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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, JO, JP, KE, KG, KH, 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.
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(54) Title: ORTHOPEDIC BREAK-OFF SCREWS, TOOLS FOR INSERTING SUCH SCREWS, AND RELATED SYSTEMS AND METHODS

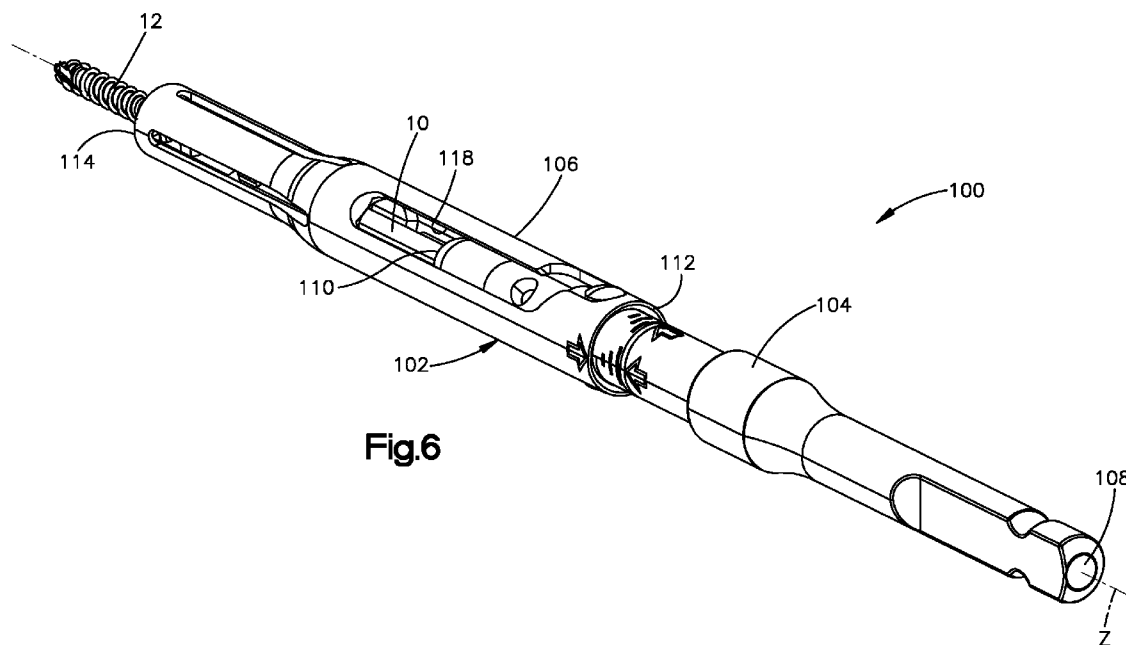


Fig.6

(57) Abstract: A system for inserting an anchor member into bone includes a receiving member and an anchor member receivable within the receiving member. The receiving member is elongate along a longitudinal axis and has a proximal end and a distal end spaced from the proximal end along the longitudinal axis. The receiving member has an internal surface that defines a transmission element. The anchor member includes an engagement element configured to rotatably engage the transmission element such that the transmission element is configured to drive the anchor member in a distal direction relative to the transmission element so as to rotatably decouple the engagement element from the transmission element. The distal direction extends from the proximal end to the distal end of the receiving member and is parallel with the longitudinal axis.



GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, 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).

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))*
- *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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INTERNATIONAL SEARCH REPORT

International application No PCT/US2017/063908

A. CLASSIFICATION OF SUBJECT MATTER INV. A61B17/88 A61B17/86 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) 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				
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 2009/149889 A1 (PETERSON SCOTT M [US] ET AL) 11 June 2009 (2009-06-11) figures 16-20 -----	1-6, 10-13,17 14-16, 18,19		
X A	US 2010/217333 A1 (MC SHANE EDWARD [US] ET AL) 26 August 2010 (2010-08-26) figure 4B -----	1,3-7 8,9		
X	US 2007/227314 A1 (ERICKSON DAVID R [US] ET AL) 4 October 2007 (2007-10-04) figure 2 -----	1,3-6		
X	US 2014/142715 A1 (MCCORMICK DANIEL FRANCIS [US]) 22 May 2014 (2014-05-22) figures 7-11B, 31B-33C -----	1,3-6, 10-13,17		
-/--				
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> </tr> </table>			"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
"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	Date of mailing of the international search report			
7 June 2018	20/06/2018			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Hamann, Joachim			

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/063908

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 2014/236247 A1 (REZACH WILLIAM ALAN [US]) 21 August 2014 (2014-08-21) paragraph [0027]; figure 2 -----	10,11,17
X	US 2016/262818 A1 (GRANGER DAREN [US] ET AL) 15 September 2016 (2016-09-15) paragraph [0027]; figure 1 -----	10,11,17
A	EP 0 857 465 A1 (DIEBOLD PATRICE FRANCOIS [FR]) 12 August 1998 (1998-08-12) figure 3 -----	19,20
A	US 2007/218750 A1 (CORRAO ERNIE [US] ET AL) 20 September 2007 (2007-09-20) the whole document -----	19
A	US 2004/243139 A1 (LEWIS DEREK S [US] ET AL) 2 December 2004 (2004-12-02) figures 13,19 -----	19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/063908

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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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. claims: 1-9

A system for inserting an anchor member into bone, wherein the engagement element of the anchor member is configured to rotatably engage the transmission element of the receiving member, and wherein the engagement element rotatably decouples from the transmission element when the anchor member is moved in a distal direction relative to the receiving member, as defined in claim 1.

2. claims: 10-18

A tool for driving an anchor member into bone during each of a first mode of operation and a second mode of operation, as defined in claim 10.

3. claims: 19, 20

A fixation element comprising a first plurality of projections and a second plurality of projections, wherein each of the projections defines a pair of opposed surfaces being substantially parallel with one another, as defined in claim 19.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2017/063908

Patent document cited in search report	A1	Publication date	Patent family member(s)	Publication date
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