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(54) **MOTION COMPATIBLE SENSOR FOR
NON-INVASIVE OPTICAL BLOOD ANALYSIS**

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7,260,425, which is a continuation of application No. 10/080,433, filed on Feb. 21, 2002, now Pat. No. 6,845,256, which is a division of application No. 09/348,437, filed on Jul. 7, 1999, now Pat. No. 6,374,129, which is a division of application No. 08/722,443, filed on Oct. 10, 1996, now Pat. No. 6,018,673.

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(52) **U.S. Cl.** **600/324**
(57) **ABSTRACT**

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Boulder, CO (US)

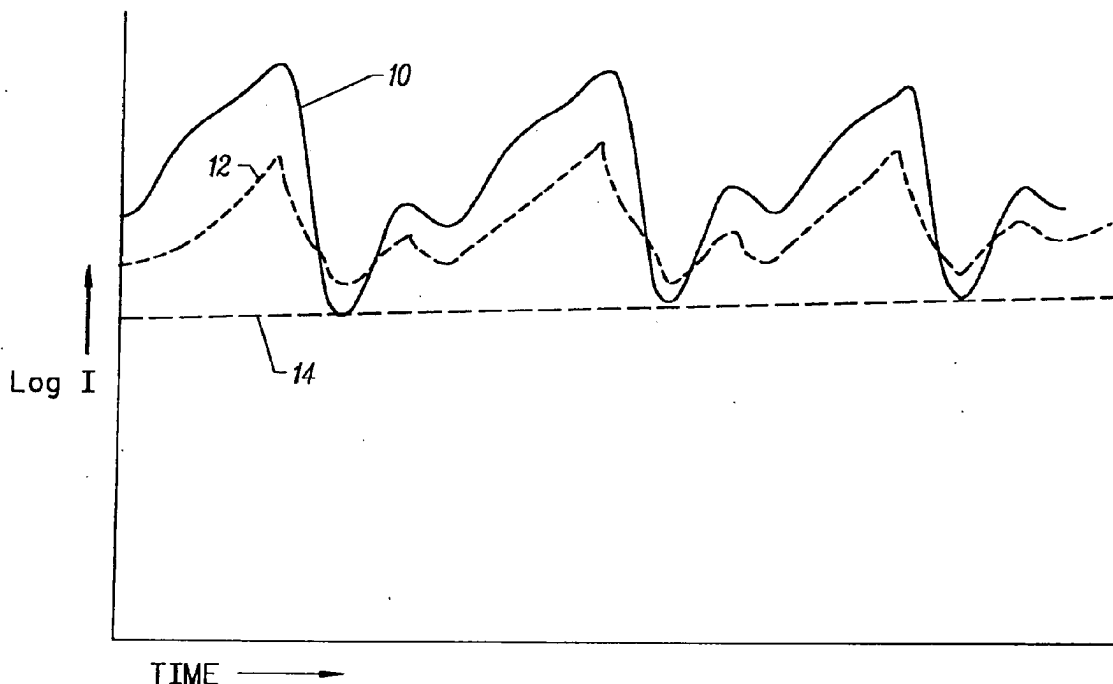
(21) Appl. No.: **12/822,898**

(22) Filed: **Jun. 24, 2010**

A non-invasive optical sensor which uses the motion signal to calculate the physiological characteristic being measured. For pulse oximetry, a least squares or a ratio-of-ratios technique can be applied to the motion signal itself. This is made possible by selecting a site on the patient where variations in motion produce signals of two wavelengths which are sufficiently correlated. In particular, it has been determined that a sensor placed on a nail, in particular a thumbnail, exhibits the characteristics of having the red and infrared signals correlated when used for pulse oximetry, and the resulting signals correlate to arterial oxygen saturation.

Related U.S. Application Data

(60) Continuation of application No. 11/827,858, filed on Jul. 13, 2007, which is a continuation of application No. 10/991,111, filed on Nov. 16, 2004, now Pat. No.



