(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 26 August 2004 (26.08.2004)

PCT

(10) International Publication Number $WO\ 2004/071339\ A3$

(51) International Patent Classification⁷: A61B 17/58, 17/56

(21) International Application Number:

PCT/US2004/003605

(22) International Filing Date: 5 February 2004 (05.02.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 10/358,530

5 February 2003 (05.02.2003) US

(71) Applicant (for all designated States except US): PIO-NEER LABORATORIES, INC. [US/US]; 375 River Park Circle, Marquette, MI 49855 (US).

(72) Inventors; and

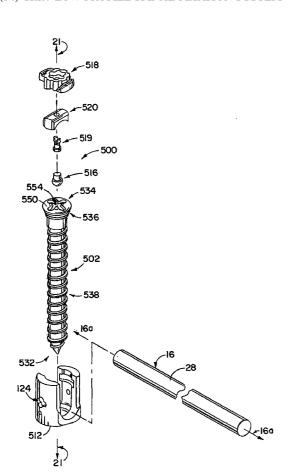
(75) Inventors/Applicants (for US only): JANOWSKI, Brian, P. [US/US]; 971 Highland Drive, Marquette, MI

49855 (US). KORHONEN, Francis, J. [US/US]; 522 Elm Street, Neguanee, MI 49866 (US). KILPELA, Thomas, S. [US/US]; 1600 County Road #492, Marquette, MI 49855 (US). BERREVOETS, Gregory [—/US]; 143 Heidtman, Skandia, MI 49885 (US).

- (74) Agents: SAMPLES, Kenneth, H. et al.; Fitch, Even, Tabin & Flannery, Room 1600, 120 South LaSalle, Chicago, IL 60603 (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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, 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.

[Continued on next page]

(54) Title: LOW PROFILE SPINAL FIXATION SYSTEM



(57) Abstract: A spinal fixation system (500) is provided that, in one form, includes a coupling member (514) having a cam lock member (518) that is fixed against translation therealong as it is turned with turning of the cam lock member (518) causing an elongate member (16) such as a spinal rod to be pushed downward in the coupling member (514) for fixing the rod therein. In another aspect, the rod is fixed against a low profile insert (516) that seats in a recess formed in the head of an anchor member (502) projecting from the coupling member (514). The insert has an upper surface against which the rod is fixed and that in one form is flat to provide for line contact against the rod so as to minimize damage thereto.

WO 2004/071339 A3



(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, 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, IT, LU, MC, NL, 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: 2 June 2005

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/03605

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : A61B 17/58, 17/56 US CL : 606/61 A. CLASSIFICATION OF SUBJECT MATTER							
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.: 606/61, 60, 53, 72, 73							
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 a	opropriate, of the relevant passages	Relevant to claim No.				
X	EP 1,190, 678 A2 (BONO et al.) 27 March 2002 (27.03.2002), See whole document		1-5, 8, 9, 21-23, 27-29				
X, P	US 6,554,834 B1 (CROZET et al.) 29 April 2003, (29.04.2003), See whole document		1-3, 9-11, 13, 14, 15, 17-19, 21-23				
Y,P			16				
X,P			1-6, 8, 9, 11				
 Ү,Р			16				
Further documents are listed in the continuation of Box C.		See patent family annex.					
* Special categories of cited documents:		"T" later document published after the inte					
"A" document defining the general state of the art which is not considered to be of particular relevance date and not in conflict with the application but cited to understand principle or theory underlying the invention			ention				
 "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 		"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					
				"P" document published prior to the international filing date but later than the priority date claimed		"&" document member of the same patent family	
						Date of mailing of the international search report 24 FEB 2005	
	2005 (07.02.2005)						
Name and mailing address of the ISA/US Mail Stop PCT, Aun: ISA/US		Authorized officer Sharm N. Brune for					
Commissioner for Patents		Jessica R Baxter					
P.O. Box 1450 Alexandria, Virginia 22313-1450		Telephone No. 703-308-0858					
Facsimile No. (703) 305-3230							