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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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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))

(88) Date of publication of the international search report:  
30 March 2017

(54) Title: ROTATION ADAPTER AND RECEIVER FOR MINIMALLY INVASIVE SURGICAL DEVICES

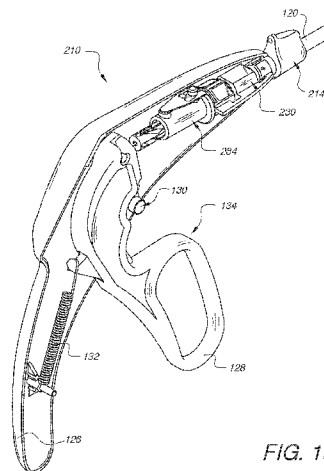
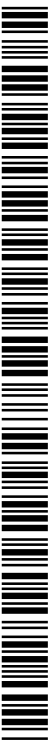


FIG. 19

(57) Abstract: A rotation adapter for a minimally invasive surgical apparatus is disclosed. The rotation adapter has a proximal journal and a distal journal. The rotation adapter also has a rotation index coupled between the proximal and distal journals. The rotation adapter further has an actuator input and an effector output. A rotation adapter receiver for a minimally invasive surgical apparatus is also disclosed. The rotation adapter receiver has opposing beams and a proximal bushing coupled between the opposing beams. The rotation adapter receiver also has a distal bushing coupled between the opposing beams. The rotation adapter receiver further has a rotation constraint coupled between the opposing beams and positioned between the proximal and distal bushings.



WO 2017/031448 A3

## INTERNATIONAL SEARCH REPORT

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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.:  
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 Supplemental Box -

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 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.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/47839

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - A61B 1/00; A61B 17/00; A61B 17/04 (2016.01) CPC - A61B 1/00; A61B 17/00; A61B/17/04; A61B 17/0469 According to International Patent Classification (IPC) or to both national classification and IPC																																											
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8) A61B 1/00; A61B 17/00; A61B 17/04 (2016.01) CPC A61B 1/00; A61B 17/00; A61B/17/04; A61B 17/0469 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8) A61B17/08, A61B17/30, A61B17/064, A61B17/068, A61B17/072, A61B17/10, A61B17/11, A61B19/00, A61B90/50 (2016.01) CPC A61B2017/306, A61B17/0467, A61B1/018, A61B17/0469, A61B1/0014, A61B2017/00296, A61B2017/0496 (keywords below) Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Google; Google Patents; PatBase. Search terms: Ti-knot Cor-knot suture fastener rotation beams adaptor proximal bushing 2 surgical receiver LSI Solutions Inc index distal journal structure split clinch stapl facet sauer jude effector direction indicator actuator input cam spring keyed slot bearing pusher knot crimper																																											
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																																											
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 6,733,218 B2 (DEL RIO et al.) 11 May 2004 (11.05.2004); entire document, especially col 4</td> <td>14</td> </tr> <tr> <td>--</td> <td>In 7-14, col 4 in 18-19, col 4 in 28-63, col 5 in 3-9, and Figs. 1-6.</td> <td>--</td> </tr> <tr> <td>Y</td> <td></td> <td>15-18, 20</td> </tr> <tr> <td>--</td> <td></td> <td>--</td> </tr> <tr> <td>A</td> <td></td> <td>19</td> </tr> <tr> <td>Y</td> <td>US 7,435,251 B2 (GREEN) 14 October 2008 (14.10.2008); entire document, especially Figs. 1-2.</td> <td>15-16</td> </tr> <tr> <td>Y</td> <td>US 7,235,086 B2 (SAUER et al.) 26 June 2007 (26.06.2007); entire document, especially Figs. 1, 4, and 7.</td> <td>17</td> </tr> <tr> <td>Y</td> <td>CA 2582964 A1 (ETHICON ENDO-SURGERY INC US) 30 September 2007 (30.09.2007); entire document, especially Fig. 11.</td> <td>18</td> </tr> <tr> <td>Y</td> <td>US 8,313,496 B2 (SAUER et al.) 20 November 2012 (20.11.2012); entire document, especially col 23 in 4-67, and Figs. 1 and 60.</td> <td>20</td> </tr> <tr> <td>A</td> <td>US 8,105,355 B2 (PAGE et al.) 31 January 2012 (31.01.2012); entire document, especially col 9 in 67, col 10 in 1-3, and Fig. 3.</td> <td>1-13</td> </tr> <tr> <td>A</td> <td>US 2010/0187283 A1 (CRAINICH et al.) 29 July 2010 (29.07.2010); entire document.</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>US 2005/0006430 A1 (WALES) 13 January 2005 (13.01.2005); entire document.</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>US 9,055,943 B2 (ZEMLOK et al.) 16 June 2015 (16.06.2015); entire document.</td> <td>1-20</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 6,733,218 B2 (DEL RIO et al.) 11 May 2004 (11.05.2004); entire document, especially col 4	14	--	In 7-14, col 4 in 18-19, col 4 in 28-63, col 5 in 3-9, and Figs. 1-6.	--	Y		15-18, 20	--		--	A		19	Y	US 7,435,251 B2 (GREEN) 14 October 2008 (14.10.2008); entire document, especially Figs. 1-2.	15-16	Y	US 7,235,086 B2 (SAUER et al.) 26 June 2007 (26.06.2007); entire document, especially Figs. 1, 4, and 7.	17	Y	CA 2582964 A1 (ETHICON ENDO-SURGERY INC US) 30 September 2007 (30.09.2007); entire document, especially Fig. 11.	18	Y	US 8,313,496 B2 (SAUER et al.) 20 November 2012 (20.11.2012); entire document, especially col 23 in 4-67, and Figs. 1 and 60.	20	A	US 8,105,355 B2 (PAGE et al.) 31 January 2012 (31.01.2012); entire document, especially col 9 in 67, col 10 in 1-3, and Fig. 3.	1-13	A	US 2010/0187283 A1 (CRAINICH et al.) 29 July 2010 (29.07.2010); entire document.	1-20	A	US 2005/0006430 A1 (WALES) 13 January 2005 (13.01.2005); entire document.	1-20	A	US 9,055,943 B2 (ZEMLOK et al.) 16 June 2015 (16.06.2015); entire document.	1-20	<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774																																										

## INTERNATIONAL SEARCH REPORT

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## \*.\* Box III.0 - Observations where unity of invention is lacking -\*.\*

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-13 directed to a rotation adaptor receiver for a minimally invasive surgical apparatus.

Group II: Claim 14-20 directed to a rotation adaptor for a minimally invasive surgical apparatus.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons.

## SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical feature of a rotation adaptor receiver, not required by the claims of Group II.

The invention of Group II includes the special technical feature of a rotation adaptor, not required by the claims of Group I.

## COMMON TECHNICAL FEATURES

Groups I and II share no common technical features.

Therefore, Groups I-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.