CIRCULATION AND ROTATION TOOL

A tool (100) circulates drilling fluid through and rotates a pipe string (157) while making up or breaking out a stand of pipe (171). The tool (100) includes a tubular member defining a central bore (101) having an axis (102), wherein the tubular member comprises an upper tubular member (109) and a lower tubular member (111), and wherein the upper tubular member (109) and the lower tubular member (111) are configured to alternately rotate independently and in unison. The tool (100) also includes a central bore valve (131) coupled to the upper member (109), and at least one radial valve (133) coupled to the upper tubular member (109) axially below the central bore valve (131).


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: 1 August 2013
**INTERNATIONAL SEARCH REPORT**

INTERNATIONAL APPLICATION NO
PCT/US2012/030329

A. CLASSIFICATION OF SUBJECT MATTER

INV. E21B19/16 E21B21/10

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)

E21B

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

<table>
<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>A</td>
<td>US 1 491 986 A (GREENE LORENZO H) 29 April 1924 (1924-04-29) sentences 9-20; figure 1</td>
<td>1-20</td>
</tr>
</tbody>
</table>

---

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 prior 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

- "Z" document member of the same patent family

Date of the actual completion of the international search: 10 June 2013

Date of mailing of the international search report: 18/06/2013

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: Thomas, Judith

Form PCT/ISA/210 (second sheet) (April 2005)
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 2006278434 A1</td>
<td>14-12-2006</td>
<td>AR 055334 A1</td>
<td>22-08-2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GB 2427217 A</td>
<td>20-12-2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HK 1096136 A1</td>
<td>13-03-2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MY 144833 A</td>
<td>15-11-2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PE 00662007 A1</td>
<td>31-01-2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2006278434 A1</td>
<td>14-12-2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2006133826 A1</td>
<td>21-12-2006</td>
</tr>
<tr>
<td>US 1491986 A</td>
<td>29-04-1924</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2011026035 A2</td>
<td>03-03-2011</td>
</tr>
</tbody>
</table>