5477123

CONNECTION MULTIPLE BATTERIES TO BATTERY POWERED DEVICES

Allen Paul M; Kuhn John R Cincinnati, OH, UNITED STATES assigned to Technoggin Inc

A circuit for serially connecting multiple batteries to a battery-powered device such as a notebook computer or camcorder so that the device will serially charge or discharge the batteries. The device includes at least two controllable switch circuits for selectively connecting batteries to the battery-powered device, a power flow sensor for sensing power flow from the device to the selected battery or vice-versa, and a selector circuit for sequentially enabling the switch circuits to sequentially connect the batteries to the battery-powered device so that the batteries will sequentially charge or discharge.

5477124

CIRCUIT TO PREVENT EXCESSIVE RECHARGEABLE BATTERY DISCHARGE

Tamai Mikitak Sumoto, JAPAN assigned to Sanyo Electric Co Ltd

A circuit effectively prevents excessive discharge of a rechargeable battery that is either detachable from, or internal to an electrical apparatus. The circuit has a battery voltage detector, a comparitor to compare the battery voltage with a reference voltage, and a controller to cut-off power drain from a discharged battery when its voltage drops below the reference voltage. The discharged battery is electrically cut-off from both the load and the comparitor.

5477125

BATTERY CHARGER

Ettel Victor; Hohercak Jan; Nor Jiri K; Soltys Josef; Charles Dougla Mississauga, CANADA assigned to Inco Limited; Norvik Technologies Inc

A battery charge is provided which automatically controls the charging process independent of individual battery construction or temperature. Control of the charging process is achieved by periodically interrupting the charging current, determining resistance-free voltage of the battery in fixed intervals after interruptions of current, and comparing the resistance-free voltage with a reference voltage. Reference voltage is automatically determined for each recharging subject by analyzing the change in resistance-free voltage with respect to time during an initial, constant current period to locate certain characteristic points indicative of the onset of overcharge. The charging current is reduced as necessary, so that the resistance-free voltage does not exceed the reference voltage and significant overcharge is avoided.

5477126

SECONDARY BATTERY CHARGING CIRCUIT

Shiojima Nobuo Tokyo, JAPAN assigned to Toshiba Battery Co Ltd

A secondary battery charging circuit of this invention includes a charging source for supplying a charging current to a secondary battery, a temperature detection unit for generating an output which changes almost linearly with respect to a change in temperature of the secondary battery during a charging operation, a differential unit for obtaining a differential value of an output from the temperature detection unit, a comparator unit for comparing the differential value during the charging operation with a setting value, and for, when the relationship between the two values is reversed, generating an inverted output, a timer circuit unit, started simultaneously with start of the charging operation of the secondary battery, for generating a timer output after an elapse of a predetermined period of time, and a charge control unit for controlling the charging operation of the secondary battery in response to one, generated earlier, of the inverted output from the comparator unit, and the timer output from the timer circuit unit.

5477127

SECONDARY BATTERY CHARGING CIRCUIT

Shiojima Nobuo; Enomoto Sadakazu Tokyo, JAPAN assigned to Toshiba Battery Co Ltd

A secondary battery charging circuit of this invention includes a charging source for supplying a charging current to a secondary battery, a temperature detection unit for generating an output which changes almost linearly with respect to a change in temperature of the secondary battery during a charging operation, a differential unit for obtaining a differential value of an output from the temperature detection unit, a comparator unit for comparing the differential value during the charging operation with a setting value, and for, when the relationship between the two values is reversed, generating an inverted output, a timer circuit unit, started simultaneously with start of the charging operation of the secondary battery, for generating a timer output after an elapse of a predetermined period of time, and a charge control unit for controlling the charging operation of the secondary battery in response to one, generated earlier, of the inverted output from the comparator unit, and the timer output from the timer circuit unit.

5477128

AUTOMATIC CHARGING APPARATUS

Iizuka Souichi; Yamada Yasuharu; Kuhara Sohei Tokyo, JAPAN assigned to Technical Associates Co

An automatic charging apparatus comprises a rectifier circuit composed of a plurality of diodes and thyristors, said diodes and thyristors being arranged in a bridge connection, a phase control circuit for obtaining the charging voltage of a battery by controlling the phase of said thyristors, a voltage setting resistor for setting a charging voltage suitable for the state of said battery, a current setting resistor for setting a charging current suitable for the state of said battery and a current control circuit which obtains the charging current best suited to the state of the battery by controlling the pulse width of base current flowing in a transistor connected to the outputs of said thyristors. As a result, it is possible to efficiently charge the battery with charging voltage and current best suited to the state of the battery even if the battery is of large capacity.

5477130

BATTERY PACK WITH SHORT CIRCUIT PROTECTION

Hashimoto Hisash; Tamai Mikitaka Sumoto, JAPAN assigned to Sanyo Electric Co Ltd

Connection between internal batteries and external terminals of the battery pack is controlled by semiconductor switching devices, rather than by switches with mechanical contacts. When the battery pack Is not connected, battery short circuits are prevented by non-conduction of the switching devices. When the battery pack is attached to electrical equipment, a control circuit turns the switching devices on to supply power to the equipment. If the electrical equipment is a battery charger,the switching devices are turned on to supply power to the battery pack.

5477936

ELECTRIC MOTOR VEHICLE AND BATTERY UNIT FOR ELECTRIC MOTOR VEHICLE

Sugioka Kouichi; Ogawa Masao; Sako Hiroyuki; Takamatsu Hidetoshi Saitama, JAPAN assigned to Honda Giken Kogyo Kabushiki Kaisha

A battery for an electrically powered vehicle includes a vehicle body having a battery unit operatively connected to the vehicle body for supplying electricity to the electrically powered vehicle. The battery unit is of an elongated shape in outer configuration and is located under the vehicle body with the length direction extending along the longitudinal direction of the vehicle body. A battery unit for an electric motor vehicle includes a battery assembly including a plurality of elongated batteries extending in the longitudinal direction of the motor vehicle and being disposed adjacent to one another with a small gap being provided therebetween. A battery box is provided for accommodating the battery assembly. The battery box includes a front portion, side portions and a rear portion. Ventilation holes are provided in the front portion of the battery box for introducing cool air at positions corresponding to the gap spaces between adjacent individual batteries. At least one exhaust hole is formed in at least one of the side portions and the rear portion of the battery box.

5478363

METHOD OF MAKING ELECTRODES FOR BIPOLAR ELECTROCHEMICAL BATTERY