

recharging system receiving current from a power supply and delivering current through a rectifier to a battery and a load, the system having a low voltage disconnect switch capable of interrupting current to the battery. A current shunt is provided for generating a first signal having a first value representative of the current flowing through the rectifier. A current shunt is provided for generating a second signal having a second value representative of the current flowing through the load. A microprocessor is provided for calculating a third value, the third value being equal to the second value subtracted from the first value. A microprocessor is also provided for generating a third signal indicative of thermal runaway when the third value exceeds a predetermined value. A switch for interrupting current to the battery when the third signal exceeds the predetermined value may also be provided.

**5642270**

**BATTERY POWERED ELECTRIC  
VEHICLE AND ELECTRICAL SUPPLY  
SYSTEM**

Green Ross Marti; Kellaway Michael John Cambridge, UNITED KINGDOM assigned to Wavedriver Limited

PCT No. PCT/GB92/01435 Sec. 371 Date Jan. 28, 1994 Sec. 102(e) Date Jan. 28, 1994 PCT Filed Aug. 3, 1992 PCT Pub. No. WO93/02887 PCT Pub. Date Feb. 18, 1993. A charging system for a battery powered electric vehicle operates bidirectionally for charging the battery or for supplying power back to the utility grid at any selected power factor so that load leveling may be effected. A communications link between the utility and the charging system carries control signals and a control system associated with the charging system is responsive to the signals for controlling the charging rate and direction.

**5645952**

**METHOD AND APPARATUS FOR  
CHARGING AND DISCHARGING  
ELECTRIC ENERGY**

Lampinen Markku; Viitanen Minna; Lamminen Jaakko; Fomino Marina FIN Espoo, FINLAND assigned to Lampinen Markku

PCT No. PCT/FI93/00154 Sec. 371 Date Oct. 13, 1994 Sec. 102(e) Date Oct. 13, 1994 PCT Filed Apr. 13, 1993 PCT Pub. No. WO93/21664 PCT Pub. Date Oct. 28, 1993. A method and apparatus for storing and producing electrical energy in an electrochemical cell, where the cathode is a porous air electrode and the anode is a hydrogen-containing metal hydride. According to the invention, an overpressure is allowed to form inside the porous air electrode during charging, the said pressure preventing the formation of hydrogen bubbles on the metal hydride electrode. The overpressure remains at the desired level because the pores of the air electrode are made so small that the surface tension of the electrolytic solution penetrating into the pores seals the porous air electrode.

**5646503**

**METHOD FOR BALANCING POWER  
SOURCES AND STRUCTURE THEREFOR**

Stockstad Troy L Phoenix, AZ, UNITED STATES assigned to Motorola Inc

A power source balancing circuit balances two power sources such as two battery cells. When the power source balancing circuit is enabled, it compares a current flowing through the first battery cell and a first resistor with a current flowing through the second battery cell and a second resistor. Because the resistance of the first resistor is equal to that of the second resistor, a difference between the two currents indicates a difference between the voltages of the two battery cells. If a current difference larger than a predetermined limit is detected, the battery cell with a higher voltage is discharged through a corresponding discharge resistor by switching on a corresponding switch. The corresponding switch is controlled by a corresponding flip-flop.

**5646504**

**MAGNETICALLY BALANCED  
MULTI-OUTPUT BATTERY CHARGING  
SYSTEM**

Feldstein Robert S Dobbs Ferry, NY, UNITED STATES