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Nanba et al.

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(45) **Date of Patent: Dec. 30, 2003**

(54) **APPARATUS AND METHOD FOR ELECTRONICALLY PREDICTING PLEURAL PRESSURE FROM PULSE WAVE SIGNALS**

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Jan. 28, 2002 (JP) 2002-018403

(51) **Int. Cl.**[7] **A61B 5/02**
(52) **U.S. Cl.** **600/300**; 600/500; 600/529; 600/561
(58) **Field of Search** 600/300, 485, 600/500–507, 529–543, 561

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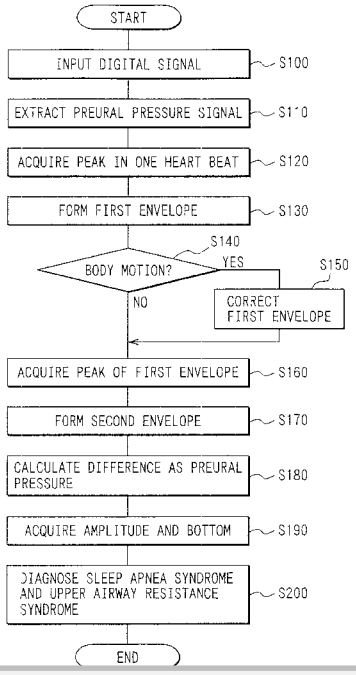
(57) **ABSTRACT**

A pleural pressure is predicted from pleural pressure based upon pulse wave signals, which are continuously produced and picked up in a time sequential manner. A first variation signal indicative of a condition of a variation contained in the pulse wave signals is acquired based upon the pulse wave signals. A second variation signal representative of a condition of a variation contained in the first variation signal is acquired based upon the first variation signal. The pleural pressure is predicted based on a difference between the first variation signal and the second variation signal.

