



(51) International Patent Classification:

E21B 44/00 (2006.01) E21B 47/00 (2012.01)
E21B 44/02 (2006.01)

(21) International Application Number:

PCT/US2014/011998

(22) International Filing Date:

17 January 2014 (17.01.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/837,986 21 June 2013 (21.06.2013)

US

(71) Applicant: **LANDMARK GRAPHICS CORPORATION** [US/US]; 2107 City West Boulevard, Building 2, Houston, TX 77042 (US).

(72) Inventors: **SAMUEL, Robello**; 11306 Dawnheath Dr., Cypress, TX 77433 (US). **WANG, Zhenying**; 1318 Blue-stone Dr., Missouri City, TX 77459 (US).

(74) Agents: **KRUEGER, Daniel, J.** et al.; Krueger Iselin LLP, P.O. Box 1906, Cypress, TX 77410-1906 (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, IR, 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.

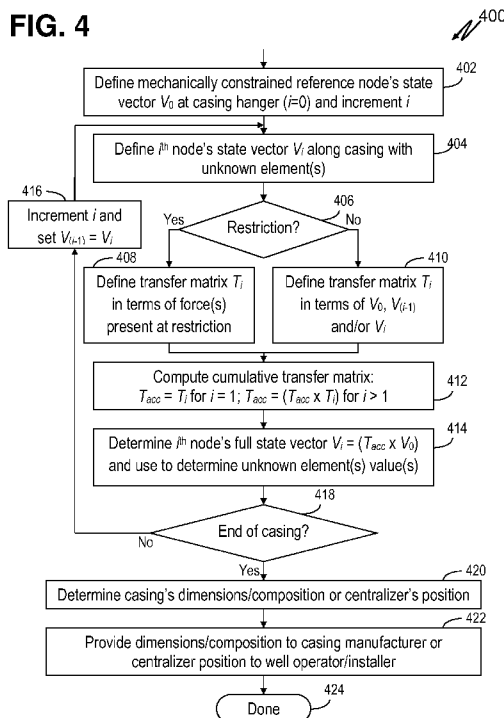
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE,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

Published:

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

(54) Title: METHODS AND SYSTEMS FOR DETERMINING MANUFACTURING AND OPERATING PARAMETERS FOR A DEVIATED DOWNHOLE WELL COMPONENT

FIG. 4



(57) Abstract: Systems and methods for determining manufacturing or operating parameters for a deviated downhole well component, including a method that includes representing a tubular string as nodes separated by segments, determining transfer matrices for determining an i^{th} node's state vector from an $i^{th}-1$ node's state vector, and defining initial state vector values for the reference node. The nodes are numerable from 1 to N with an initial, mechanically constrained reference node representable with $i = 0$, and each is associated with a state vector describing a corresponding node position and one or more forces present at said node. The method further includes applying the transfer matrices to obtain each of the state vectors' values, deriving from at least one of the state vectors a parameter value for said component, and specifying a component having said parameter value. The parameter value can include a centralizer or stabilizer composition, manufacturing dimensions, or position.