

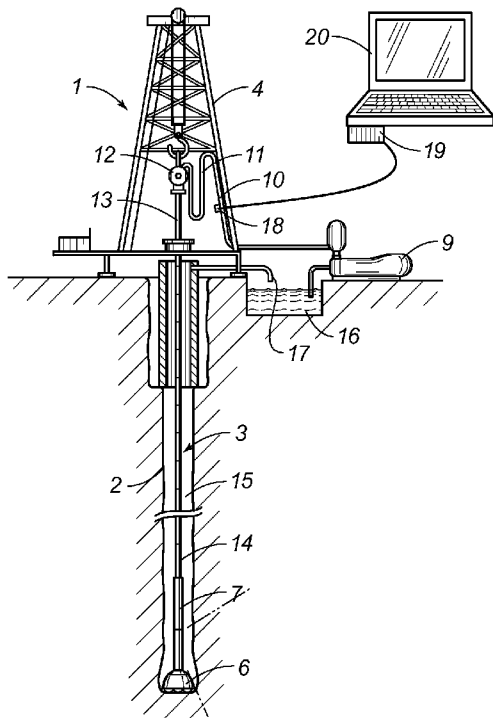


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- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,

[Continued on next page]

(54) Title: METHOD FOR A PRESSURE RELEASE ENCODING SYSTEM FOR COMMUNICATING DOWNHOLE INFORMATION THROUGH A WELLBORE TO A SURFACE LOCATION

FIG. 1



(57) Abstract: A method for a pressure release encoding system (1) for communicating downhole information through a wellbore (2) to a surface location includes positioning a valve (36) and a brake (44) in a drilling mud circulation system, initiating flow of drilling mud through the system (1), sensing flow through the valve (36) and setting the brake (44) at predefined pressure levels, sensing downhole conditions and releasing corresponding percentages of pressure across the valve at time intervals, and determining the downhole conditions at the surface by analyzing those associated time intervals. The method includes activation of the encoding system (1) using drilling mud flow and setting predefined pressure levels, so that the pressure drops in the encoding process are from predefined levels at equilibrium and independent of fluid flow.

WO 2012/094242 A3

UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(88) Date of publication of the international search report:
10 January 2013

A. CLASSIFICATION OF SUBJECT MATTER***E21B 47/12(2006.01)i, E21B 47/007(2012.01)i, E21B 44/06(2006.01)i***

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 47/12; G01V 3/00; E21B 47/18

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: valve, communicating, mud, circulation and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010-0110833 A1 (CLOSE, DAVID) 06 May 2010 See paragraphs 42,71-78, claims 11-21 and figures 1-8	1-10
A	US 7417920 B2 (HAHN, DETLEF et al.) 26 August 2008 See column 4, line 33- column 6, line 34 and figure 2	1-10
A	US 6714138 B1 (TURNER, WILLIAM EVANS et al.) 30 March 2004 See column 6, line 18 - column 7, line 24 and figures 1, 2	1-10
A	US 2008-0024319 A1 (CLOSE, DAVID) 31 January 2008 See paragraphs 32, 55-57 and figure 1-4	1-10

 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 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

12 SEPTEMBER 2012 (12.09.2012)

Date of mailing of the international search report

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Name and mailing address of the ISA/KR

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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:

Independent claims 1, 11, 15, 16, 25, 30 are directed to a method of communicating within the wellbore. However, said independent claims lack novelty/inventive step with respect to US 2010/0110833 A1 (Close, David) in that this document discloses pressure release encoding system for communicating downhole information. Accordingly, said independent claims do not share a single general inventive concept. Hence, there is lack of unity a posteriori (PCT Rule 13.1 and 13.2).

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 fee, this Authority did not invite payment of any additional fee.
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.: 1-10

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/US2011/068066

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		WO 2008-014039 A3	31.01.2008
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