



- (51) **International Patent Classification:**
G06N 7/00 (2006.01)
- (21) **International Application Number:**
PCT/US2013/057356
- (22) **International Filing Date:**
29 August 2013 (29.08.2013)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
13/600,406 31 August 2012 (31.08.2012) US
- (71) **Applicants:** **CHEVRON U.S.A. INC.** [US/US]; 6001 Bollinger Canyon Road, San Ramon, California 94583 (US). **LAWRENCE LIVERMORE NATIONAL SECURITY, LLC** [US/US]; 2300 First Street, Suite 204, Livermore, CA 94550 (US).
- (72) **Inventors:** **HOVERSTEN, Gary Michael**; 3345 Ridge Road, Lafayette, California 94549 (US). **TRAIN-OR-GUITTON, Whitney**; 4062 Walnut Drive, Pleasanton, California 94566 (US).
- (74) **Agents:** **BARUFKA, Jack S.** et al.; Pillsbury Winthrop Shaw Pittman LLP, P.O. Box 10500, McLean, Virginia 22102 (US).
- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, 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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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,

[Continued on next page]

- (54) **Title:** SYSTEM AND METHOD FOR DETERMINING A PROBABILITY OF WELL SUCCESS USING STOCHASTIC INVERSION

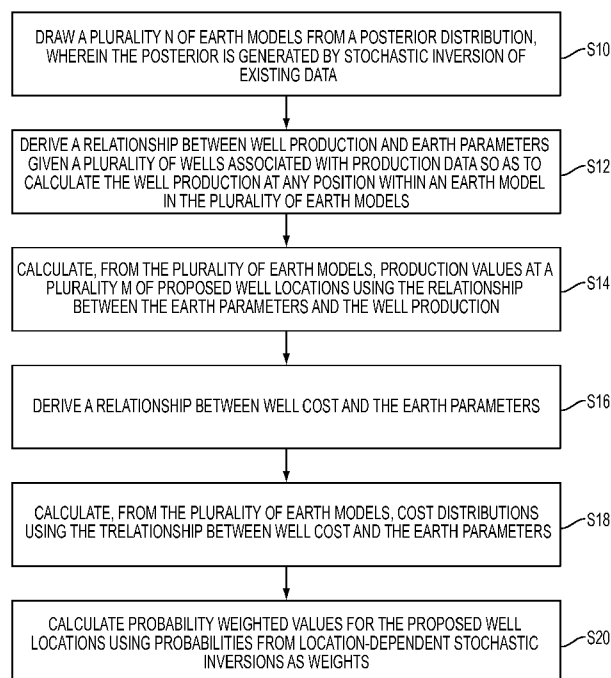


FIG. 3

(57) **Abstract:** A system and a computer implemented method for determining a best well location from a plurality of possible well locations are described herein. The method includes drawing a plurality of earth models from a posterior distribution, wherein the posterior distribution is generated by stochastic inversion of existing data; calculating a well production at a plurality of proposed well locations within an earth model in the plurality of earth models using a relationship between the well production and earth parameters; calculating from the plurality of earth models, cost distributions using the relationship between well cost and the earth parameters; and calculating probability weighted values for the proposed well locations using probabilities from location dependent stochastic inversions as weights.



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

Published:

— *with international search report (Art. 21(3))*

(88) Date of publication of the international search report:

21 August 2014