



(51) International Patent Classification:

A61F 2/80 (2006.01) A61F 2/74 (2006.01)
A61F 2/78 (2006.01) A61F 2/50 (2006.01)

(21) International Application Number:

PCT/US2010/041814

(22) International Filing Date:

13 July 2010 (13.07.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/477,572 3 June 2009 (03.06.2009) US

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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))

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

[Continued on next page]

(54) Title: DYNAMICALLY ACTIVATED VARIABLE RESPONSE SOCKET TECHNOLOGY

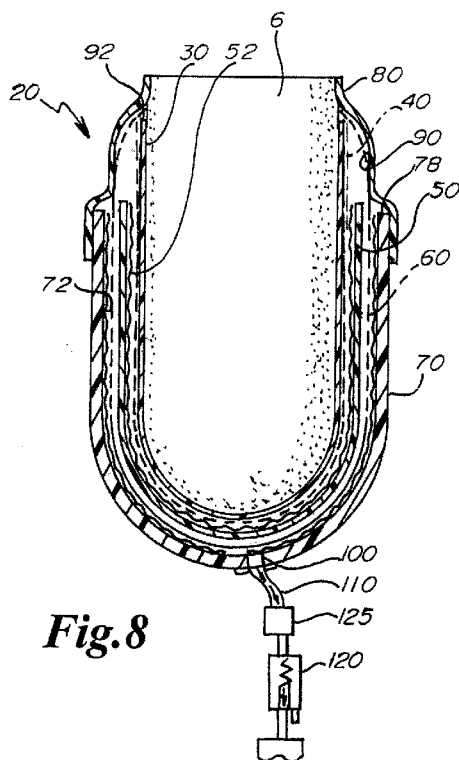


Fig. 8

(57) Abstract: A socket system (20) for use in a prosthetic or orthotic artificial limb for amputees, the socket system being dynamically activated by weight-bearing loads and variable in response to shear forces imposed by weight-bearing loads. The socket system includes: a liner (30) adapted to engage the residual limb; a semi-flexible inner socket (50) having a textured surface; an inner socket air wick (40) between the liner and the textured surface of the inner socket; a semi-rigid outer socket (70) having a textured surface; an outer socket air wick (60) between the inner socket and the textured surface of the outer socket; a sealing sleeve (80) engaging the outer socket and the residual limb, the sealing sleeve, the outer socket, and the residual limb creating a sealed chamber; and a vacuum source (120) connected to the sealed chamber and creating a vacuum within the sealed chamber. The vacuum source is dynamically activated in response to weight-bearing loads and varies the response of the socket system to shear forces imposed by weight-bearing loads. The socket system may alternatively be a single rigid socket (70) with a flexible brim (76).



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- *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))*
 - *with information concerning request for restoration of the right of priority in respect of one or more priority claims (Rules 26bis.3 and 48.2(b)(vii))*

(88) Date of publication of the international search report:
14 April 2011

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/041814

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61F2/80 A61F2/78
ADD. A61F2/74 A61F2/50

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

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 6 726 726 B2 (CASPER CARL A [US]) 27 April 2004 (2004-04-27) cited in the application	15-22
Y	column 11, line 57 - column 12, line 15; figure 15 column 6, lines 55-65 column 8, line 42 - column 9, line 6; figure 8 column 9, line 41 - column 10, line 40; figure 11	1-14
X	----- US 5 931 872 A (LOHMANN KLAUS H [US]) 3 August 1999 (1999-08-03)	15-18
Y	* abstract; figures 1-2 column 3, lines 41-55; claims 1,6 ----- -/--	1-14

☒ 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

17 February 2011

Date of mailing of the international search report

02/03/2011

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/041814

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/149202 A1 (SCHAFER STEPHEN P [US] ET AL) 7 July 2005 (2005-07-07) paragraph [0099]; figures 7-10 -----	1-14
X	US 2007/055383 A1 (KING CHARLES [US]) 8 March 2007 (2007-03-08) paragraphs [0108] - [0109], [0112]; figure 8B -----	15-18
A	US 2008/221706 A1 (SCUSSEL RICK C [US] ET AL) 11 September 2008 (2008-09-11) paragraph [0015]; figures 2-4 -----	1-18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/041814

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.:

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: 1-18

a socket system comprising in particular: a liner adapted to engage a residual limb; an inner socket having a textured surface; an inner socket air wick between the liner and the inner socket; an outer socket having a textured surface; an outer socket air wick between the inner socket and the outer socket; a sealing sleeve engaging the outer socket and the residual limb, creating a sealed chamber enclosing the outer socket, the outer socket air wick, the inner socket, and the inner socket air wick; and a vacuum source connected to the sealed chamber and creating a vacuum within the sealed chamber, said vacuum drawing the inner socket air wick against the textured surface of the inner socket and the outer socket air wick against the textured surface of the outer socket.

2. claims: 19-22

a socket system comprising in particular: a liner adapted to engage the residual limb; a rigid socket having a flexible brim; an air wick between the liner and the socket; a sealing sleeve engaging the rigid socket and the residual limb, creating a sealed chamber enclosing the socket and the air wick; and a vacuum source connected to the sealed chamber and creating a vacuum within the sealed chamber and a pressure differential force holding the socket brim against the liner.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/041814

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6726726	B2	27-04-2004	US 2001005798 A1	28-06-2001
US 5931872	A	03-08-1999	W0 9621405 A1	18-07-1996
			US 5728167 A	17-03-1998
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US 2007055383	A1	08-03-2007	NONE	
US 2008221706	A1	11-09-2008	NONE	