



US006711691B1

(12) **United States Patent**
Howard et al.

(10) **Patent No.:** **US 6,711,691 B1**
(45) **Date of Patent:** **Mar. 23, 2004**

(54) **POWER MANAGEMENT FOR COMPUTER SYSTEMS**

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

(21) Appl. No.: **09/567,201**

(22) Filed: **May 8, 2000**

Related U.S. Application Data

(60) Provisional application No. 60/133,918, filed on May 13, 1999.

(51) **Int. Cl.**⁷ **G06F 1/32**

(52) **U.S. Cl.** **713/300; 713/320; 713/322**

(58) **Field of Search** **713/300, 320, 713/322, 323, 324**

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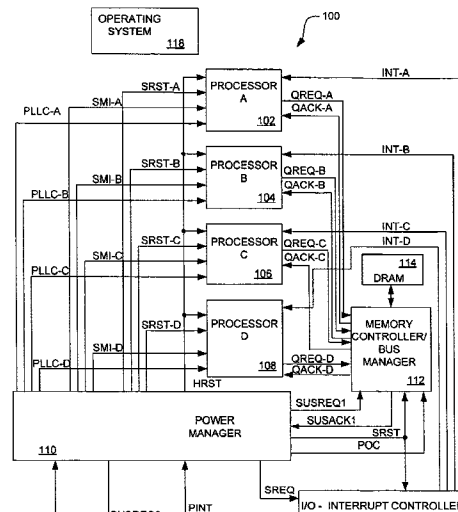
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(57) **ABSTRACT**

Power management approaches for computer systems having one or more processors are disclosed. One power management approach provides hierarchical power management. The hierarchical nature of the power management provided by the invention has various levels of power management such that power consumption of the computer system is dependent upon the amount of work placed on the processing resources of the computer system. Another power management approach pertains to deterministic handshaking provided between a power manager and one or more controller units. The deterministic handshaking provides for more reliable and controllable transitions between power management states which have associated power management taking place in the controller units. The power management approaches are suitable for use with a single-processor computer system or a multi-processor computer system.

