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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 February 2008 (07.02.2008)

PCT

(10) International Publication Number
WO 2008/016876 A2

(51) International Patent Classification:
E21B 47/00 (2006.01)

(21) International Application Number:
PCT/US2007/074736

(22) International Filing Date: 30 July 2007 (30.07.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/496,322 31 July 2006 (31.07.2006) US

(71) Applicant *(for all designated States except US)*: **CHEVRON U.S.A. INC.** [US/US]; 6001 Bollinger Canyon Road - 3rd Floor, San Ramon, CA 94583 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **CRAWLEY, Charles Milton** [US/US]; 16819 Winnstream Lane, Sugar Land, Texas 77478 (US). **MOCA, Steve M.** [US/US]; 5411 Black Avenue #1, Pleasanton, California 94566 (US). **KUTLIK, Roy Lester** [US/US]; 5969 Westover Drive, Oakland, California 94611 (US).

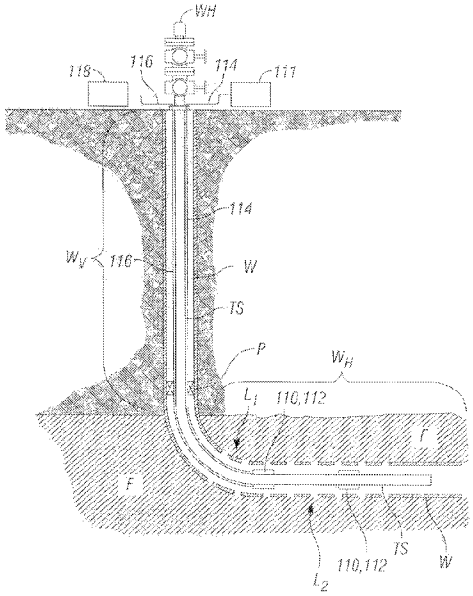
(74) Agents: **CHRISTIAN, Steven L.** et al.; Chevron Corporation - Law Department, Post Office Box 6006, San Ramon, California 94583-0806 (US).

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

Published:
— *without international search report and to be republished upon receipt of that report*

(54) Title: FLUID FLOWRATE DETERMINATION



(57) Abstract: A method and apparatus are υsefυ! for determining the flow rate of fluid flowing within a passage. The method comprises the step of measuring the equilibrium temperature of a location of interest within or proximate to the passage within which fluid flows. The temperature of the location of interest is perturbed to a second temperature, and the temperature of the location of interest is then allowed to return to its equilibrium temperature. The temperature of the location of interest is monitored as it transitions between the second temperature and the equilibrium temperature. The monitored temperature transition is then used to determine the flow rate of the fluid flowIng within the passage.

WO 2008/016876 A2