

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:  
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INVITATION TO PAY ADDITIONAL FEES  
 AND, WHERE APPLICABLE, PROTEST FEE  
 (PCT Article 17(3)(a) and Rule 40.1 and 40.2(e))

	Date of mailing <i>(day/month/year)</i>
	13 November 2018 (13-11-2018)
Applicant's or agent's file reference 2018-0854EG	<b>PAYMENT DUE</b> within <b>ONE MONTH</b> from the above date of mailing
International application No. PCT/PT2018/050023	International filing date <i>(day/month/year)</i>
	7 June 2018 (07-06-2018)
Applicant  UNIVERSIDADE DO ALGARVE	

1. This International Searching Authority

(i) considers that there are 3 *(number of)* inventions claimed in the international application covered by the claims indicated on an extra sheet:

(ii) therefore considers that **the international application does not comply with the requirements of unity of invention** (Rules 13.1, 13.2 and 13.3) for the reasons indicated on an extra sheet:

(iii)  has carried out a partial international search (see Annex)  will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:  
**see extra sheet**

(iv) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid.

2. Consequently, the applicant is hereby **invited to pay**, within the time limit indicated above, the amount indicated below:

EUR 1.775,00	x	2	=	EUR 3.550,00
Fee per additional invention		number of additional inventions		currency/total amount of additional fees

3. The applicant is informed that, according to Rule 40.2(c), **the payment of any additional fee may be made under protest**, i.e., a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive, where applicable, subject to the payment of a protest fee.  
 Where the applicant pays additional fees under protest, the applicant is hereby invited, within the time limit indicated above, to pay a protest fee (Rule 40.2(e)) in the amount of EUR 875,00 *(currency/amount)*

Where the applicant has not, within the time limit indicated above, paid the required protest fee, the protest will be considered not to have been made and the International Searching Authority will so declare.

4.  Claim(s) Nos. see extra sheet have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer SAAD, Tanya Tel: +49 (0)89 2399-7457
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**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 206**

Continuation of Box 4.

Claim(s) completely searchable:  
1-13

Claim(s) not searched:  
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).

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.

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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.

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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.

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This Authority considers that the application does not meet the requirements of unity of invention and there are three inventions covered by the claims as indicated.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

A complete search of the a priori first potential invention claimed, namely the subject-matter of independent claim 1, revealed US 2014/0257521 (D1) as the most pertinent state of the art with respect to claim 1.

The common subject-matter between independent claims 1A, 1B and 11, is thus a orthosis with an actuator which is not new (Art. 33(2) PCT) since D1 discloses such orthosis with an actuator.

The subject-matter of these groups of claims is not so linked as to form a single inventive concept (Rule 13.1 PCT), since there is apparently no technical relationship in the sense of Rule 13.2 PCT between these groups of special technical features and the corresponding technical problems which they solve.

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos.:
- see 'Invitation to pay additional fees'
2. This communication is not the international search report which will be established according to Article 18 and Rule 43.
3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.
4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

**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.

Patent family members are listed in 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

# Patent Family Annex

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

Application no:  
Demande n°: PCT/PT2018/050023  
Anmelde-Nr:

#### DISCLAIMER

The attached provisional opinion on the patentability of the first invention searched serves only as information.  
A reply addressing the points raised in the opinion is **not** required and will **not** be taken into account when issuing the final search report and opinion on patentability.

#### AVERTISSEMENT

L'avis provisoire ci-joint sur la brevetabilité de la première invention recherchée ne sert qu'à titre d'information.  
Une réponse abordant les points soulevés dans l'avis n'est **pas** nécessaire et ne sera **pas** prise en compte lors de l'établissement du rapport final de la recherche et de l'avis sur la brevetabilité.

#### DISCLAIMER

Die beigefügte vorläufige Stellungnahme zur Patentierbarkeit der ersten geprüften Erfindung dient lediglich zur Information.  
Eine Antwort auf die erhobenen Punkte in der Stellungnahme ist **nicht** erforderlich und bleibt bei der Erstellung des endgültigen Recherchenberichts und der Stellungnahme zur Patentierbarkeit **unberücksichtigt**.

