

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
07 July 2022 (07.07.2022)



(10) International Publication Number
WO 2022/146453 A1

(51) International Patent Classification:

E21B 43/16 (2006.01) *E21B 34/14* (2006.01)
E21B 43/12 (2006.01) *E21B 34/06* (2006.01)
E21B 33/124 (2006.01)

(21) International Application Number:

PCT/US2021/012499

(22) International Filing Date:

07 January 2021 (07.01.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/138,228 30 December 2020 (30.12.2020) US

(71) Applicant: **HALLIBURTON ENERGY SERVICES, INC.** [US/US]; 3000 N. Sam Houston Parkway E., Houston, Texas 77032-3219 (US).

(72) Inventors: **MAHENDRAN, Mathusan**; Rua Paulo Emidio Barbosa, 485, 630204 Rio De Janeiro (BR). **LEMUS TORRES, Luis Fernando**; Rua Lauro Muller, 26/910, H118389 Rio De Janeiro (BR). **RODRIGUES, Desiderio Naegle**; Av Jose Passos De Souza Junior, 18, 468855 Macae (BR).

(74) Agent: **TUMEY, Corey S.**; P.O. Box 890226, Houston, Texas 77062-9998 (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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, 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, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, ST, 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: PHASE TRANSFORMATION MATERIAL DELIVERY AND DEPLOYMENT CHASSIS FOR OPENHOLE ISOLATION

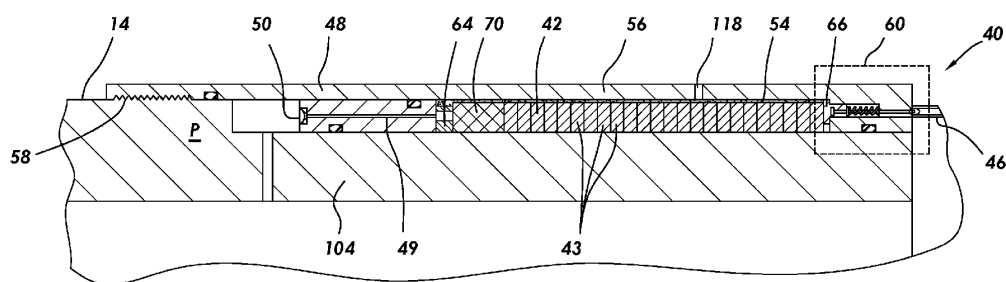


FIG. 5

(57) Abstract: An openhole interval of a well may be sealed by deploying a liquified phase transformation material to the openhole interval and allowing it to harden. In at least one example, this may be performed in a single step of building and maintaining pressure. The pressure may rupture a membrane, to introduce a fluid into a chamber with a reactive material (e.g. powder) in a delivery chassis, whereupon the fluid may exothermically combine with the reactive material to liquify the solid phase transformation material. The same applied pressure may also deliver the liquified phase transformation material to a deployment chassis, which then distributes the liquified phase transformation material under pressure to the openhole interval of the well. Various delivery chassis, deployment chassis, and related compositions and methods are disclosed as well.

WO 2022/146453 A1