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

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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

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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