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(54) Title: EXPANDABLE REAMERS

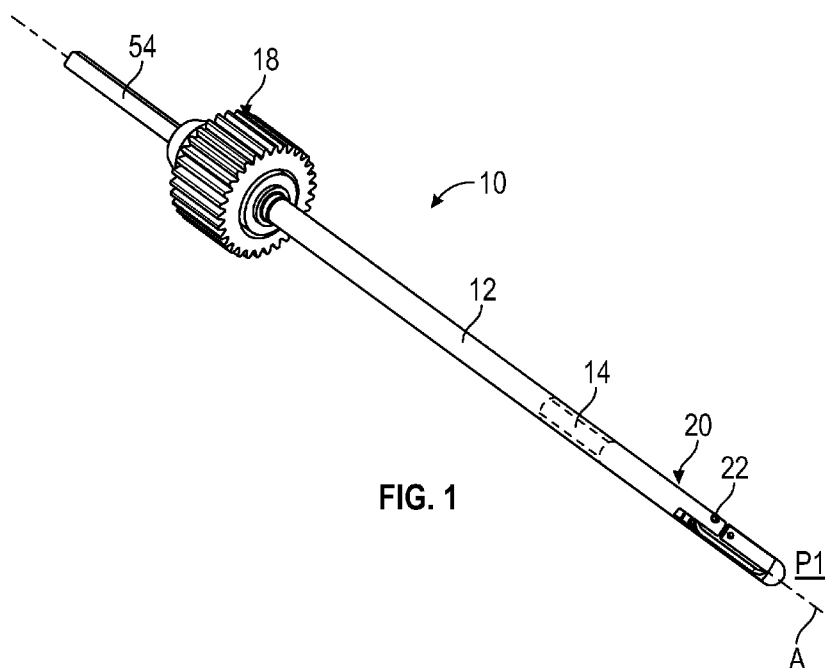


FIG. 1

(57) Abstract: An expandable reamer includes, inter alia, an outer tube, an inner shaft, a movable blade, and an actuator assembly. The expandable reamers can be used to remove diseased bone.



Published:

- *with international search report (Art. 21(3))*
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/031726

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/16
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.
Y A	EP 2 823 778 A1 (SMITH & NEPHEW INC [US]) 14 January 2015 (2015-01-14) paragraphs [0028] - [0030], [0039]; figures 1-10	2-5,7,8, 16 1,6,9-15
Y	US 2004/097947 A1 (WOLFORD TODD A [US] ET AL) 20 May 2004 (2004-05-20) paragraph [0031]; figures 1-5	2,3,7,8, 16
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Y	US 2011/238074 A1 (EK STEVEN W [US]) 29 September 2011 (2011-09-29) paragraphs [0069] - [0077]; figures 10-12	4,5
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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 20 November 2018	Date of mailing of the international search report 04/12/2018
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 Fourcade, Olivier

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/031726

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/60268 A1 (SPINEOLOGY GROUP LLC [US]; KUSLICH STEPHEN D [US]; PETERSON FRANCIS [U]) 23 August 2001 (2001-08-23) page 3, line 19 - page 5, line 15; figures 1-9	4-6
A	----- US 2005/277971 A1 (MELKENT ANTHONY J [US] ET AL) 15 December 2005 (2005-12-15) paragraphs [0038] - [0041]; figures 1,3,8	9-11
A	----- WO 2014/089198 A1 (SMITH & NEPHEW INC [US]) 12 June 2014 (2014-06-12) paragraph [0037]; figures 7a,7b -----	4-6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/031726

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.: 17-20
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. claims: 1-3, 7, 8, 12-16

Expandable reamer having a ratcheting assembly that can selectively prevent the expansion/retraction of the reamer blade.

2. claims: 4-6

Expandable reamer having a cam cap positioned within a distal portion of an outer tube.

3. claims: 9-11

Expandable reamer having a first pin movable within a helical groove including a plurality of detents.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2018/031726

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 17-20

Claims 17-20 relate to subject-matter covered by the provisions of Rule 39.1(iv) PCT (Method for treatment of the human or animal body by surgery). Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims which are also not searched.