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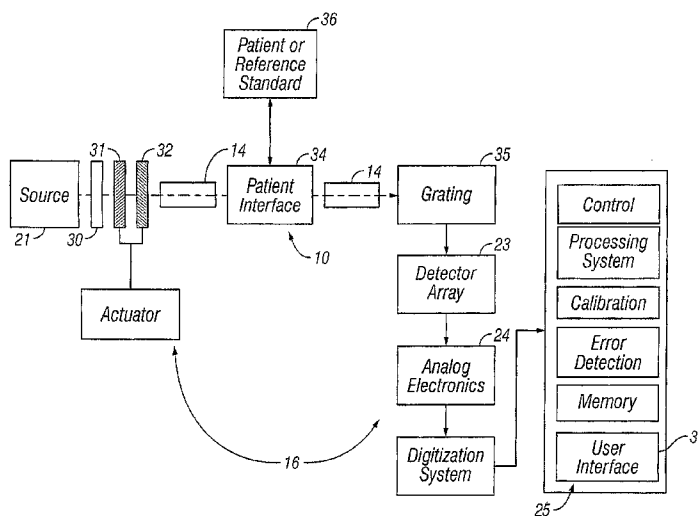
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(54) Title: COMPACT APPARATUS FOR NONINVASIVE MEASUREMENT OF GLUCOSE THROUGH NEAR-INFRARED SPECTROSCOPY



(57) Abstract: A near IR spectrometer-based analyzer attaches continuously or semi-continuously to a human subject and collects spectral measurements for determining a biological parameter in the sampled tissue, such as glucose concentration. The analyzer includes an optical system optimized to target the cutaneous layer of the sampled tissue so that interference from the adipose layer is minimized. The optical system includes at least one optical probe. Spacing between optical paths and detection fibers of each probe and between probes is optimized to minimize sampling of the adipose subcutaneous layer and to maximize collection of light backscattered from the cutaneous layer. Penetration depth is optimized by limiting range of distance between paths and detection fibers. Minimizing sampling of the adipose layer greatly reduces interference contributed by the fat band in the sample spectrum, increasing signal-to-noise ratio. Providing multiple probes also minimizes interference in the sample spectrum due to placement errors.

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A. CLASSIFICATION OF SUBJECT MATTER

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USPC: 600/316,310

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 600/316,310,322,344

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,770,454 A (ESSENPREIS et al) 23 June 1998 (23.06.1998), Figures 2, 8 - 10, and descriptions thereof.	95-99
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Y	US 5,879,373 A (ROPER et al) 09 March 1999 (09.03.1999), see the entire document.	4, 5, 13-16

Further documents are listed in the continuation of Box C.

See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means		
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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 5,978,691 A (MILLS) 02 November 1999 (09.11.1999), column 4, line 65 - column 6, line 2.	17, 52
Y	US 5,632,273 A (SUZUKI) 27 May 1997 (27.05.1997), Figure 3 and the description thereof.	30
Y	US 5,687,717 A (HALPERN et al) 18 November 1997 (18.11.1997), see the entire document.	21, 58,68
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Y	US 6,095,974 A (SHEMWELL et al) 01 August 2000 (01.08.2000), Figures 1, 2 and the descriptions thereof.	31-33
Y	US 6,157,041 A (THOMAS et al) 05 December 2000 (05.12.2000), Figure 2 and the description thereof.	66,67