### **Re Item III**

#### **Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

- 1 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).

### **Re Item IV**

#### **Lack of unity of invention**

- 2 Initially it is noted that claim 1 contains two alternatives:
  - 1A: an orthosis with an upper portion and an instep - with a pneumatic cylinder assembled therebetween, and
  - 1B an orthosis with two pneumatic cylinders mounted laterally from the centre of the malleoli,

As the two alternatives are non-unitary, claim 1 de facto comprises two independent claims – hereinafter designated claims 1A and 1B – and is hence treated as such.
- 3 Accordingly, this Authority considers that the application does not meet the requirements of unity of invention and there are three inventions covered by the claims as indicated:
  - 3.1 Claims 1A-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.
  - 3.2 Claims 1B-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.
  - 3.3 Clams 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.

- 4 The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:
- 5 A complete search of the a priori first potential invention claimed, namely the subject-matter of independent claim 1, revealed US 2014/0257521 (D1) as the most pertinent state of the art with respect to claim 1.
- 6 The common subject-matter between independent claims 1A, 1B and 11, is thus a orthosis with an actuator which is not new (Art. 33(2) PCT) since D1 discloses such orthosis with an actuator.
- 7 The subject-matter of these groups of claims is not so linked as to form a single inventive concept (Rule 13.1 PCT), since there is apparently no technical relationship in the sense of Rule 13.2 PCT between these groups of special technical features and the corresponding technical problems which they solve.

### **Re Item V**

#### **Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- 8 Reference is made to the following documents:
- D1 US 2014/257521 A1 (FLAVEN THIERRY [FR] ET AL) 11 September 2014 (2014-09-11)
- 9 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1A is not new.
- D1 discloses a semiautomatic anterior ankle foot orthosis, comprising at least one pneumatic cylinder (*D1: actuation component 130*) controlled by an electronic circuit wherein the at least one pneumatic cylinder is centrally assembled from the upper portion (*D1: first prosthetic component 302*) of the orthosis corresponding to the leg to the instep (*D1: second prosthetic component 304*) of the orthosis.
- Accordingly, claim 1A is not novel in view of D1.
- 10 The combination of the features of dependent claims 2-10 as dependent on claim 1A is neither known from, nor rendered obvious by, the available prior art.



## **Re Item VII**

### **Certain defects in the international application**

- 11 The cited prior art has not been identified in the description (Rule 5.1(a)ii PCT).
- 12 The features of the claims are not provided with reference signs placed in parentheses to increase the intelligibility of claims (Rule 6.2(b) PCT).

## **Re Item VIII**

### **Certain observations on the international application**

- 13 Claim 4 is unclear in that the terms "L16" and "B25" cannot be understood.
- 14 The category of claim 6 is unclear in that the phrase "electrical circuit is controlled through a mobile application via Bluetooth<sup>®</sup> Low technology" indicates use of the device although the claim relates to an apparatus. Accordingly, it is not clear whether the claim relates to an apparatus or to a method. One way of overcoming this clarity objection is to amend "is" with "is adapted to" .
- 15 The category of claim 10 is unclear in that the phrase "the ankle foot orthosis is connected to the foot and leg" indicates use of the device although the claim relates to an apparatus. Accordingly, it is not clear whether the claim relates to an apparatus or to a method. One way of overcoming this clarity objection is to amend "is" with "is adapted to" .
- 16 The applicant is kindly asked to review the claims dependencies as it seems that an error has been made.
  - 16.1 Especially it is noted that claim 12 refers back to claim 9. It is believed that the intention of the applicant was to refer back to claim 11 - as only claim 11 contains a method step "a)".
  - 16.2 Similarly, it is noted that claim 13 refers back to claims 9-10. It is believed that the intention of the applicant was to refer back to claims 11-12 as the method step "b)" is defined in claim 11.