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Kondoh et al.

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(54) **METHOD OF MEASURING BIOLOGICAL INFORMATION USING LIGHT AND APPARATUS OF MEASURING BIOLOGICAL INFORMATION USING LIGHT**

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A61B 5/00 (2006.01)

(52) **U.S. Cl.** **600/310**

(58) **Field of Classification Search** **600/310,**
600/316, 335, 344

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,927,264 A * 5/1990 Shiga et al. 600/322
5,057,695 A * 10/1991 Hirao et al. 600/310
6,016,435 A 1/2000 Maruo et al.
6,026,313 A 2/2000 Kexin

(Continued)

FOREIGN PATENT DOCUMENTS

EP 1 013 219 A1 6/2000

(Continued)

OTHER PUBLICATIONS

International Search Report for PCT/JP03/00586 dated Mar. 18, 2003.

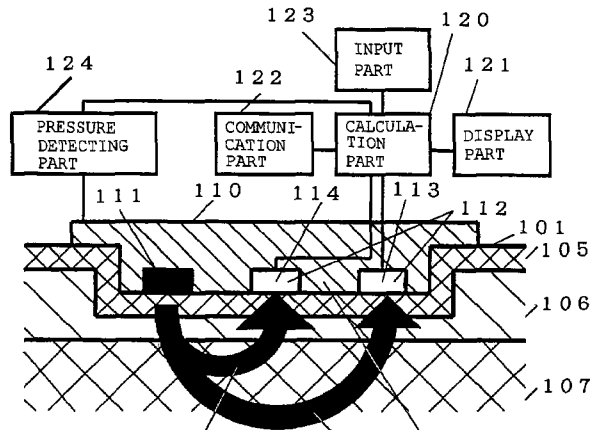
(Continued)

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(57) **ABSTRACT**

A compact apparatus of measuring biological information using light capable of measuring biological information with high reproducibility and accuracy is provided. The apparatus of measuring biological information using light comprises a light source part irradiating an organism, a light receiving part receiving light propagating from the light source part through the inside of the organism and outgoing from the surface of the organism, a forming part forming the surface of the organism into a predetermined shape by applying a pressure thereto, and a calculation part calculating information of the relation between the amount of received light and the biological information of the organism previously determined based on the amount of light received in the light receiving part.

19 Claims, 33 Drawing Sheets



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U.S. PATENT DOCUMENTS

6,078,828 A * 6/2000 Yasuda et al. 600/310
6,449,500 B1 9/2002 Asai et al.
6,618,615 B1 9/2003 Kimura et al.

JP 2000-237195 A 9/2000
JP 2001-029333 2/2001
JP 2001-037741 2/2001
JP 2001-95806 A 4/2001

FOREIGN PATENT DOCUMENTS

JP 11-070101 3/1999
JP 11-123196 5/1999
JP 2000-155091 6/2000

OTHER PUBLICATIONS

Form PCT/ISA/210 English Translation of ISR for PCT/JP03/00586 dated Mar. 18, 2003.

