

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 September 2009 (03.09.2009)

(10) International Publication Number
WO 2009/108318 A3

- (51) **International Patent Classification:**
A61B 17/58 (2006.01) *A61M 39/00* (2006.01)
- (21) **International Application Number:**
PCT/US2009/001198
- (22) **International Filing Date:**
26 February 2009 (26.02.2009)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
12/072,694 27 February 2008 (27.02.2008) US
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, 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, ST, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

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

(88) **Date of publication of the international search report:**
3 December 2009

(54) **Title:** TOOLS FOR PERFORMING LESS INVASIVE ORTHOPEDIC JOINT PROCEDURES

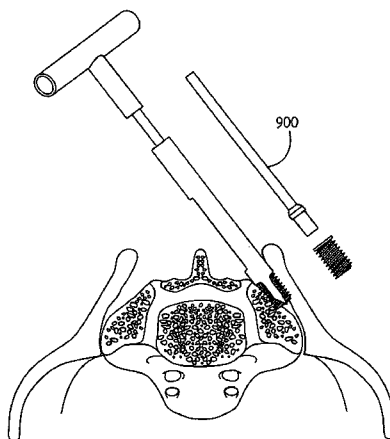


FIG. 26

(57) **Abstract:** A tool set for preparing a joint, inserting an implant or removing an implant from a joint in an open or less invasive procedure generally comprises a set of nested tools, pin guides, jigs, and/or immobilization elements. The nested tool set comprises at least one pin and at least one cannulated tool. In some embodiments, the cannula can comprise tangs that project from the distal end of the cannula. The tangs can be offset such that drilling would remove different amounts of bone relative to drilling through a centered drill guide. The cannulated tool kit generally can comprise at least one tool guide/cannula, drill bits/reamer, syringe, and/or inserter. With the pin positioned into the joint, at least one cannula is positioned over and around the pin. The channel of the cannula guides the other tools into the joint. A plurality of cannulae in a nested arrangement can be used to afford selectively sized channels for tools and/or implants based on selected cannulae configuration. Jigs can be used to facilitate the procedure. Multiple implants can be placed to immobilize the joint.



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A. CLASSIFICATION OF SUBJECT MATTER*A61B 17/58(2006.01)i, A61M 39/00(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)

IPC A61B, A61M

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 since 1975

Japanese Utility models and applications for Utility models since 1975

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

eKOMPASS(KPA, PAJ, FPD, USPATFULL) in KIPO, CA online & keywords: orthopedic, cannula, drill guide, guide pin

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2002-0143343 A1 (CASTRO) 03 October 2002 See the abstract; paragraphs [0042], [0044], [0050]-[0054]; figures 1-3, 6-11; claims 12, 15, 16	1-3, 12 4-11, 13-16, 29
Y A	US 05295980 A (ERSEK) 22 March 1994 See the abstract; column 4, lines 36-53; figures 1, 2; claim 1	1-3, 29 4-16
Y A	US 2005-0137602 A1 (ASSELL et al.) 23 June 2005 See the abstract; paragraphs [0022], [0173], [0205], [0206], [0349]-[0351]; figures 2A, 2B, 15, 31, 32A, 32B	7-9,12,15 1-6,10,11 13,14,16,29
Y A	US 2008-0009861 A1 (STARK) 10 January 2008 See the abstract; paragraphs [0041], [0047], [0048], [0050], [0055]; figures 4, 6, 12	7-9,12,15 1-6,10,11,13,14,16,29
Y A	US 2006-0190001 A1 (POWELL) 24 August 2006 See the abstract; paragraphs [0007], [0010], [0046], [0066], [0070], [0083], [0086]; figure 1; claim 1	29 1-16
A	WO 2008-011410 A2 (KYPHON INC.) 24 January 2008 See the abstract; paragraphs [0047], [0055], [0059], [0067]; claims 1, 3, 4, 13, 14, 20	1-16, 29

 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

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"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

30 SEPTEMBER 2009 (30.09.2009)

Date of mailing of the international search report

30 SEPTEMBER 2009 (30.09.2009)

Name and mailing address of the ISA/KR

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Government Complex-Daejeon, 139 Seonsa-ro, Seo-
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Facsimile No. 82-42-472-7140

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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.: 17-28, 30-32
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 17-28 and 30-32 pertain to methods for treatment of human by surgery, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
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/US2009/001198

