[54] METHOD FOR NONINVASIVE INTERMITTENT AND/OR CONTINUOUS HEMOGLOBIN, ARTERIAL OXYGEN CONTENT, AND HEMATOCRIT DETERMINATION


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Related U.S. Application Data

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[58] Field of Search 128/633, 634, 665, 664, 128/898, 637, 666/10, 11, 13

[56] References Cited
U.S. PATENT DOCUMENTS
4,167,331 9/1979 Nielsen
4,704,029 11/1987 Van Heuvelen 128/633

PLETHYSMOGRAPH (PG)
PHOTODETECTOR (PD)

660NM LED
TISSUE
PG
CALCULATE ΔV
ΔV

660NM LED
CALCULATE ΔΗΗΟ2/ΔV
ΗΗΟ2

CORRECTED AC SIGNAL
AC
DC
CALCULATE ΗΗΟ2

INPUT SpO2
CALCULATE THb
THb

DISPLAY THb
DISPLAY HCT

ENTRER RBC SHAPE
CALCULATE HCT EST.
HCT


OTHER PUBLICATIONS

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ABSTRACT
Described here are a novel means and device for noninvasively quantifying important blood constituents. Total hemoglobin, arterial oxygen content, hematocrit, and other parameters can all be determined quickly and easily without the need for skin puncture or lengthy laboratory analysis. The invention described here concerns the simultaneous measurement of volume changes and changes in the mass of either oxyhemoglobin, total hemoglobin, or reduced hemoglobin. The data obtained by these measurements is used to quantify the parameters of interest.

14 Claims, 4 Drawing Sheets