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- (71) Applicant: ETHICON ENDO-SURGERY, INC.  
[US/US]; 4545 Creek Road, Cincinnati, OH 45242 (US).
- (72) Inventors: PARSONS, Matthew, L.; 1306 Reed Rd.,  
Dartmouth, MA 02747 (US). LOMELI, Roman, C.; 16  
Knoll Rd., Plymouth, MA 02360 (US). PETERSON,  
Joseph, A.; 20 Spinnaker Lane, South Dartmouth, MA  
02748 (US). KIMBALL, Cory, G.; 3795 Layhigh Road,  
Hamilton, OH 45013 (US). STULEN, Foster, B.; 6245  
Bridgewater Court, Mason, OH 45040 (US). MADAN,  
Ashvani, K.; 6842 Keeneland Way, Mason, OH 45040  
(US).
- (74) Agents: PLANTZ, Bernard, F. et al.; Johnson & Johnson,  
One Johnson & Johnson Plaza, New Brunswick, NJ 08933  
(US).

- (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, 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, 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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**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i))
- 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))

[Continued on next page]

(54) Title: ULTRASONIC BONE CUTTING INSTRUMENT

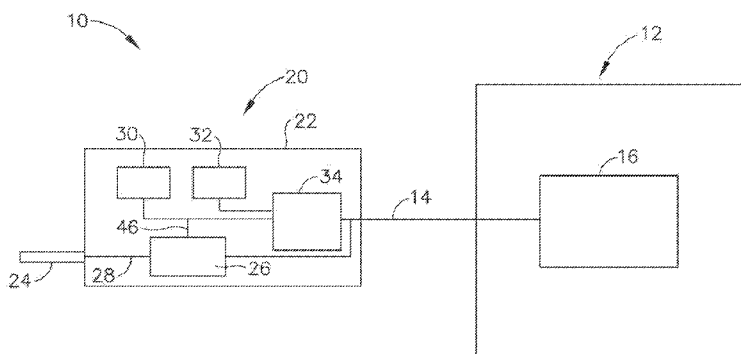


Fig.1

(57) Abstract: A system includes an ultrasonic instrument and a bone insertion element. The instrument includes an ultrasonic transducer and an ultrasonic blade. The ultrasonic transducer is operable to convert electrical power into ultrasonic vibrations. The ultrasonic blade is in acoustic communication with the ultrasonic transducer such that the ultrasonic transducer drives the ultrasonic blade to vibrate ultrasonically to form an opening within bone. The bone insertion element is configured to be inserted within the opening formed by the ultrasonic blade.





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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))*

INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2014/072050

A. CLASSIFICATION OF SUBJECT MATTER  
INV. A61B17/32  
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, 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	EP 1 938 775 A2 (DEPUY MITEK INC [US]) 2 July 2008 (2008-07-02)	1-4, 8-10,14, 15
Y	paragraphs [0025], [0030]; figures 1A-1C	5-7, 11-13
X	WO 2007/019870 A1 (A & M ELECTRIC TOOLS GMBH [DE]; FOHR DIETHARD [DE]; HESS ACHIM [DE]) 22 February 2007 (2007-02-22) abstract; figures 1-3	1
Y	US 2013/184711 A1 (RAD ABTIN JAMSHIDI [DE]) 18 July 2013 (2013-07-18) paragraph [0032]; figure 4	5-7
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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  13 August 2015	Date of mailing of the international search report  24/08/2015
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  Mayer-Martenson, E

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2014/072050

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2008/038307 A1 (PIEZOSURGERY S R L [IT]; VERCELLOTTI DOMENICO [IT]; VERCELLOTTI TOMASO) 3 April 2008 (2008-04-03) page 8, line 18 - page 9, line 7; figure 4 -----	11-13
A	US 2009/312692 A1 (COTTER DANIEL J [US] ET AL) 17 December 2009 (2009-12-17) figure 5 -----	11-13
Y	US 6 443 969 B1 (NOVAK THEODORE A D [US] ET AL) 3 September 2002 (2002-09-03) abstract; figure 3 -----	16,17
Y	EP 0 456 470 A1 (SUMITOMO BAKELITE CO [JP]) 13 November 1991 (1991-11-13) column 4, line 14 - line 30; figure 7b -----	16,17
A	US 2008/194999 A1 (YAMAHA NORIHIRO [JP] ET AL) 14 August 2008 (2008-08-14) figures 17A,17B -----	16,17
A	US 2012/095472 A1 (YOUNG MICHAEL JOHN RADLEY [GB]) 19 April 2012 (2012-04-19) figure 1E -----	16,17

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2014/072050

## 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.: 18-20  
because they relate to subject matter not required to be searched by this Authority, namely:  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
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: 1-15

System with ultrasonic blade and insertion element

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2. claims: 16, 17

Instrument with ultrasonic blade with plurality of lateral recesses

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/072050

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