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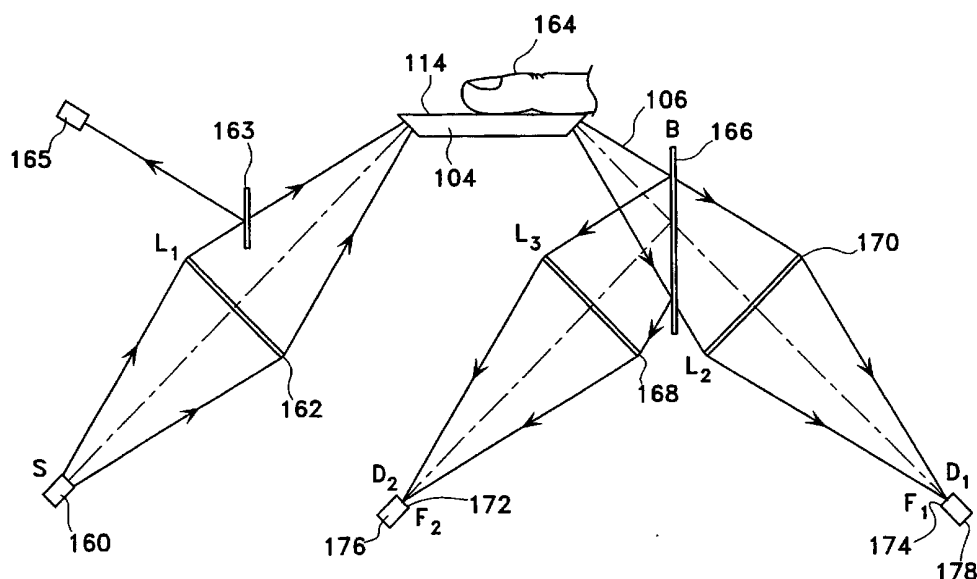
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- Published:
— with international search report
- (88) Date of publication of the international search report:
19 July 2001

[Continued on next page]

(54) Title: INFRARED ATR GLUCOSE MEASUREMENT SYSTEM



(57) Abstract: This involves a non-invasive glucose measurement device and a process for determining blood glucose level in the human body using the device. In typical operation, the glucose measurement device is self-normalizing in that it does not employ an independent reference sample in its operation. The device uses attenuated total reflection (ATR) infrared spectroscopy. Preferably, the device is used on a fingertip and compares two specific regions of a measured infrared spectrum to determine the blood glucose level of the user. Clearly, this device is especially suitable for monitoring glucose levels in the human body, and is especially beneficial to users having diabetes mellitus. The device and procedure may be used for other analyte materials which exhibit unique mid-IR signatures of the type described herein and that are found in appropriate regions of the outer skin.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/23823

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B5/00

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)

IPC 7 A61B

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 practical, 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.
A X	US 4 169 676 A (KAISER) 2 October 1979 (1979-10-02) cited in the application the whole document	1-3,7,8, 10,12, 13,16,18 19,25, 28,34, 36,37, 40,46,48
A	<p style="text-align: center;">---</p> WO 97 29368 A (SHELL) 14 August 1997 (1997-08-14) the whole document <p style="text-align: center;">---</p>	1,9-11, 16-19, 26,27, 29, 34-41, 46-48
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

20 April 2000

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/23823

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 427 889 A (MÜLLER) 24 January 1984 (1984-01-24) column 2, line 50 -column 3, line 29 column 5, line 55 -column 7, line 51 ---	1-3, 7-15, 19, 26-28, 37, 41
A	US 4 538 618 A (ROSENBERG & AL) 3 September 1985 (1985-09-03) column 2, line 22 - line 34 ---	1, 4-6, 19-22
A	US 5 470 323 A (SMITH & AL.) 28 November 1995 (1995-11-28) column 3, line 63 -column 4, line 34 ---	49
A	EP 0 329 361 A (SUNTORY) 23 August 1989 (1989-08-23) page 6, line 56 -page 7, line 31 ---	49-51
A	US 4 710 231 A (BATEMAN) 1 December 1987 (1987-12-01) column 3, line 21 - line 23 ---	49, 52
A	WO 96 19180 A (MAYBELLINE) 27 June 1996 (1996-06-27) page 14, line 13 - line 16 -----	49, 50, 53

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 99/23823

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-48

Method and device for measuring glucose by infrared attenuated total reflectance

2. Claims: 49-53

Cleaning kit

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Application No

PCT/US 99/23823

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