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Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv))*

[Continued on next page]

(54) Title: DRILLING HEAD FOR REBORINQ A STUCK VALVE

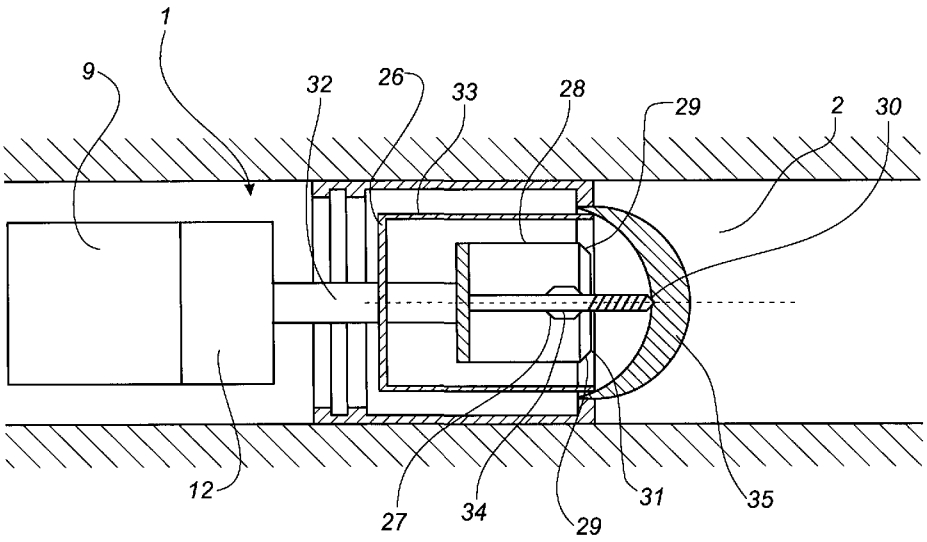


Fig. 1

(57) Abstract: The present invention relates to a drilling head (2) for reboring a stuck valve (35) or drilling into the formation downhole (36). The invention furthermore relates to a drilling tool (1) comprising the drilling head and a driving unit (9). The drilling head comprises a hole saw (28) beside a drill bit for cutting out a piece (37) from the stuck valve. Furthermore, the invention relates to a drilling system comprising the drilling tool and a driving tool for moving the drilling tool downhole; a method of drilling; and a use of the drilling head.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B11/00 E21B34/06 E21B10/26 E21B29/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. RELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E21B B28D B23B

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 207 158 A (SMIT & SONS DIAMOND TOOLS) 25 January 1989 (1989-01-25) page 4, line 17 - page 5, line 21	1-14
A	US 3 848 687 A (FUNAKUBO T) 19 November 1974 (1974-11-19) the whole document	1,2,8-14
P,A	WO 2007/084623 A (DUNCAN C WARREN [US]) 26 July 2007 (2007-07-26) page 11, paragraph 46 page 12, paragraph 49	3-7
A	US 1 542 172 A (REED WARREN B ET AL) 16 June 1925 (1925-06-16) page 2, column 1, line 14 - line 25	3-7

D Further documents are listed in the continuation of Box C.

[X] 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 document 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

[1]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

[1]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 docu¬ments, 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	Date of mailing of the international search report
7 August 2008	19/08/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Ott , Stephane

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2008/000084

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:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable 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 reportcovers 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/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,2,8-14

A downhole drilling head for mounting onto a drilling tool for reboring a stuck valve or drilling into the formation downhole, comprising:
- a hole saw having a cylindrical body with a circumferential rim
- a drill bit extending along the longitudinal axis and through the center of the cylindrical body,
the circumferential rim having a cutting edge inclining towards the longitudinal axis, so that an inner diameter of the body decreases at least 2% forming a tip diameter at a tip of the cutting edge.

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2. claims: 3-7

A downhole drilling head for mounting onto a drilling tool for reboring a stuck valve or drilling into the formation downhole, comprising:
- a hole, saw having a cylindrical body with a circumferential rim having a cutting edge,
- a drill bit extending along the longitudinal axis and through' the center of the cylindrical body,
the drill bit has a retractable projection; when drilling in the valve, the projection is retracted when it is passsed by the piece cut out by the cutting edge, the projection subsequently returning to its projected position, and the piece thus returning with the drilling bit when the drilling ends.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2008/000084

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2207158 A	25-01-1989	NONE	
US 3848687 A	19-11-1974	NONE	
WO 2007084623 A	26-07-2007	US 2007181342 A1	09-08-2007
US 1542172 A	16-06-1925	NONE	