

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number
WO 2004/015280 A3

(51) International Patent Classification⁷: **F16B 19/05**

91803 (US). **PARKER, Lloyd, Jr.** [US/US]; 1261 W. Kingsdale Drive, Corona, CA 91720 (US).

(21) International Application Number:

PCT/US2003/024372

(74) Agent: **GALLOWAY, Peter, D.**; Ladas & Parry, 26 West 61 Street, New York, NY 10023 (US).

(22) International Filing Date: 1 August 2003 (01.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/215,630 8 August 2002 (08.08.2002) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:

US 10/215,630 (CON)
Filed on 8 August 2002 (08.08.2002)

(71) Applicant (for all designated States except US): **HUCK INTERNATIONAL, INC.** [US/US]; 3724 E. Columbia Street, Tucson, AZ 85714 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MONTERRATT, Ernest** [US/US]; 2925 Terrace Avenue, Alhambra, CA

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

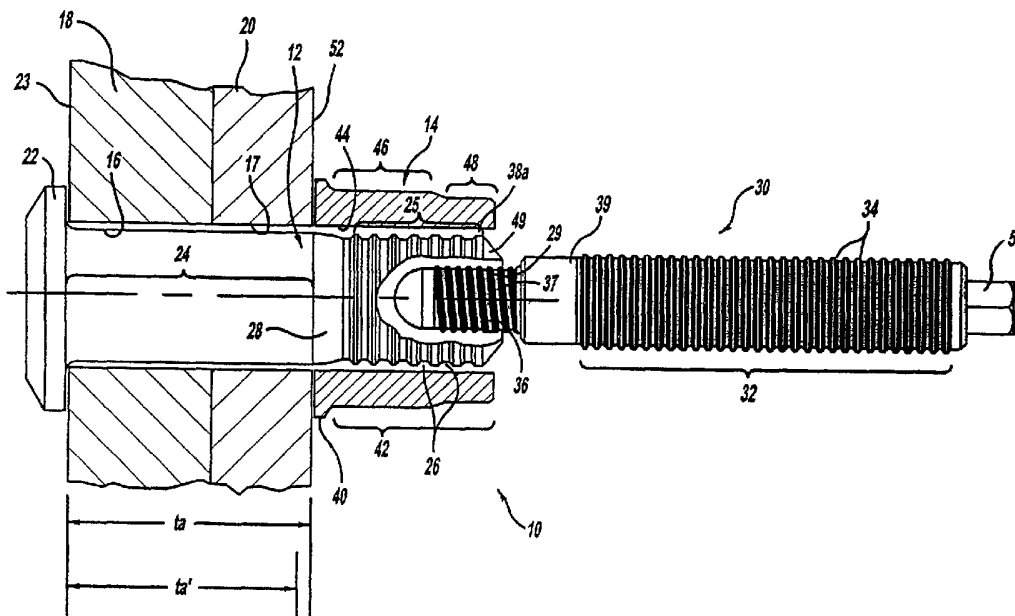
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: PULL TYPE SWAGE FASTENERS WITH REMOVABLE MANDREL



(57) Abstract: A pull type swage fastener including a pin and a collar adapted to be swaged into a locking portion on the pin shank and with a removable mandrel being threadably securable in a pull cavity at the end of the pin shank and with the mandrel adapted to be gripped by an installation tool for applying a relative axial force between the pin and collar to swage the collar into the locking portion with the mandrel being releasable from the tool and removable from the pull cavity.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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.

