymer provides a battery material and a primary battery or a secondary battery which have high electromotive force, high energy density, high environmental acceptability, a low internal resistance in charging and discharging and strong recoverability of the electromotive force, and can be useful as a fluorinating agent.

LITHIUM BATTERIES

5733681

NON-AQUEOUS BATTERY WITH NOVEL LITHIUM MANGANESE OXIDE CATHODE

Li Wu; Dahn Jeffrey Raymond Burnaby, CANADA assigned to Moli Energy (1990) Limited

Insertion compounds that are not stable in pure water can be prepared by an aqueous electrochemical method. The pH of the electrolyte and/or the concentration of ions of the inserted species must be sufficiently high to provide stability for the product compound. The method is useful for further lithiation of conventional lithium ion battery cathode materials.

5733685

METHOD OF TREATING LITHIUM MANGANESE OXIDE SPINEL

Wang Enoch I Mansfield, MA, UNITED STATES assigned to Duracell Inc

A method of treating lithium manganese oxide of spinel structure is disclosed. The method involves heating the lithium manganese oxide spinel in an atmosphere of an inert gas which does not react with the spinel. Such gases may be selected advantageously from argon, helium, nitrogen, and carbon dioxide. Preferred nonreacting gases which may be employed for spinel treatment are nitrogen or carbon dioxide. The spinel is advantageously treated with such gases at elevated temperatures. Alternatively, the spinel may be first coated with a hydroxide, preferably lithium, sodium or potassium hydroxide and then heated in an atmosphere of carbon dioxide gas at elevated temperatures. Such treatment of lithium manganese oxide spinel has been determined to improve the performance of the spinel when employed as an electrode in rechargeable cells such as lithium-ion cells.

NICKEL METAL HYDRIDE BATTERIES

5733680

METHOD FOR MAKING HYDRIDE ELECTRODES AND HYDRIDE BATTERIES SUITABLE FOR VARIOUS TEMPERATURES

Hong Kuochih Troy, MI, UNITED STATES

This invention provides a method to make a hydrogen storage hydride electrode and a hydride battery,

particularly a sealed type, suitable for various temperatures. The battery, according to this invention, is composed of a container, a positive electrode, a negative electrode suitable for various temperatures comprising of at least two hydrogen storage electrode materials and/or their hydrides, a separator positioned between the positive and negative electrodes, and an electrolyte in the container and in contact with the positive and negative electrodes and the separator. The negative electrode is a hydrogen storage hydride electrode which is composed of at least two hydrogen storage electrode alloys having compositions represented by AaBbCc . . . and A'a'B'b'C'c' . . . respectively; where the set of elements: A, B, C, . . . and the set of elements: A', B', C', . . . , both are consisting of 6 to 80 at. % of nickel, preferably 24-55 at. % nickel; and at least four other elements chosen from the group consisting of Mg, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Al, Y, Zr, Nb, Pd, Ag, Mo, Ca, Si, C, Cu, Ta, Ca, rare earth metals, B, Hf, Sc, Zn, Sb, W, Sn, N, O, Ge, Ga, the alkali metals, P, and S; the sets of atomic mole ratio a, b, c . . . and a', b', c', . . . are defined by the heat of hydride formation Hh and H'h respectively; where Hh and H'h are in a range of between -2.85 and -10.50 Kcal/mole H, preferably between -3.85 and -8.50 Kcal/mole H; the difference between the heat of hydride formation Hh and H'h being in the range between 0.1 and 5.0 Kcal/mole H, preferably between 1.0 and 3.0 Kcal/mole H.

5735913

NICKEL HYDROGEN STORAGE CELL

Borthomieu Yannick Poitiers, FRANCE assigned to SAFT

The present invention provides a nickel hydrogen storage cell including negative electrodes and positive electrodes in which the electrochemically active material containing a majority of nickel hydroxide is deposited electrochemically, and is located in the pores of a three-dimensional porous conductive support, wherein the ratio of the capacity of said positive electrodes over the capacity of said negative electrodes lies in the range 1.02 to 1.10, said active material of said positive electrodes being covered in cobalt hydroxide after impregnation.

5738953

ALKALINE METAL OXIDE/METAL HYDRIDE BATTERY

Lichtenberg Frank; Kuml ohler Uw; Kleinsorgen Klaus; Fuml olzer Andreas; Bouvier Alexander Zeiskam, GERMANY assigned to Varta Batterie Aktiengesellschaft

As an active material for its negative electrode, a hydrogen storage alloy for a Ni/H battery has the composition (*See Patent for Tabular Presentation*) PS where Mm is a misch metal, M is Fe, Cu, or a mixture of Fe and Cu, and where 0.1< or =z< or =0.4, 0.2< or =y< or =0.4, 0.3< or =w< or =0.5, 0.2< or =x< or =0.4, and 4.9< or =v+w+x+y+z< or =5.1. The partial substitution of Co by M, in conjunction with a special production method including the steps of atomizing the molten alloy, followed by heat-treatment and pulverization, leads to an alloy having a particularly high cycle lifetime and discharge capability.

