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(12) **United States Patent**  
**Chagny**

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(45) **Date of Patent:** **Mar. 29, 2005**

(54) **SMART VRM TO EXTEND THE BATTERY LIFE**

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Zhou, Xunwei et al.; *Investigation of Candidate VRM Topologies for Future Microprocessors*, IEEE Transactions on Power Electronics, vol. 15, No. 6, Nov. 2000.

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\* cited by examiner

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(57) **ABSTRACT**

(21) Appl. No.: **10/462,982**

In a method and system for generating a regulated direct current (DC) voltage output of a voltage regulator module (VRM) to power a device of the information handling system, an activity input, which is indicative of levels of activity of a processor included in the device, is received by the controller module. The controller module selects a first switching frequency from a plurality of switching frequencies of the VRM. The first switching frequency corresponds to a first level of activity. A charge switch is operable to receive a DC voltage input and generate a switched IDC voltage output having the first switching frequency. A discharge switch is operable to provide a discharge path for the switched DC voltage signal while the charge switch is open. A filter module is operable to filter the first switching frequency from the switched DC voltage output and generate the regulated DC voltage output.

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(65) **Prior Publication Data**

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(51) **Int. Cl.**<sup>7</sup> ..... **H02J 7/04**

(52) **U.S. Cl.** ..... **320/141; 320/139**

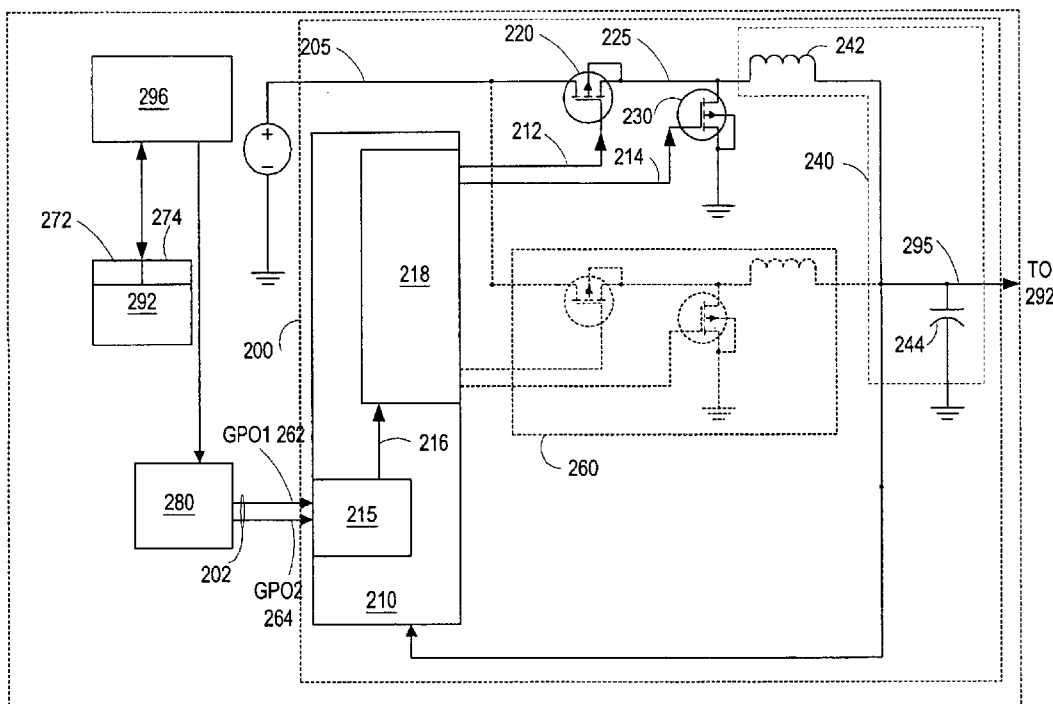
(58) **Field of Search** ..... 320/141, 139, 320/137, 136, 134, 132, 129, 128, 145, 163; 323/282, 272; 324/426, 430

