

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

International application No.
PCT/EP2018/073908

International filing date (day/month/year)
05.09.2018

Priority date (day/month/year)
08.09.2017

International Patent Classification (IPC) or both national classification and IPC
INV. A61B6/00 G21K1/10

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:



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Date of completion of this opinion

see form PCT/ISA/210

Authorized Officer

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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. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

the entire international application

claims Nos. 9-16

because:

the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

no international search report has been established for the whole application or for said claims Nos. 9-16

a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13^{ter}.1(a) or (b).

See Supplemental Box for further details

Box No. IV Lack of unity of invention

1. In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- paid additional fees
 - paid additional fees under protest and, where applicable, the protest fee
 - paid additional fees under protest but the applicable protest fee was not paid
 - not paid additional fees
2. This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- complied with
 - not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- all parts.
 - the parts relating to claims Nos. 1-8, 17-20

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	
	No: Claims	<u>1-8, 17-20</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-8, 17-20</u>
Industrial applicability (IA)	Yes: Claims	<u>1-8, 17-20</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

1 **Re Item IV**

Lack of unity of invention

1.1 This Authority considers that the application does not meet the requirements of unity of invention and that there are 2 inventions covered by the claims indicated as follows:

Claims: 1-8, 17-20

Device and method with a dynamically adjustable bowtie filter

Claims: 9-16

Computer readable storage medium with method for assessing acceptance of fluency levels.

1.2 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:

Claim 1 relates to a device with a bowtie filter made of two half-wedges, with motors attached, which work with a controller to independently move these two half-wedges. This could possibly solve problems relating to a more dynamic set up.

Claim 9 however relates in effect to a method which only requires one wedge, and which estimates fluency of photons and acceptability of the results for a series of settings of the wedge.

There are no features which link these two claims, as they solve different problems with different features, with no features that correspond to each other. It is not possible to define a special, technical feature which finds its correspondence in both independent claims.

Claim 17, the method, is considered to belong to the first group, as it relates to the first and second half wedge and their movement, which finds its correspondence in claim 1.

2 **Re Item V**

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

2.1 Reference is made to the following documents:

D1 WO 2012/174246 A2

D2 US 2006/018435 A1

- 2.2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new. The reasons are as follows.
- 2.3 D1 discloses (see D1, paragraph [0026] - paragraph [0071]) an imaging system (800), comprising: a radiation source (816) configured to emit radiation that traverses an examination region; a radiation detector array (824) having a plurality of detectors configured to detect the radiation traversing the examination region; a dynamic bowtie filter (820), disposed between the radiation source and the examination region, wherein the dynamic bowtie filter comprises a first half wedge (822) and a separate and distinct second half wedge with a material free space there between; a first motor (1104) in mechanical communication with the first half wedge, wherein the first motor is configured to move the first half wedge; a second motor in mechanical communication with the second half wedge, wherein the second motor is configured to move the second half wedge (see paragraph [0067]); and a controller (812) configured to independently control the first and second motors to move the first and second half wedges to increase or decrease a distance there between during an acquisition interval.
- 2.4 Furthermore, document D2 also shows (see D2, paragraph [0016] - paragraph [0023]; figure 7) an imaging system (12), comprising: a radiation source (14) configured to emit radiation that traverses an examination region; a radiation detector array (18) having a plurality of detectors (20) configured to detect the radiation traversing the examination region; a dynamic bowtie filter (76), disposed between the radiation source and the examination region, wherein the dynamic bowtie filter comprises a first half wedge and a separate and distinct second half wedge with a material free space there between (see figure 7); a first motor in mechanical communication with the first half wedge, wherein the first motor is configured to move the first half wedge; a second motor in mechanical communication with the second half wedge, wherein the second motor is configured to move the second half wedge; and a controller (26) configured to independently control the first and second motors to move the first and second half wedges to increase or decrease a distance there between during an acquisition interval.
- 2.5 The subject-matter of claim 1 is therefore already known in combination in the prior art, and the requirement of novelty, Article 33(2) PCT, is not complied with.
- 2.6 The same arguments apply, *mutatis mutandis*, to the corresponding method claim 17, which is also found as lacking in novelty, Article 33(2) PCT.

2.7 Dependent claims 2-8 and 18-20 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 and/or inventive step. The features claimed are either known from D1 or D2, or they amount to nothing more than trivial workshop modifications which a skilled person would effect without having to exercise any inventive skill, Article 33(3) PCT.

3 **Re Item VII**

Certain defects in the international application

3.1 Independent claims 1 and 17 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

3.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 and D2 is not mentioned in the description, nor are these documents identified therein.