5738958

ALLOYS FOR USE AS ACTIVE MATERIAL FOR THE NEGATIVE ELECTRODE OF AN ALKALINE, RECHARGEABLE NICKEL-METAL HYDRIDE BATTERY, AND PROCESS FOR ITS PRODUCTION

Lichtenberg Frank Zeiskam, GERMANY assigned to Varta Batterie Aktiengesellschaft

To provide an improved high-temperature cycle lifetime, an alloy for use as active material for the negative electrode of an alkaline, rechargeable nickel-metal hydride battery has the composition (*See Patent for Tabular Presentation*) PS Mm is a misch metal including La and Ce, and which can further include Pr, Nd and/or other lanthanides, E is Ti and/or Zr, with 0.01< or =u< or =0.1, and M is Fe and/or Cu, with 0< or =z< or =0.4, wherein 0.2< or =w< or =0.4, 0.3< or =x< or =0.5, 0.2< or =y< or =0.4, and 4.9< or =v+w+x+y+z< or =5.1.

COMPONENTS AND/OR CHARGERS

5736831

POWER LIMITING CIRCUIT FOR ELECTRIC VEHICLE BATTERY CHARGER

Harrington William S Crownsville, MD, UNITED STATES assigned to Northrop Grumman Corporation

In an electric vehicle battery charging system where the batteries of an electric vehicle are charged from an external power source including a battery energy management system which monitors the vehicle batteries and develops a current control command representing the current to be supplied to the vehicle batteries and a controllable charger having a design power limit supplies current under command of the current command at a voltage of the vehicle batteries, a charger power limiting circuit is provided and includes a voltage sensor, and a circuit for modifying the current control command to limit power to be low at least in approximation of the designed power limit of the charger. The current control command modifying circuit modifies the current control command from the BEMS to ensure that the controllable charger will not supply power to the batteries in excess of the controllable chargers design power. The charger power limiting circuit includes a power limiting characteristic defining circuit, a current limiting feedback circuit and a power limiting characteristic defining circuit. The voltage of the vehicle batteries is sensed and the current control command from the battery energy management system is used as the charging current. The current control command is then modified to limit power to below at least an approximation of the design power limit of the charger.

5736832

MULTIPLE FUNCTION BATTERY CHARGER, SELF-CONFIGURING AS SUPPLY VOLTAGE REGULATOR FOR BATTERY POWERED APPARATUSES

Seragnoli Giordano Agrate Brianza, ITALY assigned to SGS-Thomson Microelectronics S r 1

Regulation of the output supply voltage to a load powered by a rechargeable battery of a portable apparatus, typically a telephone, is advantageously implemented by exploiting the switching STEP-DOWN REGULATOR of an in-built battery charger. The regulator circuit configures itself in function of the voltage level at the regulator input to retain an unmodified constant current and constant voltage battery charger function as long as a sufficiently high voltage source is connected to the input. Otherwise the battery voltage is applied to the input of the regulator and configuring means modify automatically the partition ratio of an output voltage sensing divider of the voltage-mode control loop of the charger, isolate the battery pole from the output and disable the current-mode control loop of the charger.

5736833

RAPID BATTERY CHARGING CIRCUIT WITH OVERVOLTAGE SHUNT

Farris Richard D Wichita, KS, UNITED STATES assigned to Symbios Logic Inc

A circuit for charging a battery comprising a charging source, a transistor and a charge control device for switching the transistor. When saturated and switched on, the transistor permits flow of charge to the battery from the charging source. The charge control device senses when main power is lost and switches the transistor off to prevent discharge of the battery through the charging source. After the battery is charged the transistor provides a path of least resistance to bleed off unwanted charge from other sources thereby preventing overcharging of the battery. The circuit therefore charges a battery rapidly and prevents overcharging of the battery. The charge control device is operable from a constant supply voltage supplied by a main power source when available or from the charged battery to continue operation despite loss of main power.

5737114

LABEL HAVING AN INCORPORATED ELECTROCHROMIC STATE-OF-CHARGE INDICATOR FOR AN ELECTROCHEMICAL CELL

Bailey John C Columbia Station, OH, UNITED STATES assigned to Eveready Battery Company Inc

A label for electrochemical cell employs an electrochromic material so that when the material is connected to power provided by the electrochemical cell, the material will undergo a visible change as a result of a chemical reaction.