18 Claims, 22 Drawing Sheets



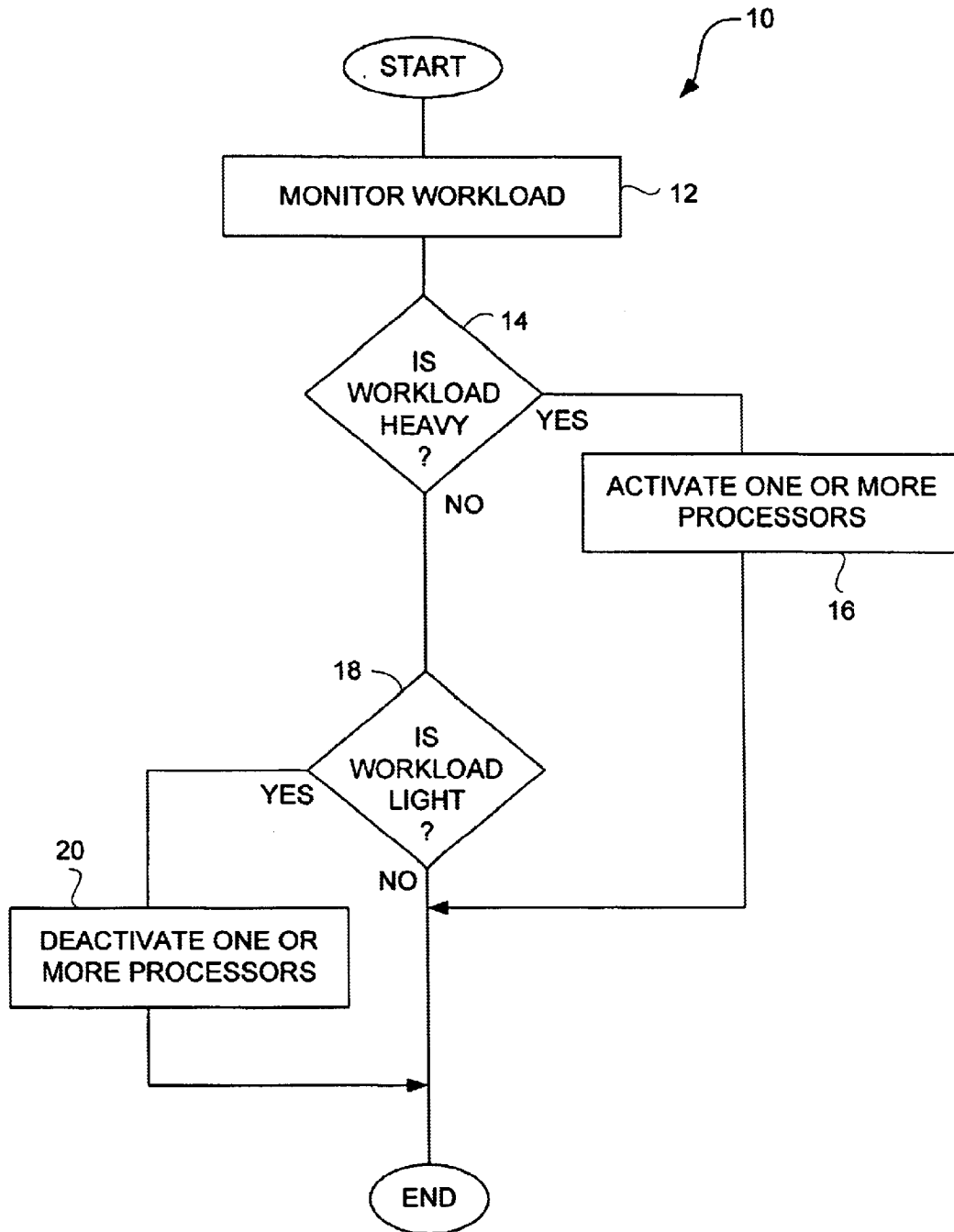


FIG. 1A

