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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 December 2005 (08.12.2005)

PCT

(10) International Publication Number
WO 2005/116676 A1

(51) International Patent Classification[7]: G01R 33/28, A61B 5/00, 5/055

(21) International Application Number: PCT/DK2005/000343

(22) International Filing Date: 25 May 2005 (25.05.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA 2004 00818 25 May 2004 (25.05.2004) DK

(71) Applicant *(for all designated States except US)*: **HVIDOVRE HOSPITAL** [DK/DK]; Kettegårds Allé 30, DK-2650 Hvidovre (DK).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HANSON, Lars, Peter, Grüner** [DK/DK]; Asnæsgade 1, st.th., DK-2200 Copenhagen N (DK). **LUND, Torben, Ellegård** [DK/DK]; Prinsessegade 2b, st.76, DK-1422 Copenhagen K (DK). **HANSON, Christian, Georg, Grüner** [DK/DK]; Magnoliavej 22, 2.tv., DK-2600 Glostrup (DK).

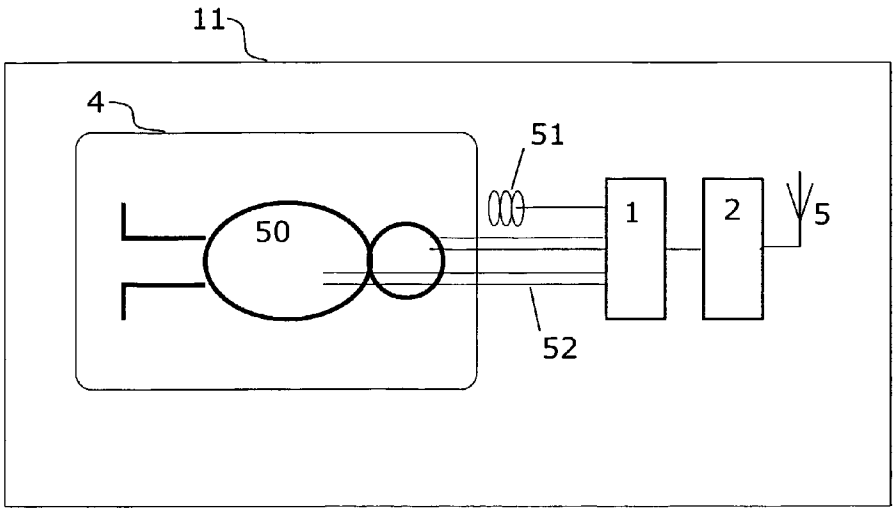
(74) Agent: **PLOUGMANN & VINGTOFT A/S**; Sundkrogsgade 9, P.O. Box 831, DK-2100 Copenhagen Ø (DK).

(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, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, MC, NL, PL, PT, RO,

[Continued on next page]

(54) Title: ENCODING AND TRANSMISSION OF SIGNALS AS RF SIGNALS FOR DETECTION USING AN MR APPARATUS



(57) Abstract: The invention provides a novel way of handling electric or electromagnetic signals during magnetic resonance (MR) measurements. Non-MR data signals such as EPH signals (e.g. EEG, ECG, blood pressure, respiration) or subject responses (e.g. keystrokes, joystick movements) originating in the MR suite is recorded while performing magnetic resonance imaging or spectroscopy. Relatively simple, possibly battery driven hardware is used to transform the non-MR signals into radio waves detectable by the MR apparatus. The electrical signals are in this way encoded as artifacts appearing in the MR images or spectra outside the region of interest, and the encoded signals can subsequently be reconstructed from the signal recorded by the scanner. If oversampling is employed, artifacts can be avoided altogether. The method inherently provides superior synchronisation between the sampling of non-MR data signals and the MR sequence. The invention minimises the need for costly special MR adapted equipment and can be applied with scanners for MR imaging as well as with NMR spectrometers.

WO 2005/116676 A1