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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

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(54) Title: DISSECTOMY DEVICES AND METHODS

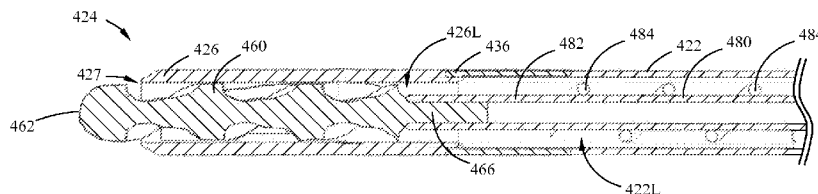


FIG. 8

(57) Abstract: A tissue removal device may comprise a handle portion and a tissue removal mechanism coupled to the handle portion. The tissue removal mechanism may include a tubular member having a lumen and an elongate member rotatably and slidably disposed within the lumen of the tubular member. A proximal end of the elongate member may be coupled to a drive source to impart rotational movement thereof. A distal end of the elongate member may include an impeller for cutting tissue. The elongate member may be configured to exit the distal end of the lumen of the first tubular member, such that the distal end of the second tubular member is distal to the distal end of the first tubular member. The impeller may include a blunt distal end to minimize tissue damage when the distal end of the elongate member is distal to the distal end of the tubular member.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 13/77300

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 17/00 (2014.01)

USPC - 606/80

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)

USPC: 606/80

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC: 606/167, 180; 433/165; 408/67, 208; 604/164.06, 164.01

IPC: A61M 17/32, 17/14, 5/178; A61C 3/02; B23B 47/00; B23G 11/00 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase; Google Patents; Google

Search Terms Used: tissue, specimen, sample, biopsy, remov*, harvest*, auger, helical, helix, screw, flute, catheter, cannula, channel, lumen, cut*, slic*, rotat*, serrat*, distal, nucleotomy, discectomy, discectomy, motor, drill, power, battery

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 5,676,545 A (JONES) 14 October 1997 (14.10.1997) fig 1, col 2, ln 54-60, col 3, ln 8-11, col 3, ln 15-21	1, 4-13 ----- 3
X	US 2006/0074425 A1 (SUTTERLIN et al) 06 April 2006 (06.04.2006) fig 1, 3, para [0044], [0048]	1-2, 14, 16
X	US 2012/0203230 A1 (ADAMS) 09 August 2012 (09.08.2012) fig 2A, 2C, 6A-6E, abstract, para [0029]	1-2, 15
Y	US 5,591,187 A (DEKEL) 07 January 1997 (07.01.1997) fig 1, col 5, ln 6-8	3

Further documents are listed in the continuation of Box C.

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|---|--|
| * Special categories of cited documents: | "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 |
| "A" document defining the general state of the art which is not considered to be of particular relevance | "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 |
| "E" earlier application or patent but published on or after the international filing date | "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 |
| "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) | "&" document member of the same patent family |
| "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 | |

Date of the actual completion of the international search 12 July 2014 (12.07.2014)	Date of mailing of the international search report 01 AUG 2014
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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. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 13/77300

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:
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 1-16 directed to a tissue removal device.

Group II: Claims 17-20 directed to a method of using a tissue removal device.

-----See Supplemental 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 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.:
1-16

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.

Continuation of Box III: Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

The inventions listed as Groups I and 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:

The invention of Group II includes the special technical feature of a method, comprising: advancing the device of claim 1 to a target tissue; advancing the elongate member such that a portion of the impeller is distal to the distal opening of the tubular member; and removing a portion of the target tissue with the tissue removal mechanism while the portion of the impeller is distal to the distal opening of the tubular member., not required in Group I.

The inventions of Groups I-II share the technical features of a device, comprising: a handle; and a tissue removal mechanism coupled to the handle, the tissue removal mechanism including: a tubular member having a lumen therethrough terminating in a distal opening; an elongate member rotatably and slidably disposed within the lumen of the tubular member, a proximal end of the elongate member coupled to a drive source to impart rotational movement thereof, a distal end of the elongate member including an impeller, the elongate member being configured to advance from the distal opening of the tubular member, such that a portion of the impeller is distal to the distal end of the tubular member. Specifically, Groups I and II are related as an apparatus (Group I) and a method for using the apparatus (Group 2). The apparatus is known in prior art as shown in US 5,676,545 A (JONES). Therefore, Groups I and II lack unity since the shared technical features do not represent a contribution over Jones:

Jones discloses a device, comprising:

a handle (portion of tube near 9 and 15, fig 1); and

a tissue removal mechanism coupled to the handle, the tissue removal mechanism including:

a tubular member (3) having a lumen therethrough terminating in a distal opening (fig 1);

an elongate member (5) rotatably and slidably disposed within the lumen of the tubular member (fig 1), a proximal end of the elongate member coupled to a drive source to impart rotational movement thereof (col 3, ln 8-11), a distal end of the elongate member including an impeller (11, fig 1, col 2, ln 59-60), the elongate member being configured to advance from the distal opening of the tubular member, such that a portion of the impeller is distal to the distal end of the tubular member (intended use - elongate member is capable of intended use, as it is sized to slide outside of distal end of tubular member).

As the common features were known in the art at the time of the invention, they cannot be considered special technical features that would otherwise unify the groups.

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