

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
2 April 2009 (02.04.2009)

PCT

(10) International Publication Number
WO 2009/042781 A3

(51) International Patent Classification:
E21B 25/00 (2006.01) *E21B 49/00* (2006.01)
E21B 47/00 (2006.01) *E21B 49/02* (2006.01)

(21) International Application Number:
PCT/US2008/077698

(22) International Filing Date:
25 September 2008 (25.09.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/975,065 25 September 2007 (25.09.2007) US
12/236,295 23 September 2008 (23.09.2008) US
12/235,859 23 September 2008 (23.09.2008) US
12/236,206 23 September 2008 (23.09.2008) US

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (for all designated States except US): **BAKER HUGHES INCORPORATED** [US/US]; P.O. Box 4740, Houston, TX 77210-4740 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CASTILLO, Homero** [PE/US]; 5222 Sycamore Villas Drive, Kingwood, TX 77345 (US).

(74) Agents: **CARSON, Matt, W.** et al.; Baker Hughes Incorporated, P.o. Box 4740, Houston, TX 77210-4740 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

Declarations under Rule 4.17:

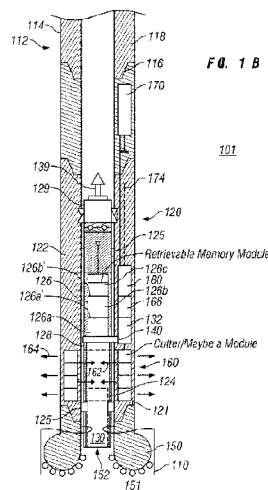
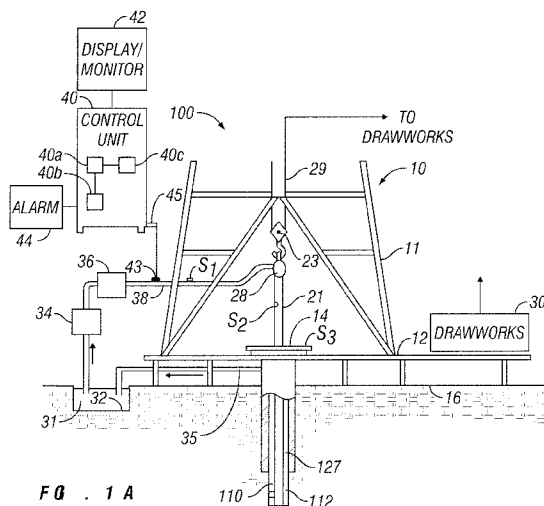
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
2 July 2009

(54) Title: APPARATUS AND METHODS FOR CONTINUOUS TOMOGRAPHY OF CORES



(57) Abstract: A method of estimating a property of interest downhole according to one aspect of the disclosure may include continuously receiving a core drilled from a formation into an open end of a chamber while removing the core distal from the open end of the chamber; obtaining a measurement relating to property of interest of the core using at least one sensor; and estimating the property of interest of the core using the obtained measurement.

WO 2009/042781 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/077698

A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B25/00 E21B47/00 E21B49/00 E21B49/02

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 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. |
|-----------|--|-----------------------|
| X | US 5 984 023 A (SHARMA MUKUL M [US] ET AL) 16 November 1999 (1999-11-16) column 3, line 60 - column 4, line 61 the whole document | 1-19 |
| A | US 2005/199393 A1 (GOLDBERG DAVID S [US] ET AL) 15 September 2005 (2005-09-15) page 4, paragraph 66 - paragraph 71 | 1-19 |
| A | US 2004/007387 A1 (BAR-COHEN YOSEPH [US] ET AL) 15 January 2004 (2004-01-15) the whole document | 1-19 |
| A | GB 2 305 679 A (SCHLUMBERGER LTD [US]) 16 April 1997 (1997-04-16) the whole document | 1-19 |
| | ----- -/-- | |

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 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

- *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

Date of mailing of the international search report

29 April 2009

14/05/2009

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

Morrish, Susan

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/077698

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| A | US 6 655 220 B1 (REIFFSTECK PHILIPPE [FR]) 2 December 2003 (2003-12-02) the whole document ----- | 1-19 |
| A | US 6 659 204 B2 (AUMANN JAMES T [US] ET AL) 9 December 2003 (2003-12-09) the whole document ----- | 1-19 |
| A | US 5 333 686 A (VAUGHAN SUSANNE F [US] ET AL) 2 August 1994 (1994-08-02) the whole document ----- | 1-19 |
| A | US 5 301 759 A (RUHLE JAMES L [US]) 12 April 1994 (1994-04-12) the whole document ----- | 1-19 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

| |
|---|
| International application No PCT/US2008/077698 |
|---|

| Patent document cited in search report | A | Publication date | Patent family member(s) | Publication date |
|--|----|------------------|---|--|
| US 5984023 | A | 16-11-1999 | NONE | |
| US 2005199393 | A1 | 15-09-2005 | US 2007107939 A1 | 17-05-2007 |
| US 2004007387 | A1 | 15-01-2004 | NONE | |
| GB 2305679 | A | 16-04-1997 | AU 712046 B2 AU 6791796 A CA 2186691 A1 NO 963861 A US 5667025 A ZA 9607799 A | 28-10-1999 10-04-1997 30-03-1997 01-04-1997 16-09-1997 11-04-1997 |
| US 6655220 | B1 | 02-12-2003 | AT 352030 T CA 2390023 A1 EP 1226417 A1 WO 0133194 A1 FR 2800871 A1 JP 2003526089 T | 15-02-2007 10-05-2001 31-07-2002 10-05-2001 11-05-2001 02-09-2003 |
| US 6659204 | B2 | 09-12-2003 | AU 5097299 A WO 0006866 A1 US 6216804 B1 US 6230825 B1 US 6305482 B1 US 6378631 B1 US 2002033281 A1 | 21-02-2000 10-02-2000 17-04-2001 15-05-2001 23-10-2001 30-04-2002 21-03-2002 |
| US 5333686 | A | 02-08-1994 | NONE | |
| US 5301759 | A | 12-04-1994 | NONE | |