5739667

CONTROL SYSTEM FOR CHARGING BATTERIES AND ELECTRONIC APPARATUS USING SAME

Matsuda Kouichi; Saeki Mitsuo; Tanaka Nobuo; Ozawa Hidekiyo Kawasaki, JAPAN assigned to Fujitsu Limited

A control system for charging enabling efficient charging of rechargeable batteries in an electronic apparatus which charges its rechargeable batteries by using a charger circuit when driving the apparatus by using an external power source, including first detecting unit for detecting a differential value between a maximum permissible charging current allowed by the rechargeable batteries and a charging current flowing to the rechargeable batteries; second detecting unit for detecting a maximum usable current by detecting a differential value between a maximum supplyable current allowed by the external power source and the current consumption of the apparatus; third detecting unit for detecting a differential value between a maximum useable current and the charging current flowing to the rechargeable batteries; and control unit for controlling the system in accordance with the differential values detected by the first and third detecting units so that the charger circuit generates the maximum charging current within the range where the charging current flowing to the rechargeable batteries does not exceed either of the maximum permissible charging current and the maximum useable current.

5739668

CHARGING CONTROL SYSTEMS AND CIRCUITS FOR RECHARGING AUTOMOBILE BATTERIES

Nishikiori Hidetaka Hamamatsu, JAPAN assigned to Suzuki Motor Corporation

A charging control unit includes plug contacts and jack contacts for detecting connection of a charging plug of a charger to a receptacle, a current sensor for detecting completion of charging from the charger to a main battery, a main controller for starting operation of a DC-to-DC converter when connection of the charging plug is detected by the plug contacts and the jack contacts and for terminating operation of the DC-to-DC converter when completion of charging is detected by the current sensor, and a distribution circuit whereby operation of the DC-to-DC converter after completion of charging is finished.

5739669

ELECTRIC BATTERY MANAGEMENT DEVICE

Bruml ulhardt Marcel; Terrier Christian Cudrefin, SWITZERLAND assigned to EM Microelectronic-Marin SA

The device for the management of a plurality electric battery elements connected in series, comprises a plurality of battery management modules, each management module being connected in parallel to the terminals of a respective battery element and supplied by its output voltage, the management modules including a digital circuit and being connected in series by at least a digital liaison so as to exchange binary information between said digital circuit and a control unit of the battery, and is characterized in that at least a capacitor is connected in series on said digital liaison so that the binary information may be exchanged between each management module and the unit control, independently of the electric potentials at the terminals of the battery elements.

5739670

METHOD FOR DIAGNOSING BATTERY CONDITION

Brost Ronald David; Sullivan Michael Scott; Strickland Tracy Frye Fishers, IN, UNITED STATES assigned to General Motors Corporation

A method for diagnosing the general condition of a battery module in a string of such modules comprising a battery pack monitors voltage, current and temperatures of the modules and battery pack. Accumulators account for various charge quantities including charge out and net charge used for the battery pack as well as discharge period durations. State of charge is provided by appropriate means and used to update module capacities. The various charge and time accumulators are used to derive depth of discharge and discharge rate information providing inputs to predetermined functions for determining a simple scalar outputs directly indicative of the general condition of the modules.

5739671

DEVICE FOR ACCURATE DETECTION OF REMAINING DISCHARGE CAPACITIES OF A PLURALITY OF BATTERIES

Hamada Ken Kariya, JAPAN assigned to Nippondenso Co Ltd

A charge state detecting device has a battery device including a plurality of batteries connected in series, a current sensor which detects a current flowing from the battery device, and a voltage sensor which detects the voltage of each of the batteries. A main controller calculates a correlation between discharge current and battery voltage, and provides an estimated voltage of each battery of the batteries under a constant energy discharge, based on the correlation. The estimated voltages for the batteries are used for deriving the capacity of each battery with reference to a voltage-capacity characteristic, which is stored in advance. The main controller supplies to a display indicator the minimum one of the derived capacities to warn of an impending need to charge the batteries.

5739672

METHOD AND APPARATUS FOR CHARGING BATTERIES

Lane Robert W Chandler, AZ, UNITED STATES assigned to United Continental

Batteries are charged using sequences of charge and discharge pulses in which a controller adjusts charge rate and/or terminates the charge process based on measurements taken during the preceding charge cycle and an internally computed algorithmic logic equation to optimize the charge cycle for the battery being charged. A preferred embodiment utilizes six sense parameters, three of which are 1st order (Vps, Vload and Vunload)and three of which are 2nd order (V'ps, V'load and V'unload). The charging scheme is applicable to batteries of many different types, including lead-acid, nickel-cadmium, and nickel-metal-hydride), and requires neither input of battery type nor instrumentation of the battery.

