

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 October 2006 (05.10.2006)

PCT

(10) International Publication Number
WO 2006/104885 A3

(51) International Patent Classification:
E21B 10/54 (2006.01)

(21) International Application Number:
PCT/US2006/010775

(22) International Filing Date: 24 March 2006 (24.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/090,932 25 March 2005 (25.03.2005) US

(71) Applicant (for all designated States except US): **BAKER HUGHES INCORPORATED** [US/US]; 3900 Essex Lane, Suite 1200, Houston, TX 77027 (US).

(72) Inventors: **ZAHRADNIK, Anton, F.**; 227 Burkwood Court, Sugarland, TX 77479 (US). **SULLIVAN, Eric, C.**; 10714 Sage Canyon, Houston, TX 77089 (US). **SMITH, R., Scot**; 15305 Louisiana Highway 331, Erath, LA 70533 (US). **RUFF, Daniel, E.**; 5202 Manner Glen, Kingwood,

TX 77345 (US). **ROBERTS, Danielle, V.**; 1069 Prestwick Circle SE, Calgary, Alberta T2Z 3M2 (CA). **ROBERTS, Danielle**; 1069 Prestwick Circle Se, Calgary, Alberta T2Z 3M2 (CA).

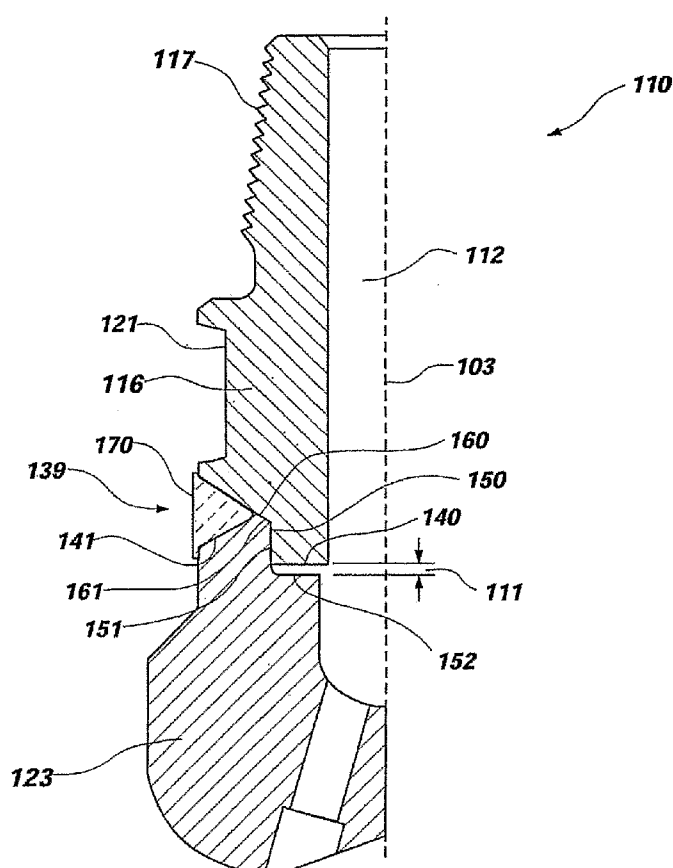
(74) Agents: **WELBORN, Brian, S.** et al.; Baker Hughes Incorporated, 3900 Essex Lane, Suite 1200, Houston, TX 77027 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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),

[Continued on next page]

(54) Title: ROTARY DRILL BIT SHANK, ROTARY DRILL BITS SO EQUIPPED, AND METHODS OF MANUFACTURE



(57) Abstract: A shank configuration for rotary drill bits, is disclosed for positioning of the shank in relation to the bit body. A tapered surface or feature of the shank may be configured and sized to matingly engage a complementarily shaped surface or feature of the drill bit body and thereby become centered or positioned in relation thereto. A deformable element may be disposed between the shank and bit body. Also, the shank may comprise a material having a carbon equivalent of less than about 0.35%. A multi-pass weld procedure may be employed to affix the shank and bit body to one another wherein welds may be formed so that one weld originates at a circumferential position that differs from the origination circumferential position of its immediately preceding weld by at least about 90°. Further, a stress state may be developed within the multi-pass weld. A method of manufacture is also disclosed.



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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))*

Published:

- *with international search report*

(88) Date of publication of the international search report:
19 July 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.