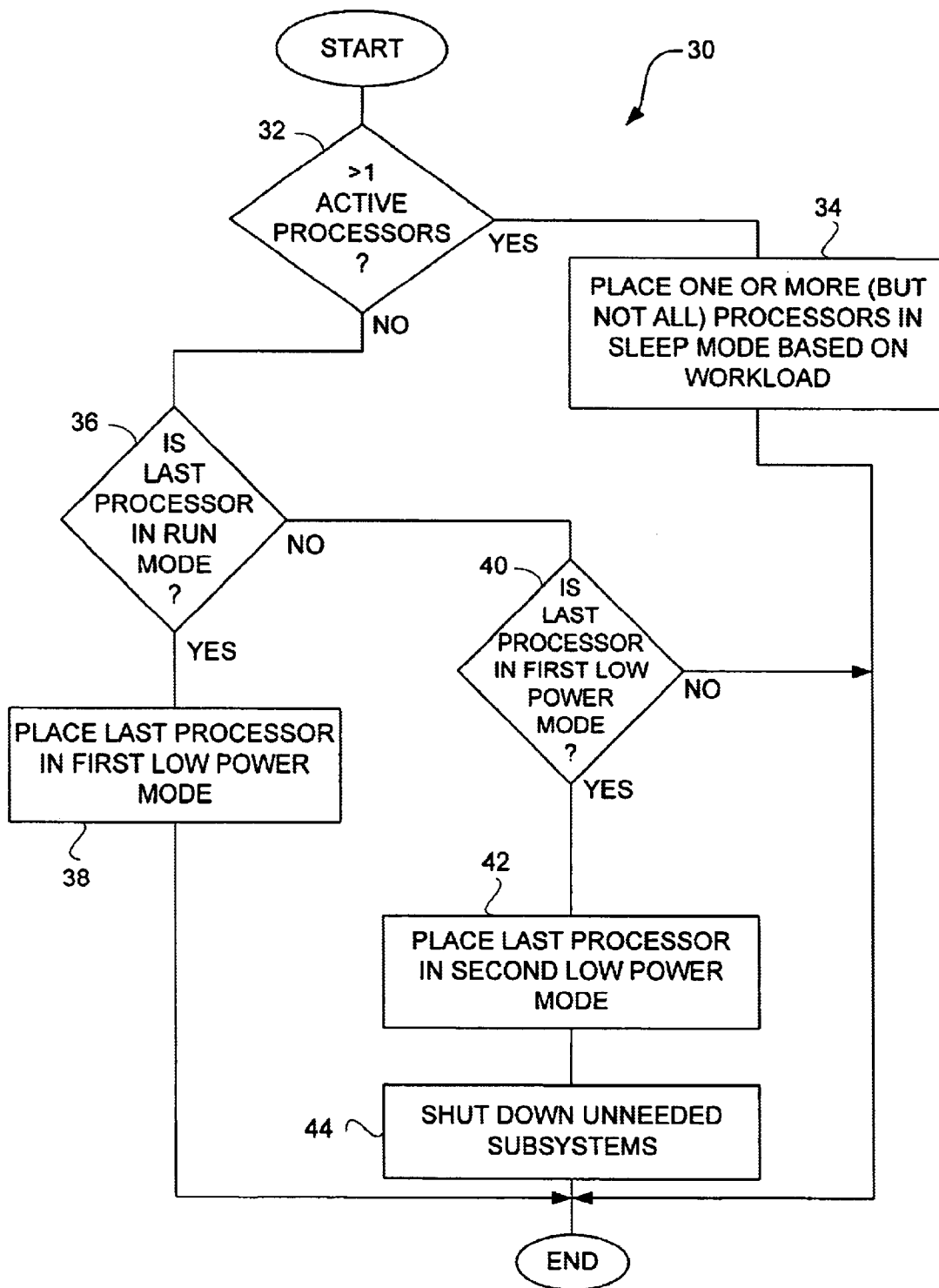


FIG. 1B

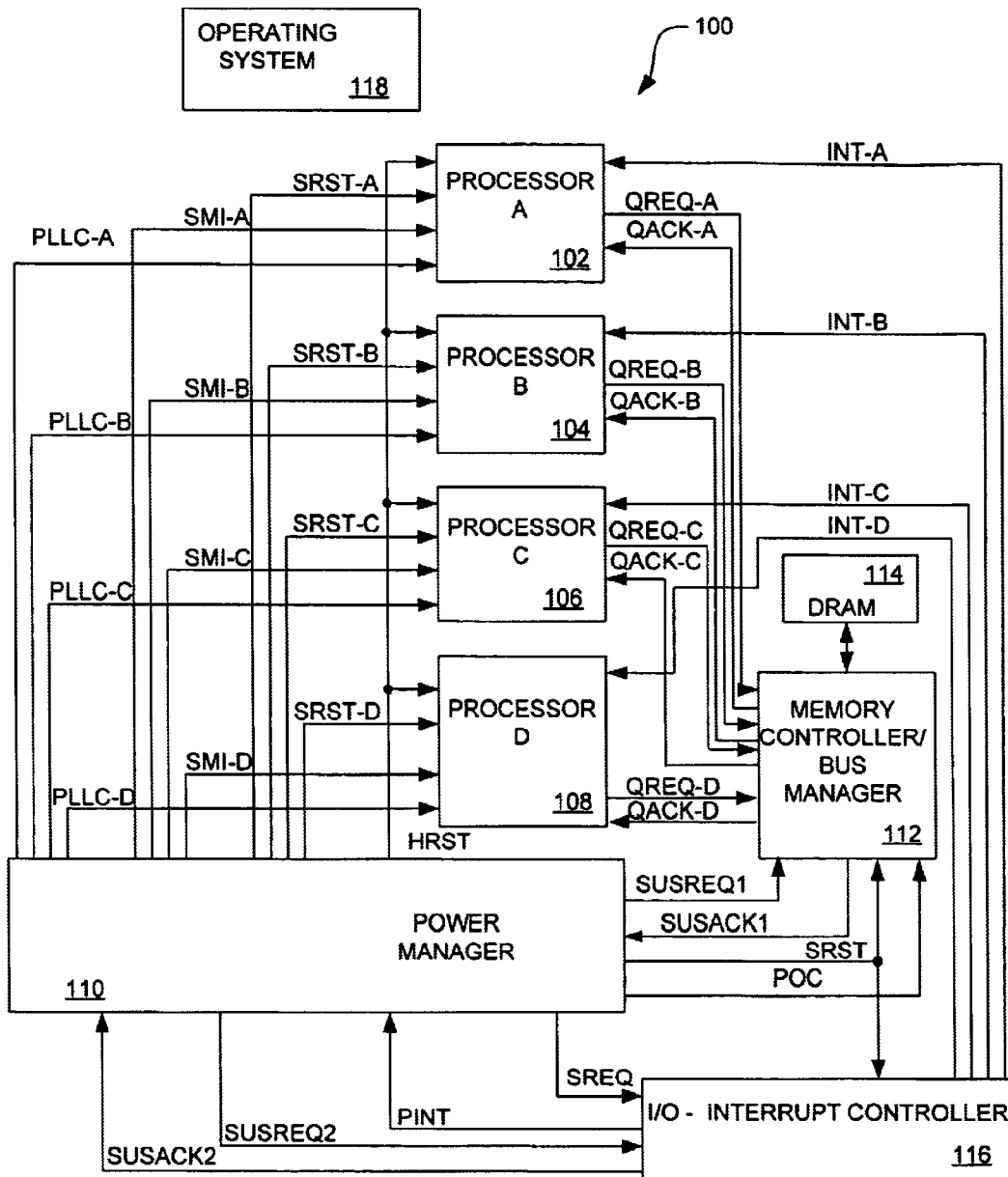


FIG. 1C