5739673

CONTROL DEVICE FOR THE CHARGING OF AT LEAST ONE BATTERY

Le Van Suu Maurice Romainville, FRANCE assigned to SGS-Thomson Microelectronics S A

A battery-charger uses a fuzzy logic microprocessor. The use of fuzzy logic makes it easier to take account of the diversity of the types of batteries to be charged and to control the state of the batteries charged while, at the same time, producing a battery at very low cost, whereas these functions are normally carried out by far bigger microprocessors. The invention can be applied especially to the charging of batteries assembled to constitute powerful energy sources, that are used especially for automobile haulage, large-scale consumer articles, professional and industrial equipment or computer equipment.

5739674

METHOD OF TRANSMITTING AND RECEIVING SIGNAL INDICATIVE OF REMAINING CAPACITY OF STORAGE BATTERY FOR PROPELLING ELECTRIC VEHICLE

Kawahara Naohisa; Nakai Tomoaki; Imura Yoshikazu; Kondo Makoto Wako, JAPAN assigned to Honda Giken Kogyo Kabushiki Kaisha

A signal indicative of the remaining capacity of a storage battery for propelling an electric vehicle is transmitted and received between a portable control unit and a communication unit on the electric vehicle. A display request signal for displaying the remaining capacity of the storage battery is transmitted from the portable control unit which has a plurality of indicator lamps corresponding to respective ranges of a rated capacity of the storage battery, to the communication unit. When the display request signal is received by the communication unit, one of the ranges to which the remaining capacity of the storage battery belongs is determined by the communication unit, and a remaining capacity display signal representing the determined range is transmitted from the communication unit to the portable control unit. The remaining capacity display signal is received by the portable control unit, and one of the indicator lamps which corresponds to the range to which the remaining capacity of the storage battery belongs is turned on based on the received remaining capacity display signal for a predetermined period of time.

OTHER BATTERIES

5733676

METAL-AIR CATHODE CAN AND ELECTROCHEMICAL CELL MADE THEREWITH

Dopp Robert B; Oltman John Edward Madison, WI, UNITED STATES assigned to Rayovac Corporation

This invention pertains to metal-air electrochemical cells wherein one or more air entry ports is located in the bottom of the cathode can, to provide for entry of oxygen-rich air into the cathode can, where the oxygen participates in the chemical reaction whereby the cell produces electrical energy. In this invention, multiple small air entry ports are provided. Generally, the use of multiple ports distributed over the bottom of the cathode can, opposite the reaction surface of the cathode assembly, while not increasing the overall open area of the ports, results in an increase in the ratio of the cell limiting current to the rate at which moisture is lost from the cell. Accordingly, moisture loss as a function of electrical energy produced, is less.

5733677

METAL-AIR ELECTROCHEMICAL CELL WITH OXYGEN RESERVOIR

Golovin Milton Neal; Reynolds Thomas Alan; Brose Daniel John Marietta, GA, UNITED STATES assigned to AER Energy Resources Inc

A metal-air electrochemical cell comprising an oxygen reservoir disposed in an air plenum adjacent the air cathode. The oxygen reservoir includes an oxygen binding compound characterized in that the oxygen binding compound reversibly binds oxygen and releases oxygen into the air in the air plenum to power the cell when the partial pressure of oxygen in the air plenum drops due to a load on the cell.

5733679

BATTERY SYSTEM AND A METHOD FOR GENERATING ELECTRICAL POWER

Tucker Steven P; Roberts Raymond W; Dow Eric G; Moden James Portsmouth, RI, UNITED STATES assigned to The United States of America as represented by the Secretary of the Navy

The present invention relates to a dry composition of materials to be used in a battery system. The dry composition comprises a mixture consisting of sodium hydroxide and sodium oxide. In a first reservoir in the battery system, the mixture is present in an amount sufficient to form with water a heated sodium hydroxide electrolyte solution having a 15% by weight concentration of sodium hydroxide. In a second reservoir in the battery system, the mixture is present in an

amount sufficient to form with water a heated sodium hydroxide electrolyte solution having to up to about 75% by weight concentration of sodium hydroxide. The present invention also relates to a battery system and a method for generating electrical power which utilize the aforementioned dry composition of materials.

