



(51) International Patent Classification:
E21B 17/07 (2006.01) *F16F 7/12* (2006.01)

(21) International Application Number:
PCT/US2009/037656

(22) International Filing Date:
19 March 2009 (19.03.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/054,592 25 March 2008 (25.03.2008) US

(71) Applicant (for all designated States except US): **BAKER HUGHES INCORPORATED** [US/US]; P. O. Box 4740, Houston, TX 77210-4740 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WAGNER, Alan, N.** [US/US]; 3746 South 194 East Avenue, Broken Arrow, OK 74014 (US). **COGHILL, Anthony, S.** [US/US]; 3017 East 2nd Street, Tulsa, OK 74104 (US).

(74) Agent: **DUPHORNE, Darin, H.**; Baker Oil Tools Division-Baker Hughes Incorporated, Division Intellectual Property Counsel, P.O. Box 4740, Houston, TX 77210-4740 (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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (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, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- 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))

(54) Title: DOWNHOLE SHOCK ABSORBER WITH CRUSHABLE NOSE

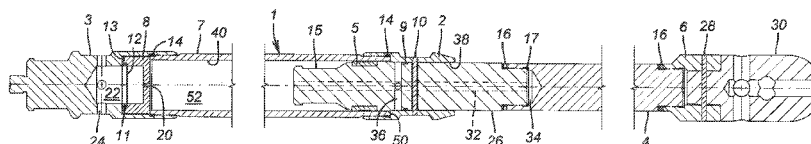


FIG. 1

(57) Abstract: A downhole shock absorber preferably is filled with well fluid in a chamber that is reduced in volume due to impact. A rupture disc can hold the initial non-compressible liquid charge until impact. Upon impact, the rupture disc breaks to allow the fluid to be forced through an orifice to absorb some of the shock that occurs when a string hits a fixed object after dropping in the wellbore. The nose of the shock absorber is a soft material that has voids so that the combination of the softness of the material and the voids allow the nose to reshape until it encounters a surrounding tubular wall and then to collapse inwardly into the voids, making it simple to remove. The nose is releasably mounted to the shock absorber so the two can separate if the nose gets stuck after impact.

