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- (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, RO, RS, RU, 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.

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(54) **Title:** TORQUE ENHANCED THREADED CONNECTION

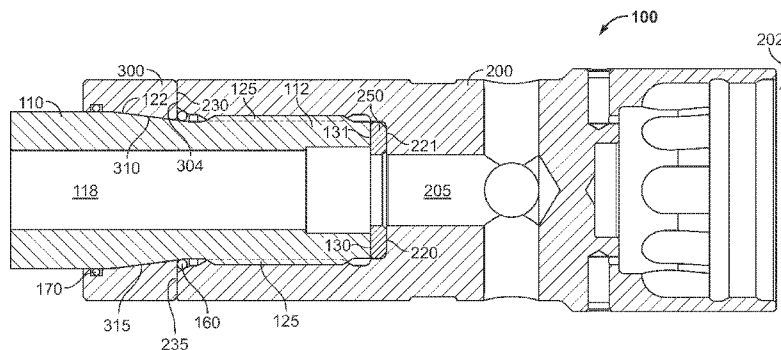


FIG. 6

(57) **Abstract:** Apparatus and method for increasing the torque capacity of threaded connections between tubular members. The apparatus may include a first tubular member (110) coupled with a second tubular member (200), and a torque member (300) wherein the torque member (300) is torqued against the second tubular member (200) and wherein tapered surfaces (122, 310) are engaged between the torque member (300) and the first tubular member (110) at a tapered surface interface.



**INTERNATIONAL SEARCH REPORT**

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A. CLASSIFICATION OF SUBJECT MATTER  
INV. E21B19/12 E21B17/042  
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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 644 524 A (BAKER REUBEN C) 7 July 1953 (1953-07-07) column 3, line 43 - column 5, line 3; figures 1-4	1-17
X	----- WO 97/11303 A1 (UTD INC [US]) 27 March 1997 (1997-03-27) page 10, line 5 - page 12, line 19; figure 13	1-17
X	----- EP 0 268 306 A2 (KWIK PRODUCTS CORP [US]) 25 May 1988 (1988-05-25) column 7, line 1 - column 8, line 38; figure 3	1,7,13
X	----- US 4 099 745 A (COBBS JAMES H) 11 July 1978 (1978-07-11) claims 1, 6, 7; figure 6 ----- -/--	1,7,13

Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search  16 November 2012	Date of mailing of the international search report  26/11/2012
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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  Manolache, Iustin
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# INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 355 528 A (DARDELET THREADLOCK CORP) 27 August 1931 (1931-08-27) the whole document -----	1-17

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2644524	A	07-07-1953	NONE
-----			
WO 9711303	A1	27-03-1997	CA 2229805 A1 27-03-1997
			NO 981283 A 20-03-1998
			US 5785357 A 28-07-1998
			WO 9711303 A1 27-03-1997
-----			
EP 0268306	A2	25-05-1988	AU 1339288 A 14-07-1988
			AU 1743483 A 02-02-1984
			CA 1205068 A1 27-05-1986
			EP 0102197 A2 07-03-1984
			EP 0264969 A2 27-04-1988
			EP 0268306 A2 25-05-1988
			MX 157874 A 19-12-1988
			US 4549613 A 29-10-1985
-----			
US 4099745	A	11-07-1978	NONE
-----			
GB 355528	A	27-08-1931	NONE
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