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

3 June 2004

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/24372

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F16B19/05

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 7 F16B B21J

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 practical, 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 6 233 802 B1 (FULBRIGHT DAVID J) 22 May 2001 (2001-05-22) cited in the application	25
Y	column 23, line 63 -column 24, line 7; figures 9,9B	1
A	column 32, line 34 - line 67; claim 1; figures 17,18	2-24, 26-28
Y	US 5 315 755 A (FULBRIGHT DAVID J ET AL) 31 May 1994 (1994-05-31) cited in the application	1
A	column 12, line 51 -column 13, line 33; figures 11,12 column 15, line 66 -column 16, line 43; figures 17,18	2-28
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in 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 document but 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

4 March 2004

Date of mailing of the international search report

29.03.04

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Heinzler-Rödl, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/24372

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 915 053 A (RUHL JOHN HOWLAND) 28 October 1975 (1975-10-28) cited in the application column 1, line 62 -column 2, line 30; figures 1-9 -----	1
A	US 3 799 229 A (JOHNSON L) 26 March 1974 (1974-03-26) column 2, line 23 -column 4, line 33; figures 1-6 -----	1,25

INTERNATIONAL SEARCH REPORT

national application No.
PCT/US 03/24372

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-24,26,27

- A fastening system including a fastener with a pin shank comprising a locking portion having a plurality of lock grooves defined by circumferentially extending pin grooves and associated pin shoulders terminating in pin crests,
- said pin grooves having an effective width W_r relative to the effective width W of the crests with the pitch of the crests and grooves varying from the longest at the first crest and groove at the outer end of said pin shank to the shortest at the last crest and groove,
- the width W_r of said pin grooves being substantially uniform over said locking portion with the width W of said crests varying with the longest width W being at the outer end of said pin shank and with subsequent widths W being shorter in preselected steps (claim 1).

2. Claims: 25,28

- A fastening system including a fastener with a pin shank having a threaded pull cavity at its outer end,
- the threads of said pull cavity having roots terminating in generally flat surfaces whereby the root diameter can be minimized to enhance the compressive strength of said pull cavity and the threads of said pull cavity having crests terminating in generally flat surfaces whereby the crest diameter can be increased, the width of the flat surfaces of the crests of the threads of said pull cavity being approximately 50% longer than the width of the flat surfaces of the roots, the roots and the crests of the mating threads of said connecting rod portion having flat surfaces and being of a contour matching that of the threads of the pull cavity whereby the strength of the threads of said pull cavity and of said connecting rod portion can be maximized (claim 25).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/24372

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6233802	B1	22-05-2001	
		AU 759793 B2	01-05-2003
		AU 5740600 A	05-03-2001
		CA 2379926 A1	15-02-2001
		CN 1369041 T	11-09-2002
		EP 1200747 A1	02-05-2002
		JP 2003506220 T	18-02-2003
		TW 460665 B	21-10-2001
		WO 0111248 A1	15-02-2001
		US 2001029651 A1	18-10-2001
US 5315755	A	31-05-1994	
		US 5548889 A	27-08-1996
		US 5604968 A	25-02-1997
		AU 646394 B2	24-02-1994
		AU 5646990 A	07-01-1991
		AU 670181 B2	04-07-1996
		AU 5944394 A	02-06-1994
		CA 2057890 A1	01-12-1990
		CA 2256996 A1	01-12-1990
		DE 69020153 D1	20-07-1995
		EP 0474665 A1	18-03-1992
		ES 2077679 T3	01-12-1995
		JP 2672190 B2	05-11-1997
		JP 4507278 T	17-12-1992
		KR 163594 B1	15-01-1999
		WO 9014904 A1	13-12-1990
US 3915053	A	28-10-1975	
		BE 832636 A1	23-02-1976
		CA 1031610 A1	23-05-1978
		CA 1070992 B	05-02-1980
		DE 2537582 A1	11-03-1976
		FR 2283347 A1	26-03-1976
		GB 1496729 A	30-12-1977
		IT 1057904 B	30-03-1982
		JP 1078964 C	25-12-1981
		JP 51049361 A	28-04-1976
		JP 56019487 B	08-05-1981
		NL 7509930 A ,B,	01-03-1976
		US RE30445 E	16-12-1980
US 3799229	A	26-03-1974	NONE