



(43) International Publication Date
11 May 2017 (11.05.2017)

(51) International Patent Classification:

A61F 2/46 (2006.01) *A61B 17/60* (2006.01)
A61B 17/02 (2006.01) *A61B 17/66* (2006.01)

(21) International Application Number:

PCT/US2016/060676

(22) International Filing Date:

4 November 2016 (04.11.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/250,743	4 November 2015 (04.11.2015)	US
62/413,159	26 October 2016 (26.10.2016)	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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,

[Continued on next page]

(54) Title: APPARATUS FOR SPINAL RECONSTRUCTIVE SURGERY AND MEASURING SPINAL LENGTH AND INTERVERTEBRAL SPACING, TENSION AND ROTATION

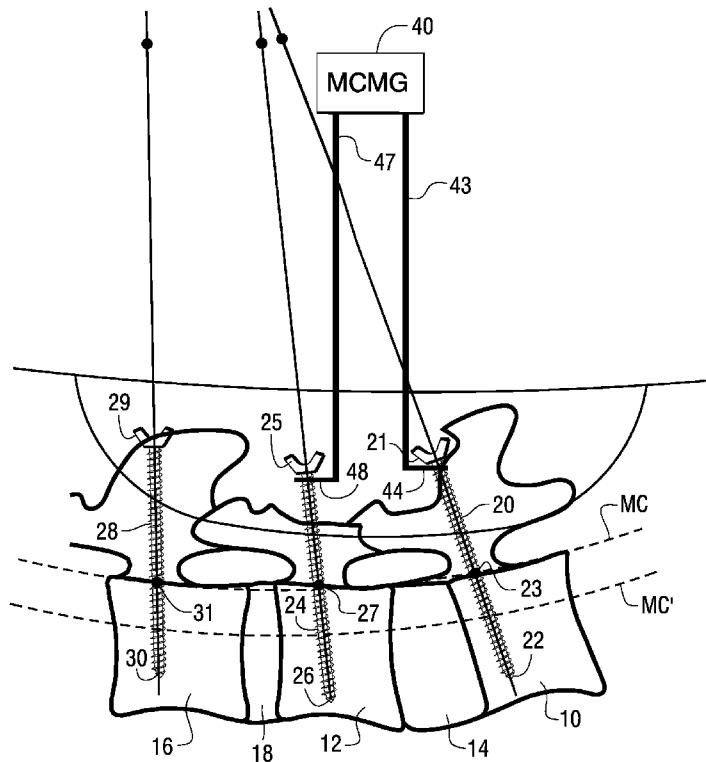


FIG. 4

(57) Abstract: Methods and apparatus are disclosed for performing spinal reconstructive surgery, including measuring spinal length in the Y-axis at the middle column, measuring intervertebral spacing in the Y-axis at the middle column, measuring intervertebral tension applied to the posterior longitudinal ligament, establishing the height of intervertebral spacers along the Y-axis at the middle column based on one or more of such measurements, measuring intervertebral rotation around the Y-axis, and measuring flexion-extension or anterior-posterior rotation around the X-axis.



TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

— *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:

8 June 2017

Published:

— *with international search report (Art. 21(3))*

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/060676

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61F2/46 A61B17/02 A61B17/60 A61B17/66
ADD.

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)
A61F A61B

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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013/079790 A1 (STEIN MARC [US] ET AL) 28 March 2013 (2013-03-28) paragraph [0053] - paragraph [0054] paragraph [0057]; figure 6 paragraph [0061]; figure 7 -----	14
A	WO 2004/089224 A2 (DEPUY SPINE INC [US]; HAWKINS JOHN RILEY [US]; STAD SHAWN D [US]; ROGE) 21 October 2004 (2004-10-21) page 17, line 15 - page 18, line 2; figures 12A-12C page 18, line 5 - page 19, line 15; figures 13A-13E -----	14
A	US 2012/035611 A1 (KAVE DOUGLAS D [US]) 9 February 2012 (2012-02-09) paragraph [0034] - paragraph [0035]; figures 6, 7 ----- -/-	14



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 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 April 2017

Date of mailing of the international search report

11/05/2017

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/060676

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/074431 A1 (SUTTON JEFFREY K [US] ET AL) 6 April 2006 (2006-04-06) paragraph [0031] - paragraph [0033]; figure 1 paragraph [0041]; figure 5 paragraph [0043] - paragraph [0044]; figures 7A-7C paragraph [0045]; figure 8 paragraph [0046]; figure 9 claim 12 -----	15
A	US 2005/203532 A1 (FERGUSON JOE W [US] ET AL) 15 September 2005 (2005-09-15) paragraph [0027]; figure 4 paragraph [0036] - paragraph [0039]; figures 11, 12 -----	15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/060676

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.: 1-13
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
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:

see additional sheet

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 fees, this Authority did not invite payment of additional fees.
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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claim: 14

An apparatus for measuring intervertebral spacing distances between adjacent vertebrae.

2. claim: 15

An intervertebral tension measuring apparatus for measuring intervertebral tension

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 1-13

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability Claims 1-13 relate to a "method of measuring in a spine of a human or animal body" comprising the step of "accessing the surgical site ". The method is thus clearly of surgical nature. No international search and no preliminary examination are required for such methods (Art. 17(2)(a)i, Rule 39.1(iv); Art. 34(4)(a)I, Rule 67.1(iv) PCT).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/060676

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