



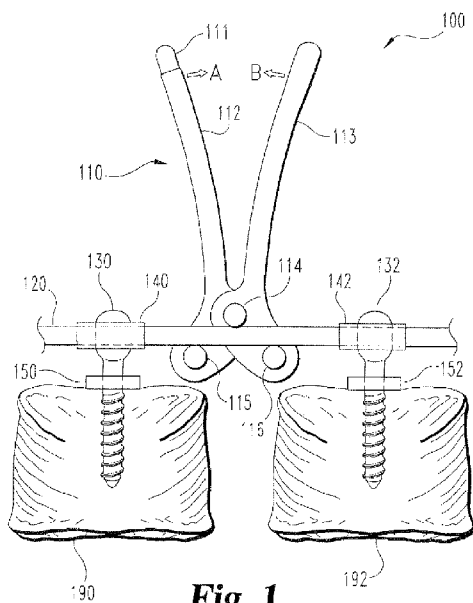
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- (71) **Applicant (for all designated States except US):** WARSAW ORTHOPEDIC, INC. [US/US]; 2500 Silveus Crossing, Warsaw, IN 46581 (US).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** MORRISON, Matthew, M. [US/US]; 8774 Lybrook Cove, Cordova, TN 38018 (US).
- (74) **Agents:** WOLFE, Thomas, S. et al.; 710 Medtronic Parkway Ms LC340, Minneapolis, MN 55432 (US).
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CA, CH, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, 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.

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  - 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:**  
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(54) **Title:** INTEGRATED FEEDBACK FOR IN-SITU SURGICAL DEVICE CONTOURING



**Fig. 1**

(57) **Abstract:** Apparatuses, systems, and methods including integrated feedback for in-situ surgical device contouring or bending are disclosed. One embodiment is a system including a bone anchor, a longitudinal member coupled with the bone anchor, an instrument adapted to bend the longitudinal member, a sensor configured to provide an output indicative of force exerted by the bone anchor on a bone coupled with the bone anchor when the instrument applies force to the longitudinal member, and an indicator configured to provide an indication when the output meets or exceeds a threshold. Another embodiment further includes a second sensor configured to provide a second output indicative of temperature of the longitudinal member and wherein the instrument is further configured to apply heat to the longitudinal member and the indicator is further configured to provide an indication when the second output meets or exceeds a second threshold.



**A. CLASSIFICATION OF SUBJECT MATTER***A61B 17/70(2006.01)i, A61B 17/86(2006.01)i, A61B 17/88(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 17/70; A61B 17/58; A61B 17/56

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) &amp; Keywords: bone anchor, feedback, sensor, dynamic, indicator

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008-0154307 A1 (COLLERAN DENNIS et al.) 26 June 2008 See paragraphs 22-26, figs. 1-5A	1-9
A	US 5672175 A1 (MARTIN; JEAN RAYMOND) 30 September 1997 See abstract, col.4 line 20- col.5 line 55, col.8 line 46-col.9 line 36, fig. 16	1-9
A	US 2005-0203518 A1 (LUTZ BIEDERMANN et al.) 15 September 2005 See figs. 6a-7, paragraphs 43-47	1-9
A	WO 2005-084567 A1 (JOINT SOLUTIONS LIMITED et al.) 15 September 2005 See abstract, claim 1, fig. 1	1-9
A	US 2008-0195154 A1 (BROWN STEVEN et al.) 14 August 2008 See abstract, figs. 3, 5, paragraphs 33-35	1-9

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

29 DECEMBER 2010 (29.12.2010)

Date of mailing of the international search report

**29 DECEMBER 2010 (29.12.2010)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
Government Complex-Daejeon, 139 Seonsa-ro, Seo-  
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

OH Seung Jae

Telephone No. 82-42-481-8469



**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.: 10-15  
because they relate to subject matter not required to be searched by this Authority, namely:  
The subject matter of claim 10 is directed to a method including a surgical procedure such as the step for coupling a bone anchor to a bone. This method falls into the category of a method for treatment of the human body by surgery, therapy or diagnostic methods. The same reasoning applies to claims 11-15, which is dependent on claim 10 [Article 17(2)(a)(i), Rule 39.1(iv) 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/US2010/031154**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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