26 Claims, 9 Drawing Sheets



APPLE 1011

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FIG. 1A

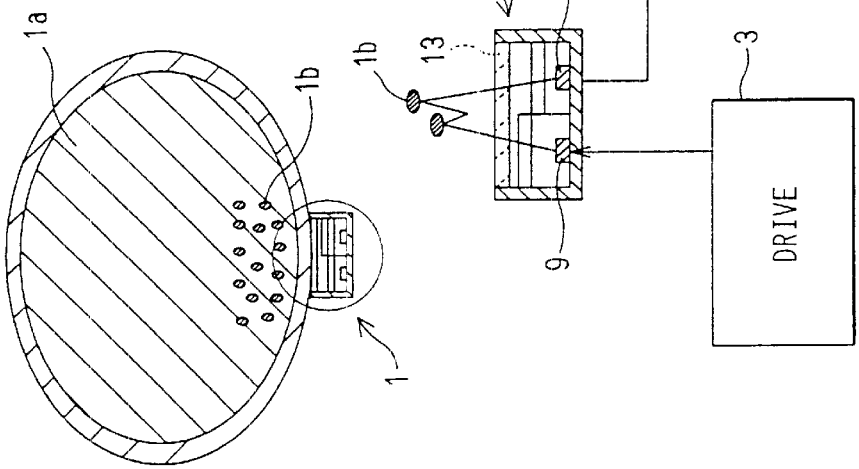

FIG. 1B

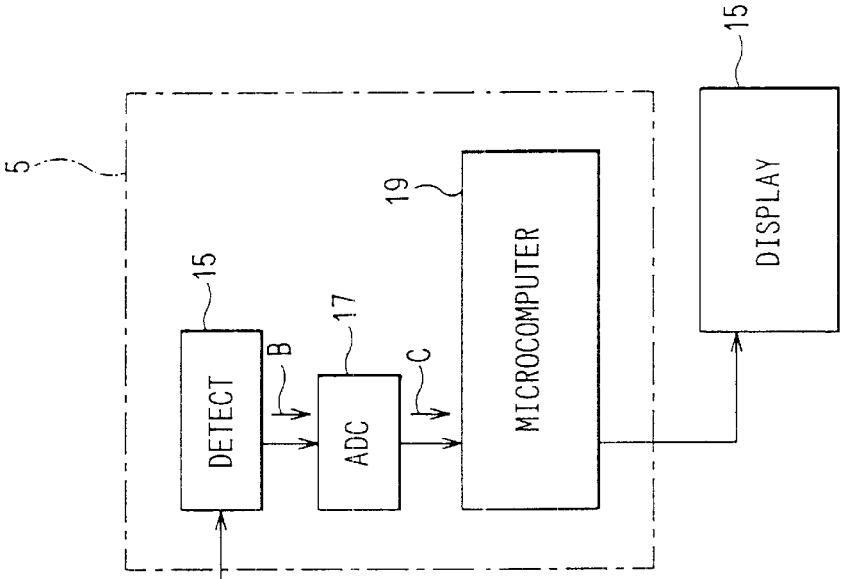

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FIG. 2

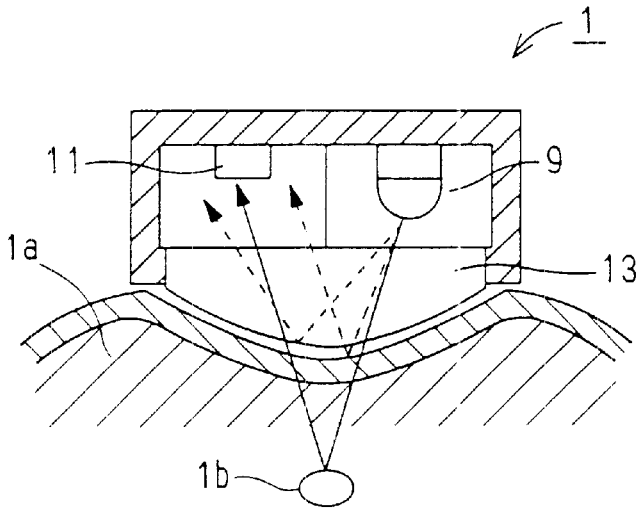

FIG. 3

