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(54) Title: PROSTHETIC BALL-AND-SOCKET JOINT

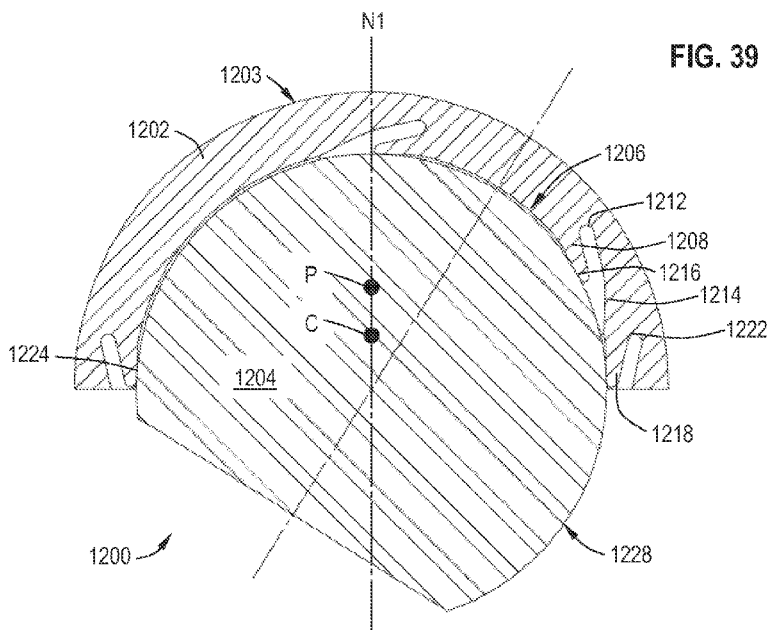


FIG. 39

(57) Abstract: A prosthetic joint includes: (a) first member having a balanced centroidal axis, and comprising rigid material and a concave interior defining a cup surface, the cup surface including: (i) a cantilevered first flange defining a wear-resistant protruding first contact rim, the first flange being asymmetric relative to the balanced centroidal axis; and (ii) a cantilevered second flange defining a wear-resistant protruding second contact rim; (b) a second member comprising a rigid material with a wear-resistant, convex contact surface; (c) where the first and second contact rims bear against the contact surface of the second member, to transfer loads between the first and second members, while allowing pivoting motion therebetween; and (d) wherein the flanges are shaped and sized so as to deform elastically and permit the first and second contact rims to conform in an irregular shape to the contact surface, when the joint is under load.



A. CLASSIFICATION OF SUBJECT MATTER*A61F 2/30(2006.01)i, A61F 2/28(2006.01)i, A61L 27/10(2006.01)i, A61L 27/04(2006.01)i*

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 2/30; A61F 2/46; A61F 2/44; B23P 11/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: KOMPASS, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0262250 A1 (KELLAR, F. W. and CROWDER, JR. H. L.) 14 October 2010 See entire document.	1-17
A	US 2002-0035400 A1 (BRYAN, V. and KUNZLER, A.) 21 March 2002 See entire document.	1-17
A	US 2005-0131544 A1 (KURAS, J. M. et al.) 16 June 2005 See entire document.	1-17
A	US 2009-0326656 A1 (DE VILLIERS, M. and HAHNLE, M.D. U.) 31 December 2009 See entire document.	1-17

