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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 (Rule 48.2(h))

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(54) Title: SYSTEMS AND METHODS FOR INSTALLING AND REMOVING AN EXPANDABLE POLYMER

(57) Abstract: The present disclosure relates to systems and methods for installing shape memory polymers relative to orthopedic implants.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61L27/14 A61L27/50 A61L31/04 A61L31/14

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)
A61L 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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/142119 A1 (SEWARD KIRK P [US] ET AL) 3 October 2002 (2002-10-03) paragraph [0002] paragraph [0007] paragraph [0076] - paragraph [0080] paragraph [0102]; claims 1,29-31; figures 12A-12D, 13A, 13B, 18A-18C	1,2
A	EP 1 000 958 A (TAKIRON CO [JP]) 17 May 2000 (2000-05-17) paragraph [0110] - paragraph [0114]; figures 15-17,20,21; examples 1,2	1,2

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 8 July 2009	Date of mailing of the international search report 20/10/2009
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Muellners, Wilhelm
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/056836

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.:
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 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 (partially), 2

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 (partially), 2 (entirely)

A method of deforming a shape memory polymer material of an internal fixation device by inserting multiple heating probes of a heating device into corresponding multiple holes of a shape memory polymeric component and heating, and an internal fixation device adapted for applying this method

2. claims: 1 (partially), 3 (entirely)

A method of deforming a shape memory polymer material of an internal fixation device by inserting a tubular coil into the through hole of a shape memory polymeric component and passing a heated fluid through the tubular coil, and an internal fixation device adapted for applying this method

3. claims: 1 (partially), 4 (entirely)

A method of placing and removing an internal fixation device having a shape memory polymer material component coupled to an internal fixing component comprising fixing the internal fixation device to the bone; inserting a drill into the device, separate the shape memory polymeric component from the fixing component by drilling; and removing the internal fixation device from the bone and an internal fixation device adapted for applying this method

4. claim: 5 (entirely)

An internal fixation device comprising: a channel; a cannulated rod disposed within the channel; and a plurality of openings located at an end of the internal fixation device, wherein each opening includes a shape memory polymer material located within the opening.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/056836

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002142119	A1	03-10-2002	NONE
EP 1000958	A	17-05-2000	AU 763085 B2 10-07-2003
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