

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
31 January 2008 (31.01.2008)

PCT

(10) International Publication Number  
**WO 2008/014123 A3**

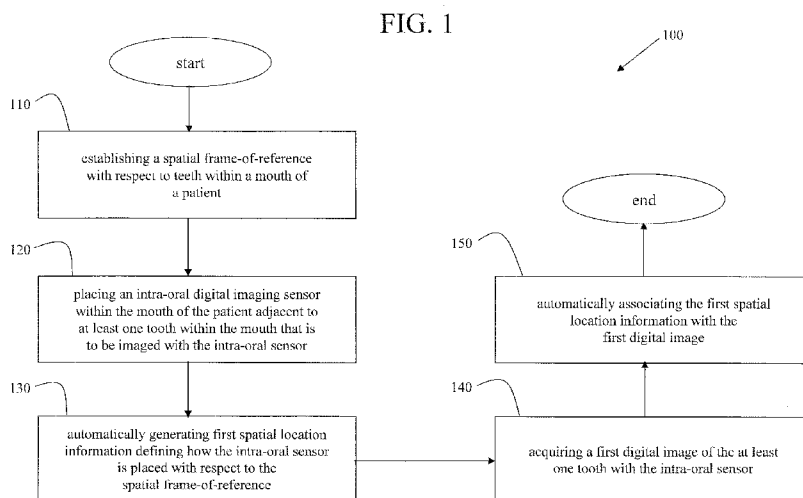
- (51) International Patent Classification:  
G06K 9/00 (2006.01) A61B 6/14 (2006.01)
- (21) International Application Number:  
PCT/US2007/073234
- (22) International Filing Date: 11 July 2007 (11.07.2007)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
11/459,444 24 July 2006 (24.07.2006) US
- (71) Applicant (for all designated States except US):  
APTERYX, INC. [US/US]; 313 South High Street,  
Suite 200, Akron, Ohio 44308 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): CRUCS, Kevin M.  
[US/US]; 313 South High Street, Suite 200, Akron, Ohio  
44308 (US).
- (74) Agents: MUZILLA, David J. et al.; Hahn Loeser & Parks  
LLP, One GOJO Plaza, Suite 300, Akron, Ohio 44311-1076  
(US).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, 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, IS, JP, KE, KG, KM, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:  
— with international search report

(88) Date of publication of the international search report:  
4 December 2008

(54) Title: METHOD AND SYSTEM FOR AUTOMATIC INTRA-ORAL SENSOR LOCATING FOR IMAGE ACQUISITION



(57) Abstract: A method and systems for capturing digital intra-oral images, while automatically determining a location of an intra-oral sensor placed within a mouth of a patient, is disclosed. A spatial frame-of-reference is established with respect to teeth within the mouth of the patient (110). An intra-oral digital imaging sensor is placed within the mouth of the patient adjacent to at least one tooth within the mouth that is to be imaged using the intra-oral sensor (120). Spatial location information is automatically generated such that the spatial location information defines how the intra-oral sensor is placed with respect to the spatial frame-of-reference (130). A digital image of the at least one tooth is acquired using the intra-oral sensor (140) and the spatial location information is automatically associated with the acquired digital image (150).

WO 2008/014123 A3

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US07/73234

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: **G06K 9/00( 2006.01);A61B 6/14( 2006.01)**  
  
 USPC: **382/128,133,154;378/38,98.8,191**  
 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. : 382/128, 133, 154; 378/38, 98.8, 191

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.
Y	US 7,286,954 ( KOPELMAN et al ) 03 March 2005; figures 1-2,4-10; col 3, lines 23 to column 4, lines 1-15; col 5, lines 46-62; col 7, lines 15-48	1-24
---		-----
Y	US 2006/0154198 ( DURBIN et al ) 11 January 2005; paragraph [0058-0069], figure 1 ,3 and 9	1-24
Y	US 5,995,583 (SCHICK et al) 13 November 1996; abstract and figure 1	9-10,16-20
A	US 2007/0036454 (CRUCS et al) 15 August 2005; whole document	1-24
Y	US 2002/0094509 (DURBIN et al) 30 November 2000, abstract and figures 3-4	1-24
A	US 7,068,825 (RUBBERT et al) 08 November 2001; abstract and figure 10	1

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 11 June 2008 (11.06.2008)	Date of mailing of the international search report <b>30 JUL 2008</b>
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 <b>Bhavesh Mehta</b> Telephone No. 571/272/2100 <i>Karen S. Ward</i>