

(43) International Publication Date
25 September 2014 (25.09.2014)(51) International Patent Classification:
G06K 9/58 (2006.01)(21) International Application Number:
PCT/US2014/026797(22) International Filing Date:
13 March 2014 (13.03.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/788,670 15 March 2013 (15.03.2013) US

(72) Inventors; and

(71) Applicants : BETENSKY, Ellis, I. [US/CA]; 1803-1
Palace Pier Court, Etobicoke, Ontario M8V 3W9 (CA).
PLUMMER, William, T. [US/US]; 129 Arena Terrace,
Concord, Massachusetts 01742 (US). YOUNGSWORTH,
Richard, N. [US/US]; 2217 East Warm Springs Avenue,
Boise, Idaho 83712 (US).(74) Agent: COLE, David, John; 7 Lakeshore Drive, Medway,
Massachusetts 02053-1034 (US).(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW.(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:

26 November 2015

(54) Title: METHOD AND APPARATUS FOR ACQUIRING BIOMETRIC IMAGE

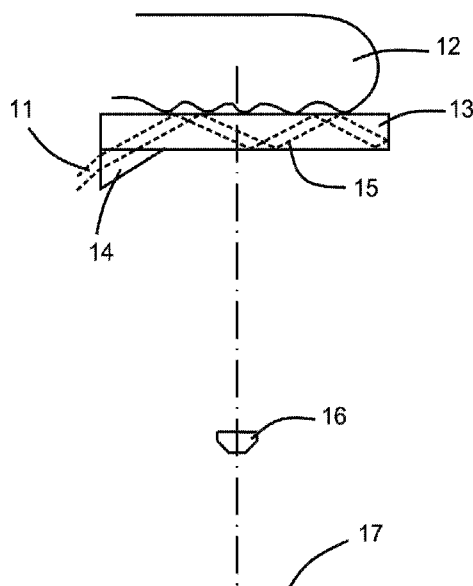


Figure 1

(57) Abstract: A compact and inexpensive method and apparatus for illuminating and acquiring a digital image of a biometric feature such as a fingerprint, palm print, footprint, or some subset or multiple of such features. A source of illumination (11) is introduced into an exposed edge of a transparent optical window (13) that is essentially smooth and generally flat with spaced apart surfaces. The illumination propagates between the surfaces of a flat or slightly curved transparent window (13) via total internal reflection (15) to obliquely illuminate a biometric feature (12) when in contact with the window (13). A digital camera (17) views the obliquely illuminated biometric feature (12) to record an image of it which can then be compared with registered images for matching and control purposes.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/26797

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06K 9/58 (2014.01)

USPC - 382/125

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(8) Classification(s): G06K 9/00, 9/20, 9/58 (2014.01)

USPC Classification(s): 382/115, 124, 125

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)

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IEEE; Google/Google Scholar
Keywords: biometric, camera, image, platen, window, LED, light, illuminate, radiate, beam, surface, angle, radius, compare, access control

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0265586 A1, (ROWE, R. et al.), 01 December 2005; paragraphs [0014], [0054], [0058], [0069], [0070], [0107].	1-6, 13-14, 17-19
Y		7-12, 15-16
Y	US 4,792,226, (FISHBINE, G. et al.), 20 December 1988; column 11, lines 22-34.	7
Y	US 8,180,122 B2, (ALLEN, R.), 15 May 2012; figures 1, 2; column 3, lines 58-64.	8-9
Y	US 2012/0306619 A1, (LONGO, L.), 06 December 2012; paragraphs [0031], [0034].	9
Y	US 6,296,610 B1, (SCHNEIDER, J. et al.), 02 October 2001; column 11, lines 52-56.	10-11
Y	US 2011/0001038 A1, (TSENG, C. et al.), 06 January 2011; paragraphs [0008], [0021], Table 1.	12
Y	US 6,282,304 B1, (NOVIKOV, S. et al.), 28 August 2001; column 5, lines 26-32.	15
Y	US 8,031,981 B2, (PEIRCE, M.), 04 October 2011; column 1, lines 58-63.	16

☐ Further documents are listed in the continuation of Box C.

* 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 application or patent 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

03 July 2014 (03.07.2014)

Date of mailing of the international search report

13 AUG 2014

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:

Shane Thomas

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774