

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

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

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/IT2018/000164

International filing date (day/month/year)
14.12.2018

Priority date (day/month/year)
15.12.2017

International Patent Classification (IPC) or both national classification and IPC
INV. F04D13/04 F04D25/04 F04D29/18 F03B7/00

Applicant
LAVANGA VITO

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 66.1 bis(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. 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>1-7</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-7</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-7</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

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Item V.

1 **Independent claim 1 and document D1:**

With regard to the clarity objections as stated under point 5.1, prior art document US-A-3353028 (D1) (see Figure 1) discloses a device for the conversion of mechanical energy into electrical power and vice versa, of the type comprising:

- first means 1, 2, 4 for converting a rectilinear flow of a fluid into the rotary motion of a rotor system 1, 2, and vice versa, said conversion occurring with exchange of mechanical energy between said fluid and said rotor,
- second means 7, 9, 10 for converting the mechanical energy of said rotor system into electrical energy and vice versa, wherein said rotor system is adapted to integrate in a single element the functions of:

- said first means, adapted to convert said rectilinear flow of a fluid into the rotary movement of said rotor system and vice versa,

- said second means for transforming the mechanical energy of said rotor system into electrical energy and vice versa, said transformation occurring through interaction with a stator system;

said rotor system comprising:

- a first outer cylinder 7, comprising permanent magnets, capable of transforming the mechanical energy of said rotor system into electrical energy and vice versa, said transformation occurring through said interaction with the stator system;

- a second intermediate cylinder (radially inner part of the u-shaped ring 7 in conjunction with the blades 1) adapted to convert said rectilinear flow of a fluid into the rotary movement of said rotor system and vice versa;

- a third internal cylinder 2, 3 adapted to perform the axis function of the rotor system wherein:

~~- said second intermediate cylinder, adapted to convert said rectilinear flow of a fluid into the rotary movement of said rotor system and vice versa, is structured with conduits, wrapped in a helix.~~

Thus, the subject-matter of claim 1 differs from the disclosures of document D1 by the characterizing portion of the claim, namely in that:

- said second intermediate cylinder, adapted to convert said rectilinear flow of a fluid into the rotary movement of said rotor system and vice versa, is structured with conduits, wrapped in a helix.

The associated technical effect is to provide a very smooth deviation of the fluid in the intermediate cylinder.

The problem to be solved may be therefore regarded as to provide a transformation of the mechanical energy of a fluid into electrical power and vice versa with high efficiency and minimal generation of turbulence.

There is no indication in the prior art that would prompt the skilled person to solve the problem as proposed in claim 1.

In particular, documents D1 to D4 do not disclose a plurality of conduits wrapped in a helix in a cylinder part to convert the mechanical energy of the fluid into electric power and vice versa. Therefore the skilled person would not arrive to this solution without inventive skills.

Thus, the present application appears to meet the requirements of Articles 33(2) PCT and 33(3) PCT.

2 Dependent claims 2 to 7 and document D1:

The dependent claims 2 to 7 relate back on claim 1 and are as well new and inventive (Article 33(2) and 33(3), PCT).

3 Industrial applicability:

The industrial applicability of the claimed subject-matter is self-evident (Article 33(4) PCT).

Item VII.

4 General items:

The attention of the applicant is also drawn to the following:

- 4.1 Contrary to the requirements of Rule 5.1 (a) ii) PCT, the documents D1 to D4 have not been acknowledged in the description.

- 4.2 Different names have been given to reference signs 7, 7a, "ducts", "channels" or "raceways" in the description (cf. pages 4 and 5) and "conduits" or "ducts" in the claims 1 and 2 (cf. Rule 11.13(m), PCT).
- 4.3 Different names have been given to reference sign 3, "first outer cylinder" (cf. claim 1), and "first external cylinder" (cf. description, e.g. page 3, line 17) (cf. Rule 11.13(m), PCT).
- 4.4 Two reference signs have been given to the conduits, the reference signs 7 and 7a. However, it seems that only the reference sign 7 refers to the conduits and the reference sign 7a to the wall between the conduits (cf. the enlarged detail according to Figure 2) (cf. Rule 11.13(m), PCT).

Item VIII.

5 Clarity:

The application does not meet the requirements of Article 6 PCT, because claims 1 to 4 and 6 are not clear.

- 5.1 In **claim 1** the expression "magnets permanent" is unclear and has been interpreted as "permanent magnets".

- 5.2 In **claim 2** the expression:

"... of said third cylinder (5), more internal, in adherence to the external generatrices of said first cylinder (5)."

is contradictory and has been interpreted as:

"... of said third cylinder (5), more internal, in adherence to the external generatrices of said ~~first~~ third cylinder (5)." (cf. claim 1 and Figure 1).

- 5.3 In **claim 3** the expression:

"... the difference between the whole area of the section of said intermediate cylinder (4) and that actually affected by the flow of the fluid is equal to that relative to the thickness of the walls of said conduits (7)."

is vague and unclear and has been interpreted as meaning that:

- the conduits (7) are equidistantly distributed around the circumference of the intermediate cylinder.

Please note: In case of an adaptation of this claim 3, the applicant is reminded that the amendments shall not go beyond the disclosure in the international application as filed (cf. Article 19(2) and Rule 34(2)(b), PCT).