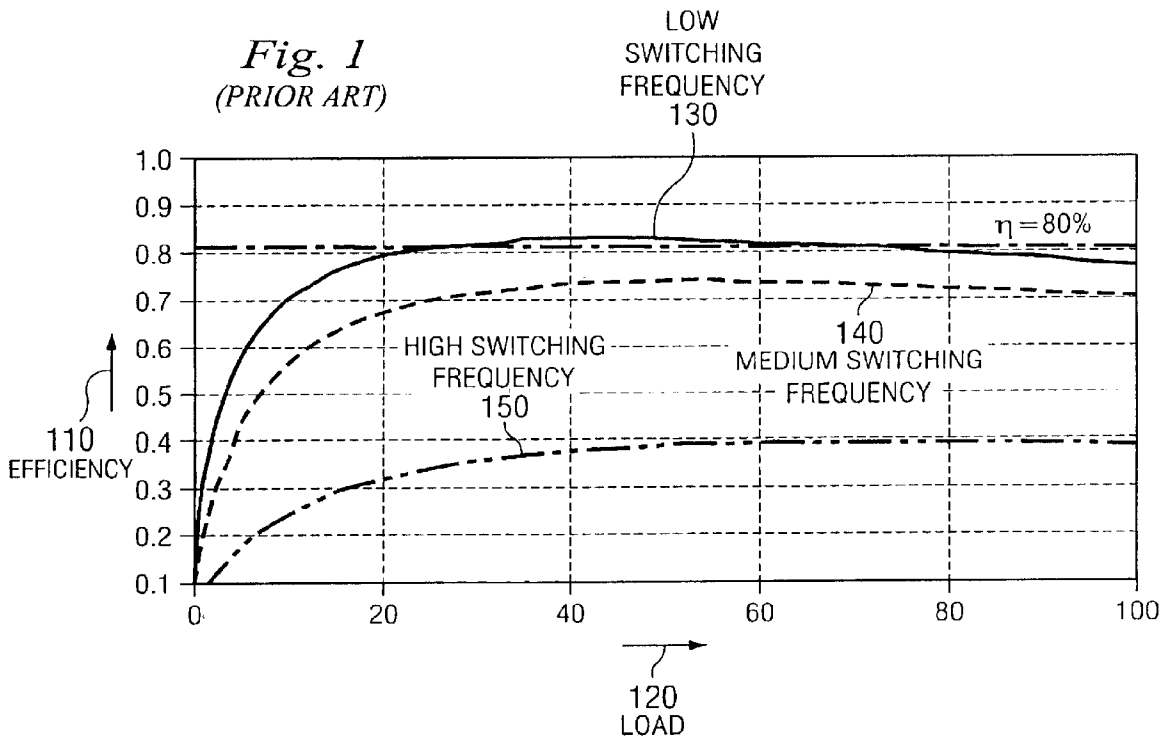
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**20 Claims, 5 Drawing Sheets**





