

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference see form PCT/ISA/220	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/EP2019/082488	International filing date (day/month/year) 26.11.2019	Priority date (day/month/year) 28.11.2018
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International Patent Classification (IPC) or both national classification and IPC
INV. A61N1/36 ADD. A61B5/0484

Applicant
KONINKLIJKE PHILIPS N.V.

1. This opinion contains indications relating to the following items:


- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Ließmann, Frank Telephone No. +49 89 2399-0
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>5-8, 10, 11, 13, 14</u>
	No: Claims	<u>1-4, 9, 12, 15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

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

Reference is made to the following documents:

- D1 JIANG DAI ET AL: "A Multichannel High-Frequency Power-Isolated Neural Stimulator With Crosstalk Reduction",
IEEE TRANSACTIONS ON BIOMEDICAL CIRCUITS AND SYSTEMS,
IEEE, US,
vol. 12, no. 4, 1 August 2018 (2018-08-01), pages 940-953, XP011688660,
ISSN: 1932-4545, DOI: 10.1109/TBCAS.2018.2832541
[retrieved on 2018-08-14]
- D2 IAN WILLIAMS ET AL: "An Energy-Efficient, Dynamic Voltage Scaling Neural Stimulator for a Proprioceptive Prosthesis",
IEEE TRANSACTIONS ON BIOMEDICAL CIRCUITS AND SYSTEMS,
IEEE, US,
vol. 7, no. 2, 1 April 2013 (2013-04-01), pages 129-139, XP011507012,
ISSN: 1932-4545, DOI: 10.1109/TBCAS.2013.2256906

1 Independent claim 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 discloses:

A neurostimulator circuit (D1, fig. 2, 7; Abstract), comprising:
a galvanically isolated first stimulator channel, comprising a current source unit (D1, fig. 2, 3; p. 941, 4th par. of right col., l. 1-6), the current source unit comprising:
an H-bridge circuit comprising a first pair of switch transistors configured to operate according to a first voltage (D1, fig. 7(a); p. 942, 1st par. of right col., l. 4) and a cascode circuit comprising a second pair transistors (D1, fig. 7(a), 7(b); p. 945, 2nd par. of left col., l. 1; p. 945, 3rd par. of left col.); and

a current source circuit configured to operate according to a second voltage and coupled to the cascode circuit (D1, fig. 7(a); p. 942, 1st par. of right col., l. 3-4); and a pair of electrodes having one of a positive or negative current driven across the pair of electrodes based on parameters received at each of the transistors of the H-bridge circuit, the current comprising a magnitude according to the current source circuit (D1, fig. 3, 7(a); p. 943, last par. of right col.; p. 945, 2nd and 3rd par. of left col.).

2 Dependent claims 2-15

Dependent claims 2-15 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT) and/or inventive step (Article 33(3) PCT), the reasons being as follows:

- 2.1 The additional features of claims 2-4, 9, 12 and 15 are also known from document D1 (see D1, fig. 2, 3, 4; p. 942, last sentence of 1st par. of right col.; p. 942, A. Power-Isolated Stimulation; p. 943, B. Stimulation Control; p. 945, D. Output Stage; p. 946, F. Isolation Switches).
- 2.2 The additional features of claims 5-8, 10, 11, 13 and 14 are known from the field of neurostimulators (see D2, fig. 8; B. DC-DC Converter for claim 5) or merely one of several straightforward neurostimulator implementations from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, especially as the advantages thus achieved can readily be foreseen.

Re Item VII

Certain defects in the international application

- 1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.
- 2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

- 3 The independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT.