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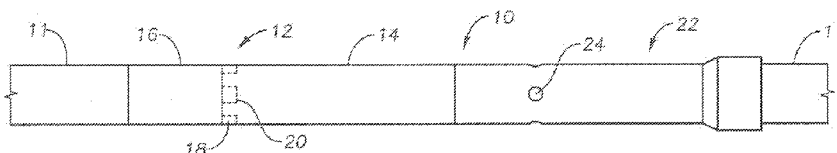
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(54) Title: A DOWNHOLE TOOL FOR USE IN A DRILL STRING



(57) Abstract: A downhole tool 10 in a drill string 11 for mitigating hazards of a blockage in an annulus of the drill string 11. The downhole tool 10 can sense blockages and selectively recirculate flow from within the annulus back to surface. Further, the downhole tool 10 is made up of segments 14, 16 that are selectively detachable from one another, so that the segments above the point of detachment are removable from a wellbore 98. A bypass sub 22 recirculates flow and includes a sleeve 44 with openings 52 in its side; when the annulus reaches a set pressure, the sleeve 44 slides to a position so the openings 52 register with ports 52 formed through a side wall 26 of the sub 22 to allow bypass flow. A processor 74 in the downhole tool 10 senses movement of the string 11, and when the string 11 is axially stationary more than a designated period of time, the processor 74 emits signals to detach the segments.



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/036096

A. CLASSIFICATION OF SUBJECT MATTER INV. 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		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 480 559 A (ARRIVAL OIL TOOLS INC [CA]) 23 November 2011 (2011-11-23) paragraphs [0004], [0019] - [0023], [0026], [0031] - [0033]; figures 1-11 -----	1-5
A	US 6 263 969 B1 (STOESZ CARL W [US] ET AL) 24 July 2001 (2001-07-24) figures 1,2 -----	1-5
A	US 7 069 991 B2 (GUDMESTAD TARALD [US] ET AL) 4 July 2006 (2006-07-04) column 5, lines 12-18 column 9, line 40 - column 10, line 7 -----	1-5
☐ 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 3 June 2014	Date of mailing of the international search report 02/09/2014	
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 Schneiderbauer, K	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/036096

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 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. :

"see additional sheet(s) "

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/036096

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2480559	A	23-11 -2011	CA 2739981 AI 29-10-2012
			GB 2480559 A 23-11-2011
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			NO 327103 BI 20-04-2009
			US 2004134664 AI 15-07-2004

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-5

A downhole sub that is selectively coupled in series with a drill string comprising: a bypass sub.

2. claims: 6-19

A downhole sub that is selectively coupled in series with a drill string comprising: a disconnect sub.