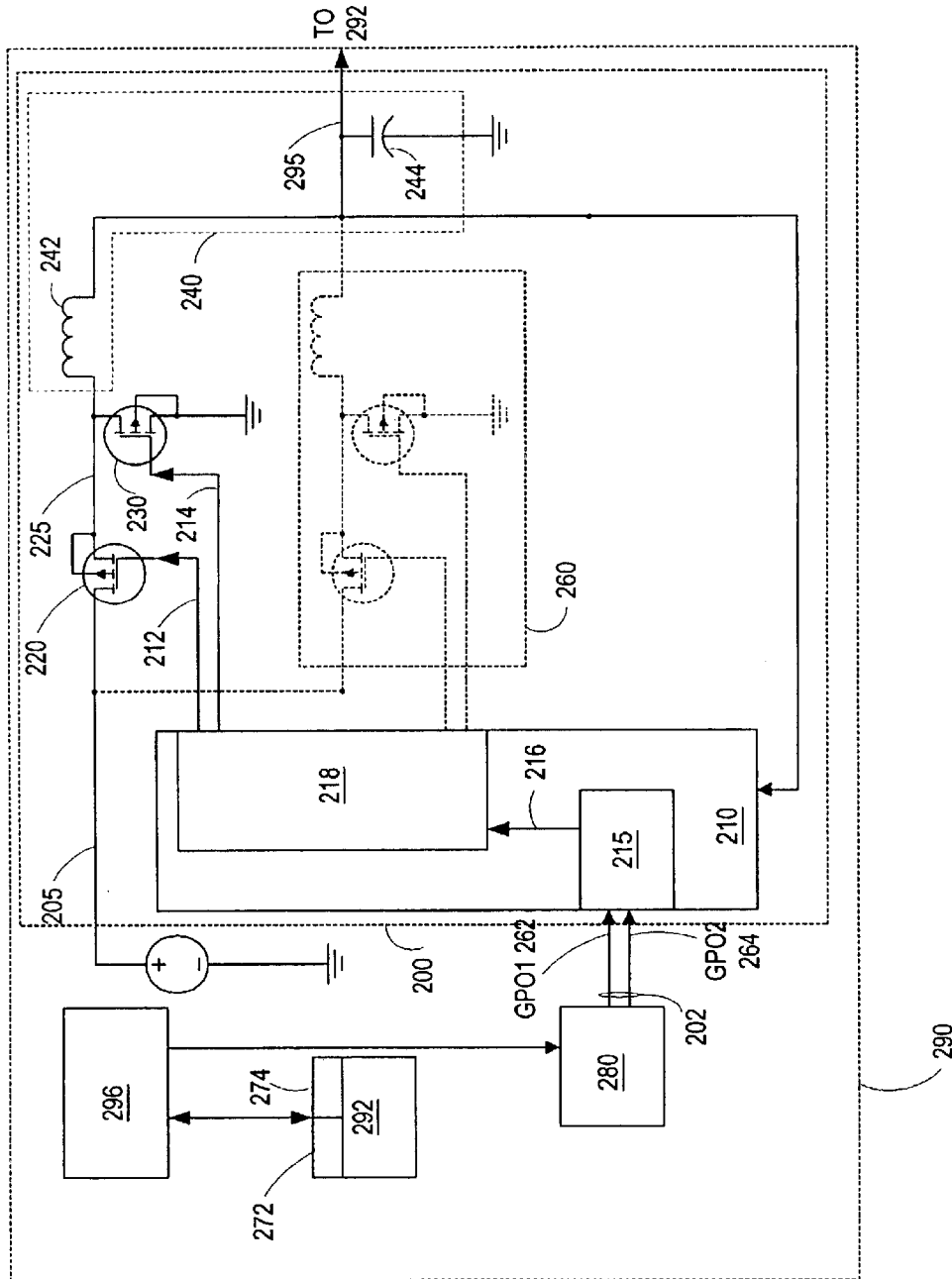


FIG. 2A

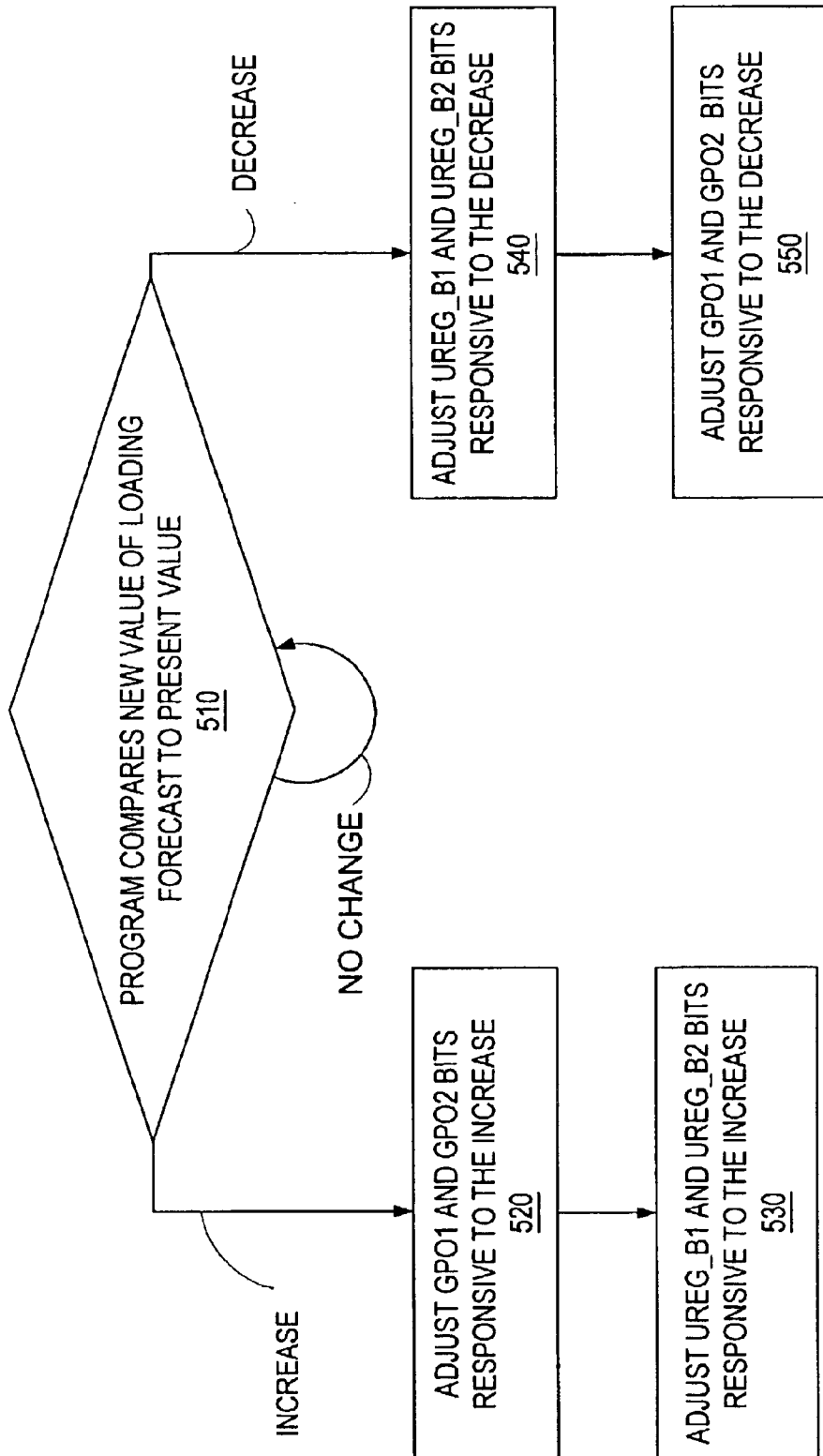


FIG. 2B