5.4 In **claim 4** the expression:

"... comprises both, overhead and in the tail, of the ogives (6a, 6b), of a ... conical or similar shape ..."

has been interpreted as:

"... comprises both, overhead and in the tail, ~~of the~~ ogives (6a, 6b) of a ... conical or similar shape ...".

5.5 In **claim 6** the expression:

"... said third inner cylinder (5) ..., it is hollow, ..."

has been interpreted as:

"... said third inner cylinder (5) ..., ~~it~~ is hollow, ..."

**Filing a demand
for international
preliminary
examination**

In principle, the **WO/ISA** will be considered to be the written opinion of the International Preliminary Examining Authority (**IPEA**). Where the **WO/ISA** issued by the **EPO** as **ISA** gives a positive opinion on the international application and the invention to which it relates, filing a **demand** with the **EPO** as **IPEA** would normally be unnecessary, since a positive IPRP would anyway be established by the **IB** based on the **WO/ISA** (see also further below).

If the applicant wishes to file a **demand** (for example, to allow him to argue his case in international preliminary examination with regard to objections raised in a negative **WO/ISA** before the **IPEA** issues an **IPER**), this must be done before expiration of **3 months after the date of mailing of the ISR and WO/ISA** or **22 months after priority date**, whichever expires later (Rule 54*bis* PCT). Amendments under Art. 34 PCT can be filed with the **IPEA**, normally at the same time as filing the demand (Rule 66.1(b) PCT) or within the time limit set for reply to any written opinion issued during international preliminary examination by the **IPEA**.

If a **demand** is filed at the **EPO** as **IPEA** and no comments/amendments have been received by the time the **EPO** starts drawing up the **IPER** (Rule 66.4*bis* PCT), the **WO/ISA** will be transformed by the **IPEA** into an **IPER** (also called the **IPRP (Chapter II)** which would merely reflect the content of the **WO/ISA** (OJ 10/2011, 532). The **demand** can still be withdrawn (Art. 37 PCT).

Please also note that, when filing amendments under Art. 34 PCT, such amendments shall be accompanied by a letter which identifies the amendments made and also the basis for the amendments in the application as originally filed (Rule 66.8(a) PCT). Failure to comply with this requirement may result in the amendments being ignored in the **IPER (IPRP (Chapter II))**, see Rule 70.2(c-*bis*) PCT.

**Filing a request
for supplementary
international
search**

The applicant may, with the **IB**, file a request for **supplementary international search** under Rule 45*bis*.1 PCT. The present **ISR** and **WO/ISA** may also be taken into account in the execution of that supplementary international search, provided that these are available to the Authority charged with this task before it starts the supplementary search (Rule 45*bis*.5 PCT).

This kind of request **cannot be filed specifying the ISA** who did the **international search**.

More information on this topic can be found in the **PCT Applicant's Guide**, Chapter 8 (<http://www.wipo.int/pct/en/guide/ip08.html>).

**End of the
international
phase**

Where no **demand** is filed, at the end of the international phase, the **IB** will transform the **WO/ISA** into the **IPRP (PCT Chapter I)** (Rule 44*bis* PCT), which will then be transmitted together with possible informal comments to the designated Offices. Where a demand is filed, the **WO/ISA** is not transformed into an **IPRP (Chapter I)** by the **IB**, but rather the **IPEA** will establish an **IPER**, (the **IPER** is the same as the **IPRP (PCT Chapter II)**, see Rule 70.15 PCT).

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO/ISA)

General information

For all international applications, the competent International Searching Authority (ISA) will establish an international search report (ISR) accompanied by a written opinion of the International Searching Authority (WO/ISA). The WO/ISA may be responded to by

- filing informal comments with the International Bureau of WIPO (IB) (where no demand for international preliminary examination (**demand**) is filed)
- filing amendments under Art. 19 PCT (this can be done whether or not a **demand** is filed)
- filing amendments under Art. 34 PCT and/or formal observations in response to objections raised in the WO/ISA (where a **demand** is actually filed)

This document explains these possibilities.

Filing informal comments

After receipt of the ISR and WO/ISA, the applicant may file informal comments on the WO/ISA, **directly with the IB** (see International Search and Preliminary Examination Guidelines 2.15). These will be communicated to the designated/elected Offices, together with the International Preliminary Report on Patentability (IPRP) at 30 months from the priority date.

Amending claims under Art. 19 PCT

The applicant may file **amended claims** under Art. 19 PCT, **directly with the IB** by the later of the following dates:

- 2 months from the date of mailing of the ISR and the WO/ISA
- 16 months from the priority date

However, any such amendment received by the IB after the expiration of the applicable time limit shall be **considered to have been received on time** by the IB, if it reaches it **before** the technical preparations for international publication have been completed (the 15th day prior to the date of publication, see PCT Applicant's Guide, International Phase, 9.013).

For further information, please see Rule 46 PCT as well as form PCT/ISA/220.

Please also note that, when filing amended claims under Art. 19 PCT, such amendments shall be **accompanied by a letter** identifying the amendments made and also the basis for the amendments in the application as originally filed (Rule 46.5(b) PCT). Where a **demand** is filed, failure to comply with this requirement may result in the amendments being ignored in the International Preliminary Examination Report (IPER), see Rule 70.2(c-bis) PCT.
