

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 July 2008 (24.07.2008)

PCT

(10) International Publication Number
WO 2008/089350 A3

(51) International Patent Classification:

A61F 2/44 (2006.01) A61B 17/17 (2006.01)
A61F 2/46 (2006.01) A61B 17/70 (2006.01)

(21) International Application Number:

PCT/US2008/051346

(22) International Filing Date: 17 January 2008 (17.01.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

11/655,790 19 January 2007 (19.01.2007) US
11/655,723 19 January 2007 (19.01.2007) US
11/655,737 19 January 2007 (19.01.2007) US
11/655,787 19 January 2007 (19.01.2007) US
11/655,724 19 January 2007 (19.01.2007) US

(71) Applicant (for all designated States except US): **FLEXUS-PINE, INC.** [US/US]; 600 N. Bell Avenue, Suite 130, Carnegie, Pennsylvania 15106 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LANDRY, Michael**

E. [US/US]; 1306 Quaker Ridge, Austin, Texas 78746 (US). **WAGNER, Erik J.** [US/US]; 16920 Squaw Valley Lane, Austin, Texas 78717 (US). **SCHULAR, Michael S.** [US/US]; 774 Country Club Drive, Pittsburgh, Pennsylvania 15228 (US). **WANG, Jeffrey C.** [US/US]; 14946 Greenleaf St., Sherman Oaks, California 91403 (US).

(74) Agent: **MEYERTONS, Eric B.**; MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C., P.O. Box 398, Austin, Texas 78767-0398 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

[Continued on next page]

(54) Title: ARTIFICIAL FUNCTIONAL SPINAL UNIT SYSTEM AND METHOD FOR USE

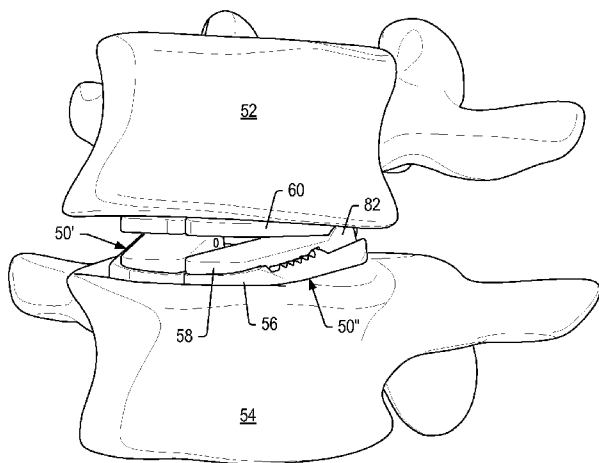


FIG. 12

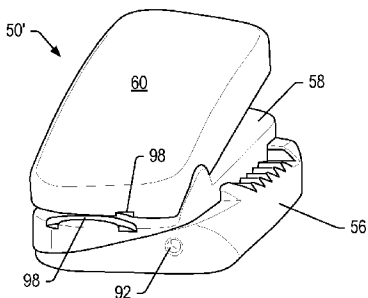


FIG. 13

(57) Abstract: A stabilization system for a human spine is provided. The stabilization system may include one or more dynamic interbody devices and/or one or more dynamic posterior stabilization systems. The dynamic interbody devices may provide for coupled axial rotation and lateral bending of vertebrae adjacent to the dynamic interbody devices. The dynamic posterior stabilization systems may provide resistance to movement that mimics the resistance provided by a normal functional spinal unit.



WO 2008/089350 A3



(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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, 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*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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

30 October 2008

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/051346

A. CLASSIFICATION OF SUBJECT MATTER
 INV: A61F2/44 A61F2/46 A61B17/17 A61B17/70

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)
 A61F A61B

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	WO 2006/116851 A (KINETIC SPINE TECHNOLOGIES INC [CA]; DUPLESSIS STEPHAN J [CA]; SEKHON) 9 November 2006 (2006-11-09)	1,4,6,7,9
Y	paragraphs [0009], [0055] - [0073], [0089]	5,8
X	WO 2004/019828 A (MATHYS MEDIZINALTECHNIK AG [CH]; BAUMGARTNER DANIEL [CH]; BURRI ADRIAN) 11 March 2004 (2004-03-11)	1-4
X	pages 7-8	
X	WO 2006/066198 A (SAVAGE BIOMECHANICS INC O [US]; PAXSON ROBERT D [US]; NILSSON CARL M []) 22 June 2006 (2006-06-22)	1,9
Y	page 6, line 22 - page 10, line 5	
Y	US 2006/089717 A1 (KRISHNA MANOJ [GB] ET AL) 27 April 2006 (2006-04-27)	5,8
	paragraphs [0047], [0048], [0062]	

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 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

15 May 2008

Date of mailing of the international search report

09/09/2008

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

Buchmann, Gerhard

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/051346

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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.: **65-90, 104**
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
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 No. III Observations where unity of invention is lacking (Continuation of item 3 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 allsearchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
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.:

1-9

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- 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: 1-9

An intervertebral device comprising two members being movable with respect to each other, allowing coupled lateral bending and axial rotation.

2. claims: 10-17

An intervertebral device comprising two members having guide surfaces and being movable with respect to each other, allowing lateral bending.

3. claims: 18-25

An intervertebral device comprising two members having guide surfaces and being movable with respect to each other, allowing axial rotation.

4. claims: 26-30

An intervertebral device comprising two pairs of members being movable with respect to each other, allowing coupled lateral bending and axial rotation.

5. claims: 31-38

An intervertebral device comprising two coupled pairs of members having guide surfaces and being movable with respect to each other, allowing lateral bending.

6. claims: 39-46

An intervertebral device comprising two coupled pairs of members having guide surfaces and being movable with respect to each other, allowing axial rotation.

