

**PATENT COOPERATION TREATY**

**TRANSLATION**

From the  
INTERNATIONAL SEARCHING AUTHORITY

**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year) **See form PCT/ISA/210**

Applicant's or agent's file reference <b>PG 06350WO</b>		<b>FOR FURTHER ACTION</b> See paragraph 2 below
International application No. <b>PCT/EP2006/001812</b>	International filing date (day/month/year) <b>28.02.2006</b>	Priority date (day/month/year) <b>02.03.2005</b>
International Patent Classification (IPC) or both national classification and IPC <b>B60T1/087</b>		
Applicant <b>VOITH TURBO GMBH &amp; CO. KG</b>		

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 or 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 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.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

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Box No. I	Basis of this opinion
1.	<p>With regard to the <b>language</b>, this opinion has been established on the basis of:</p> <p><input checked="" type="checkbox"/> the international application in the language in which it was filed</p> <p><input type="checkbox"/> the translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rule 12.3(a) and 23.1(b)).</p>
2.	<p>With regard to any <b>nucleotide and/or amino acid sequence</b> disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:</p> <p>a. type of material</p> <p><input type="checkbox"/> a sequence listing</p> <p><input type="checkbox"/> table(s) related to the sequence listing</p> <p>b. format of material</p> <p><input type="checkbox"/> on paper</p> <p><input type="checkbox"/> in electronic form</p> <p>c. time of filing/furnishing</p> <p><input type="checkbox"/> contained in the international application as filed</p> <p><input type="checkbox"/> filed together with the international application in electronic form</p> <p><input type="checkbox"/> furnished subsequently to this Authority for the purposes of search</p>
3.	<p><input type="checkbox"/> In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.</p>
4.	<p>Additional comments:</p>

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<b>Box No. V</b>	<b>Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</b>		
1. Statement			
Novelty (N)	Claims	1-12	YES
	Claims		NO
Inventive step (IS)	Claims	1-12	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO
2. Citations and explanations:			
1. Reference is made to the following documents:			
D1: EP 0 428 311 A (GENERAL MOTORS CORPORATION) 22 May 1991 (1991-05-22)			
D2: WO 98/35170 A (VOITH TURBO GMBH & CO. KG; FRIEDRICH, JUERGEN; HEILINGER, PETER; HOELL) 13 August 1998 (1998-08-13)			
D3: DE 198 35 119 C1 (VOITH TURBO GMBH & CO. KG) 27 July 2000 (2000-07-27)			
2. CLAIM 1			
2.1 Document D1 (see, in particular, column 2, line 31 - column 6, line 11 and figure 1) is considered to be the closest prior art.			
It discloses (the references relate to this document) a retarder-rotary pump assembly -) having a hydrodynamic retarder 10, comprising a vaned rotor 20, 24 and a vaned stator 22, 26; the vaned rotor 20, 24 and the vaned stator 22, 26 together form a toroidal working chamber which can be filled with a working medium in order to transmit torque from the rotor 20 to the stator 22			

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in retarder operation, and which can be emptied to a predetermined residual amount of working medium in order to avoid torque transmission in idling operation (see D1, in particular, column 2, line 55 - column 3, line 15 and figure 1);  
-) having a rotary pump which has a pump impeller in order to boost a pumping medium from a pump inlet pressure to a pump outlet pressure; the pumping medium of the rotary pump being at the same time the working medium of the retarder; the rotary pump has an inlet duct for supplying pumping medium at pump inlet pressure and an outlet duct for discharging pumping medium at pump outlet pressure (implicitly disclosed by D1; see also column 2, lines 40 - 49).

The subject matter of claim 1 therefore differs from the known retarder-rotary pump assembly in that the rotor has a rotor shaft which bears a rotor impeller and which in the axial direction, on both sides of the rotor impeller, forms a respective flow-conducting connection with stationary components of the assembly via a rotary transmission leadthrough, the connection connecting the working chamber of the retarder to the pump inlet duct and/or the pump outlet duct; in each of the flow-conducting connections there is respectively provided at least one sealing element which causes a predetermined pressure drop in the working medium flowing through the connection; at least one of the two flow-conducting connections is sealed off from the

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surroundings by means of a shaft seal, at least against the escape of liquid working medium; an additional safety sealing element being provided between the sealing element of the corresponding flow-conducting connection and the shaft seal in order to protect the shaft seal from an overload in the event of failure of the sealing element.

The subject matter of claim 1 is therefore novel (PCT Article 33(2)).

- 2.2 The problem addressed by the present invention can therefore be considered that of providing a retarder-rotary pump assembly which enables optimised working medium guidance with respect to the two functions of pumping operation (only the pump is working, while the retarder is idling) and braking operation (the pump and the retarder are working), and at the same time ensures secure sealing against undesired escape of working medium.

The solution to this problem, as proposed in claim 1 of the present application, involves an inventive step (PCT Article (33(3))) because the characterising features of claim 1 are not known from any printed publication, nor is any reference made in any printed publication to the statement of the problem and the advantages which can be achieved.

3. Claims 2-12 are dependent on claim 1 and therefore

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likewise meet the PCT requirements for novelty and inventive step.

4. The subject matter of claims 1-12 is considered to be industrially applicable.

5. In addition, the following should be taken into account:

a) Independent claim 1 has not been drafted in the two-part form defined by PCT Rule 6.3(b). However, in the present case the two-part form would appear to be appropriate. Accordingly, the features known in combination from the prior art (document D1) should have been placed in the preamble (PCT Rule 6.3(b)(i)) and the remaining features specified in the characterising part (PCT Rule 6.3(b)(ii)).

b) Contrary to PCT Rule 5.1(a)(ii), the description does not cite documents D1, D2 and D3 or indicate the relevant prior art disclosed therein.