(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 February 2006 (23.02.2006)

PCT

(10) International Publication Number
WO 2006/019655 A3

(51) International Patent Classification:
B25B 13/02 (2006.01)

(21) International Application Number:
PCT/US2005/024430

(22) International Filing Date: 11 July 2005 (11.07.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/587,925 14 July 2004 (14.07.2004) US

(71) Applicant and
(72) Inventor: **CHACONAS, Peter C.** [US/US]; 4340 Butler Road, Glyndon, Maryland 21071 (US).

(72) Inventors: **DELANEY, Dana, L.**; 2628 Natalie Drive, York, PA 17402 (US). **GHARIB, Awad, Aly**; 10205 Sunny Lake Place, Apt. K, Cockeyville, MD 21030 (US).

(74) Agent: **NELSON MULLINS RILEY & SCARBOROUGH, LLP**; 1320 Main Street, Columbia, South Carolina 29201 (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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, 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.

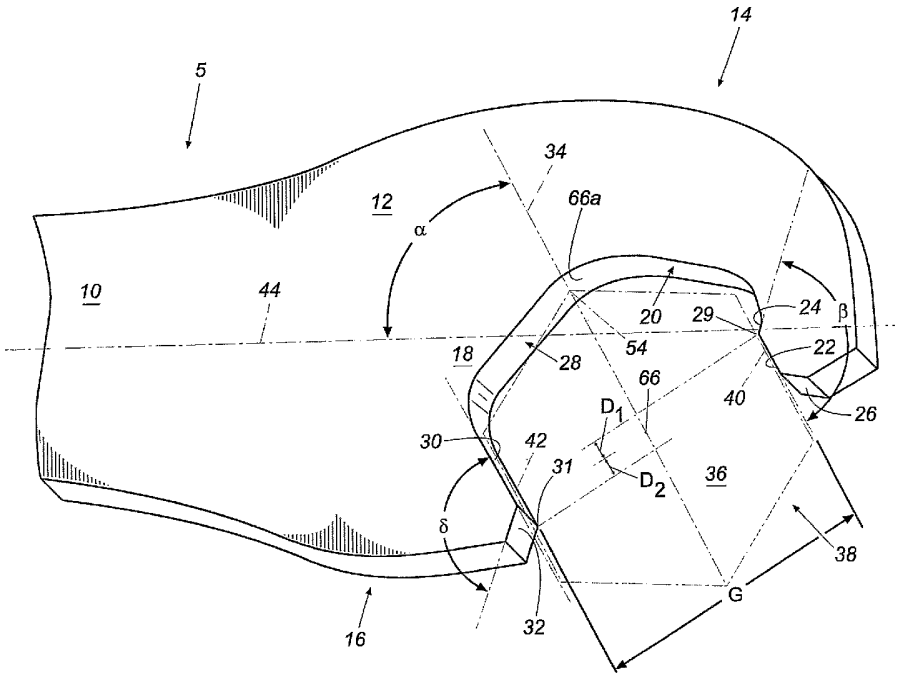
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, 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).

Published:
— *with international search report*

(88) Date of publication of the international search report:
20 July 2006

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.

(54) Title: HIGH TORQUE OPEN END WRENCH



(57) Abstract: An open end wrench for use with a fastener having a polygonal gripping portion has an elongated body, a first jaw having a first bite surface and a second jaw having a second bite surface. The jaws form a throat therebetween having a closed end and an open end. The bite surfaces are disposed with engaging surfaces so that majority components of force vectors applied normal to the first and second bite surfaces are directed parallel to the wrench handle axis.

WO 2006/019655 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/24430

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **B25B 13/02**(2006.01)

USPC: 81/119,120,121,170,186
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)
U.S. : 81/119, 120, 121, 170, 186

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2,671,368 A (DIEBOLD) 09 March 1954.	
A	US 2,652,735 A (WILDER) 22 September 1953.	

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" *document defining the general state of the art which is not considered to be of particular relevance*

"E" earlier application or patent published on or after the international filing date

"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)*

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the *priority date claimed*

"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*

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 March 2006 (24.03.2006)	06 APR 2006
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 LINDA SHOLL Telephone No. 571-272-4391

Form PCT/ISA/210 (second sheet) (April 2005)