

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 June 2022 (23.06.2022)



(10) International Publication Number
WO 2022/132187 A1

(51) International Patent Classification:

E21B 34/08 (2006.01) *E21B 43/12* (2006.01)
E21B 33/127 (2006.01) *E21B 43/26* (2006.01)

(21) International Application Number:

PCT/US2020/067125

(22) International Filing Date:

28 December 2020 (28.12.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/124,666 17 December 2020 (17.12.2020) US

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

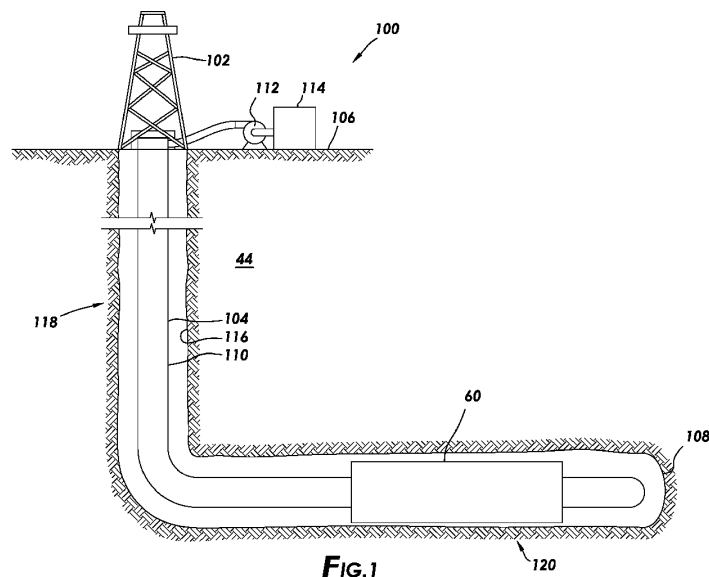
(72) Inventor: **NEWTON, Daniel Craig**; 28 HUA GUAN AVE, SINGAPORE 58912 (SG).

(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,

(54) Title: FLUID ACTIVATED METAL ALLOY SHUT OFF DEVICE



(57) Abstract: A variety of methods, systems, and apparatus are disclosed. In one example, a well tool is deployed downhole on a conveyance (e.g., tubing string) with the well tool in an open condition, wherein a flow path of the tool is in fluid communication with the tubing string. A swellable metallic material is arranged along the flow path. A service operation may be performed while the tool is in the open condition, including flowing a well fluid down the tubing string and through the flow path of the tool. After performing the service operation, an activation fluid may be delivered downhole to the well tool to activate the swellable metallic material to close the flow path of the tool.

[Continued on next page]

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))*