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002-0143343 A1	03.10.2002	None	
US 05295980 A	22.03.1994	None	
US 2005-0137602 A1	23.06.2005	AU 2003-262387 A1	03.11.2003
		AU 2007-284635 A1	10.08.2007
		AU 2003-293241 A8	23.06.2004
		AU 2004-283727 A1	06.05.2005
		AU 2001-37008 A1	14.02.2001
		AU 2001-38205 A1	14.02.2001
		AU 2001-38260 A1	14.02.2001
		AU 2001-38264 A1	14.02.2001
		AU 2001-38284 A1	14.02.2001
		AU 2001-39763 A1	14.02.2001
		AU 2001-238205 A8	14.02.2001
		AU 2001-238260 A8	14.02.2001
		AU 2001-239763 A8	14.02.2001
		AU 2003-262387 A1	18.04.2003
		AU 2003-293241 A1	02.12.2003
		AU 2003-293241 A8	02.12.2003
		AU 2005-299356 A1	25.10.2005
		AU 2005-299446 A1	24.10.2005
		AU 2006-306225 A1	24.10.2006
		AU 2006-306302 A1	24.10.2006
		AU 2007-220992 A1	28.02.2007
		AU 2007-220994 A1	28.02.2007
		AU 2003-293241 A1	23.06.2004
		CA 2543295 A1	06.05.2005
		CA 2585124 A1	04.05.2006
		CA 2585463 A1	04.05.2006
		CA 2627030 A1	03.05.2007
		CA 2627167 A1	03.05.2007
		CA 2644196 A1	07.09.2007
		CA 2644160 A1	07.09.2007
		CN 101410065 A	15.04.2009
		CN 101437457 A	20.05.2009
		EP 2056721 A2	13.05.2009
		EP 1257212 A4	16.08.2006
		EP 1257213 A4	23.07.2008
		EP 1257217 A4	24.05.2006
		EP 1265538 A4	05.11.2008
		EP 1265541 A4	10.05.2006
		EP 1578315 A4	05.07.2006
		EP 1691848 A2	23.08.2006
		EP 1691848 A4	26.03.2008
		EP 1257210 A1	20.11.2002
		EP 1257212 A1	20.11.2002
		EP 1257212 B1	02.09.2009
		EP 1257213 A1	20.11.2002

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/001198

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 1257217 A2	20.11.2002
		EP 1257217 B1	09.01.2008
		EP 1265538 A2	18.12.2002
		EP 1265541 A1	18.12.2002
		EP 1265541 B1	26.11.2008
		EP 1501455 A1	02.02.2005
		EP 1578315 A2	28.09.2005
		EP 1578315 B1	18.06.2008
		EP 1814494 A2	08.08.2007
		EP 1824421 A2	29.08.2007
		EP 1945114 A2	23.07.2008
		EP 1945115 A2	23.07.2008
		EP 1993448 A2	26.11.2008
		EP 1996081 A2	03.12.2008
		EP 1257210 A4	07.03.2007
		JP 2007-516738 T	28.06.2007
		JP 04-292360 B2	17.04.2009
		JP 2003-522575 A	29.07.2003
		JP 2003-522585 A	29.07.2003
		JP 2003-522586 A	29.07.2003
		JP 2003-522588 A	29.07.2003
		JP 2009-528137 A	06.08.2009
		JP 2004-516855 A	10.06.2004
		JP 2008-517672 A	29.05.2008
		JP 2008-517675 A	29.05.2008
		JP 2009-512537 A	26.03.2009
		JP 2009-512538 A	26.03.2009
		JP 2009-528136 A	06.08.2009
		JP 2003-531648 A	28.10.2003
		KR 20060132588 A	21.12.2006
		KR 10-2007-0091116 A	07.09.2007
		KR 10-2009-0043472 A	06.05.2009
		KR 10-2008-0083265 A	17.09.2008
		KR 10-2008-0111461 A	23.12.2008
		KR 10-2008-0080505 A	04.09.2008
		NO 20062121 A	18.07.2006
		US 2005-149034 A1	07.07.2005
		US 2005-149049 A1	07.07.2005
		US 2005-149191 A1	07.07.2005
		US 06558386 B1	06.05.2003
		US 06558390 B2	06.05.2003
		US 06575979 B1	10.06.2003
		US 06740090 B1	25.05.2004
		US 06790210 B1	14.09.2004
		US 06899716 B2	31.05.2005
		US 06921403 B2	26.07.2005
		US 07014633 B2	21.03.2006
		US 07087058 B2	08.08.2006
		US 07309338 B2	18.12.2007
		US 07329259 B2	12.02.2008
		US 07473256 B2	06.01.2009