* cited by examiner

Fig. 1

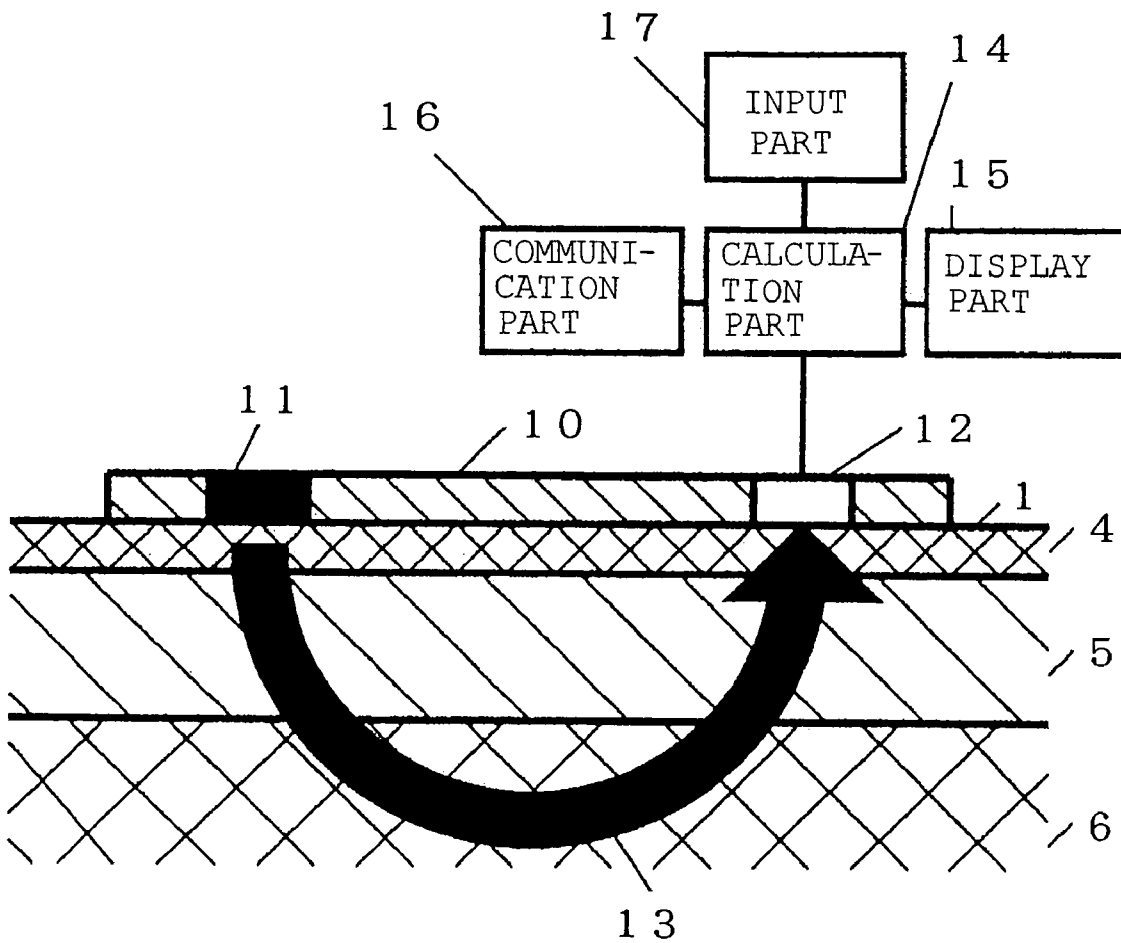


Fig. 2

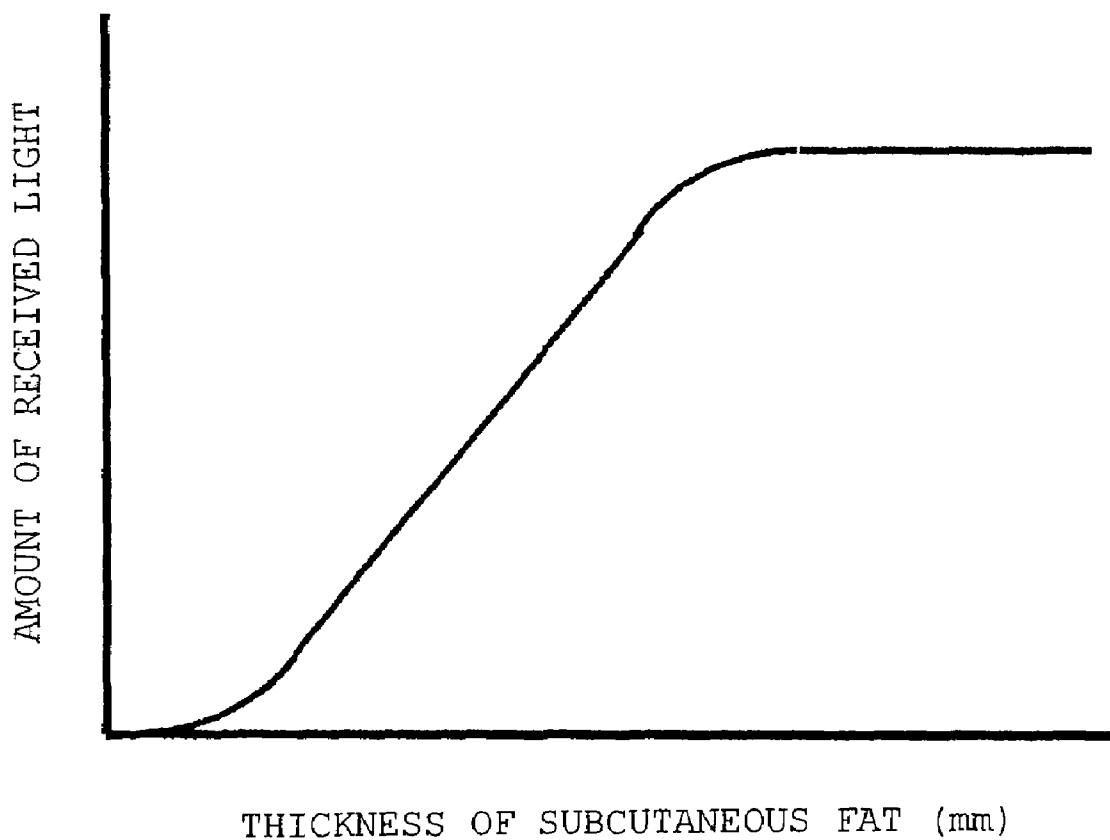
