(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 August 2007 (30.08.2007)

PCT

(10) International Publication Number
WO 2007/098312 A3

(51) International Patent Classification:
E21B 47/06 (2006.01)

(21) International Application Number:
PCT/US2007/061491

(22) International Filing Date: 1 February 2007 (01.02.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/356,466 16 February 2006 (16.02.2006) US

(71) Applicant *(for all designated States except US)*: **WELL-DYNAMICS, B.V.** [NL/NL]; Weversbaan 1-3, Leiderdorp (NL).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **JOHNSON, David, O.** [US/US]; 20334 Brightonwood Lane, Spring, TX 77379 (US). **SIERRA, Jose** [PE/US]; 3219 Brinmont Place Lane, Katy, TX 77494 (US). **DAVID, Christopher, L.** [US/US]; 10604 Ascot Crossing, Bakersfield, CA 93311 (US).

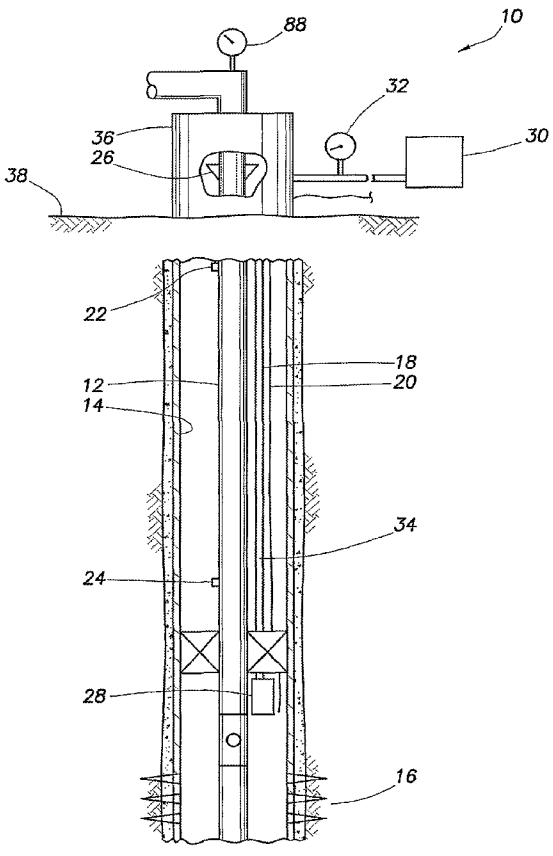
(74) Agent: **SMITH, Marlin, R.**; Smith IP Services, P.C., P.O. Box 997, Rockwall, TX 75087 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, LV, LY, MA, MD, 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, 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, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: SINGLE POINT AND FIBER OPTIC TEMPERATURE MEASUREMENT FOR CORRECTION OF A GAS COLUMN WEIGHT IN A WELL



(57) Abstract: Fluid column weight correction using discrete point and fiber optic temperature measurement. A method for determining pressure at a distal end of a fluid column in a well includes the steps of: dividing the fluid column into multiple segments; determining a temperature of each segment; and determining a pressure and density for each segment. Another method includes the steps of : determining the temperature of each segment by measuring a temperature in the well near a proximal end of the fluid column, and using the measured temperature in conjunction with a thermal wellbore model to generate a temperature profile of the fluid column. Another method includes the steps of: causing a pressure change in the fluid column; recording multiple pressure measurements during the pressure change; and generating a temperature profile of the fluid column for each of the pressure measurements.

WO 2007/098312 A3

Published:
— *with international search report*

(88) Date of publication of the international search report:
19 June 2008

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US07/61491

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - E21B 47/06 (2007.01)
USPC - 73/152.51
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)
IPC(8) - E21B 47/06 (2007.01)
USPC - 73/152.51

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)
MicroPatent

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,176,323 B1 (WEIRICH et al) 23 January 2001 (23.01.2001) entire document	1, 4-12
A	US 6,206,108 B1 (MACDONALD et al) 27 March 2001 (27.03.2001) entire document	1-13
A	US 4,491,016 A (HAEFNER) 01 January 1985 (01.01.1985) entire document	1-13

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

* 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	Date of mailing of the international search report
20 September 2007	21 FEB 2008
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2007)