

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/IT2015/000306

International filing date (day/month/year)
14.12.2015

Priority date (day/month/year)
12.12.2014

International Patent Classification (IPC) or both national classification and IPC
INV. C12M1/107 C12M1/00 C12M1/02

Applicant
LAVANGA VITO

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:



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Date of completion of this opinion

see form
PCT/ISA/210

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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>1-16</u>
	No: Claims	

Inventive step (IS)	Yes: Claims	<u>1-16</u>
	No: Claims	

Industrial applicability (IA)	Yes: Claims	<u>1-16</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 2014/075192 A1 (GEA FARM TECHNOLOGIES) 22 May 2014
- D2 US 2010/206791 A1 (SANG BUM LEE ET AL.) 19 August 2010
- D3 US 4 429 043 A (PATON) 31 January 1984
- D4 WO 2010/102746 A1 (OAG OBJEKT UND ANLAGEPLANUNG GMBH)
16 September 2010

D1 is regarded as being the prior art closest to the subject-matter of the independent claims 1 and 5, and discloses a closed system and method for producing biogas by anaerobic decomposition of organic matter with the three typical phases acidogenesis, acetogenesis and methanogenesis (claims 1, 47; fig. 1), the digestion reservoir (20) having separating walls defining a sinuous path along which the biomass is conveyed and digested.

The subject-matter of claims 1 and 5 therefore differs from this known D1 in that:

- the method comprises a step for gravimetric separation of a light phase rich in oleic acid,
- the method comprises a step of gravimetric separation of NPK salts (nitrogen, phosphorus and potassium salts),
- at the end of the process clarified water is obtained from the bioreactor,
- the interior of the bioreactor has 2 parallel longitudinal baffles, the second one extending along the whole bioreactor length, and two perpendicular small baffles as depicted in fig. 1 of the application,
- the second baffle is perforated by a pipe that leads the flow of decomposing liquid to enter into the third volume,
- two blocks including a plurality of vertical pipes are situated at the upper part of the bioreactor for gases collection and separation.

The problem to be solved by the present invention may be regarded as the provision of an alternative method and system for producing biogas from organic matter.

The solution to this problem proposed in claims 1 and 5 of the present application is considered as involving an inventive step for the following reasons:

The further documents of the prior art cited in the international search report disclose compartmentalized biogas reactors using baffles, heat exchange at the bottom, sedimentation of components, etc.

However the constructive design and constructive details of the solution proposed in claims 1 and 5 of the present application and especially the distinguishing features listed above are not disclosed or suggested in the prior art.

Novelty and inventive step are acknowledged under Articles 33(2) and (3) PCT.

Claims 1-4 and 6-16 are dependent on claims 1 or 5 and as such also meet the requirements of the PCT with respect to novelty and inventive step.