 Further documents are listed in the continuation of Box C. See patent family annex.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date		
US 2010-0262250 A1	14.10.2010	CA 2668692 A1	15.05.2008		
		EP 2081520 A1	29.07.2009		
		US 2008-0154369 A1	26.06.2008		
		US 2010-0161064 A1	24.06.2010		
		US 2010-0280623 A9	04.11.2010		
		US 2011-0087333 A1	14.04.2011		
		US 2011-0166667 A1	07.07.2011		
		US 2011-0166671 A1	07.07.2011		
		US 7905919 B2	15.03.2011		
		US 7914580 B2	29.03.2011		
		US 8029574 B2	04.10.2011		
		US 8070823 B2	06.12.2011		
		WO 2008-058205 A1	15.05.2008		
		WO 2011-106668 A2	01.09.2011		
		WO 2012-006067 A2	12.01.2012		
		US 2002-0035400 A1	21.03.2002	AU 2001-281166 B2	20.07.2006
				AU 2001-81166 A1	18.02.2002
AU 2001-84752 A1	18.02.2002				
AU 2002-326694 B2	05.07.2007				
CA 2426453 A1	14.02.2002				
CA 2429246 A1	14.02.2002				
EP 1307153 A2	07.05.2003				
EP 1307153 B1	23.09.2009				
EP 1363565 A2	26.11.2003				
EP 1420703 A1	26.05.2004				
EP 1420703 B1	14.03.2007				
EP 2301447 A2	30.03.2011				
EP 2301447 A3	06.04.2011				
JP 04-255375 B2	15.04.2009				
JP 04-617408 B2	05.11.2010				
JP 2004-505668 A	26.02.2004				
JP 2004-516044 A	03.06.2004				
JP 2005-500122 A	06.01.2005				
US 2002-0111631 A1	15.08.2002				
US 2002-0128715 A1	12.09.2002				
US 2002-0161446 A1	31.10.2002				
US 2003-0199738 A1	23.10.2003				
US 2004-0054411 A1	18.03.2004				
US 2005-0038515 A1	17.02.2005				
US 2005-0059976 A1	17.03.2005				
US 2010-0070042 A1	18.03.2010				
US 6562045 B2	13.05.2003				
US 6949105 B2	27.09.2005				
US 7125380 B2	24.10.2006				
US 7179262 B2	20.02.2007				
US 7537612 B2	26.05.2009				
US 7601174 B2	13.10.2009				
US 7641692 B2	05.01.2010				

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/030905

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 8092542 B2	10.01.2012
		WO 02-11633 A2	14.02.2002
		WO 02-11650 A2	14.02.2002
		WO 03-017853 A1	06.03.2003
		WO 2004-080322 A1	23.09.2004
US 2005-0131544 A1	16.06.2005	AU 2004-299008 A1	30.06.2005
		AU 2004-299008 B2	25.02.2010
		CA 2549101 A1	30.06.2005
		CA 2650756 A1	30.06.2005
		CN 101816596 A	01.09.2010
		CN 1901854 A	24.01.2007
		CN 1901854 B	12.05.2010
		EP 1703869 A2	27.09.2006
		EP 1703869 A4	27.05.2009
		EP 1703869 B1	23.11.2011
		EP 2387976 A1	23.11.2011
		JP 04-750042 B2	27.05.2011
		JP 2007-513711 A	31.05.2007
		KR 10-0753465 B1	31.08.2007
		US 2005-0131542 A1	16.06.2005
		US 2005-0131543 A1	16.06.2005
		US 7128761 B2	31.10.2006
		US 7588600 B2	15.09.2009
		US 7695517 B2	13.04.2010
		WO 2005-058194 A2	30.06.2005
		WO 2005-058194 A3	19.01.2006
US 2009-0326656 A1	31.12.2009	EP 1626685 A2	22.02.2006
		EP 1626685 A4	21.01.2009
		EP 1626685 B1	08.09.2010
		EP 2161008 A2	10.03.2010
		EP 2161008 A3	30.06.2010
		EP 2226038 A1	08.09.2010
		JP 04-481312 B2	26.03.2010
		JP 2007-501686 A	01.02.2007
		JP 2009-219889 A	01.10.2009
		JP 2010-017568 A	28.01.2010
		US 2005-0021145 A1	27.01.2005
		US 2005-0021146 A1	27.01.2005
		US 2008-0133011 A1	05.06.2008
		US 2008-0215155 A1	04.09.2008
		US 2008-0221696 A1	11.09.2008
		US 2009-0222101 A1	03.09.2009
		US 2010-0076558 A1	25.03.2010
		US 2010-0191338 A1	29.07.2010
		US 2011-0160862 A1	30.06.2011
		US 2012-0035732 A1	09.02.2012
		US 7442211 B2	28.10.2008
		US 7753956 B2	13.07.2010

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/030905

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 8092538 B2	10.01.2012
		WO 2004-105638 A2	09.12.2004
		WO 2004-105638 A3	13.01.2005