

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 April 2007 (05.04.2007)

PCT

(10) International Publication Number
WO 2007/037784 A3

(51) International Patent Classification:
A61F 2/30 (2006.01)

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.

(21) International Application Number:
PCT/US2006/007581

(22) International Filing Date: 3 March 2006 (03.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/073,125 4 March 2005 (04.03.2005) US

(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).

(71) Applicant and

(72) Inventor: HYDE JR, Edward [US/US]; 2928 Arnoldson Ave, San Diego, California 92122 (US).

Published:

— with international search report

(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,

(88) Date of publication of the international search report:
9 April 2009

(15) Information about Correction:
Previous Correction:
see Notice of 24 May 2007

(54) Title: PARAMAGNETIC LIQUID INTERFACE

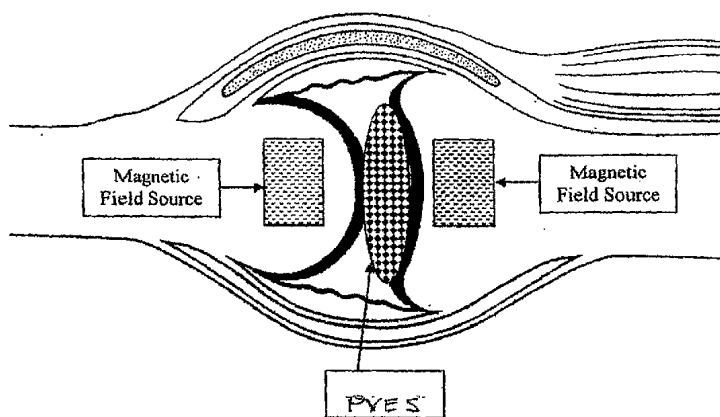


Fig. 14

(57) Abstract: Natural joint interfaces wear out causing pain and disability. They can be currently replaced by artificial surfaces. They would benefit from a PVES (paramagnetic visco-viscoelastic supplement) that can replace or augment natural joint interfaces or augment total joint replacements. Joint replacement components can be modular and would benefit from a PVES to decrease wear and damp impact between modular parts of a single component. PVES can act as an interface between natural damaged joint surfaces obviating the need for classic total joint replacement or between the surfaces of artificial joint components to improve or supplement their function. These PVES can be controlled by magnetic fields with respect to their location, physical properties, loads, etc. PVES are typically made of paramagnetic particles and a substrate molecule. One such PVES can be made of gadolinium Particles and hyaluronic acid to form a gadolinium-hyaluronic acid suspension.



WO 2007/037784 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/07581

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61F 2/30(2006.01)

USPC: 623/18.12

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. : 623/18.12

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.
X	US 5268165 (Hedlund et al) 5:1-30, 7:5-15, 10:30-60	1-6, 11, 12, 16
X	US 4269826 (Zimmerman et al.) 3:1-30, 5:1-10	12, 22, 26-28
---		-----
Y		17, 29-32, 35
X	US 6403056 (Unger) 10:5-10, 12:2, 11:60-65, 21:1-10, 28:45-65, 43:10-15	12, 18
---		-----
Y		7-10, 19-21, 23-25, 33-34
Y	US 6387096 (Hyde, Jr) whole document	13-15



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

31 January 2008 (31.01.2008)

Date of mailing of the international search report

21 FEB 2008

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

Amanda Walker

Telephone No. (571)270-3296