

5482587

**METHOD FOR FORMING A LAMINATE  
HAVING A SMOOTH SURFACE FOR USE  
IN POLYMER ELECTROLYTE  
BATTERIES**

McAlevey Michael E San Jose, CA, UNITED STATES assigned to Valence Technology Inc

An apparatus for forming a laminate having a smooth surface includes a planar member having, on at least one side thereof, desired surface roughness characteristics, is forced against the material layer on the substrate such that the material layer attains substantially the same surface roughness characteristics as the one side of the planar member.

5482796

**ELECTROCHEMICAL CELL  
COMPRISING GAMMA MNO<sub>2</sub> CATHODE  
HAVING FILAMENTARY PROTRUSIONS**

Wang Enoch I; Lin Lifu; Bowden William L Attleboro, MA, UNITED STATES assigned to Duracell Inc

The invention relates to the manufacture of manganese dioxide by a chemical process. The resulting manganese dioxide product takes the form of particles characterized by filament-like protrusions jutting out from its surface. The manganese dioxide particles having such surface features can be manufactured by reacting manganese sulfate with sodium peroxodisulfate in an aqueous solution. The process can be controlled to yield high density manganese dioxide. The manganese dioxide formed in the process can be deposited directly onto the surface of electrolytic manganese dioxide (EMD). The manganese dioxide product is particularly suitable for use as a cathode active material in electrochemical cells.

5482797

**NONAQUEOUS SECONDARY BATTERY**

Yamada Kazuo; Tanaka Hideaki; Yoneda Tetsuya; Mitate Takehit; Kitayama Hiroyuki Nara, JAPAN assigned to Sharp Kabushiki Kaisha

A nonaqueous secondary battery comprising a cathode, an anode and a nonaqueous electrolyte disposed and sealed between the cathode and the anode wherein the anode is made of a carbon material as its active material, in which the carbon material comprises a fine core particle of a metal or an alloy thereof, and a carbon layer which is arranged and stacked in an onion-like shell configuration centering on the fine core particle, at least part of the carbon layer having a crystal structure in which graphite-like layers are stacked and the fine core particle having an average diameter of about 10 to 150nm.

**NICKEL METAL HYDRIDE BATTERY**

5478594

**ELECTRODE STRUCTURE FOR NICKEL  
METAL HYDRIDE CELLS**

Frye Blake; Pensabene Sa; Puglisi Vinc Gainesville, FL, UNITED STATES assigned to Eveready Battery Company Inc

An electrode is disclosed for use in a wound nickel metal hydride electrochemical cell. The electrode has an electrochemically active material carried on the substrate. The electrode includes the improvement of an effective amount of an elastic binder coating the outer surface of the active material to enhance the integrity of the electrode and to substantially inhibit infantile shorting during operation thereof.

5478664

**METHOD OF RECOVERING REUSABLE  
METALS FROM NICKEL-HYDROGEN  
RECHARGEABLE BATTERY**

Kaneko Akihito; Kitazume Nobuyuki; Okada Chikara Sendai, JAPAN assigned to Santoku Metal Industry Co Ltd

PCT No. PCT/JP94/00560 Sec. 371 Date Nov. 30, 1994 Sec. 102(e) Date Nov. 30, 1994 PCT Filed Apr. 5, 1994 PCT Pub. No. WO94/23073 PCT Pub. Date Oct. 13, 1994. A method of recovering a reusable metal from a nickel-hydrogen rechargeable battery characterized in

that the method comprises crushing the nickel-hydrogen rechargeable battery to obtain a crushed material, separating alkali, organic substances and iron from the crushed material to obtain a separated component from which at least the alkali, organic substances and iron are separated, obtaining the reusable metal to be recovered as an oxide from the separated component by calcination, and processing the oxide by a molten salt electrolysis method with an electrolytic molten salt bath. According to this method for recovery, electrode materials effective for nickel-hydrogen rechargeable batteries and the like can be recovered efficiently and in a large amount in lower cost compared to the ordinary separation, purification and refining utilizing chemical processing.

5480740

### **HYDROGEN STORAGE ALLOY AND ELECTRODE THEREFROM**

Seri Hajime; Yamamura Yasuharu; Tsuji Yoichiro; Owada Naoko; Iwaki Tsutomu Izumiotsu, JAPAN assigned to Matsushita Electric Industrial Co Ltd

A hydrogen storage alloy preferably used for electrodes in an alkaline storage battery is provided. The alloy is of the general formula  $ZrMn_wV_xMg_bM_yNi_z$ , wherein M is at least one element selected from the group consisting of Fe and Co and  $0.4 < w < 0.8$ ,  $0 < x < 0.3$ ,  $0.05 < b < 0.2$ ,  $0 < y < 0.2$ ,  $1.0 < z < 1.5$ , and  $2.0 < w+x+b+y+z < 2.4$ . The alloy has C15-type Laves phases of a crystal structure similar to that of MgCu<sub>2</sub> as a main alloy phase, and a lattice constant a such that  $7.05 \leq a < 7.13$ . +RE+RE+RE+RE.+REE+RE+RE+RE.+RE+RE+RE.

### **COMPONENTS AND/OR CHARGERS**

365880

### **TUBE PLACEMENT VERIFIER WITH BATTERY CHARGER**

Tiefenthal James; Goldhardt Donald; Morrow James Dublin, OH, UNITED STATES assigned to Abbott Laboratories

The ornamental design for a tube placement verifier with battery charger, as shown and described.

5475294

### **CHARGE CONTROLLER FOR BATTERY CHARGER**

Isoda Takuya Kitaibaraki, JAPAN assigned to Nippon Densan Corporation

For charging a storage battery, e.g. a nickel-cadmium cell, recharging is conducted after the battery is forcibly discharged while the charge voltage stays in a specified range after a period of time from the start of the charging action. Accordingly, the generation of memory effect will be avoided. The charging will successfully be carried out without declining the storage capacity of the battery. In both charge and adaptor modes, output voltage and current are examined whether the battery is coupled correctly or not and if not, their delivery is canceled with producing an alarm display. As the result, the charging to the battery and the power supply to an external electric appliance will be implemented without error.

5476734

### **CURRENT COLLECTOR WITH INTEGRAL TAB FOR HIGH TEMPERATURE CELL**

Pulley Christopher; Specht Steven J; Barlow Geoffrey Shaker Heights, OH, UNITED STATES assigned to Westinghouse Electric Corporation

A current collector for use in a cell. The current collector has a thin sheet of conductive material having oppositely directed planar faces. The sheet is preferably graphite. The current collector also has a metal tab having oppositely directed planar faces. A face of the tab is in planar contact with a face of the sheet. The current collector may further have a second thin sheet of conductive material, preferably graphite, having oppositely directed planar faces. The second sheet is placed in planar contact with the tab such that the tab is disposed between the two conductive sheets.