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AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
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HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
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(54) Title: SEMIAUTOMATIC ANTERIOR ANKLE FOOT ORTHOSIS

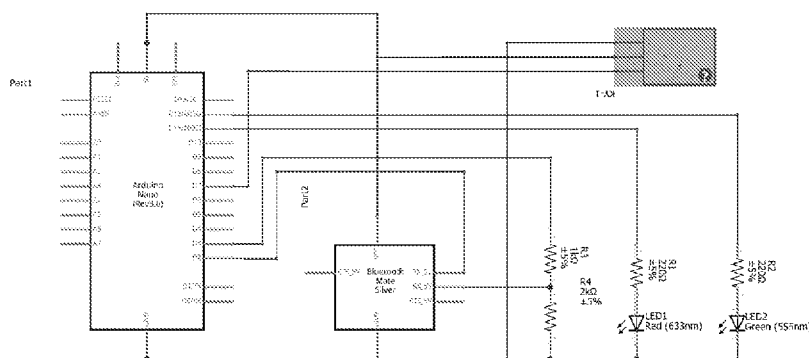


Figure 2

(57) Abstract: The present invention discloses a semiautomatic anterior ankle foot orthosis that comprises at least one pneumatic cylinder controlled by an electronic circuit wherein the at least one pneumatic cylinder is centrally assembled from the upper portion of the orthosis corresponding to the leg to the instep of the orthosis, or at least two pneumatic cylinders controlled by an electronic circuit wherein the at least two pneumatic cylinders are laterally assembled from the centre of the malleoli as being the articular centre of the ankle. The present invention also discloses a process for manufacturing the semiautomatic anterior ankle foot orthosis.



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, 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))*
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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61F5/01
ADD.

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 practicable, 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 2014/257521 A1 (FLAVEN THIERRY [FR] ET AL) 11 September 2014 (2014-09-11) Figs. 1, 2B, 2C, 3 // claim 1 // [0023]-[0029]	1-10
X	US 2005/070834 A1 (HERR HUGH [US] ET AL) 31 March 2005 (2005-03-31) cited in the application Figs. // actuator 12, active ankle foot orthosis 10 // [0019] - [0023], [0057] - [0059]	1-10
A	WO 2016/180073 A1 (UNIV HONG KONG POLYTECHNIC [CN]) 17 November 2016 (2016-11-17) Fig. 14	1-10

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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 30 October 2018	Date of mailing of the international search report 17/01/2019
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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 Foged, Søren
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/PT2018/050023

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.: 14
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210

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.:
1-10(partially)

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: 1-10(partially)

An orthosis with an upper portion and an instep - with a pneumatic cylinder assembled therebetween,

solving the problem of providing actuation between an upper portion and an instep.

2. claims: 1-10(partially)

An orthosis with two pneumatic cylinders mounted laterally from the centre of the malleoli,

solving the problem of providing an orthosis with a larger pneumatic force.

3. claims: 11-13

A process for manufacturing an ankle-foot orthosis comprising a high-density thermoplastic and a pneumatic cylinder with an electro-mechanically actuated valve,

solving the problem of controlling a pneumatic cylinder.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 14

Claim 14 relates to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of this claim (Article 34(4)(a)(I) PCT) which are also not searched, see Rule 39.1(iv) PCT (method for treatment of the human, in this case a method of treating a drop foot of a patient).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/PT2018/050023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014257521	A1	11-09-2014	NONE

US 2005070834	A1	31-03-2005	US 8287477 B1 16-10-2012
			US 8376971 B1 19-02-2013
			US 8551029 B1 08-10-2013
			US 2005070834 A1 31-03-2005
			US 2012136459 A1 31-05-2012
			US 2015127117 A1 07-05-2015
			US 2017231854 A1 17-08-2017

WO 2016180073	A1	17-11-2016	NONE
