(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 May 2008 (22.05.2008)

PCT

(10) International Publication Number
WO 2008/059400 A3

(51) **International Patent Classification:**
A61B 6/00 **(2006.01)** *G06T5/00* **(2006.01)**
A61B 6/03 **(2006.01)** *G06T5/50* **(2006.01)**
GOIN 23/04 **(2006.01)**

(21) **International Application Number:**
PCT/IB2007/054522

(22) International Filing Date:
7 November 2007 (07.1 1.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
06124208.7 16 November 2006 (16.1 1.2006) EP

(71) **Applicant** *(for all designated States except US):* **KONINKLUKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventor; and

(75) Inventor/Applicant *(for US only):* **VAN DE HAAR, Peter, George** [NL/NL]; c/o High Tech Campus 44, NL-5656 AE Eindhoven (NL).

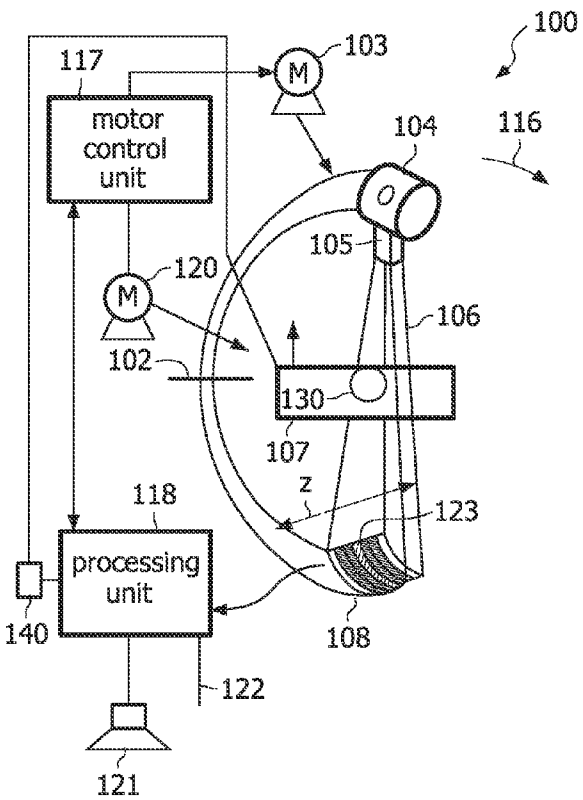
(74) Agent: SCHOUTEN, Marcus, M.; High Tech Campus 44, NL-5656 AE Eindhoven, (NL).

(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).

[Continued on next page]

(54) Title: COMPUTER TOMOGRAPHY (CT) C-ARM SYSTEM AND METHOD FOR EXAMINATION OF AN OBJECT



(57) Abstract: A Computer Tomography (CT) C-arm system and method for examination of an object is provided. The Computer Tomography (CT) C-arm system for examination of an object of interest, the CT- C-arm system comprises an X-ray tube adapted for generating X-rays, an X-ray detection unit to acquire a set of CT slices, wherein the X-ray tube, and the X-ray detection unit are adapted to be rotatable on a C- arm around a common axis around the object under examination and a processing unit by which the following steps are executable: acquiring a first 3D data volume of the CT slices using first scan parameters; adjusting the first data volume to a second data volume (segmented volume) such that voxel values of the first data volume of at least one predefined range of Hounsfield (H) are set to an at least one predefined H-value; generating a forward projection of the second data volume using the first scan parameters; reconstructing the projection to a third data volume; generating a fourth data volume (artefact-only volume) by subtracting the third volume with the second volume; generating a fifth volume by adding the first volume with the fourth volume.

WO 2008/059400 A3

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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

Yl July 2008

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054522

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B6/00 A61B6/03 G01N23/04 G06T5/00 G06T5/50

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)
A61B G01N G06T

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)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 266 388 B1 (HSIEH JIANG [US]) 24 July 2001 (2001-07-24) column 2, line 35 - column 3, line 56 claims 3,12 figures 1,2	7,8
Y	-----	1-6
Y	US 2006/008046 A1 (RUHRNSCHOPF ERNST-PETER [DE] RUEHRNSCHOPF ERNST-PETER [DE]) 12 January 2006 (2006-01-12) paragraphs [0040], [0045] paragraph [0051] - paragraph [0053] paragraph [0060] - paragraph [0068] paragraph [0101] - paragraph [0106]	1-6

	-/-	

[X] Further documents are listed in the continuation of Box C. [X] 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

"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	Date of mailing of the international search report
22 May 2008	29/05/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Görlach, Tobias

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054522

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
A	WO 2005/078661 A (PHILIPS INTELLECTUAL PROPERTY [DE]; KONINKL PHILIPS ELECTRONICS NV [NL]) 25 August 2005 (2005-08-25) page 6, line 6 - page 7, line 29 figures 1-5	1-8
A	WO 02/086822 A (MARCONI MEDICAL SYSTEMS ISRAEL [IL]; GRINGAUZ ASHER [IL]; BAR YOAV [IL]) 31 October 2002 (2002-10-31) page 5, line 7 - page 6, line 11 figures 1,2	1-8
A	WO 2006/056942 A (PHILIPS INTELLECTUAL PROPERTY [DE]; KONINKL PHILIPS ELECTRONICS NV [NL]) 1 June 2006 (2006-06-01) page 4, line 14 - line 20 page 5, line 5 - page 6, line 8 page 6, line 27 - page 7, line 10 page 7, line 31 - page 8, line 6 figures l,2,4a-4f	1-8
A	US 2006/227928 Al (TIMMER JAN [NL]) 12 October 2006 (2006-10-12) the whole document	1-8
A	FELDKAMP L A ET AL: "Practical cone-beam algorithm" JOURNAL OF THE OPTICAL SOCIETY OF AMERICA - A, OPTICAL SOCIETY OF AMERICA, WASHINGTON, US, vol. 1, no. 6, 1 June 1984 (1984-06-01), pages 612-619, XP002085783 ISSN: 1084-7529 cited in the application the whole document	1-8

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/054522

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6266388 B1	24-07-2001	DE 10043725 A1	19-04-2001
		JP 2001137228 A	22-05-2001
US 2006008046 A1	12-01-2006	DE 102004029009 A1	19-01-2006
WO 2005078661 A	25-08-2005	CN 1918600 A	21-02-2007
		JP 2007521905 T	09-08-2007
WO 02086822 A	31-10-2002	EP 1386288 A1	04-02-2004
		JP 2004528100 T	16-09-2004
		US 2004146136 A1	29-07-2004
WO 2006056942 A	01-06-2006	CN 101065781 A	31-10-2007
US 2006227928 A1	12-10-2006	NONE	