5733683

ELECTROCHEMICAL STORAGE CELL CONTAINING AT LEAST ONE ELECTRODE FORMULATED FROM A FLUOROPHENYL THIOPHENE POLYMER

Searson Peter; Killian Jeffrey Gilbert; Sarker Haripada; Giaccai Jennifer; Gofer Yossef;Poehler Theodore O Baltimore, MD, UNITED STATES assigned to The Johns Hopkins University

An electrochemical storage cell or battery including as at least one electrode at least one electrically conductive polymer, the polymer being poly (3(2-fluorophenyl)thiophene), poly(3(3-fluorophenyl) thiophene), poly(3(2,4-fluorophenyl) thiophene), poly(3(3,4-difluorophenyl) thiophene), poly(3(3,5-difluorophenyl) thiophene), or poly(3(3,4,5-trifluorophenyl)thiophene). These polymeric electrodes have remarkably high charge capacities, and excellent cycling efficiency. The provision of these polymeric electrode further permits the electrochemical storage cell to be substantially free of metal components, thereby improving handling of the storage cell and obviating safety and environmental concerns associated with alternative secondary battery technology.

5735912

METHODS OF FORMING BATTERY ELECTRODES

Lake Rickie C Eagle, ID, UNITED STATES assigned to Micron Communications Inc

In one aspect, a method of making a battery includes fusing an alkali metal onto a patterned conductive layer. In another aspect, a method of forming a battery includes: a) providing a cathode base which comprises: a first nonconductive surface; a first conductive layer superjacent the first nonconductive surface; the first conductive layer comprising a first area; and a cathode layer superjacent the first conductive layer leaving at least a portion of the first area exposed; b) providing an anode base which comprises: a second nonconductive surface; a second conductive layer superjacent the first nonconductive surface, the second conductive layer comprising a second area; and an anode layer superjacent the second conductive layer leaving at least a portion of the second area exposed, the anode layer comprising an alkali metal; and c) aligning and coupling the anode layer of the anode base with the cathode layer of the cathode base, wherein the aligning and coupling leaves at least a portion of the first area and at least a portion of the second area exposed for electrical connection. The invention also encompasses batteries formed by such methods.

5735914

METHOD FOR FORMING BATTERY CONSTRUCTIONS

Lake Rickie C Eagle, ID, UNITED STATES assigned to Micron Communications Inc

In one aspect, a method of making a battery includes fusing an alkali metal onto a patterned conductive layer. In another aspect, a method of forming a battery includes: a) providing a cathode base which comprises: a first nonconductive surface; a first conductive layer superjacent the first nonconductive surface; the first conductive layer comprising a first area; and a cathode layer superjacent the first conductive layer leaving at least a portion of the first area exposed; b) providing an anode base which comprises: a second nonconductive surface; a second conductive layer superjacent the first nonconductive surface, the second conductive layer comprising a second area; and an anode layer superjacent the second conductive layer leaving at least a portion of the second area exposed, the anode layer comprising an alkali metal; and c) aligning and coupling the anode layer of the anode base with the cathode layer of the cathode base, wherein the aligning and coupling leaves at least a portion of the first area and at least a portion of the second area exposed for electrical connection. The invention also encompasses batteries formed by such methods.

5736275

HIGH POWER BIPOLAR BATTERY/CELLS WITH ENHANCED OVERCHARGE TOLERANCE

Kaun Thomas D New Lenox, IL, UNITED STATES assigned to The University of Chicago

A cell or battery of cells having improved overcharge tolerance and increased power capability, and methods for the construction of such cells or batteries, via electrolyte modification.

5738690

METHOD OF FILLING BATTERY CELL

Hughett Elmer; Alexandres Richard B Huntsville, TN, UNITED STATES

An electric vehicle cell featuring internal pressure relief and spring disengagement devices which vent various internal pressures to atmosphere to prevent cell bulging or explosion and which also internally interrupt current flow through the cell due to internal overheat, excessive current draw and the like. Internal reconnection of cell members reoccurs subsequent to internal thermal and other abnormalities. The electric vehicle cell contains an electrolyte which is introduced into the cell casing by a method involving the use of apparatus including a filling fixture having an electrolyte fill line and a vacuum line for vacuum assisted filling.

5738955

DEEP-DISCHARGE BATTERY SEPARATOR

Gardner Thomas N; Salkind Alvin J;Stempin John L; Wexell Dale R Horseheads, NY, UNITED STATES assigned to Corning Incorporated

A tubular, rigid, porous, ceramic separator for a rechargeable, deep-discharge battery assembly, the separator having a porosity greater than 40%. A plurality of battery cells, each embodying such separators, are assembled with a common terminal to form the positive electrode in a motive traction battery.

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