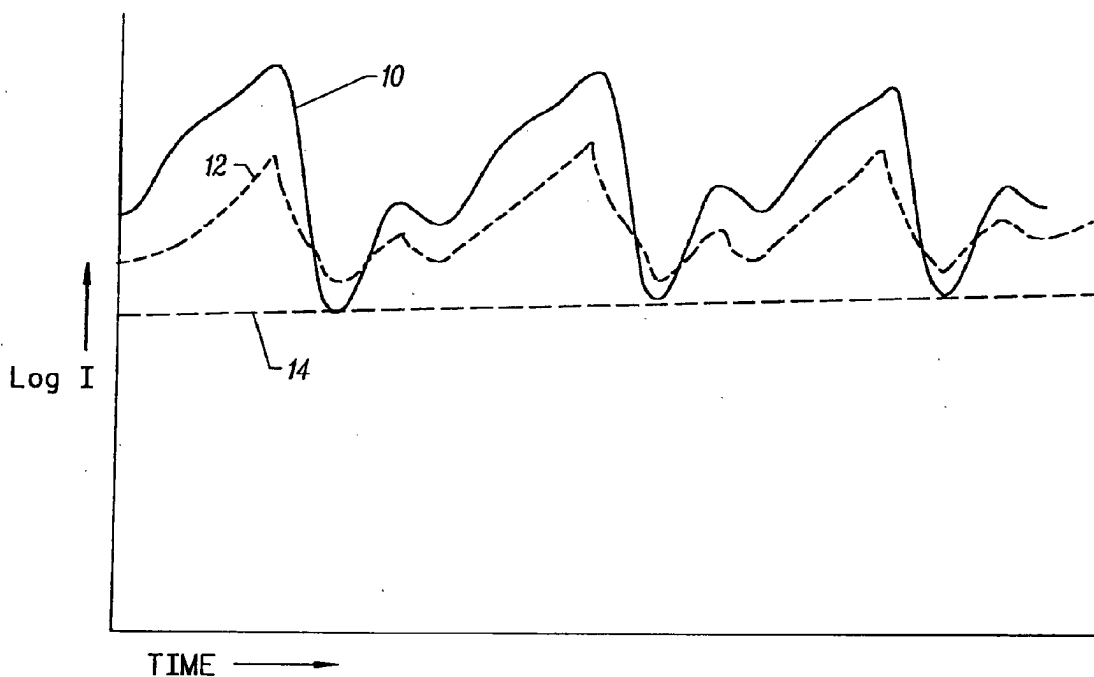


FIG. 1

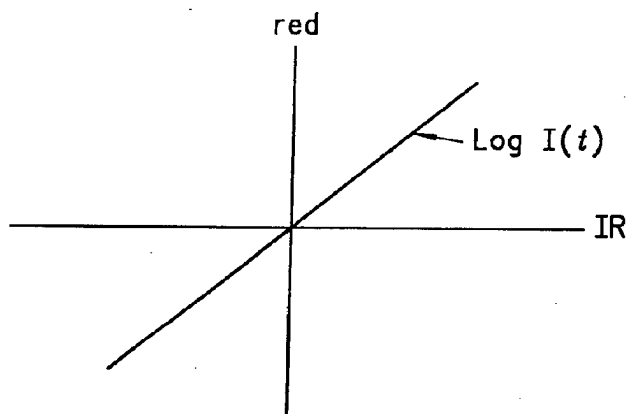


FIG. 2

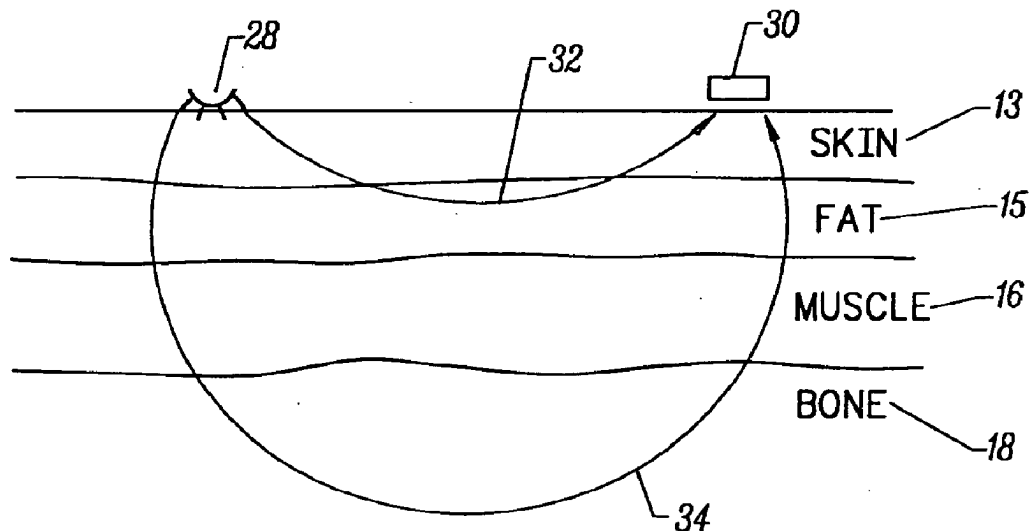


FIG. 3

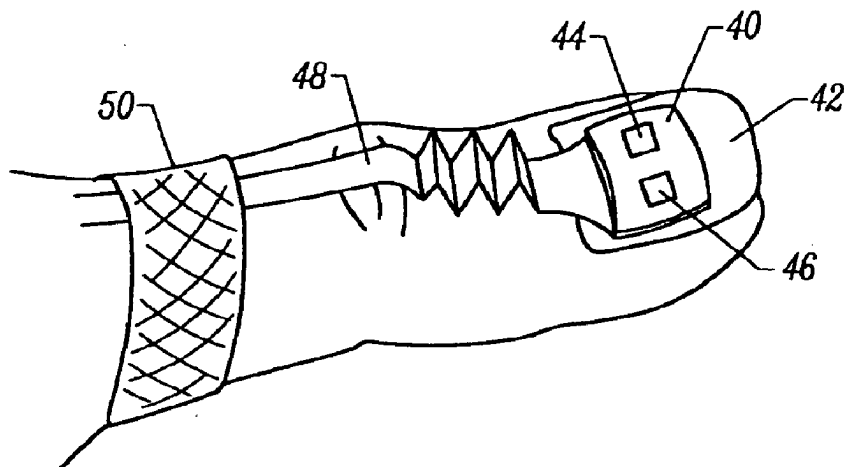


FIG. 4

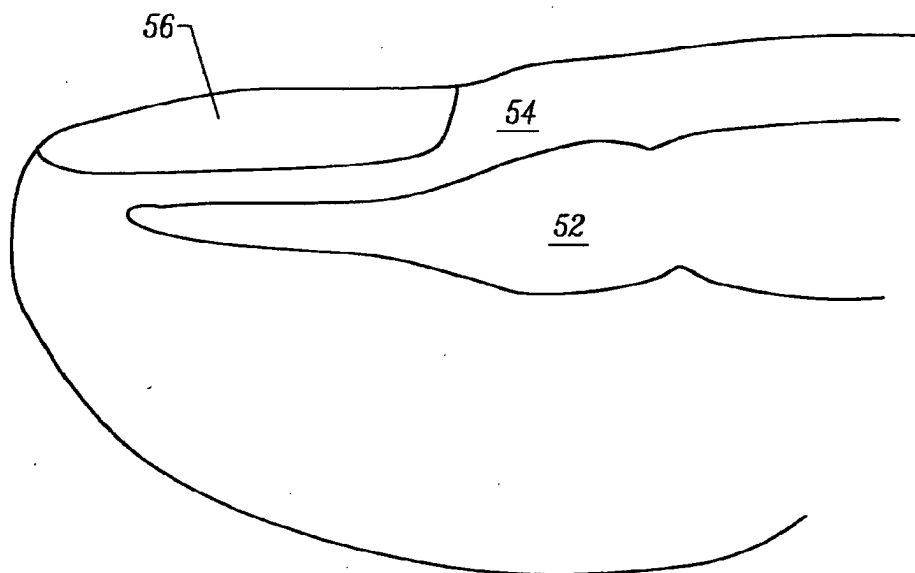


FIG. 5

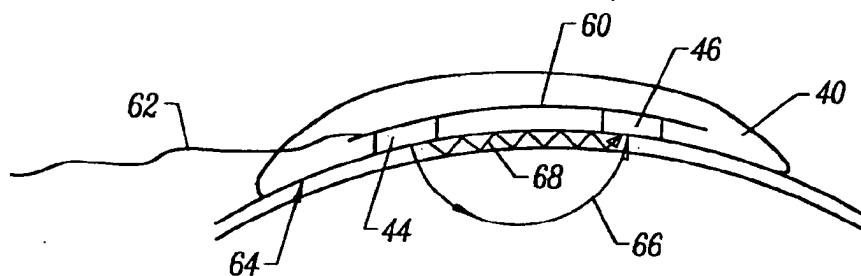


FIG. 6

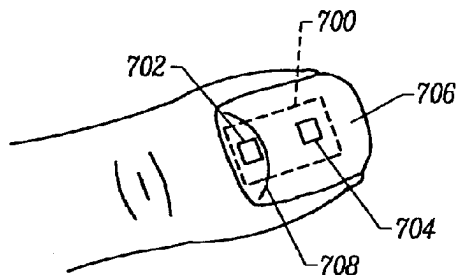


FIG. 7

FIG. 8A

FIG. 8B

*Lissajous-Bandpass <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		*Lissajous-Bandpass <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
	Red		
	IR		
10X	NO MOTION HIGH SATURATION(100%)		MOTION HIGH SATURATION(100%)
*Lissajous-Bandpass <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		*Lissajous-Bandpass <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
10X	NO MOTION LOW SATURATION(70%)		MOTION LOW SATURATION(70%)

FIG. 8C

FIG. 8D

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