

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43*bis*.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/EP2016/070635

International filing date (day/month/year)
01.09.2016

Priority date (day/month/year)
04.09.2015

International Patent Classification (IPC) or both national classification and IPC
INV. F02D41/02 F02D41/04 F02B37/10 F02B39/10 F02D41/00

Applicant
GE JENBACHER GMBH & CO. OG

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 43*bis*.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:



European Patent Office
P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040
Fax: +31 70 340 - 3016


Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Röttger, Klaus

Telephone No. +31 70 340-0



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

2. Citations and explanations

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: WO 2005/093235 A1 (DAIMLER CHRYSLER AG [DE]; KEPPELER BERTHOLD [DE]; NOLTE ARNO [DE]) 6 October 2005
- D2: DE 101 39 526 A1 (DAIMLER CHRYSLER AG [DE]) 20 February 2003
- D3: DE 10 2010 011026 A1 (BAYERISCHE MOTOREN WERKE AG [DE]) 15 September 2011
- D4: US 2011/022289 A1 (HOFBAUER PETER [US]) 27 January 2011
- D5: WO 2011/023848 A1 (WAERTSILAE FINLAND OY [FI]; LEVANDER OSKAR [FI]; HAEGGMAN STEN-ERIK [F]) 3 March 2011

1 Independent claim 1

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

1.1 Lack of novelty with regard to D1

Document D1 discloses the subject-matter of independent claim 1:

An internal combustion engine ("*Hubkolben-Brennkraftmaschine*") comprising:

- at least one piston-cylinder unit ("*Zylinder*") ,
- a turbocharger ("*Abgasturbolader 5*") having a shaft driven by an exhaust gas turbine ("*Abgasturbine 6*"), and
- a catalytic converter ("*Katalysator 4*") connected between the at least one piston-cylinder unit and the exhaust gas turbine, wherein there is provided an electrical machine connected to the shaft (*see page 6, lines 5-7: "ist gemäss der Erfindung der Abgasturbolader 5 über eine mechanische Antriebsverbindung 11 mit einer elektrischen Starter-Generator-Einheit 12 verbunden"*).

1.2 Further documents

Documents D2-D5 anticipate the subject-matter of independent claim 1 as well.

D2, (see Fig. 1 and 2) for example describes a catalytic burner 50 upstream of the turbine 8 of a turbocharger 4 which is provided with an electric machine 18 connected to the shaft. D3 shows in Fig. 1 a catalyst 9 (see paragraph [0023]) upstream of the turbine 3 of a turbocharger with an electric machine 11 (see paragraph [0016]). An engine as defined in claim 1 can be also found in D4 (see especially catalyst 116 upstream of turbine 212 of an electrically assisted turbocharger) and D5 (see page 4, lines 12-17).

1.3 **Dependent claims**

Dependent claims 2-8 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 for the following reasons:

- **Claim 2:**

All documents D1-D5 show a corresponding compressor, see e.g. Verdichter 7 in D1.

- **Claim 3:**

D1 already shows an injector 10 to add fuel to the exhaust gas.

- **Claim 4:**

See for example "Steuereinrichtung 29" in D2.

- **Claims 5-8**

Document D2 (see paragraph [0041]) already shows to activate the burner 50 and the electric machine during engine standstill. It is evident that the fuel injection device 54 or a corresponding fuel supply must be activated when the burner is activated. D2 shows in paragraph [0036] as well the use of a bypass 60 with a shut-off element 64.