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(88) Date of publication of the international search report:

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(54) Title: INTERNAL FIXATION DEVICES

(57) Abstract: The present disclosure relates to an internal fixation device including an interface portion and a polymer material coupled to the interface portion, wherein the polymer material includes at least one feature on a surface of the polymer material. A method of fixating the internal fixation device to a bone and other internal fixation devices and methods for fixating are also disclosed.



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**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US2008/056828

**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 6 127 597 A (BEYAR MORDECHAY [IL] ET AL) 3 October 2000 (2000-10-03) column 1, line 27 - line 42 column 3, line 26 - line 38 column 5, line 40 - column 6, line 8 column 6, line 52 - column 7, line 19 column 8, line 9 - line 40 column 9, line 1 - line 37 column 11, line 21 - line 30 column 12, line 8 - line 25 column 20, line 31 - column 21, line 2 column 21, line 62 - line 67 column 30, line 7 - line 47 column 31, line 6 - line 41 column 35, line 24 - column 36, line 33 column 38, line 46 - line 60; figures 10-14, 28, 29, 35 ----- -/--	1-9

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

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Name and mailing address of the ISA/

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Muellners, Wilhelm

## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/056828

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 360 139 A (BOEHRINGER INGELHEIM KG [DE]; BOEHRINGER INGELHEIM INT [DE]) 28 March 1990 (1990-03-28) column 3, line 19 - line 25 column 3, line 51 - column 4, line 37 column 5, line 14 - line 38 -----	1-5,9
X	WO 01/54598 A (DISC O TECH MEDICAL TECHNOLOGI [IL]; SHAVIT RONEN [IL]; MAGAL ELAD [IL]) 2 August 2001 (2001-08-02) page 2, line 1 - line 31 page 3, line 20 - page 4, line 4 page 7, line 1 - line 12 page 10, line 24 - page 12, line 2 page 13, line 33 - page 14, line 21 page 17, line 12 - line 18 page 18, line 27 - line 32 page 19, line 24 - page 20, line 2 page 24, line 31 - page 25, line 3; figures 1,2,6,10 -----	1,3,6-9
X	DE 34 17 923 A1 (STUHLER TH DR) 21 November 1985 (1985-11-21) page 5, line 10 - page 6, line 1 page 7, line 18 - line 25 page 11, line 15 - page 13; figure 1 -----	1,3,6,7,9
A	WO 2006/116164 A (MEDSHAPE SOLUTIONS INC [US]; GALL KENNETH A [US]; TYBER JEFFREY A [US]) 2 November 2006 (2006-11-02) paragraph [0005] - paragraph [0008] paragraph [0015]; figures 1-6,13,24 -----	1-9
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 -----	1-9

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2008/056828

## 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 all searchable 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.:

1-9

### 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 -9 (entirely)

An internal fixation device comprising: an interface portion and a polymer material coupled to the interface portion, wherein the polymer material includes at least one feature on a surface of the polymer material, and a method of fixating such an internal fixation device to a bone by deforming the polymer material

## 2. claims: 10,11 (partially), 12,13 (entirely)

An internal fixation device comprising: a channel; and a shape memory polymer material having a stem portion located within the channel, and a method of fixating such an internal fixation device to a bone by deforming the polymer material

## 3. claims: 10,11 (partially), 14-19 (entirely)

An internal fixation device comprising: a channel; and a shape memory polymer located at the distal portion which includes a hinge, and a method of fixating such an internal fixation device to a bone by deforming the polymer material

## 4. claims: 20-23 (entirely)

A method of fixating at least one internal fixation device to a bone comprising: providing at least one internal fixation device; inserting the internal fixation device into the bone; and inserting a thermoset matrix into the bone.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No  
PCT/US2008/056828

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