



- (51) International Patent Classification:  
A61F 2/38 (2006.01) B24B 31/00 (2006.01)  
A61F 2/30 (2006.01)
- (21) International Application Number:  
PCT/EP2010/004195
- (22) International Filing Date:  
9 July 2010 (09.07.2010)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
09009032.5 10 July 2009 (10.07.2009) EP
- (71) Applicant (for all designated States except US): **MEDI-ZINISCHE HOCHSCHULE HANNOVER** [DE/DE];  
Anna von Borries Strasse 1-7, 30625 Hannover (DE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **RICHTER, Berna** [DE/DE]; Schlägerstrasse 42-44, 30171 Hannover (DE).  
**HURSCHLER, Christof** [DE/DE]; Boderstedtstrasse 13, 30173 Hannover (DE). **OSTERMEIER, Sven** [DE/DE]; Sallstrasse 22, 30171 Hannover (DE).
- (74) Agent: **GEHRIG, Philip**; Graf von Stosch Patentanwalts-gesellschaft Mbh, Prinzregentenstrasse 22, 80538 München (DE).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- 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))

[Continued on next page]

(54) Title: KNEE JOINT PROSTHESIS AND METHOD FOR PRODUCING SAID PROSTHESIS

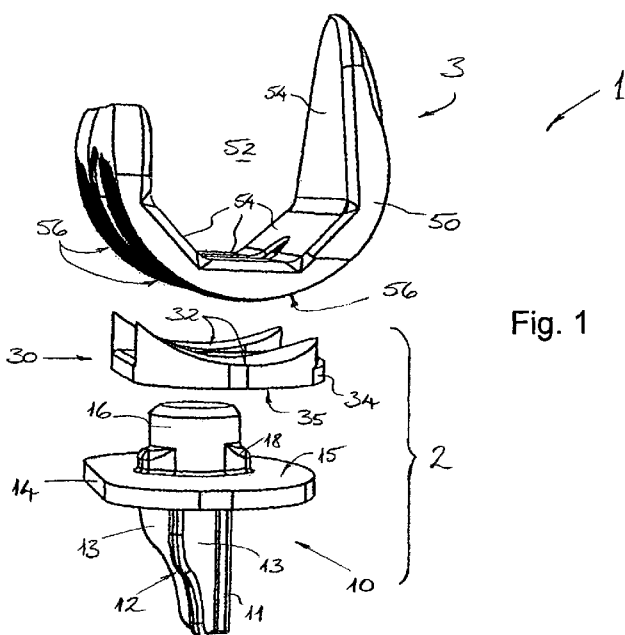


Fig. 1

(57) Abstract: The present invention relates to a knee joint prosthesis (1) having: a tibial component (2) and a femoral component (3). The tibial component (2) includes a fixation portion (10) adapted to be fixed to an upper end of a prepared tibia (T) in a patient, and a ceramic bearing portion (30) presenting at least one articulation surface (32). The femoral component (3) is adapted to be fixed to a lower end of a prepared femur (F) in a patient, and comprises a ceramic body portion (50) presenting at least one articulation surface (56) for engagement with the respective articulation surface(s) of the tibial component (2). The articulation surfaces (32, 56) of the tibial and femoral components (2, 3) are configured for essentially congruent engagement over a full range of movement of the prosthesis, and the bearing portion (30) of the tibial component (2) is adapted for movement relative to the fixation portion (10). The invention also provides a method of finishing articulation surfaces (32, 56) of ceramic components of a knee joint prosthesis, including the steps of combining the ceramic bearing portion (30) and the ceramic body portion (50) such that respective articulation surfaces (32, 56) are brought into engagement with a working substance (S) provided between them; and imparting relative movement to the bearing portion (30) and/or the body portion (50) such that the articulation surfaces (32, 56) repeatedly slide over one another, whereby friction forces generated between the articulation surfaces (32, 56) and the working substance (S) act to finish the surfaces simultaneously.

between the articulation surfaces (32, 56) and the working substance (S) act to finish the surfaces simultaneously.

WO 2011/003621 A3

**(88) Date of publication of the international search report:**  
3 March 2011

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2010/004195

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. A61F2/38      A61F2/30      B24B31/00

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)  
A61F B24B

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)

EP0-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 519 873 A (BAEHLER ANDRE [CH]) 23 December 1992 (1992-12-23)	1-12
Y	figures 4, 21-27, 28b, 28c, 29a-29c column 16, line 19 - column 18, line 25	13-15
X	DE 100 12 059 A1 (SAINT PAUL BERND [DE]) 27 September 2001 (2001-09-27)	1-15
X	figures 1-6 column 2, line 23 - column 6, line 37	1-10
Y	EP 0 442 330 A (FRIEDRICHSFELD AG [DE] FRIATEC KERAMIK KUNSTSTOFF [DE]) 21 August 1991 (1991-08-21)	13-15
Y	figures 1-5 column 5, line 9 - column 8, line 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

10 September 2010

Date of mailing of the international search report

17/01/2011

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

Storer, John

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2010/004195

**C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 724 868 A (SULZER MEDIZINALTECHNIK AG [CH]; ALLO PRO AG [CH] SULZER ORTHOPAEDIE A) 7 August 1996 (1996-08-07)                      figures 1a,2a,2b,3a,4a,4b,5d,7                      column 4, line 40 - column 5, line 19                      column 5, line 31 - column 6, line 44                      column 7, line 48 - column 8, line 43                      column 11, lines 24-34                      -----</p>	1-15

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2010/004195

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0519873      A	23-12-1992	AT      146669 T	15-01-1997
		DE      59207748 D1	06-02-1997
		DK      0519873 T3	16-06-1997
		ES      2097307 T3	01-04-1997
		GR      3022760 T3	30-06-1997
		JP      2741644 B2	22-04-1998
		JP      5200057 A	10-08-1993
		US      5395401 A	07-03-1995
DE 10012059      A1	27-09-2001	WO      0168000 A1	20-09-2001
		EP      1408887 A1	21-04-2004
EP 0442330      A	21-08-1991	DE      4009360 A1	22-08-1991
		JP      3244180 B2	07-01-2002
		JP      4218155 A	07-08-1992
		US      5064437 A	12-11-1991
EP 0724868      A	07-08-1996	AT      202465 T	15-07-2001
		DE      59509363 D1	02-08-2001

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2010/004195

## 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.:

1-15

### 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: 1-15

Knee joint prosthesis comprising a tibial component, the tibial component comprising a bearing portion formed from a ceramic material and presenting at least one articulation surface; wherein the bearing portion is adapted for movement relative to the upper end of the tibia.

---

2. claims: 16-19

Method of and apparatus for finishing articulation surfaces of ceramic components of a knee joint prosthesis, comprising the steps of: providing a ceramic bearing portion for a tibial component of the prosthesis, the bearing portion presenting at least one articulation surface; and providing a ceramic body portion for a femoral component of the prosthesis, the body portion presenting at least one articulation surface for engagement with the respective articulation surface of the bearing portion; combining the bearing portion and the body portion such that their respective articulation surfaces are brought into engagement; and imparting relative movement to the bearing portion and/or the body portion such that the articulation surfaces repeatedly slide over one another.

---