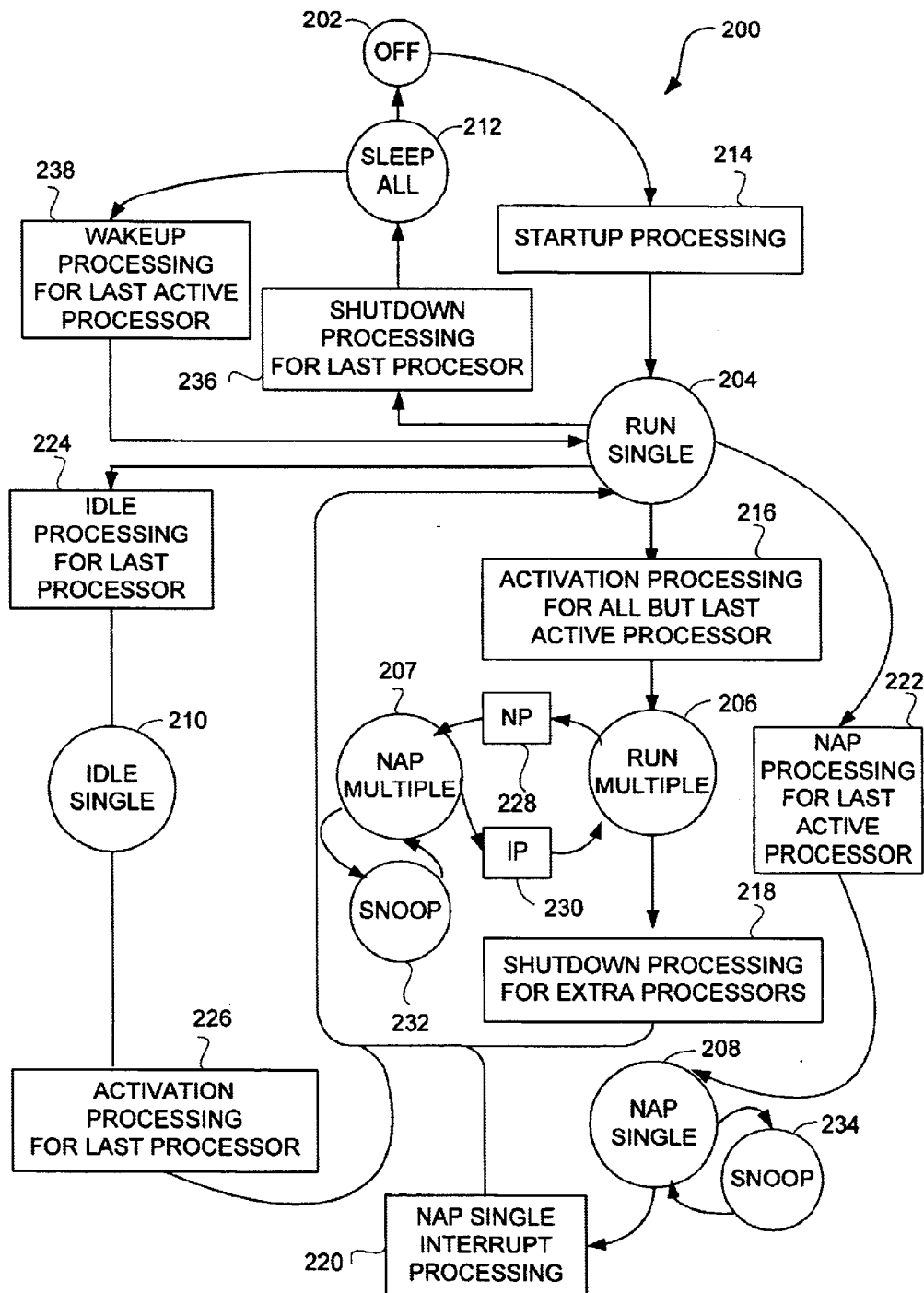


FIG. 2

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