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/001198

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 07491236 B2	17.02.2009
		US 07500977 B2	10.03.2009
		US 07547317 B2	16.06.2009
		US 07547324 B2	16.06.2009
		US 07569056 B2	04.08.2009
		US 07588574 B2	15.09.2009
		US 2001-0049527 A1	06.12.2001
		US 2002-0016583 A1	07.02.2002
		US 2002-0173796 A1	21.11.2002
		US 2003-0158557 A1	21.08.2003
		US 2003-0191474 A1	09.10.2003
		US 2003-0195518 A1	16.10.2003
		US 2003-0204189 A1	30.10.2003
		US 2003-0229353 A1	11.12.2003
		US 2004-0220577 A1	04.11.2004
		US 2005-0070908 A1	31.03.2005
		US 2005-0113919 A1	26.05.2005
		US 2005-0113928 A1	26.05.2005
		US 2005-0113929 A1	26.05.2005
		US 2005-0137601 A1	23.06.2005
		US 2005-0137604 A1	23.06.2005
		US 2005-0137605 A1	23.06.2005
		US 2005-0137607 A1	23.06.2005
		US 2005-0165406 A1	28.07.2005
		US 2005-0261695 A1	24.11.2005
		US 2006-0058800 A1	16.03.2006
		US 2006-0079898 A1	13.04.2006
		US 2006-0155297 A1	13.07.2006
		US 2006-0206209 A1	14.09.2006
		US 2006-0264957 A1	23.11.2006
		US 2007-0010717 A1	11.01.2007
		US 2007-0055260 A1	08.03.2007
		US 2007-0066977 A1	22.03.2007
		US 2007-0167951 A1	19.07.2007
		US 2007-0168036 A1	19.07.2007
		US 2007-0233099 A1	04.10.2007
		US 2007-0233260 A1	04.10.2007
		US 2007-0260270 A1	08.11.2007
		US 2007-0265652 A1	15.11.2007
		US 2008-0004707 A1	03.01.2008
		US 2008-0033466 A1	07.02.2008
		US 2008-0065076 A1	13.03.2008
		US 2008-0065080 A1	13.03.2008
		US 2008-0071278 A1	20.03.2008
		US 2008-0071282 A1	20.03.2008
		US 2008-0091199 A1	17.04.2008

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/001198

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2008-0097452 A1	24.04.2008
		US 2008-0154275 A1	26.06.2008
		US 2008-0188895 A1	07.08.2008
		US 2008-0195156 A1	14.08.2008
		US 2008-0262502 A1	23.10.2008
		WO 2005-039651 A2	06.05.2005
		WO 2008-021274 A3	21.02.2008
		WO 2001-060232 A2	23.08.2001
		WO 2001-060232 A3	23.08.2001
		WO 2001-060234 A2	23.08.2001
		WO 2001-060234 A3	23.08.2001
		WO 2001-060262 A1	23.08.2001
		WO 2001-060263 A1	23.08.2001
		WO 2001-060264 A1	23.08.2001
		WO 2001-060270 A1	23.08.2001
		WO 2003-088878 A1	30.10.2003
		WO 2004-049915 A2	17.06.2004
		WO 2004-049915 A3	17.06.2004
		WO 2006-047541 A2	04.05.2006
		WO 2006-047541 A3	04.05.2006
		WO 2006-047640 A2	04.05.2006
		WO 2006-047640 A3	04.05.2006
		WO 2007-050629 A2	03.05.2007
		WO 2007-050629 A3	03.05.2007
		WO 2007-050640 A2	03.05.2007
		WO 2007-050640 A3	03.05.2007
		WO 2007-100912 A2	07.09.2007
		WO 2007-100912 A3	07.09.2007
		WO 2007-100914 A2	07.09.2007
		WO 2007-100914 A3	07.09.2007
		WO 2008-021274 A2	21.02.2008
		WO 2005-039651 A3	01.03.2007
<hr/>			
US 2008-0009861 A1	10.01.2008	None	
<hr/>			
US 2006-0190001 A1	24.08.2006	AU 2005-244927 A1	17.05.2005
		PI 0511243 A	27.11.2007
		CA 2567396 A1	01.12.2005
		CN 1988852 A	27.06.2007
		EP 1750597 A1	14.02.2007
		JP 2007-537835 T	27.12.2007
		JP 2007-537835 A	27.12.2007
		KR 10-2007-0023756 A	28.02.2007
		US 07033363 B2	25.04.2006
		US 2005-0261698 A1	24.11.2005
		WO 2005-112793 A1	01.12.2005

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/001198

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008-011410 A2	24.01.2008	AU 2007-275344 A1 EP 2046212 A2 KR 10-2009-0038459 A US 2008-0140082 A1 WO 2008-011410 A3	17.07.2007 15.04.2009 20.04.2009 12.06.2008 24.01.2008