



(43) International Publication Date
21 August 2014 (21.08.2014)

- (51) International Patent Classification:
E21B 10/43 (2006.01) *E21B 10/573* (2006.01)
- (21) International Application Number:
PCT/US2013/071228
- (22) International Filing Date:
21 November 2013 (21.11.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
13/766,166 13 February 2013 (13.02.2013) US
- (71) Applicant: VAREL INTERNATIONAL IND., L.P.
[US/US]; 1625 West Crosby, Suite 124, Carrollton, TX
75006 (US).
- (72) Inventor: LEBECK, Alan, Otto; 1006 Tramway Lane
NE, Albuquerque, NM 87122 (US).
- (74) Agents: SZUWALSKI, Andre, M. et al.; Gardere Wynne
Sewell LLP, 1601 Elm Street, Suite 3000, Dallas, TX
75201-4761 (US).
- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

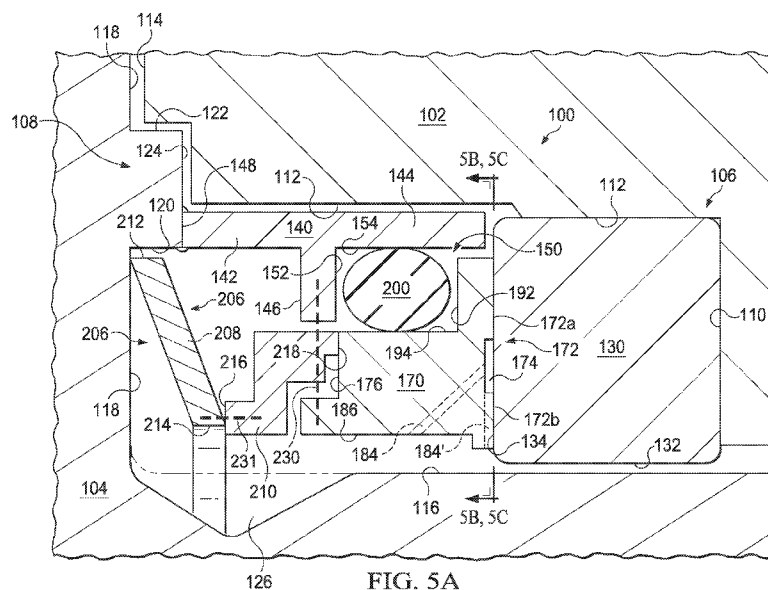
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, 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: ROCK BIT HAVING A PRESSURE BALANCED METAL FACED SEAL



(57) Abstract: A sealing system includes a first gland in a cone and a first ring mounted in the first gland. A second ring is mounted to a shaft region. A third ring is positioned between the first and second rings. The first and third rings present a pair of metal seal faces. A second gland is formed between the second and third rings, with an o-ring sealing member installed within the third gland and radially compressed in a sealing relationship between the second and third rings. The second gland is sized to permit axial movement of the o-ring sealing member within the second gland in response to pressure changes. An energizer is configured to exert an axial force against the third ring so as to keep the metal seal faces in sealing contact. The axial force is applied at a radial position corresponding to a radial center of the metal seal faces.