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(71) Applicant (for all designated States except US): **SMITH & NEPHEW, INC.** [US/US]; 1450 Brooks Road, Memphis, Tennessee 38116 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WILHELM, Hoa La** [US/US]; 8265 Hunters Meadow Lane, Arlington, Tennessee 38002 (US). **RAINS, James K.** [US/US]; 8963 Bridlewood Lane, Cordova, Tennessee 38016 (US). **HAMP-TON, Daniel** [US/US]; 2835 North Rockcreek Parkway, Cordova, Tennessee 38016 (US). **PETTEYS, Timothy J.** [US/US]; 4110 Meadowfield Lane, Bartlett, Tennessee 38135 (US). **GERLACH, Darin S.** [US/US]; 1724 Richman Lane, Germantown, Tennessee 38139-3222 (US).

(74) Agents: **JEPSEN, Nicholas** et al.; Fish & Richardson P.C., P.O. Box 1022, Minneapolis, Minnesota 55440-1022 (US).

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))

[Continued on next page]

(54) Title: TARGETING LANDMARKS OF ORTHOPAEDIC DEVICES

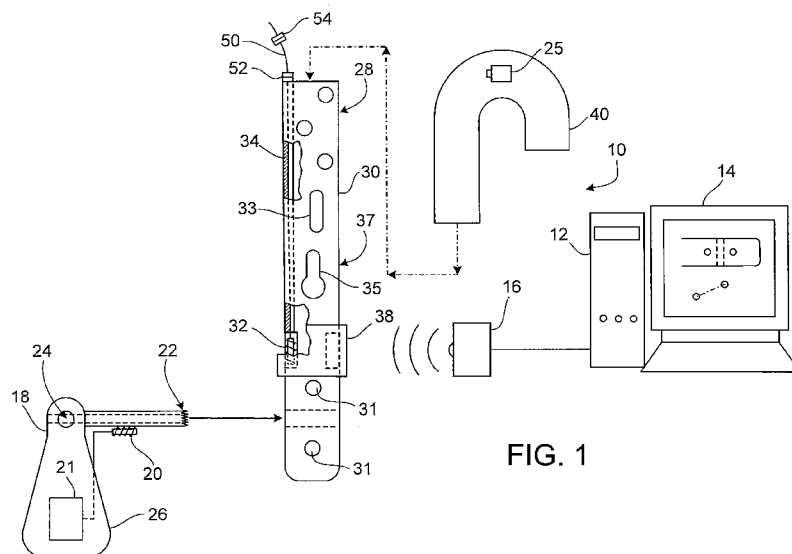
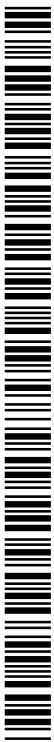


FIG. 1

(57) Abstract: A method for targeting a landmark of an orthopaedic implant comprises implanting the orthopaedic implant in a body. The orthopaedic implant having at least one landmark defining two or more locations for targeting and a first magnetic sensor located at a known distance from at least one of the two or more locations. The method includes comprises identifying one of the locations using a landmark identifier, the landmark identifier having at least one of a second magnetic sensor and a magnetic field generator, installing a transfixion element in the at least one landmark, and identifying a second location using the landmark identifier.





— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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A. CLASSIFICATION OF SUBJECT MATTER*A61B 17/56(2006.01)i, A61B 17/80(2006.01)i, A61B 17/86(2006.01)i, A61B 5/103(2006.01)i*

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 17/56; A61B 5/05; A61B 17/58; A61B 17/17

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: target, magnetic, implant, sensor, display, landmark

