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(54) Title: FINGERPRINT SCANNER AND METHOD HAVING AN ACOUSTIC DETECTOR

(57) Abstract: The invention may include a fingerprint scanner having an ultrasonic wave emitter, a platen, an acoustic splitter and an acoustic detector. The invention may also include a method of scanning a fingerprint, wherein ultrasonic energy is provided and reflected with an acoustic splitter to provide first reflected energy, the first reflected energy may be reflected from a finger to provide second reflected energy, the second reflected energy may be received at the splitter, and allowed to pass through the splitter, and the second reflected energy may then be received at a detector.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/01862

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **G06K 9/00**(2006.01);**G06K 9/22**(2006.01);**G05B 19/00**(2006.01);**H04N 1/04**(2006.01);**H01J 3/14**(2006.01)

USPC: 382/124,126,127,313,314,315;340/5.52,5.53,5.82,5.83,356;358/496,497,486;250/234

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. : 382/124,126,127,313,314,315;340/5.52,5.53,5.82,5.83,356;358/496,497,486;250/234

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)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,689,576 A (SCHNEIDER et al) 18 November 1997, abstract; column 1, lines 65-57; column 2, lines 26-28; column 7, lines 9-11; FIG. 3.	1-11 and 13-18
Y	US 6,552,841 B (LASSER et al) 22 April 2003 column 7, lines 15-25; column 3, lines 3-5, 5-12, 33-55; column 4, lines 38-49.	1-11 and 13-18

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"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	"&"	document member of the same patent family

Date of the actual completion of the international search 14 July 2008 (14.07.2008)	Date of mailing of the international search report 12 AUG 2008
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer BRIAN Q. LE DEBORAH A. THOMAS PARALEGAL SPECIALIST Telephone No. 703-306-0377 <i>DUT</i>

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation 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 additional fees, this Authority did not invite payment of any additional fees.
 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.: 1-11 and 13-18
- Remark on Protest**
- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
 - The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
 - No protest accompanied the payment of additional search fees.

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

Group I, claim(s) 1-11 and 13-18, drawn to a method fingerprint scanner or a method of analyzing a finger comprises an ultrasonic wave emitter, a platen to support finger and allow ultrasonic waves to pass through the platen, acoustic splitter and an acoustic detector to analyze fingerprint classified in 382/124.

Group II, claim(s) 12, drawn to an ultrasonic detector apparatus comprises a piezoelectric layer capable of producing electric charges, a charge coupled device in communication with the piezoelectric layer and capable of producing an electric current corresponding the electric charges, and an electric circuit in communication with electric currents classified in 310/322.