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HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,
MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,
PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,
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25 February 2016

(54) Title: DEVICES, SYSTEMS AND METHODS FOR USING AND MONITORING SPINAL IMPLANTS

(57) Abstract: Spinal device / implants are
provided, comprising a spinal device / im-
plant and a sensor.

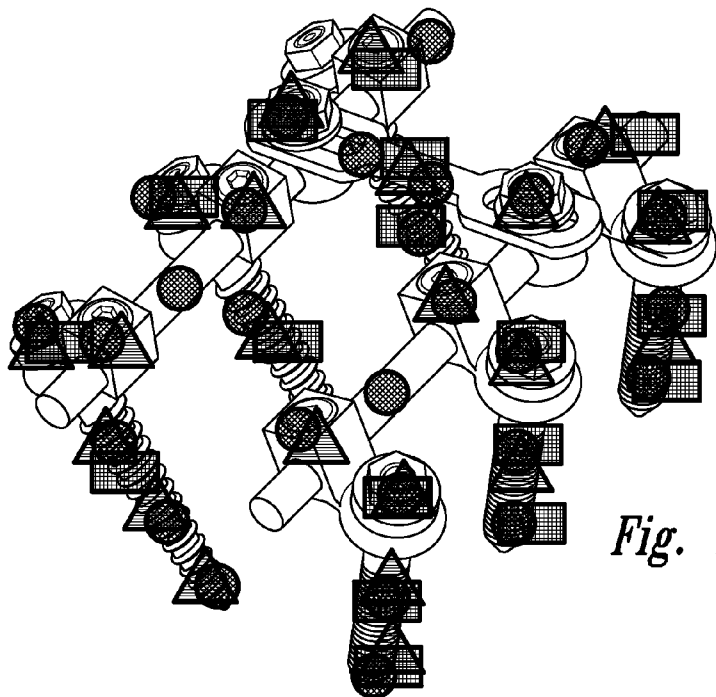


Fig. 11D

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 15/37825

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 17/58 (2015.01)

CPC - A61B 17/58

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 (8) A61B 17/58 (2015.01)

CPC: A61B 17/58

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

IPC (8) A61F 2/44, A61B 17/86 (2015.01)

CPC: A61F 2/44, A61B 17/86

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

PatBase; Google (Patents, Scholar, Web)

search terms: medical device implant spinal rod pedicle screw sensor integrity strain location temperature within

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8,083,741 B2 (MORGAN et al.); 27 December 2011 (27.12.2011); entire document, especially Fig. 7.	1, 3, 7, 12/(1, 3, 7)
A	US 2012/283781 A1 (ARNIN); 08 November 2012 (08.11.2012); entire document.	1, 3, 7, 12/(1, 3, 7)
A	US 2007/0049933 A1 (AHN et al.); 01 March 2007 (01.03.2007); entire document.	1, 3, 7, 12/(1, 3, 7)
A	US 8,663,287 B2 (BUTLER et al.); 04 March 2014 (04.03.2014); entire document.	1, 3, 7, 12/(1, 3, 7)
A	US 7,789,897 B2 (SANDERS); 07 September 2010 (07.09.2010); entire document.	1, 3, 7, 12/(1, 3, 7)

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


* 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 application or patent 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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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 15/37825

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.: 12-63
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:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.
Group I: Claims 1, 3, 7, 12/(1, 3, 7), directed to an implantable medical device comprising a pedicle screw, a spinal rod, and a sensor.

Group II: Claims 2, 12/(2) directed to an implantable medical device comprising a spinal wire and a sensor.

Group III: Claims 1, 4, 8, 12/(1, 4, 8) directed to an implantable medical device comprising a pedicle screw, a spinal plate, and a sensor.

Group IV: Claims 5, 12/(5) directed to an implantable medical device comprising a spinal cage, and a sensor.

Group V: Claims 6, 12/(6) directed to an implantable medical device comprising an artificial disc, and a sensor.

-*-Continued in extra 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 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, 3, 7, and 12/(1, 3, 7)

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 15/37825

-*Box No. III- Observations where unity of invention is lacking*-

Group VI: Claims 9, 10, 12/(9, 10) directed to an implantable medical device comprising a polymer and a sensor.

Group VII: Claims 11, 12/(11) directed to an implantable medical device comprising a kyphoplasty balloon, and a sensor.

The inventions listed as Groups I-VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical feature of a spinal rod, not required by the claims of Groups II-VII.

The invention of Group II includes the special technical feature of a spinal wire, not required by the claims of Groups I and III-VII.

The invention of Group III includes the special technical feature of a spinal plate, not required by the claims of Groups I, II, and IV-VII.

The invention of Group IV includes the special technical feature of a spinal cage, not required by the claims of Groups I-III and V-VII.

The invention of Group V includes the special technical feature of an artificial disc, not required by the claims of Groups I-IV, VI, and VII.

The invention of Group VI includes the special technical feature of a polymer, not required by the claims of Groups I-V, and VII.

The invention of Group VII includes the special technical feature of a kyphoplasty balloon, not required by the claims of Groups I-VI.

COMMON TECHNICAL FEATURES

Groups I and II share the common technical features of a pedicle screw and a sensor. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 8,083,741 B2 to Morgan, et al. (hereinafter 'Morgan'), which discloses a pedicle screw (210, Fig. 7) and a sensor (50, Fig. 1 and col. 3, lines 38-45).

Groups I-VII share the common technical feature of a sensor. However, this shared technical feature does not represent a contribution over prior art as being anticipated by Morgan, which discloses a sensor (50, Fig. 1 and col. 3, lines 38-45).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-VII lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

Note: Claims 12-63 are unsearchable because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).