

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 February 2004 (26.02.2004)

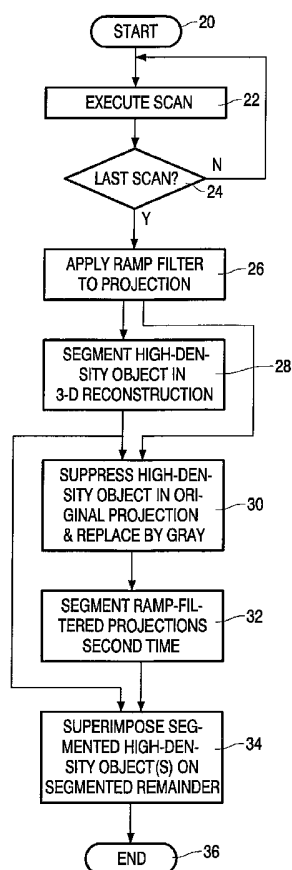
PCT

(10) International Publication Number
WO 2004/017263 A3

- (51) International Patent Classification⁷: **G06T 11/00**
- (21) International Application Number:
PCT/IB2003/003351
- (22) International Filing Date: 24 July 2003 (24.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
02078359.3 14 August 2002 (14.08.2002) EP
- (71) Applicant (for all designated States except DE, US):
KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (71) Applicant (for DE only): **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH** [DE/DE]; Stein-
damm 94, 20099 Hamburg (DE).
- (72) Inventors; and
(75) Inventors/Applicants (for US only): **KOPPE, Reiner** [DE/DE]; Prof . Holstlaan 6, NL-5656 AA Eindhoven (NL). **OP DE BEEK, Johannes, C., A.** [NL/NL]; Prof . Holstlaan 6, NL-5656 AA Eindhoven (NL). **KLOTZ, Erhard, P., A.** [DE/DE]; Prof . Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: **COHEN, Julius, S.**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR GENERATING IMPROVED COMPUTER TOMOGRAPHY IMAGES OF NATURAL TISSUES



(57) Abstract: A method is disclosed for generating images of a human or animal body on the basis of 3D-reconstructions from 3D-XRAY or 3D-Computer Tomography measurements, which bodies comprise both natural tissue and one or more high-density objects. The method comprises the steps of executing the measurements, distinguishing the one or more high-density objects and executing a separating procedure thereon for generating an improved image of regions of the natural tissue. In particular, the method comprises the following steps: applying a ramp filter on the various projection measurements to single out the one or more high-density objects; segmenting the singled-out one or more high-density objects into a separate 3D reconstruction; suppressing the reconstructed one or more high-density objects from the original projection measurements; and segmenting said projection measurements without the suppressed one or more high-density objects.



(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *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:**

11 November 2004

Published:

— *with international search report*

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

I/IB 03/03351

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06T11/00

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 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, INSPEC, PAJ, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 125 193 A (HAN KYUNG S) 26 September 2000 (2000-09-26) column 3, line 54 - column 4, line 44; figure 3	1-6
A	US 5 561 695 A (HU HUI) 1 October 1996 (1996-10-01) column 2, line 30 - line 45	1-6
A	US 6 018 561 A (TAM KWOK) 25 January 2000 (2000-01-25) claim 1	1,4
A	US 5 438 602 A (CRAWFORD CARL R ET AL) 1 August 1995 (1995-08-01)	



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

27 August 2004

Date of mailing of the international search report

06/09/2004

Name and mailing address of the ISA

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

Authorized officer

Perez Molina, E

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

/IB 03/03351

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6125193	A	26-09-2000	NONE	
US 5561695	A	01-10-1996	DE 19634821 A1 IL 119543 A JP 9187452 A	15-05-1997 01-12-2002 22-07-1997
US 6018561	A	25-01-2000	DE 19934992 A1 JP 2000107171 A US 6084937 A	09-03-2000 18-04-2000 04-07-2000
US 5438602	A	01-08-1995	NONE	