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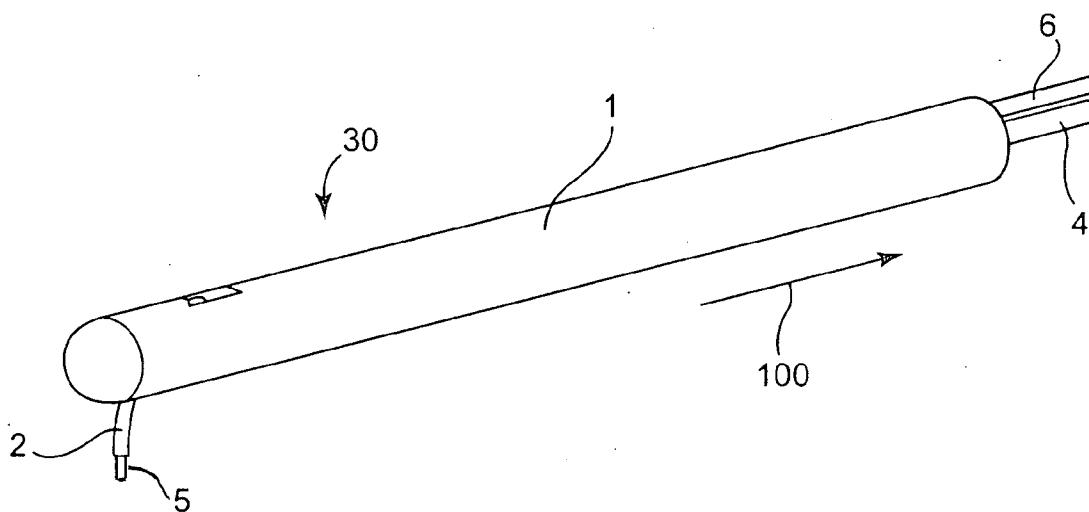
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[Continued on next page]

(54) Title: SURGICAL CUTTING DEVICES AND METHODS



(57) Abstract: The present invention provides surgical drilling devices and methods. An exemplary surgical drilling device in accordance with the present invention comprises a housing, a retractable guide tube assembly, and a flexible cable drill. The retractable guide tube assembly comprises an arcuate guide tube slidingly positioned in a first arcuate channel of the housing. The arcuate guide tube is operatively connected to an actuating rod slidingly positioned in a second channel of the housing wherein the actuating rod controllably advances and retracts the arcuate guide tube. The flexible cable drill comprises a first portion slidingly positioned in the arcuate guide tube and a second portion slidingly positioned in a third channel of the housing.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/22937

| A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - A61B 17/58, 17/60, A61F 2/00 (2008.01) USPC - 606/96 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) IPC(8) - A61B 17/58, 17/60, A61F 2/00 (2008.01) USPC - 606/96 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8) - A61B 17/58, 17/60, A61F 2/00 (2008.01) USPC - 606/96, 606/80, 408/127, 146, 158 - search terms below Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWest (USPT, PGPB, EPAB, JPAB), Google Scholar, WIPO, PubMed Search terms - Surgical drilling device, surgical drill, drill, drill guide, trocar, chisel, tube | | | | | | | | | | | | | | | | | | | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | | | | | | | | | | | | | | | | | | | | | |
| <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 ---- Y</td> <td>US 6,068,642 A (JOHNSON et al.) 30 May 2000 (30.05.2000), esp (col 6, ln 55-67), (col 2, ln 20-24), (col 3, ln 22-23 and Fig. 2), (col 8, ln 4-15), (col 11, ln 19-22), (col 13, ln 44-49)</td> <td>18-23 ---- 1-17</td> </tr> <tr> <td>Y</td> <td>US 6,342,057 B1 (BRACE et al.) 29 January 2002 (29.01.2002) entire document, especially col 5, ln 20-30</td> <td>1-14</td> </tr> <tr> <td>Y</td> <td>US 6,063,095 A (WANG et al.) 16 May 2000 (16.05.2000) entire document, especially col 14, ln 50-55 and col 15, ln 25-27</td> <td>15-17</td> </tr> <tr> <td>Y</td> <td>US 2003/0018270 A1 (MAKIN et al.) 23 January 2003 (23.01.2003), entire document, esp., para [0084]; fig 18-20.</td> <td>1-8</td> </tr> <tr> <td>Y</td> <td>US 5,895,389 A (SCHENK et al.) 20 April 1999 (20.04.1999), esp (col 6, ln 15-21), (col 4, ln 27-31)</td> <td>5,10</td> </tr> <tr> <td>A</td> <td>US 6,746,451 B2 (MIDDLETON et al.) 8 June 2004 (08.06.2004) entire document, especially Fig. 3C and col 9, ln 30-40</td> <td>1-23</td> </tr> </tbody> </table> | Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | X ---- Y | US 6,068,642 A (JOHNSON et al.) 30 May 2000 (30.05.2000), esp (col 6, ln 55-67), (col 2, ln 20-24), (col 3, ln 22-23 and Fig. 2), (col 8, ln 4-15), (col 11, ln 19-22), (col 13, ln 44-49) | 18-23 ---- 1-17 | Y | US 6,342,057 B1 (BRACE et al.) 29 January 2002 (29.01.2002) entire document, especially col 5, ln 20-30 | 1-14 | Y | US 6,063,095 A (WANG et al.) 16 May 2000 (16.05.2000) entire document, especially col 14, ln 50-55 and col 15, ln 25-27 | 15-17 | Y | US 2003/0018270 A1 (MAKIN et al.) 23 January 2003 (23.01.2003), entire document, esp., para [0084]; fig 18-20. | 1-8 | Y | US 5,895,389 A (SCHENK et al.) 20 April 1999 (20.04.1999), esp (col 6, ln 15-21), (col 4, ln 27-31) | 5,10 | A | US 6,746,451 B2 (MIDDLETON et al.) 8 June 2004 (08.06.2004) entire document, especially Fig. 3C and col 9, ln 30-40 | 1-23 | <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> |
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| <table border="1"> <tr> <td> * 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 </td> <td> "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> | | * 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 | | | | | | | | | | | | | | | | | | | |
| * 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 18 May 2008 (18.05.2008) | Date of mailing of the international search report 12 JUN 2008 | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | |

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/22937

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:

Group 1: Claims 1-14 and 18-23 are directed to the special technical feature of a retractable guide tube assembly comprising an arcuate guide tube slidingly positioned in a channel of a housing and a flexible cable drill slidingly positioned in the arcuate guide tube.

Group 2: Claims 15-17 are directed to the special technical feature of a drive motor that is translatable along a linear path relative to a housing and a disposable drive coupling having a drive shaft releasably coupled with the drive shaft of the drive motor.

None of these technical features are common to the other groups, nor do they correspond to a special technical feature in the other groups. Accordingly, unity of invention is lacking under PCT Rule 13.1.

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.