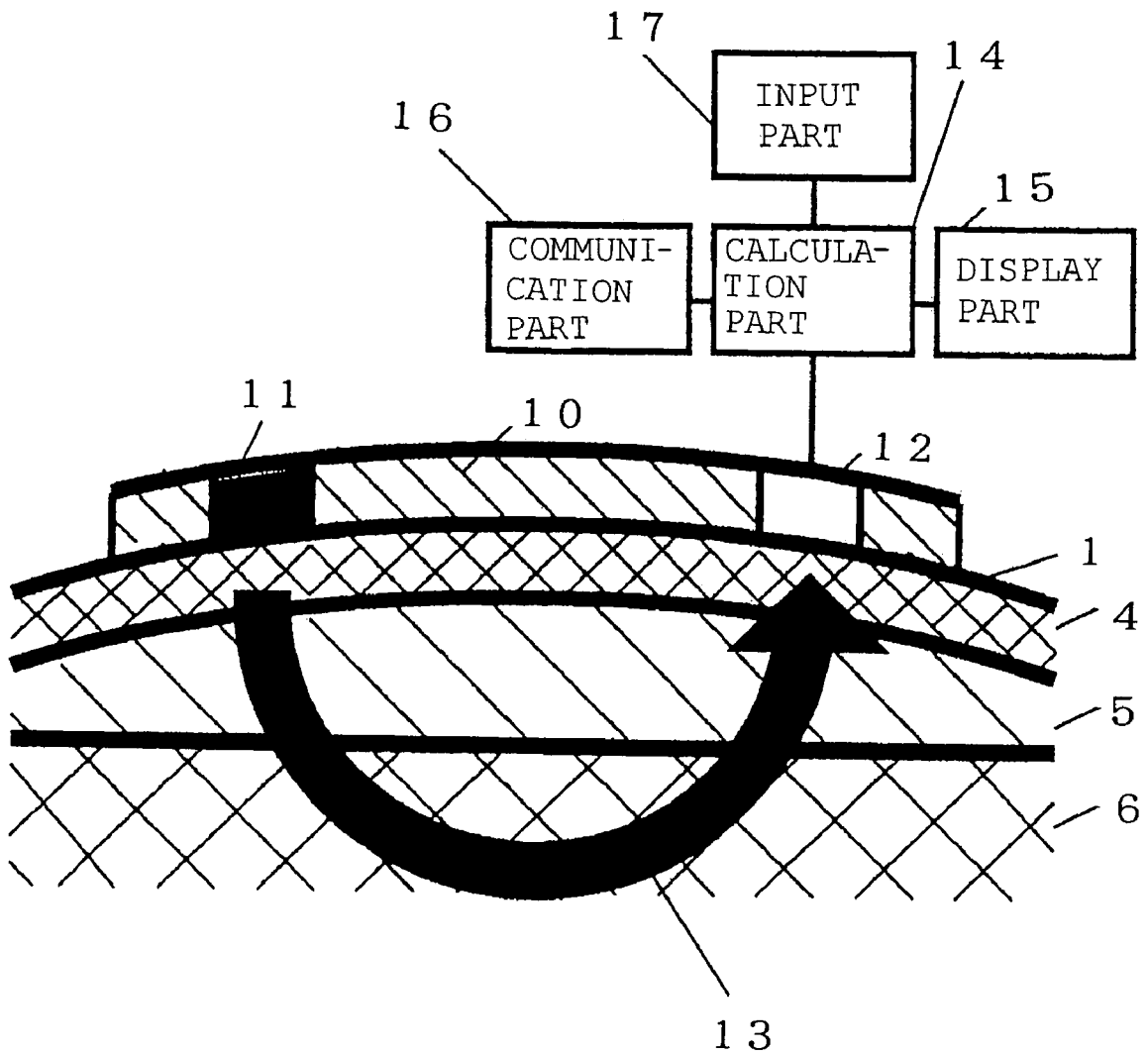


Fig. 3



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