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2010-0152573 A1 (RITCHEY, NICHOLAS S. et al.) 17 June 2010 See abstract; figs. 1, 15, 20, 25; paragraphs 84, 88, 93, 97, 110, 113, 151; claim 1.	1,16,61 2-12,62-63
X A	US 6503249 B1 (KRAUSE, WILLIAM R.) 07 January 2003 See figs. 1, 8A; column 7, line 17, 66-67; column 8, lines 5-7, 15, 29, 64- 66; column 9, lines 39-42; column 10, lines 8, 9; claims 1, 3, 9.	1,16 2-12,61-63
X A	EP 1382308 A2 (BIOSENSE, INC.) 21 January 2004 See figs. 1, 9; paragraphs 82, 84, 106, 109; claims 1, 8, 26, 31.	1,16 2-12,61-63
A	US 2005-0070916 A1 (HOLLSTIEN, DAVID STUART et al.) 31 March 2005 See abstract; fig. 1; paragraphs 29, 30, 46; claims 1, 6, 16, 37.	1-12,16,61-63

 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 application or patent 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 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

19 NOVEMBER 2012 (19.11.2012)

Date of mailing of the international search report

20 NOVEMBER 2012 (20.11.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KANG, HEE GOK

Telephone No. 82-42-481-8264



Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 13-15, 17-60
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 13-15 and 17-60 pertain to methods for treatment of human body by surgery or therapy, and thus relate to a subject matter which this International Searching Authority is not required to search under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT.
2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/036320

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010-0152573 A1	17.06.2010	AU 2008-221332 A1	04.09.2008
		AU 2008-351418 A1	03.09.2009
		AU 2010-245015 A1	11.11.2010
		AU 2010-245179 A1	11.11.2010
		CA 2678369 A1	04.09.2008
		CA 2716836 A1	03.09.2009
		CA 2759694 A1	11.11.2010
		CA 2777468 A1	11.11.2010
		CN 101621966 A	06.01.2010
		CN 102014771 A	13.04.2011
		CN 102458292 A	16.05.2012
		EP 2114263 A2	11.11.2009
		EP 2114264 A1	11.11.2009
		EP 2257229 A1	08.12.2010
		EP 2424455 A2	07.03.2012
		EP 2424459 A2	07.03.2012
		JP 2010-519971 A	10.06.2010
		JP 2011-528917 A	01.12.2011
		KR 10-2012-0013392 A	14.02.2012
		KR 10-2012-0027252 A	21.03.2012
		US 2010-0145337 A1	10.06.2010
		US 2010-0152566 A1	17.06.2010
		US 2010-0274121 A1	28.10.2010
		US 2010-0274256 A1	28.10.2010
		US 2011-0208037 A1	25.08.2011
		US 2012-0101361 A1	26.04.2012
		US 2012-035468 A1	09.02.2012
		WO 2008-105874 A1	04.09.2008
		WO 2008-106593 A2	04.09.2008
		WO 2009-108214 A1	03.09.2009
		WO 2010-129141 A2	11.11.2010
		WO 2010-129308 A2	11.11.2010
		WO 2010-129308 A3	24.03.2011
US 6503249 B1	07.01.2003	US 06074394 A	13.06.2000
EP 1382308 A2	21.01.2004	AT 379992 T	15.12.2007
		AU 2003-213476 A1	05.02.2004
		AU 2003-213476 B2	20.11.2008
		CA 2435464 A1	18.01.2004
		CA 2435464 C	08.09.2009
		CA 2640704 A1	18.01.2004
		CA 2640704 C	29.06.2010
		DE 60317861 D1	17.01.2008
		DE 60317861 T2	27.11.2008
		DK 1382308 T3	14.04.2008
		EP 1382308 A3	30.11.2005
		EP 1382308 B1	05.12.2007
		ES 2297100 T3	01.05.2008

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/036320

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		IL 156921 D0	08.02.2004
		JP 04545400 B2	15.09.2010
		JP 2004-130094 A	30.04.2004
		KR 10-2004-0010240 A	31.01.2004
		PT 1382308 E	22.01.2008
		US 2004-0011365 A1	22.01.2004
		US 2004-0034355 A1	19.02.2004
		US 2005-0080427 A1	14.04.2005
		US 7060075 B2	13.06.2006
US 2005-0070916 A1	31.03.2005	AU 2004-216617 A1	14.04.2005
		EP 1520535 A2	06.04.2005
		EP 1520535 A3	25.02.2009
		JP 2005-103275 A	21.04.2005
		US 7029478 B2	18.04.2006