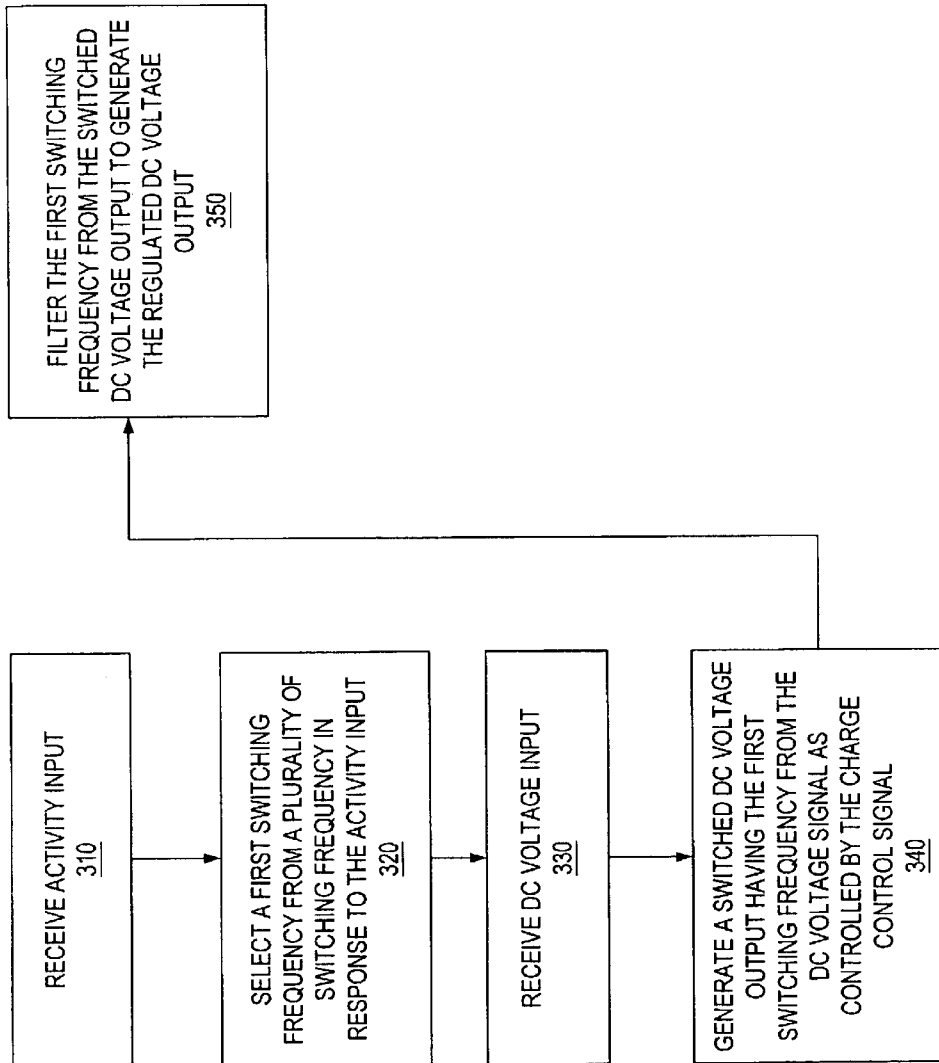


FIG. 3

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