



- (51) International Patent Classification:  
B25B 17/00 (2006.01)
- (21) International Application Number:  
PCT/US2011/043763
- (22) International Filing Date:  
12 July 2011 (12.07.2011)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/363,708 13 July 2010 (13.07.2010) US
- (72) Inventor; and
- (71) Applicant : MUSEMECHE, Clint [US/US]; 109 Fieldcrest Parkway, Youngsville, LA 70592 (US).
- (74) Agent: LAMBERT, Jesse, D.; Law Office Of Jesse D. Lambert, LLC, 1018 Harding Street, Suite 102 B, Lafayette, LA 70503 (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, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

— of inventorship (Rule 4.17(iv))

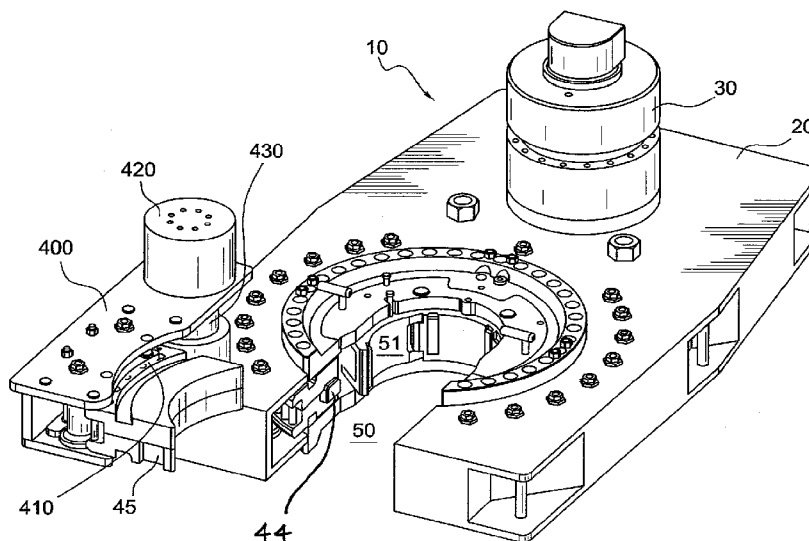
**Published:**

— with international search report (Art. 21(3))

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

20 March 2014

(54) Title: POWER TONG UNIT



**FIG. 2**

(57) Abstract: A power tong unit having a gear train in which one or more of the gears in the gear train have removable and replace roller tooth elements, in lieu of conventional gear teeth. In one embodiment, the ring gear and pinion gears have roller tooth elements, and idler gears disposed between the ring gear and pinion gears, have a semi-circular tooth root profile to mesh with the roller element gear teeth. The ring gear of the power tong unit may also have a removable section. A means for removing the removable section from the ring gear, and moving it to a position in which a tubular can be inserted into a central opening in the ring gear, may include a hydraulic cylinder, a clamping mechanism, and a cam surface to generate rotation of the removable section once lifted out of engagement with the ring gear.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/043763

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B25B 17/00 (2011.01)

USPC - 81/57.2

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)

IPC(8) - B23P 19/04; B25B 13/50, 17/00; E21B 19/16; F16H 1/24, 55/10 (2011.01)

USPC - 74/351, 465; 81/57.15, 57.18, 57.2, 57.33, 57.34

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)

Patbase

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0177870 A1 (NEVES et al) 25 September 2003 (25.09.2003) entire document	1-21
Y	US 6,023,989 A (IMASE et al) 15 February 2000 (15.02.2000) entire document	1-12, 16-21
Y	US 3,748,920 A (LAMBEV) 31 July 1973 (31.07.1973) entire document	5-6, 20
Y	US 4,372,026 A (MOSING) 08 February 1983 (08.02.1983) entire document	8
Y	US 5,381,704 A (KNOTTS) 17 January 1995 (17.01.1995) entire document	9
Y	US 4,423,647 A (TOELKE) 03 January 1984 (03.01.1984) entire document	13-20
Y	US 2006/0065778 A1 (KANNAPELL) 30 March 2006 (30.03.2006) entire document	15, 18-20

 Further documents are listed in the continuation of Box C.

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Date of the actual completion of the international search

08 December 2011

Date of mailing of the international search report

16 DEC 2011

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents  
P.O. Box 1450, Alexandria, Virginia 22313-1450  
Facsimile No. 571-273-3201

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300  
PCT OSP: 571-272-7774