

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 April 2005 (21.04.2005)

PCT

(10) International Publication Number
WO 2005/034864 A3

(51) International Patent Classification⁷: **A61F 2/44**

(21) International Application Number:
PCT/US2004/032874

(22) International Filing Date: 5 October 2004 (05.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/509,604 8 October 2003 (08.10.2003) US

(71) Applicant (for all designated States except US): **UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL** [US/US]; 308 Bynum Hall, Campus Box 4105, Chapel Hill, NC 27599-4105 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CHENG, David, Ming** [US/US]; 824 Pinehurst Drive, Chapel Hill, NC 27517 (US).

(74) Agent: **JENKINS, Richard, E.**; Jenkins, Wilson & Taylor, P.A., Suite 1400, University Tower, 3100 Tower Boulevard, Durham, NC 27707 (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.

(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, IT, LU, 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).

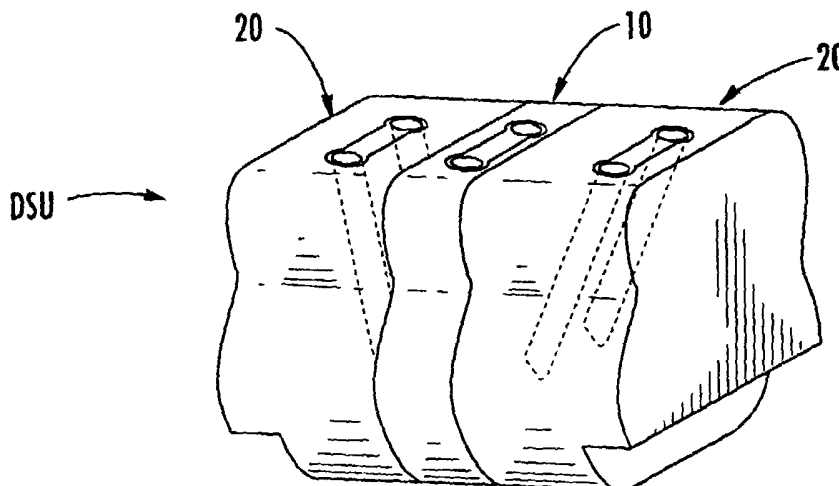
Published:

- with international search report
- 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:
16 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.

(54) Title: SPINE REPLACEMENT SYSTEM



(57) Abstract: Apparatuses and methods for single disc arthroplasty and multi-segmental spine replacement. The implant assembly includes a first cage (20) adapted to be rigidly attached to a first vertebra, a second cage (20) adapted to be rigidly attached to a second vertebrae, and a spinal disc replacement prosthesis (10) positioned between the first and second vertebrae. The spinal disc replacement prosthesis preferably includes a resilient body having two or more adjustable fluid-filled compartments.

WO 2005/034864 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/32874

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61f 2/44

US CL : 623/17.12

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. : 623/17.12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
none

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
none

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------------|--|--|
| X,P A | US 2004/0193273 A1 (Huang) 30 September 2004, see figure 1, note upper cage 11, lower cage 21, spinal disc replacement 3 which is inflatable via port 351, second compartment A. US 2004/0260396 A1 (Ferree et al) 23 December 2004, see entire document. | 1-4, 8-13, 15-17, 20, 36-40, 52, and 54 1-52 |
| X,P --- A | US 6,733,533 A (Lozier) 11 May 2004, see entire document. | 46-51 ----- 1-45, 52-54 |
| A | US 2002/0183848 A1(Ray et al) 05 December 2002, see figure 10 teaching anterior and posterior implants. | 1-54 |

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 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

"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

12 April 2005 (12.04.2005)

Date of mailing of the international search report

02 MAY 2005

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. (703) 305-3230

Authorized officer

Corrine McDermott
Corrine McDermott

Telephone No. (703) 308-0858