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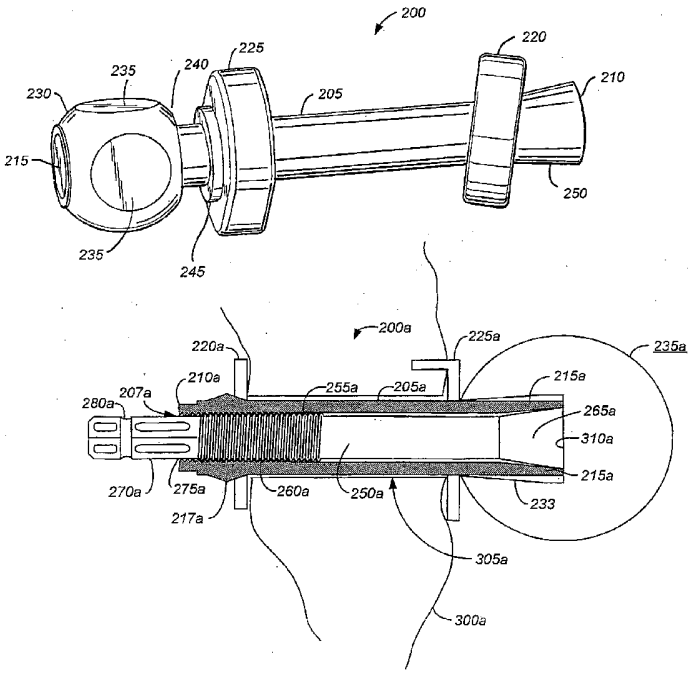
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— *with international search report*

[Continued on next page]

(54) Title: PROSTHESES, TOOLS AND METHODS FOR REPLACEMENT OF NATURAL FACET JOINTS WITH ARTIFIAL FACET JOINT SURFACES



(57) Abstract: Cephalad and caudal vertebral facet joint prostheses and methods of use are provided. The cephalad prostheses are adapted and configured to be attached to a lamina portion of a vertebra without blocking a pedicle portion of the cephalad vertebra. In one embodiment, the facet prosthesis (200) comprises a cylindrical body (205) having an expanded section (250) at a proximal end and a collar (220) securing against the expanded section. A distal collar (225) is secured about the body more proximally. A bearin ball (230) having an opening is fitted and secured over the distal end (215) of the body. In another embodiment, the facet prosthesis (200a) comprises a cylindrical hollow body (205a) having a longitudinally extending bore (207a) and an outer ridge (217a) to engage with a proximal collar (220a).A threaded shaft extends through and is screwed into the bore. The shaft has an enlarged distal plug (265a) to deform the distal end of the hollow body when advanced proximally. A bearing (235) a having an aperture (233) is positioned over the distal end (215a) and locked into place by this deformation.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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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/US2005/015347

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F2/44 A61F2/46

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)
IPC 7 A61F

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 98/48717 A (TAYLOR, JEAN; VILLARET, BERNARD; HERRERA, HARMODIO) 5 November 1998 (1998-11-05)	1-4
Y	page 5, line 5 - line 11 page 10, line 21 - page 12, line 12	7
Y	US 2002/065557 A1 (GOBLE E. MARLOWE ET AL) 30 May 2002 (2002-05-30) paragraph [0052] - paragraph [0056]	7
A,P	US 2004/230304 A1 (YUAN HANSEN A ET AL) 18 November 2004 (2004-11-18) figures	1-7

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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	Date of mailing of the international search report
22 August 2005	11. 11. 2005

Name and mailing address of the ISA	Authorized officer
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	Buchmann, G

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2005/015347

Box 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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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 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 all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

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.:

1-7

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ 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: 1-7

A spinal prosthesis comprising an elongate body with a flared proximal end, a proximal collar and a prosthetic bearing element fitted over the distal end of the body.

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2. claims: 8-13

A spinal prosthesis comprising an elongate body with a shaft movably disposed therein and a prosthetic bearing element fitted over the distal end of the body, wherein the shaft can press the outer surface of the body against an internal opening of the bearing element.

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3. claims: 14-17

A spinal prosthesis comprising an elongate body and a prosthetic bearing element attachable to the body, and a disk prosthesis.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US2005/015347

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9848717 A	05-11-1998	EP 0996383 A1	03-05-2000
		IE 970323 A2	03-06-1998
US 2002065557 A1	30-05-2002	US 2003191532 A1	09-10-2003
US 2004230304 A1	18-11-2004	WO 2004103227 A1	02-12-2004