

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 December 2002 (12.12.2002)

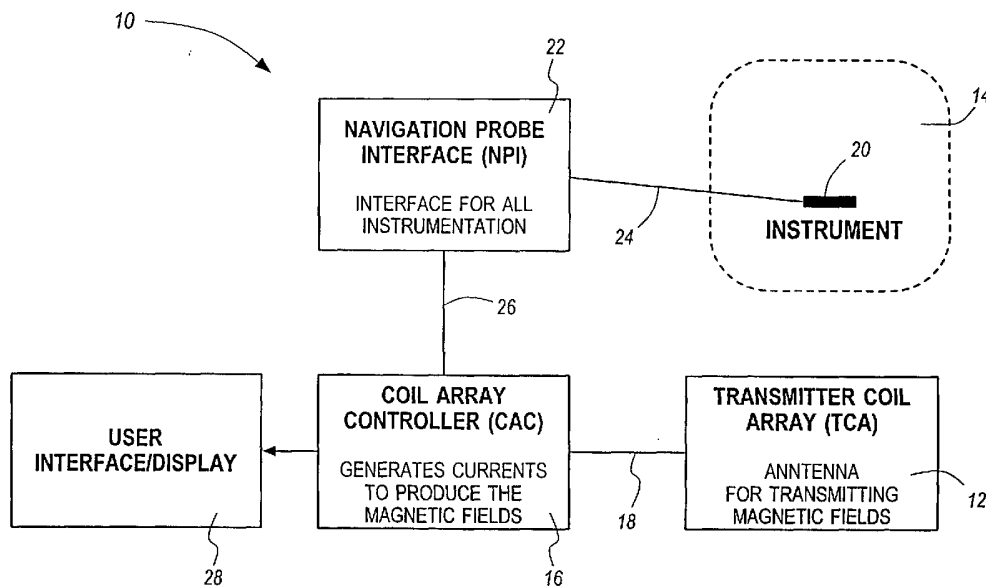
PCT

(10) International Publication Number
WO 02/098273 A3

- (51) International Patent Classification⁷: A61B 5/05
- (21) International Application Number: PCT/US02/17228
- (22) International Filing Date: 3 June 2002 (03.06.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/873,604 4 June 2001 (04.06.2001) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 09/873,604 (CON)
Filed on 4 June 2001 (04.06.2001)
- (71) Applicant (for all designated States except US): SURGICAL NAVIGATION TECHNOLOGIES, INC. [US/US]; 826 Coral Creek Circle, Louisville, CO 80027 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): JASCOB, Bradley [US/US]; 11580 Marshall St., Broomfield, CO 80020 (US). SIMON, David [US/US]; 1424 Patton Dr., Boulder, CO 80303 (US). KESSMAN, Paul [US/US]; 2765 Overlook Dr., Broomfield, CO 80303 (US). SMITH, Aaron [US/US]; 3359 Tejon St., Denver, CO 80211 (US).
- (74) Agents: WARNER, Richard, W. et al.; Harness, Dickey & Pierce, P.L.C., P.O. Box 828, Bloomfield Hills, MI 48303 (US).
- (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, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR ELECTROMAGNETIC NAVIGATION OF A SURGICAL PROBE NEAR A METAL OBJECT



(57) Abstract: A method and apparatus for electromagnetic navigation of a surgical probe (20) near a metal object. The electromagnetic navigation system includes a transmitter coil array (12) and a shield (54). The coil transmitter coil array (12) has a plurality of transmitter coils (62) and is operable to generate the electromagnetic field to navigate the probe. The shield is positioned adjacent the metal object and is operable to shield the metal object from the electromagnetic field generated by the transmitter coil array, such that the shield (54) substantially reduces distortion of the electromagnetic field by the metal object.



WO 02/098273 A3



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG).

MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent
(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent
(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,
MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI,
CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

— of inventorship (Rule 4.17(iv)) for US only

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii)) for the following designations 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, NO, NZ, OM, PH, PL, PT, RO, RU,
SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG,
UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS,

Published:

— with international search report

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

24 April 2003

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. PCT/US02/17228

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : A61B 5/05 US CL : 600/424; 324/318, 207.12 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. : 600/424; 324/318,207.12 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched 600/410; 128/889; 234/207.12-207.17 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,201,987 B1 (DUMOULIN) 13 March 2001 (13.03.2001), SEE ENTIRE DOCUMENT.	1-43
A,E	US 6,437,567 B1 (SCHENCK ET AL) 20 August 2002 (20.08.2002), SEE ENTIRE DOCUMENT.	1-43
A	US 5,913,820 A (BLADEN ET AL) 22 June 1999 (22.06.1999), SEE FIGURE 1.	1-43
A	US 4,821,731 A (MARTINELLI ET AL) 18 April 1989 (18.04.1989), SEE ENTIRE DOCUMENT.	1-43
A	US 5,740,808 A (PANESCU ET AL) 21 April 1998 (21.04.1998), SEE ENTIRE DOCUMENT.	1-43

<input type="checkbox"/> Further documents are listed in the continuation of Box C.	<input type="checkbox"/> 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 application or patent 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 28 October 2002 (28.10.2002)	Date of mailing of the international search report 06 DEC 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Teresa Walberg <i>T. Hurley for</i> Telephone No. 703 308-0861