

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
26 April 2007 (26.04.2007)

PCT

(10) International Publication Number
WO 2007/046014 A3

(51) International Patent Classification:
G01R 33/341 (2006.01) **G01R 33/3415** (2006.01)

(21) International Application Number:
PCT/IB2006/053319

(22) International Filing Date:
15 September 2006 (15.09.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/728,378 19 October 2005 (19.10.2005) US

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

(71) Applicant (for AE only): **U.S. PHILIPS CORPORATION** [US/US]; 1251 Avenue Of The Americas, New York, NY 10020 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **POSSANZINI, Cecilia** [IT/NL]; Augustijnenstraat 71, NL-6511 KE Nijmegen (NL).

(74) Common Representative: **KONINKLIJKE PHILIPS ELECTRONICS N.V.**; C/o Lundin, Thomas, M., 595 Miner Road, Cleveland, OH 44143 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, 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, 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).

Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

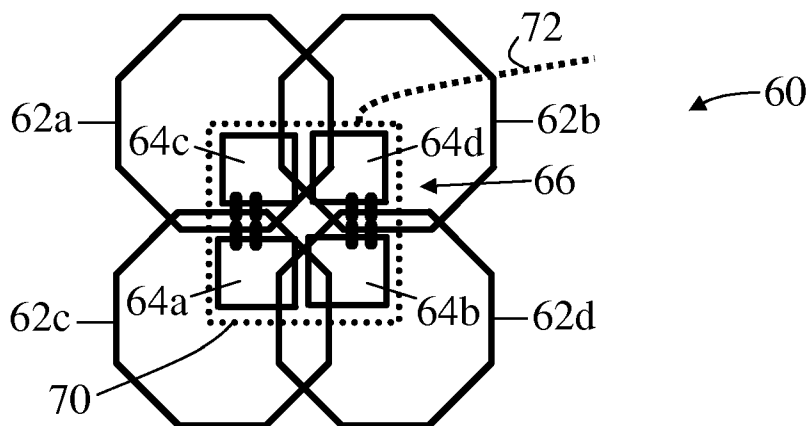
— with international search report

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

11 October 2007

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.

(54) Title: COMPACT AND FLEXIBLE RADIO FREQUENCY COIL ARRAYS



(57) Abstract: A radio frequency coils array includes a plurality of conductive RF loops (62a, 62b, 62c, 62d, 162a, 162b, 262a, 262b, 362a, 362b, 362c, 462a, 462b, 462c, 562a, 562b) configured to excite or receive magnetic resonance signals, and a plurality of electronics modules (64a, 64b, 64c, 64d, 164a, 164b, 264a, 264b, 364a, 364b, 364c, 464a, 464b, 64c, 564a, 564b) corresponding to the plurality of conductive RF loops. The electronics modules are grouped together in a compact electronics region (66, 166, 266, 366, 466, 66). Each RF coil is operatively connected with a corresponding electronics module. Each electronics module includes at least a pre-amplifier.

WO 2007/046014 A3

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/053319

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01R33/341 G01R33/3415

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)

G01R

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, COMPENDEX, INSPEC, BIOSIS, EMBASE, MEDLINE, 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 5 296 813 A (HOLMES TIMOTHY B [US] ET AL) 22 March 1994 (1994-03-22) column 1, lines 7-16 column 4, line 49 - column 6, line 52 figures 2,5	1-21
X	EP 1 521 094 A (GORE ENTERPRISE HOLDINGS INC [US]) 6 April 2005 (2005-04-06) the whole document	1-21
X	WO 2005/052621 A (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS CORP [US]; OVERWEG JOHANN) 9 June 2005 (2005-06-09) the whole document	1-21

-/--

☒ 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

"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

24 May 2007

Date of mailing of the international search report

12/06/2007

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

Streif, Jörg Ulrich

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/053319

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BECK BL ET AL: "Phased array imaging on small animal research systems" PROCEEDINGS OF THE INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE, 9TH SCIENTIFIC MEETING AND EXHIBITION, GLASGOW, SCOTLAND, UK, 21-27 APRIL 2001, 21 April 2001 (2001-04-21), page 1111, XP002435040 the whole document	1-21
X	LEUSSLER C ET AL: "Intrinsic hybrid surface coil array for improved SNR in cardiac MRI" PROCEEDINGS OF THE INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE, 10TH SCIENTIFIC MEETING AND EXHIBITION, HONOLULU, HAWAII, USA, 18-24 MAY 2002, 18 May 2002 (2002-05-18), page 772, XP002435041 the whole document	1-21
X	ORDIDGE RJ ET AL: "High resolution imaging at 4.7 T using four irregularly-shaped receiver coils" PROCEEDINGS OF THE INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE, 12TH SCIENTIFIC MEETING AND EXHIBITION, KYOTO, JAPAN, 15-21 MAY 2004, 15 May 2004 (2004-05-15), page 1557, XP002435042 the whole document	1-21
A	US 5 545 999 A (MUELLER OTWARD M [US] ET AL) 13 August 1996 (1996-08-13) the whole document	1-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2006/053319

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5296813	A	22-03-1994	US 5491415 A	13-02-1996
EP 1521094	A	06-04-2005	JP 2005103308 A	21-04-2005
			US 2005073309 A1	07-04-2005
WO 2005052621	A	09-06-2005	CN 1886670 A	27-12-2006
			EP 1690104 A1	16-08-2006
US 5545999	A	13-08-1996	NONE	