7. claims: 47-52

An intervertebral device comprising two members being movable with respect to each other, the first member having a larger width than the second member.

8. claims: 53-64

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

An intervertebral device comprising three members being movable with respect to each other, allowing coupled axial rotation and lateral bending between the first and second member, and allowing flexion/extension between the second and the third member, the first member having a larger width than the second member.

9. claims: 91-102

An intervertebral device comprising two members being movable with respect to each other by interacting grooves and ridges, so that axial rotation causes lateral bending or vice versa.

10. claim: 103

A combination of a dynamic posterior stabilization system and a dynamic interbody device.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2008/051346

Patent document cited in search report	A	Publication date		Patent family member(s)	Publication date
WO 2006116851	A	09-11-2006		AU 2006243712 A1	09-11-2006
				CA 2607314 A1	09-11-2006
				CN 101170970 A	30-04-2008
				EP 1879528 A1	23-01-2008
				KR 20080027240 A	26-03-2008
				US 2008058944 A1	06-03-2008
WO 2004019828	A	11-03-2004		AU 2002322960 A1	19-03-2004
				CA 2497278 A1	11-03-2004
				CN 1665459 A	07-09-2005
				EP 1534193 A1	01-06-2005
				JP 2005537053 T	08-12-2005
				US 2006036326 A1	16-02-2006
WO 2006066198	A	22-06-2006		EP 1845902 A1	24-10-2007
				US 2006149372 A1	06-07-2006
US 2006089717	A1	27-04-2006		EP 1647243 A2	19-04-2006
				EP 1738721 A2	03-01-2007
				EP 1738722 A2	03-01-2007
				US 2008033562 A1	07-02-2008
				US 2006085076 A1	20-04-2006

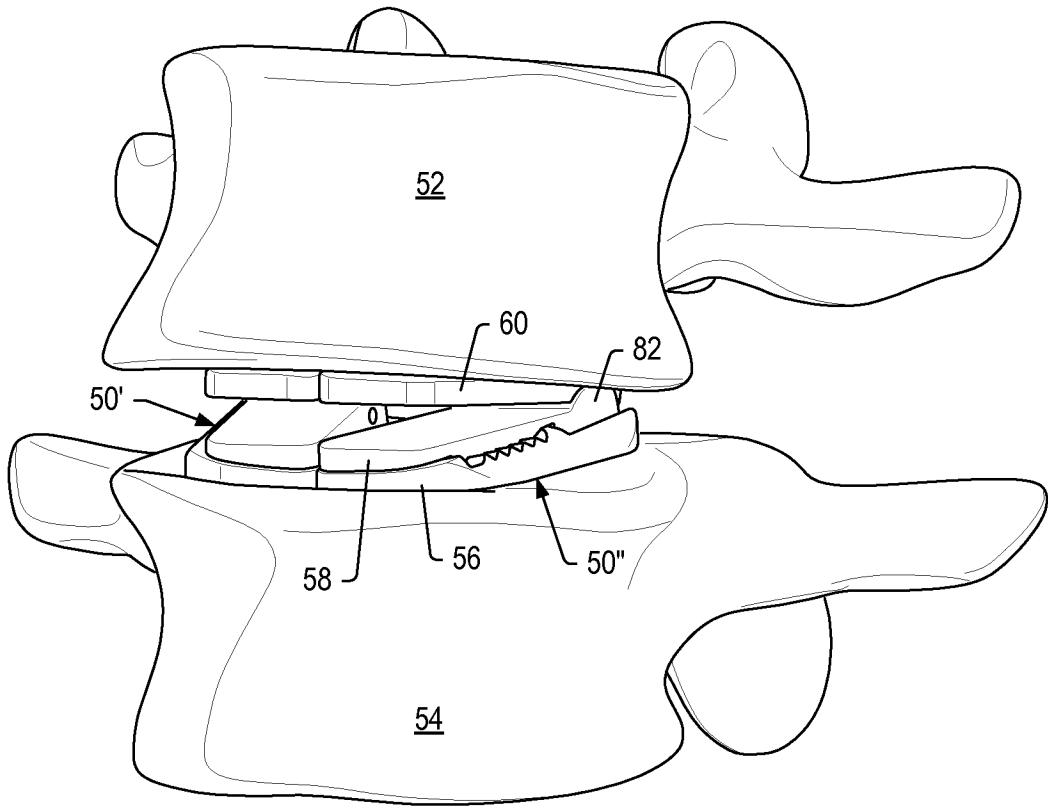


FIG. 12

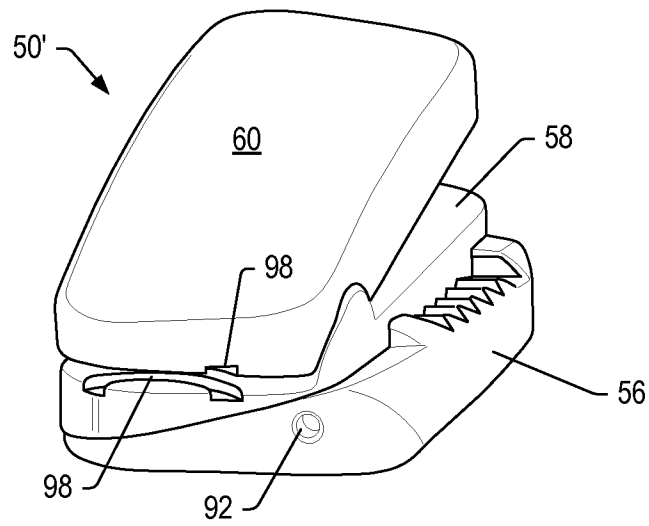


FIG. 13