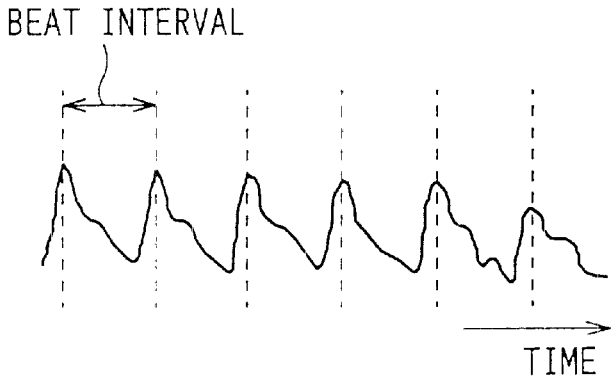

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FIG. 4

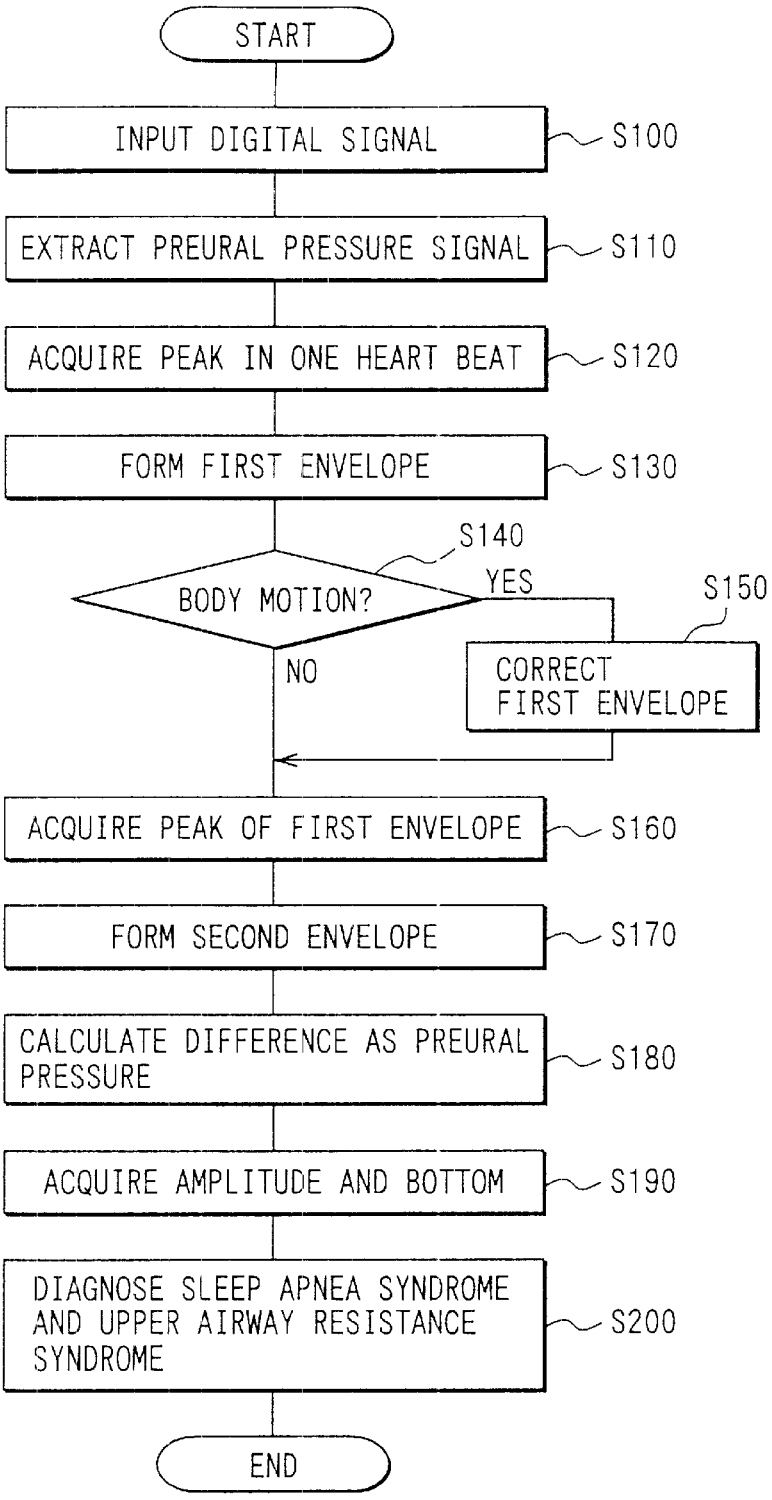

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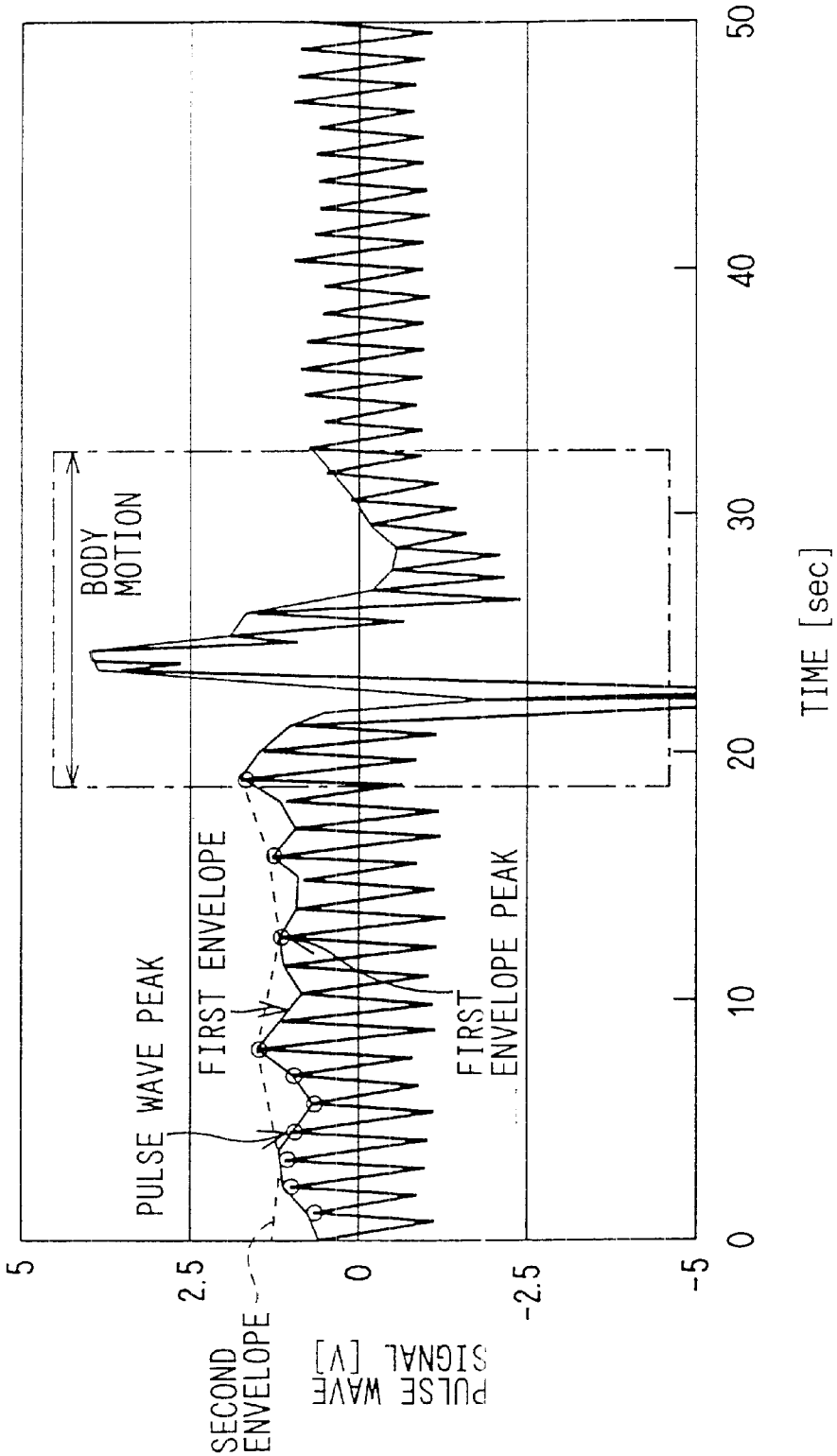
FIG. 5



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