

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 18214.5A	FOR FURTHER ACTION		See item 4 below
International application No. PCT/IB2016/000822	International filing date (<i>day/month/year</i>) 01 June 2016 (01.06.2016)	Priority date (<i>day/month/year</i>) 01 June 2015 (01.06.2015)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant CETAMAX VENTURES LTD.			

<p>1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																								
<p>3. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).</p>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																						

	Date of issuance of this report 05 December 2017 (05.12.2017)
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PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing <i>(day/month/year)</i> 02 November 2016	
Applicant's or agent's file reference 18214.5a	FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/IB2016/000822	International filing date <i>(day/month/year)</i> 01 June 2016
Priority date <i>(day/month/year)</i> 01 June 2015	
International Patent Classification (IPC) or both national classification and IPC B04C 3/00(2006.01)i; B04C 5/00(2006.01)i	
Applicant CETAMAX VENTURES LTD.	

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 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/ STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA China 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088	Date of completion of this opinion 24 October 2016	Authorized officer GAO, Xiaoying
Facsimile No. (86—10) 62019451	Telephone No. (86-10)62085364	

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/IB2016/000822

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 43*bis*.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 filed or furnished:
 - a. (means)
 - on paper
 - in electronic form
 - b. (time)
 - in the international application as filed
 - together with the international application in electronic form
 - subsequently to this Authority for the purposes of search
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 in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

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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**

1. Statement

Novelty (N)	Claims	<u>3-5, 7-22, 24-35, 37-69</u>	YES
	Claims	<u>1-2, 6, 23, 36, 70-73</u>	NO
Inventive step (IS)	Claims	<u>None</u>	YES
	Claims	<u>1-73</u>	NO
Industrial applicability (IA)	Claims	<u>1-73</u>	YES
	Claims	<u>None</u>	NO

2. Citations and explanations :

[1] The following documents are cited:

[2] D1: TW201501802A, 16 Jan.2015 (16.01.2015), see description, paragraphs [0018] to [0028], figures 1 to 3.

[3] D2: CN101939087A, 05 Jan.2011 (05.01.2011), see description, paragraphs [0024] to [0037], figures 1 to 4.

[4] 1. Novelty

[5] 1.1 D1 discloses a vortex reactor which comprises a reactor body having a first end and a second end, one or two asymmetrically arranged inlet ports which disposed at the first end and configured to direct a fluid at an angle that is tangential to the inner surface of the reactor body, and an outlet configured to receive and pass the fluid out of the reactor body. The vortex reactor induces formation of at least one vortex within the fluid when fluid is passed from inlet ports to the outlet in order to impart a chemical effect to the fluid. Advancing a fluid into the reactor body through the inlet ports causes the fluid to flow in a vortex along the inner surface of the reactor body toward the second end. D1 also discloses a method of processing a fluid in order to impart a chemical and physical effect, wherein the fluid is processed according to a hydrogen production. The technical solutions of independent claims 1, 70 and 72 are disclosed by D1. Therefore, claims 1, 70 and 72 lack novelty in the sense of PCT Article 33(2).

[6] 1.2 Independent claim 68 differs from D1 in that: the plurality of vortex reactors being arranged in series and/or in parallel. Therefore, claim 68 is novel in the sense of PCT Article 33 (2).

[7] 1.3 The additional technical features of claims 2, 6, 23, 36 and 73 are also disclosed by D1. Therefore, claims 2, 6, 23, 36 and 73 also lack novelty in the sense of PCT Article 33(2).

[8] 1.4 D1 does not explicitly or implicitly disclose the additional technical features of claims 3-5, 7-22, 24-35, 37-67 and 69; therefore, said claims are novel in the sense of PCT Article 33(2).

[9] 1.5 D2 discloses a vortex reactor which comprises a reactor body having a first end, a second end and an inner surface; at least one inlet port and an outlet. Advancing a fluid into the reactor body through the inlet ports cause the fluid to flow in an outer vortex along the inner surface of the reactor body a distance toward the second end before the fluid reverse direction to flow toward the outlet in an inner vortex. The technical solution of independent claim 71 is disclosed by D2. Therefore, claim 71 lacks novelty in the sense of PCT Article 33(2).

[10] 2. Inventive Step

[11] 2.1 The technical feature that claim 68 distinguishes from D1 is mentioned above. But the technical feature is common knowledge in the art. Therefore, claim 68 does not involve an inventive step in the sense of PCT Article 33(3).

[12] 2.2 The additional technical feature of dependent claim 24 is disclosed by D2. Therefore, claim 24 does not involve an inventive step in the sense of PCT Article 33(3).

[13] 2.3 The additional technical features of dependent claims 3-5, 7-22, 25-35, 37-67 and 69 are common knowledge in the art. Therefore, dependent claims 3-5, 7-22, 25-35, 37-67 and 69 also do not involve an inventive step in the sense of PCT Article 33(3).

**WRITTEN OPINION OF THE
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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**

[14] 3. Industrial Applicability

[15] The technical solutions of claims 1-73 can be made or used in industry. Thus, claims 1-73 are industrially applicable in the sense of PCT Article 33(4).