

# (12) United States Patent

### Odaohhara

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### (54) OVERVOLTAGE PROTECTION

(75) Inventor: Shigefumi Odaohhara, Yamato (JP)

Assignee: Lenovo (Singapore) Pte. Ltd.,

Singapore (SG)

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H02J 7/00

(2006.01)

H02J 7/04

(2006.01)

(52) **U.S. Cl.** ...... 320/134; 320/162 

See application file for complete search history.

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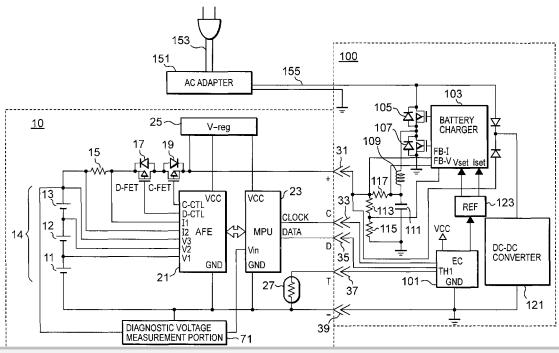
Primary Examiner — Edward Tso Assistant Examiner — M'Baye Diao

(74) Attorney, Agent, or Firm — Ference & Associates LLC

#### (57)**ABSTRACT**

An overvoltage protection system capable of maintaining a high setting voltage of a battery charger while guaranteeing that cell voltage does not exceed a value limited by a threshold value. In one preferred embodiment, a battery set is a plurality of series-connected battery cells. A protection voltage measurement portion measures a cell voltage of each battery cell. A computation portion calculates an open circuit voltage of the battery set outputs a calculated voltage as a measurement voltage. An overvoltage setting portion stops charging of battery set when the value of the cell voltage of any one of the battery cells reaches a threshold value. A diagnostic voltage measurement portion measures an open circuit voltage of battery set to output measured voltage as a diagnostic voltage. A comparing circuit stops charging of the battery set based on comparison results of value of the measurement voltage and value of diagnostic voltage.

### 21 Claims, 4 Drawing Sheets





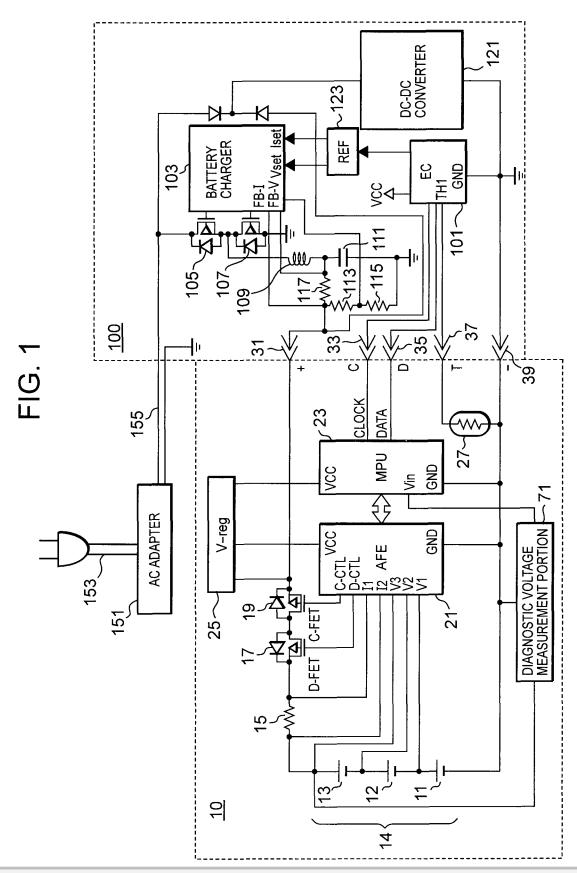
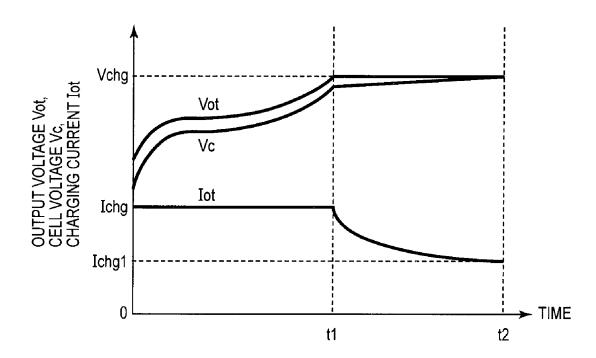




FIG. 2





65 67 COMPUTATION PORTION 67 COMPARING PORTION FUSE **2**4 55 57 REGISTER ΑD ₽ P 5

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FIG. 4

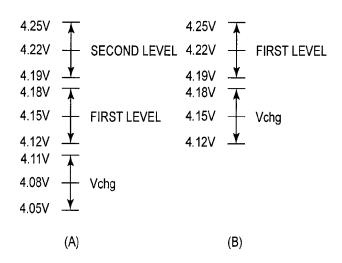
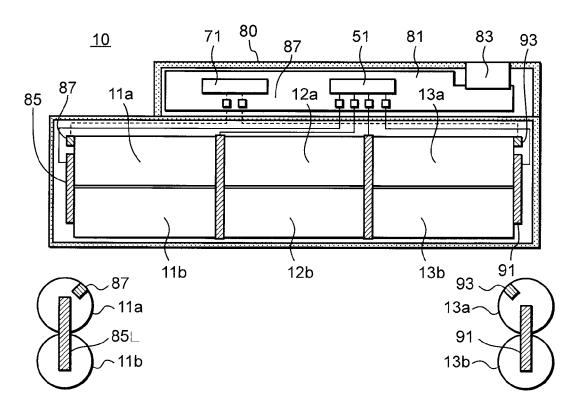


FIG. 5





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