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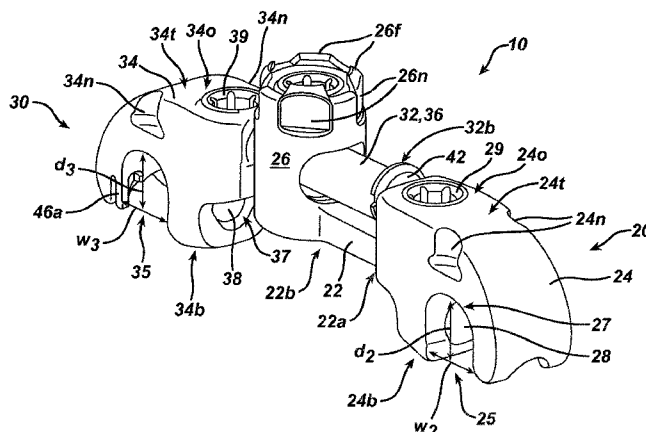
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(54) **Title:** SPINAL CROSS CONNECTORS



(57) **Abstract:** Various methods and devices are provided for connecting spinal fixation elements, such as spinal rods, implanted in a patient's spinal column. In particular, various spinal cross connectors are provided for connecting to one or more spinal fixation elements implanted in a patient's spine. The cross connectors can have a variety of configurations, including a fixed or adjustable length, as well as various features that allow certain portions of the cross connectors to be angularly oriented.

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US 07/22505

## A CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61 B 17/56, 17/58; A61 F 2/30 (2008.04)  
USPC - 606/61

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)  
USPC 606/61

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
USPC 606/63, 86, 104

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST (PGPB, USPT, EPAB, JPAB), Google Scholar, Google Patents

Keywords Spine, spinal, vertebra, vertebrae, cross, connect, female, male, ball, socket, rod, Insert, slide, slid, slldably, slides sliding, spherical, hemispherical

## C DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X ----- Y	US 2004/0133203 A1 (YOUNG et al ) 08 July 2004 (08 07 2004), para [0046], [0047], [0058], [0062], [0075], [0085]-[0087], [0089], Fig 1,2, 14-14b, 17, 18, 19	1-8, 11-14, 16-19 ----- 9, 10, 15
Y	US 2006/0058789 A1 (KIM et al ) 16 March 2006 (16 03 2006), para [0027], [0029], Fig 1a-1d	9
Y	US 2005/0119657 A1 (GOLDSMITH) 02 June 2005 (02 06 2005), para [0056], [0057]	10
Y	US 2005/0228377 A1 (CHAO et al ) 13 October 2005 (13 10 2005), para [0035], [0036], Fig 4a, 4b	15

      Further documents are listed in the continuation of Box C

* Special categories of cited documents	"P" later document published after the international filing date or pno πty date and not in conflict with the application but cited to understand the principle or theory underlying the invenUon
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive slep when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on pno πty claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"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 pno πty date claimed	

Date of the actual completion of the international search  
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# INTERNATIONAL SEARCH REPORT

International application No

PCT/US 07/22505

## 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 ☐ I Claims Nos  
because they relate to subject matter not required to be searched by this Authority, namely
- 2 **D** 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 **D** 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  
Group I claims 1-19 are directed to a spinal cross connector comprising a first connector having a female member for receiving a second member having a male member, such that the male member within the female member is slidable and rotatable along a longitudinal axis, and adjustable relative to the female member  
Group II Claims 20-30 are directed to a spinal cross connector comprising an elongate member having first and second engagement members disposed within first and second recesses, and also having locking members disposed within first and second openings, such that the locking members are configured to move the engagement members within the recesses  
The special technical feature of the Group I claims is a female member for receiving a male member, such that the male member within the female member is slidable and rotatable along a longitudinal axis, and, therefore, adjustable relative to the female member. The special technical feature of the Group II claims is an elongate member having first and second engagement members disposed within first and second recesses, and also having locking members disposed within first and second openings, such that the locking members engage the engagement members and to move the engagement members within the recesses. Neither of these technical features are common to the other groups, nor do they correspond to a special technical feature in the other groups. Accordingly unity of invention is lacking under PCT Rule 13.1

- 1 ☐ I As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
- 2 ☐ L J As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees
- 3 ☐ I I 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 1-19

### 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