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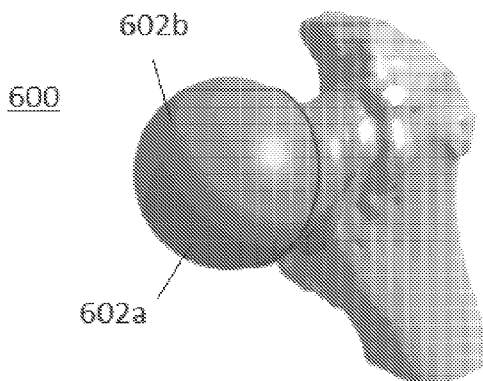
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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10 May 2024 (10.05.2024)

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see Notice of 07 March 2024 (07.03.2024)

(54) Title: DEVICE FOR MECHANICAL SECUREMENT TO HARD TISSUE

FIG. 17B



(57) Abstract: A device for mechanical securement to hard tissue of a subject, the hard tissue having an end surface defining a direction of curvature such that over at least a portion of the surface, a total curvature of at least 180 degrees is defined, the device comprising a body portion comprising at least four contact points, three contact points of the four contact point span over 180 degrees of total curvature of the end surface in a plane defined by the three contact points, and a fourth contact point outside the plane, the four contact points providing mechanical securement of the body portion to the hard tissue.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US23/71262

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. A61F 2/36 (2023.01)
ADD.
CPC - INV. A61F 2/3601; A61F 2/3609

ADD. A61F 2002/3611

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)
See Search History document

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

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0168866 A1 (SHIH, G) 01 July 2010; figure 14; paragraphs [0034]-[0037]	1, 2, 7, 9
A		3-6, 8
A	US 2008/0004711 A1 (LI, X) 03 January 2008; figure 4	1-9
A	US 2004/0260399 A1 (CHIENG, P) 23 December 2004; figure 4	1-9
A	US 6,488,716 B1 (HUANG, G) 03 December 2002; figure 1	1-9
A	US 4,728,335 A (JURGUTIS, J) 01 March 1988; see entire document	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

"D" document cited by the applicant in the international application

"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

25 January 2024 (25.01.2024)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US23/71262

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:

-Please See Supplemental Page-

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.:
1-9

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US23/71262

-Continued From Box No. III: Observations where unity of invention is lacking.-

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 1-9 are directed toward a hip joint prosthesis for securement to the neck of the femur of a subject following removal of the femoral head.

Group II: Claims 10-41 are directed toward an implant for securement to the end surface of hard tissue of a subject and a device for mechanical securement to hard tissue of a subject.

The inventions listed as Groups I-II 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:

Group I include a hip joint prosthesis for securement to the neck of the femur of a subject following removal of the femoral head, comprising: a substantially spherical ball portion for replacement of the femoral head; and a collar coupled to the ball portion and comprising a first collar portion and a second collar portion, wherein an interior surface of the collar conforms to a portion of the outer surface of the neck of the femur; wherein the first collar portion is configured to be coupled to the second collar portion to at least partially engage the outer surface of the neck of the femur to provide mechanical securement of the collar with the femur, which are not present in Group II.

Group II include an implant for securement to the end surface of hard tissue of a subject comprising: a first arm; a second arm; and a third arm extending from one or both of the first arm and the second arm, the first arm, the second arm and the third arm comprising at least four contact points, wherein three contact points of the four contact points span over 180 degrees of total curvature of the end surface in a plane defined by the three contact points, and a fourth contact point outside the plane, the four contact points providing mechanical securement of the body portion to the hard tissue and a device for mechanical securement to hard tissue of a subject, the hard tissue having an end surface defining a direction of curvature such that over at least one portion of the surface, a total curvature of at least 180 degrees is defined, the device comprising a body portion comprising at least four contact points, three contact points of the four contact point span over 180 degrees of total curvature of the end surface in a plane defined by the three contact points, and a fourth contact point outside the plane, the four contact points providing mechanical securement of the body portion to the hard tissue, which are not present in Group I.

The common technical features of Groups I and II are mechanical securement.

These common technical features are disclosed by US 4,728,335 A (Jurgutis). Jurgutis discloses mechanical securement (a secure mechanical interlock between the bone and prosthesis; abstract).

Since the common technical features are previously disclosed by the Jurgutis reference, the common features are not special and so Groups I and II lack unity.