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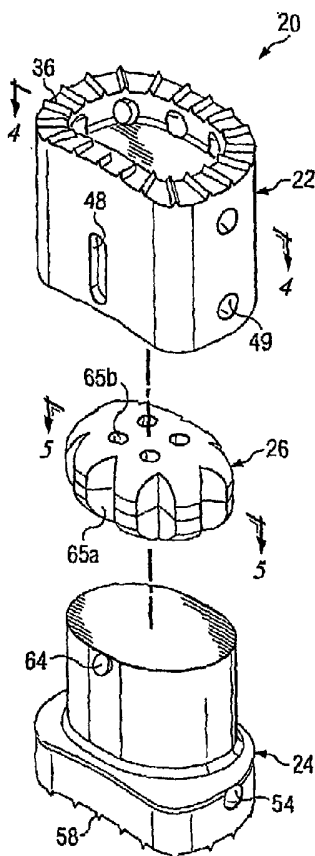
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[Continued on next page]

(54) Title: COMPRESSIBLE CORPECTOMY DEVICE

(57) Abstract: A vertebral implant device (20) for interposition between two vertebral endplates comprises an outer body (22) and an inner body (24). The outer body movably engages the inner body. A core (26) member positioned between the outer body and the inner body is at least partially compressed when a load is applied to the implant device.





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BY, KG, KZ, MD, RU, TJ, TM), European patent (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 patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

**Declarations under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations 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, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ,

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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/US2004/035577

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)

EP0-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 950 389 A (AESCULAP AG & CO. KG) 20 October 1999 (1999-10-20)  claims 17-20; figures 1-3 paragraphs [0010], [0032] - [0040]	4-7,11, 15,16, 29,30
Y		1-3, 8-10, 12-14, 17-28
X	US 5 236 460 A (BARBER ET AL) 17 August 1993 (1993-08-17) claim 1; figures 1-3 column 1, lines 26-46	4-7,15
A		1-3,28
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☒ 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

9 February 2005

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/035577

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/082695 A1 (NEUMANN CARSTEN) 27 June 2002 (2002-06-27) figures 2-7 paragraphs [0029], [0030], [0034]	1-3, 8-10,12
A	----- DE 200 19 520 U1 (AESCULAP AG & CO. KG) 1 February 2001 (2001-02-01) claims 1,4-14; figures page 11, paragraph 2	4,11 17-28
Y	----- US 2003/045877 A1 (YEH CHUNG-CHUN) 6 March 2003 (2003-03-06) claim 1; figures 2-5b paragraph [0021]	1-7,11, 15 13,14
A	----- EP 0 277 282 A (GEBRUDER SULZER AKTIENGESELLSCHAFT; GEBRUEDER SULZER AKTIENGESELLSCHAFT) 10 August 1988 (1988-08-10) claim 1; figures column 3, lines 2-15	1,4, 8-12,15 1,4, 17-19
A	----- US 6 296 665 B1 (STRNAD LEE A ET AL) 2 October 2001 (2001-10-02)	
A	----- US 6 352 556 B1 (KRETSCHMER PETER ET AL) 5 March 2002 (2002-03-05) -----	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2004/035577

## 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.:

see annex

### 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: 1-30

A vertebral implant device for interposition between two vertebral bodies, the device comprising:  
an outer body;  
an inner body; and  
a core member positioned between the outer body and the inner body,  
wherein the outer body is movably engaged with the inner body and  
wherein responsive to a load applied to the device, the outer and inner body at least partially compress the core member  
and wherein the outer body includes at least one slot and the inner body includes at least one tab, and wherein the tab movably engages the slot.

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2. claims: 31-34

A vertebral implant device for interposition between two vertebral bodies, the device comprising:  
first and second outer bodies; a center shaft; and  
first and second core members,  
wherein the first core member is positioned between the first outer body and the center shaft, and the second core member is positioned between the second outer body and the center shaft,  
wherein the outer bodies are movably engaged with the center shaft and wherein responsive to a load applied to the device, the outer bodies and the center shaft at least partially compress the core members.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/035577

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0950389	A	20-10-1999	DE 19816828 A1	28-10-1999
			DE 29806830 U1	02-07-1998
			EP 0950389 A2	20-10-1999
-----				
US 5236460	A	17-08-1993	NONE	
-----				
US 2002082695	A1	27-06-2002	DE 10065232 A1	18-07-2002
			DE 20121355 U1	05-09-2002
			DE 20121560 U1	02-01-2003
			EP 1219266 A1	03-07-2002
			JP 2002238929 A	27-08-2002
-----				
DE 20019520	U1	01-02-2001	NONE	
-----				
US 2003045877	A1	06-03-2003	TW 545211 Y	01-08-2003
-----				
EP 0277282	A	10-08-1988	CH 671691 A5	29-09-1989
			AT 65898 T	15-08-1991
			DE 3772033 D1	12-09-1991
			EP 0277282 A1	10-08-1988
			ES 2025611 T3	01-04-1992
			US 4932969 A	12-06-1990
-----				
US 6296665	B1	02-10-2001	AU 4590401 A	03-10-2001
			EP 1265563 A1	18-12-2002
			WO 0170145 A1	27-09-2001
-----				
US 6352556	B1	05-03-2002	DE 19902481 A1	27-07-2000
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