



- (51) International Patent Classification:
E21B 17/08 (2006.01) E21B 17/042 (2006.01)
F16L 15/00 (2006.01)
- (21) International Application Number:
PCT/US2013/055745
- (22) International Filing Date:
20 August 2013 (20.08.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
13/593,932 24 August 2012 (24.08.2012) US
- (71) Applicant: VETCO GRAY INC. [US/US]; 4424 West Sam Houston Pkwy North, Suite 100, Houston, TX 77041 (US).

- (72) Inventors: DO, Vinh, K.; 6904 SW 33rd Street, Oklahoma City, OK 73179 (US). PALLINI, Jr., Joseph, William; 15627 Birchview Drive, Tomball, TX 77377 (US). O'DELL, Kevin, Edward; 3623 Winstrome Court, Katy, TX 77449 (US).
- (74) Agents: DOMBROWSKI, Joanna, M. et al.; General Electric Company, Global Patent Operation, 2 Corporate Drive, Suite 648, Shelton, CT 06484 (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, 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.

[Continued on next page]

(54) Title: ELLIPTICAL UNDERCUT SHOULDER FOR SPECIALTY PIPE CONNECTORS

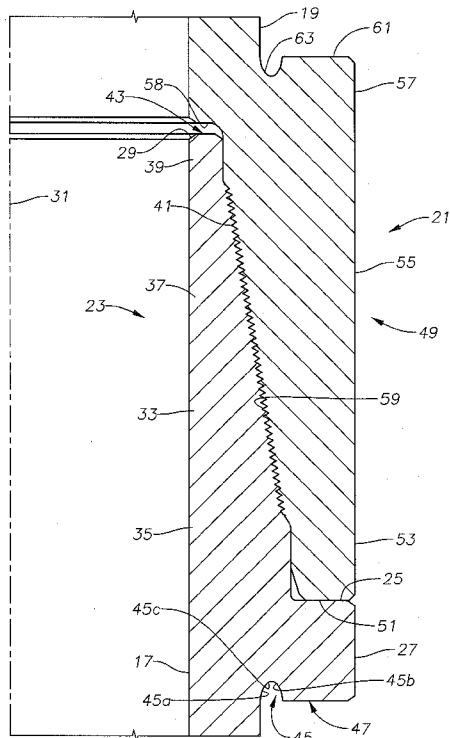


Fig. 2

(57) Abstract: A tubular connector connects two tubulars of a string of tubular members. The tubular connector has a pin end tubular member having an axis and a pin end. A pin end flange is positioned on an outer diameter of the pin end and has an undercut adjacent the union of the pin end flange with the pin end. The tubular connector also has a box end tubular member having a box end. A box end shoulder is adjacent the union of the box end with the box end tubular member. The box end shoulder has an undercut thereon. The pin end is secured to the box end so that the pin end tubular member and the box end tubular member are joined, stresses applied to the pin end tubular member and the box end tubular member are distributed through the undercuts.



(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).

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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))

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

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

7 August 2014

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/055745

A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B17/042 E21B17/08 F16L15/00
ADD.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
E21B F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1 223 591 A (LAYNE MAHLON E [US]) 24 April 1917 (1917-04-24) the whole document figures 1,8,9	1-20
X	US 4 572 549 A (SIDWELL DEREK [US]) 25 February 1986 (1986-02-25) figure 1 the whole document	1-20
A	US 3 345 084 A (HANES JAMES W E ET AL) 3 October 1967 (1967-10-03) the whole document	1,9,16
A	US 4 892 337 A (GUNDERSON RICHARD H [US] ET AL) 9 January 1990 (1990-01-09) the whole document	1,9,16
	----- -/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>
---	---

Date of the actual completion of the international search 2 June 2014	Date of mailing of the international search report 11/06/2014
--	--

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer van Berlo, André
--	--

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/055745

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 94/29565 A1 (SHELL INT RESEARCH [NL]) 22 December 1994 (1994-12-22) the whole document	1,9,16
A	----- US 8 056 940 B2 (MORGAN DAVID JAMES EDWARD [GB] ET AL) 15 November 2011 (2011-11-15) the whole document -----	1,9,16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2013/055745

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 1223591	A	24-04-1917	NONE

US 4572549	A	25-02-1986	NONE

US 3345084	A	03-10-1967	NONE

US 4892337	A	09-01-1990	NO 885118 A 18-12-1989 US 4892337 A 09-01-1990

WO 9429565	A1	22-12-1994	AU 672916 B2 17-10-1996 AU 7123594 A 03-01-1995 BR 9406790 A 30-01-1996 DE 69401939 D1 10-04-1997 DE 69401939 T2 10-07-1997 DK 0701651 T3 15-09-1997 EP 0701651 A1 20-03-1996 JP 3459645 B2 20-10-2003 JP H08511844 A 10-12-1996 NO 954972 A 08-01-1996 OA 10248 A 07-10-1997 RU 2117133 C1 10-08-1998 US 5505502 A 09-04-1996 WO 9429565 A1 22-12-1994

US 8056940	B2	15-11-2011	AT 534799 T 15-12-2011 AU 2009263947 A1 30-12-2009 CN 102076926 A 25-05-2011 EP 2288781 A2 02-03-2011 ES 2372802 T3 26-01-2012 GB 2461134 A 30-12-2009 US 2011068574 A1 24-03-2011 WO 2009156708 A2 30-12-2009
