

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/US2017/021255

International filing date (day/month/year)
08.03.2017

Priority date (day/month/year)
11.03.2016

International Patent Classification (IPC) or both national classification and IPC
INV. F04D27/02 F04D29/42 F04D29/68 F25B1/053

Applicant
DAIKIN APPLIED AMERICAS INC

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. 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>15</u>
	No: Claims	<u>1-14, 16</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-16</u>
Industrial applicability (IA)	Yes: Claims	<u>1-16</u>
	No: Claims	

2. Citations and explanations

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

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 document:

D1 JP 2003 106293 A (MITSUBISHI HEAVY IND LTD) 9 April 2003
(2003-04-09)

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

1.1 D1 discloses

A centrifugal compressor (fig. 1) adapted to be used in a chiller system (electric motor, gearing, 2 stages), the centrifugal compressor comprising:

- a casing having an inlet portion and an outlet portion;
- an inlet guide vane disposed in the inlet portion (see fig. 1);
- an impeller (18a, fig. 1, 2 and 3) disposed downstream of the inlet guide vane (fig. 1), the impeller being attached to a shaft rotatable about a rotation axis;
- a motor (17) arranged and configured to rotate the shaft in order to rotate the impeller;
- a diffuser (21) disposed in the outlet portion downstream of the impeller; and
- a casing treatment bypass (30) having an entrance port and an exit port, the casing treatment bypass being arranged and configured to inject refrigerant from a gap between the impeller and the inlet portion of the casing toward an area between the impeller and the inlet guide vane, and the exit port of the casing treatment bypass being positioned upstream in a direction of a refrigerant flow with respect to the entrance port of the casing treatment bypass (implicit from the rather small dimension of the bypass, and from the fact that otherwise the bypass would have to cross the IGV actuators).

2 Dependent claims 2-16 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.

- 2.1 Claims 2-14 and 16 are anticipated by D1. Fig. 2 anticipates claim 11 and fig. 3 anticipates claim 10.
- 2.2 Claim 15 is not inventive in view of D1.

Re Item VIII

Certain observations on the international application (clarity, Art. 6 PCT)

- 3 Claim 3 is unclear because the expression "determined based on a diameter" is always true.
- 4 Claim 8 is unclear because the adjective "fixed" alone is unclear. Fixed in time ? Fixed in space ?
- 5 Claims 12-14 are unclear because the processed gas is not a property of the compressor and therefore cannot characterise the compressor.