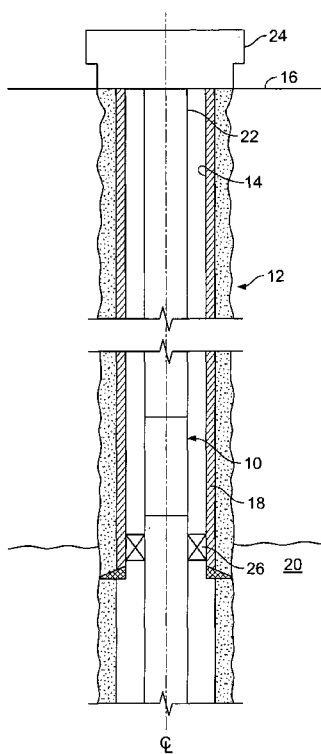




- (51) International Patent Classification:
E21B 34/08 (2006.01) *F16K 15/04* (2006.01)
- (21) International Application Number:
PCT/US2012/037417
- (22) International Filing Date:
11 May 2012 (11.05.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
13/117,905 27 May 2011 (27.05.2011) US
- (71) Applicant (for all designated States except US): **HAL-LIBURTON ENERGY SERVICES, INC.** [US/US]; 10200 Bellaire Blvd., Houston, Texas 77072 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **RINGGENBERG, Paul David** [US/US]; 2118 Goliad Circle, Frisco, Texas 75034 (US).
- (74) Agents: **GRISWOLD, Joshua A.** et al.; Fish & Richardson P.C., P.O. Box 1022, Minneapolis, Minnesota 55440 (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, 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, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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: BALL VALVE



(57) Abstract: A ball valve includes a first ball clamping assembly that defines a first seat surface in contact with an exterior of the ball. A second ball clamping assembly defines a second, sealing seat surface in contact with and adapted to seal with the exterior of the ball. The second ball clamping assembly is coupled to the first ball clamping assembly to clamp the ball between the first and second seat surfaces. The second ball clamping assembly includes a seat ring holder and a seat ring carried by the seat ring holder. The seat ring of the second ball clamping assembly has a sealing seat surface. A springing member is provided between the seat ring and the seat ring holder and springingly biases the seat ring toward the ball. The seat ring holder has a shoulder that supports the seat ring against fully compressing the springing member.



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

Published:

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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

— 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))

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

24 January 2013