

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/IB2015/059150

International filing date (day/month/year)
26.11.2015

Priority date (day/month/year)
01.12.2014

International Patent Classification (IPC) or both national classification and IPC
INV. F17C5/06

Applicant
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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.

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Date of completion of this opinion

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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	
	No: Claims	<u>1-9</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-9</u>
Industrial applicability (IA)	Yes: Claims	<u>1-9</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

Reference is made to the following documents:

- D1 EP 0 728 537 A1 (MITSUBISHI HEAVY IND LTD [JP]) 28 August 1996
(1996-08-28)
- D2 FR 2 766 473 A1 (SIDEL SA [FR]) 29 January 1999 (1999-01-29)
- D3 JP H03 69508 A (MITSUBISHI HEAVY IND LTD) 25 March 1991
(1991-03-25)

Re Item VIII

1. The subject-matter of claim 1 is not clear in the sense of Article 6 PCT, since

- there is no relation between the chamber and the pressurization means on one part, and the filling means and the sealing means on the other side, such that the subject-matter of claim 1 is completely unclear;

- as claim 1 is defined, the containers are not belonging to the scope of claim 1, such that:

- additionally there is no relation between the filling means and the sealing means ;

- it is not clear which container is meant in the expressions "the filling means are designed to fill the container with CO₂" and "the sealing means are designed to close hermetically the container full of CO₂" and "the chamber is designed to be opened towards an external environment at the working pressure in order to release the full container" ;

- the expressions "the chamber is designed to be opened towards the external low pressure environment in order to receive at its inlet at least one empty container", "the chamber is designed to be hermetically sealed off from the external low pressure environment", and "the chamber is designed to be opened towards an external environment at the working pressure in order to release the full container" do not define structural features of the chamber but rather define a method of using the chamber without defining the essential structural technical features;

- the expression "the loading device (12) is immersed during use, in an external low-pressure environment" does also not define structural features of the loading device but rather define a method of using it without defining the essential structural technical features;

- if "the pressurization means are designed to increase the pressure inside the chamber until it reaches a predefined high-pressure level or working pressure", then, the chamber and the pressurisation means must have somehow a certain arrangement which has not been defined here such that essential structural features are missing to the definition of claim 1;
- the expression "the loading device (12) is immersed during use, in an external low-pressure environment", is not supported by the description as in the embodiments of fig.1a, 1b, 2 for example the loading device (12) is NOT immersed during use. Further no embodiment could be found wherein the loading device is immersed during use;
- some essential features are missing for defining the invention, for example a loading valve (122), which is the only way disclosed in the application for allowing the chamber to be opened towards the external low-pressure environment.

Else it is indicated that the CO₂ does not belong to the scope of claim 1.

2. The subject-matter of claim 9 is not clear in the sense of Article 6 PCT, since the relation between the design pressure and the high-pressure level or working pressure, or the low-pressure external environment is not defined.

3. The subject-matter of claims 5 and 6 is not clear in the sense of Article 6 PCT, since the reference is made to "the CO₂" which does not belong to the scope of the claims.

Re Item V

4. The present application does not meet the requirements of patentability, because the subject-matter of independent claim 1 is not new .

Document D1 (column 4 - column 7; figures 1-9) discloses in accordance with claim 1 a loading device suitable for use in an apparatus for sequestration of carbon dioxide CO₂ in containers (11), comprising a chamber (into 10, where 26 are received), pressurization means (implicitly disclosed, as a pump for transferring the liquid CO₂ is necessary), filling means (4, 19), and sealing means (13), wherein:

- the loading device (10, which is a submersible working boat) is immersed during use, in an external low-pressure environment;

- the chamber (10, and in particular its pipe 20) is designed to be opened (by means of 21 or 27, although not in use as suggested by the application but not claimed) towards the external low pressure environment in order to receive at its inlet at least one empty container (11);
- the chamber is designed to be hermetically sealed off (by means of 21 or 27, although not in use as suggested by the application but not claimed) from the external low pressure environment;
- the pressurization means are designed to increase the pressure (implicitly disclosed, as a pump for transferring the liquid CO₂ is necessary) inside the chamber until it reaches a predefined high-pressure level or working pressure;
- the chamber is designed to withstand the difference between the external low-pressure and the working pressure which is established inside it (no structural features here);
- the filling means (4,19) are designed to fill the container with CO₂;
- the sealing means (13) are designed to close hermetically the container full of CO₂;
- the chamber is designed to be opened towards an external environment at the working pressure in order to release the full container at its outlet.

Further, document D2 (pages 7-19; figures 2-7) discloses in accordance with claim 1 a loading device suitable for use in an apparatus for sequestration of carbon dioxide CO₂ in containers (8), comprising a chamber (9), pressurization means (implicitly disclosed for injecting, see 13 a fluid with a certain pressure into 9), filling means (11), and sealing means ("bouché"), wherein:

- the loading device (not supported by the description thus not limiting the scope of claim 1. Further the system is as this of the present application in a low-pressure environment) is immersed during use, in an external low-pressure environment;
- the chamber (9) is designed to be opened towards the external low pressure environment in order to receive at its inlet at least one empty container (8);
- the chamber is designed to be hermetically sealed off from the external low pressure environment;
- the pressurization means are designed to increase the pressure inside the chamber until it reaches a predefined high-pressure level or working pressure;

- the chamber is designed to withstand the difference between the external low-pressure and the working pressure which is established inside it (it is the case here, and further this expression does not defines structural features);
- the filling means (11) are designed to fill the container with CO₂;
- the sealing means are designed to close hermetically the container full of CO₂;
- the chamber is designed to be opened towards an external environment at the working pressure in order to release the full container at its outlet.

Thus, a system comprising all the features of claim 1 is known from D1 and D2.

5. The subject-matter of dependent claims 2-8 is also not new and/or does not involve an inventive activity, since the additional features of these claims are also shown in D1 or D2, and/or because the slight constructional changes of the subject-matter of these claims come within the scope of the customary practice followed by the person skilled in the art.

6. The subject-matter of claim 9 is also not new, since this claim is a method claim, corresponding to system claim 1. Therefore, according to a corresponding reasoning as given for claim 1, the subject-matter of claim 9 is not new.

Re Item VII

7. Independent claims 1 and 6 are not in the two-part form.

8. The closest prior art documents cited in the search report are not mentioned in the description.

9. It is not at present apparent which part of the application could serve as a basis for a new, allowable claim.