

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
26 May 2006 (26.05.2006)

PCT

(10) International Publication Number  
**WO 2006/055581 A3**

- (51) International Patent Classification:  
*F16G 15/04* (2006.01)
- (21) International Application Number:  
PCT/US2005/041429
- (22) International Filing Date:  
16 November 2005 (16.11.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/628,483 16 November 2004 (16.11.2004) US
- (71) Applicant: **OCEANEERING INTERNATIONAL, INC.** [US/US]; 11911 FM 529, Houston, Texas 77027 (US).
- (72) Inventor: **SIAPPAS, George**; 824 Ruthven, Houston, Texas 77019 (US).
- (74) Agents: **REDANO, Richard, T.** et al.; Duane Morris LLP, 3200 Southwest Freeway, Suite 3150, Houston, Texas 77027-7528 (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, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, 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.

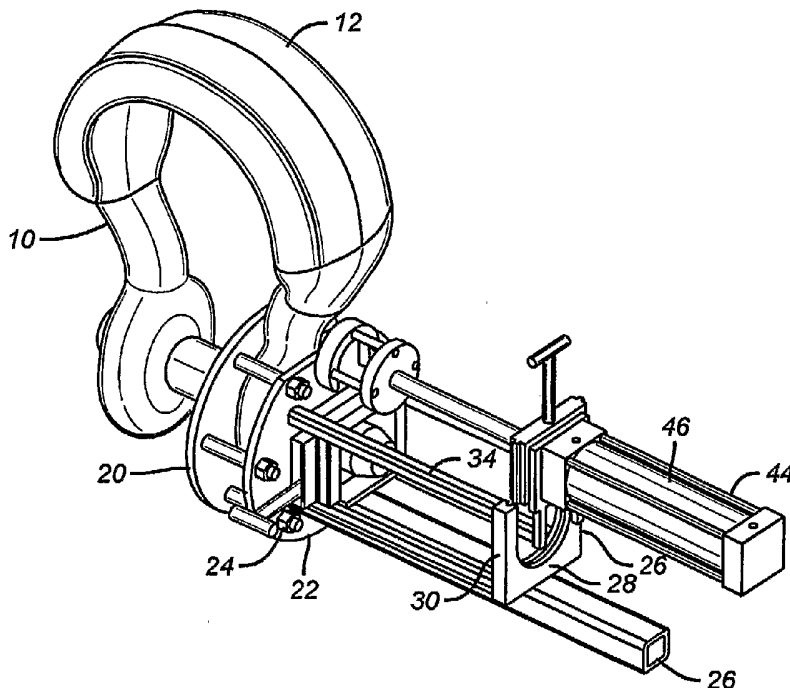
(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT,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



(57) Abstract: The present inventions relate generally to a shackle assembly and a method for installing and/or releasing the shackle assembly subsea. The shackle assembly of the present invention comprises first (20) and second (22) plates mounted on either side of a shackle body eyelet (14) and a shackle pin mounting assembly (26, 28, 30, 32, 34, and 36) for use in mounting a shackle pin (38) using a shackle pin pulling tool (44).

WO 2006/055581 A3

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US05/41429

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: **F16G 15/04( 2006.01)**

USPC: 59/85,86  
 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. : 59/85, 86; 411/120,317

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 6,023,927 A (Epstein) 15 February 2000 (15.02.2000), See entire document.	1-20
A	US 5,460,418 A (Falls) 24 October 1995 (24.10.1995), See entire document.	1-20
A	US 5,046,881 A (Swager) 10 September 1991 (10.09.1991), See entire document.	1-20
A	US 3,462,945 A (Barber) 26 August 1969 (26.08.1969), See entire document.	1-20
X	"Hydraulic Release Shackle", 5 pages from IHC Handling Systems VOF, models 120-200t, 400t, 500t, 4x800t, and 35t-1200t. Webpage from IHC Handling System VOF; <a href="http://ihc.negeso.com/hydraulic_release_shackles.html">http://ihc.negeso.com/hydraulic_release_shackles.html</a>	8-20

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	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 06 July 2006 (06.07.2006)	Date of mailing of the international search report <b>25 AUG 2006</b>
--	--

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 <i>For</i> David B. Jones <i>J. Leby</i> Telephone No. 571 272 3700
---	---