

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 39227-02CIP-WO	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2019/051095	International filing date (<i>day/month/year</i>) 13 September 2019 (13.09.2019)	Priority date (<i>day/month/year</i>) 14 September 2018 (14.09.2018)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant PURECIRCLE SDN BHD			

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 <i>bis</i> . I(a).																								
2.	This REPORT consists of a total of 6 sheets, including this cover sheet. 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.																								
3.	This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;">☒</td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</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 style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	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 Article 35(2) 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
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4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44 <i>bis</i> .3(c) and 93 <i>bis</i> .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 44 <i>bis</i> .2).																								

	Date of issuance of this report 09 March 2021 (09.03.2021)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Sun Hwa Lee e-mail pct.team1@wipo.int

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: Audrey J. Babcock
Briggs and Morgan PA
2200 IDS Center
80 South Eighth Street
Minneapolis, MN 55402
United States of America

Date of mailing
(day/month/year)

20 NOV 2019

Applicant's or agent's file reference
39227-02CIP-WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US19/51095

International filing date (day/month/year)

13 September 2019 (13.09.2019)

Priority date (day/month/year)

14 September 2018 (14.09.2018)

International Patent Classification (IPC) or both national classification and IPC

IPC - A23L 2/60, 27/00, 27/30 (2019.01)**CPC - A23L 2/60, 27/00, 27/30, 27/33, 27/34, 27/36**

Applicant

PureCircle Sdn Bhd

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/US
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P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-8300

Date of completion of this opinion

28 October 2019 (28.10.2019)

Authorized officer

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US19/51095

Box No. I Basis of this 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(b)).

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 13*ter*.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 13*ter*.1(a)).
- ☐ on paper or in the form of an image file (Rule 13*ter*.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:

**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

1. Statement

Novelty (N)	Claims	NONE	YES
	Claims	1-9	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-9	NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1-9 lack novelty under PCT Article 33(2) as being anticipated by US 2012/0282389 A1 to Purkayastha, et al. (hereinafter "Purkayastha").

As per claim 1, Purkayastha discloses a method for producing a sweetener (producing a Stevia sweetener; abstract) comprising the steps of: A) providing a Stevia sweetener powder (providing a Stevia sweetener powder; paragraph [0035]); B) reducing the particle size of the Stevia sweetener powder to a particle size of less than 260 micrometers (reducing the particle size of the Stevia sweetener powder to have a mean particle size from 20 to 60 micrometers; paragraphs [0035], [0045]); C) treating the Stevia sweetener powder under reduced pressure of between about 0 mbar to 100 mbar and an elevated temperature of between about 90-130 degrees C to obtain a treated Stevia sweetener powder (the reduced particle size Stevia sweetener powder is treated under reduced pressure between about 0 to 100 mbar and an elevated temperature between about 90-130 degrees C; paragraphs [0035], [0045]-[0046]); D) cooling down the treated Stevia sweetener powder to a low temperature of about 25 degrees C to obtain a cooled Stevia sweetener powder (the treated Stevia sweetener powder is cooled down to about 25 degrees C (a low temperature); paragraph [0047]); and E) holding the cooled Stevia sweetener powder at the low temperature to obtain a high solubility Stevia sweetener powder with an increased solubility of at least about 1 g per 100g of water at ambient temperature (the Stevia sweetener powder cooled to 25 degrees C is held at the low temperature to obtain a high solubility Stevia sweetener powder having an increased solubility at a room temperature, and has a solubility of at least 40 grams per 100 grams of water at room temperature; paragraphs [0035]-[0036], [0046]-[0047], [0067]; claim 9); and F) introducing the high solubility Stevia sweetener powder to a roll compaction apparatus to produce a compacted material (the produced high solubility Stevia powder is introduced to a roller compaction apparatus to produce a compacted material; paragraphs [0035], [0037]); introducing the compacted material to a size reducing apparatus to obtain a granule mixture (introducing the compacted material to a size reducing apparatus to obtain a granule mixture; paragraph [0037]); and fractionating the granule mixture to obtain a granulated Stevia sweetener having a particle size ranging from about 140 micrometers to about 680 micrometers (fractioning the granule mixture through sieves of various sizes to obtain a granulated Stevia sweetener having a size from US Mesh#8 to US Mesh#60, thus from 250 to 2,380 micrometers; paragraphs [0037], [0059]; table 4) and having a dissolution rate greater than a dissolution rate of the high solubility Stevia powder (the produced granular Stevia sweetener has significantly greater dissolution rate than the Stevia sweetener powder; paragraphs [0037], [0054]).

As per claim 2, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein the dissolution rate of the granulated Stevia sweetener is at least about 0.75 grams per minute (a dissolution rate of the high solubility granulated Stevia sweetener is from 0.76 to 1.07 grams per minute; abstract; paragraphs [0037]; table 6).

As per claim 3, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein Stevia sweetener is selected from a group consisting of: Stevioside, Rebaudioside A (the granulated Stevia sweetener is made from a Rebaudioside A powder; paragraphs [0035], [0042]), Rebaudioside B, Rebaudioside C, Rebaudioside D, Rebaudioside E, Rebaudioside F, Rebaudioside M, Rebaudioside N, Rebaudioside O, Steviolbioside, Dulcoside A, Rubusoside, other minor glycosides found in Stevia rebaudiana plants, and a mixture thereof.

As per claim 4, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein cooling the treated Stevia powder comprises introducing preheated nitrogen gas into a vacuum chamber and gradually reducing the nitrogen gas temperature (treating the Stevia sweetener powder by introducing preheated nitrogen gas into a vacuum chamber and gradually decrease the nitrogen temperature; paragraph [0047]).

As per claim 5, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein the roll compaction apparatus operates at between about 5 rpm and about 20 rpm, and at a roll pressure of between about 10 bar to about 60 bar to produce the compacted material (the roll compaction apparatus operates at a roll speed was between about 5-20 rpm, and a roll pressure from about 10 to 60 bar; paragraphs [0037], [0055]); and the size reducing apparatus comprises a set of sequentially located granulators equipped with rotors rotating at between about 50 rpm to about 2000 rpm to obtain the granule mixture (the size reducing apparatus comprises at least two granulators, a pre-granulator and a fine granulator (sequentially located) with rotors rotating at a rate of between about 50 to 2,000 rpm; paragraphs [0037], [0057]-[0058]).

-Continued Within the Next Supplemental Box-

WRITTEN OPINION OF THE
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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:

Claim 1 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim 1 is indefinite for the following reasons: in claim 1, section D), the phrase "the treated Stevia sweetener " and in claim 1, section E), the phrase "the cooled Stevia sweetener" lack antecedent basis. For the purpose of this opinion, as best understood, claim 1, section C) is interpreted as "treating the Stevia sweetener powder under reduced pressure of between about 0 mbar to 100 mbar and an elevated temperature of between about 90-130 degrees C to obtain a treated Stevia sweetener powder" and claim 1, section D) is interpreted as "cooling down the treated Stevia sweetener powder to a low temperature of about 25 degrees C to obtain a cooled Stevia sweetener powder" to give proper antecedent basis to the aforementioned phrases.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

-Continued from Box V: Citations and Explanations-

As per claim 6, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein the Stevia sweetener powder is selected from a group consisting of: Stevioside, Rebaudioside A (the granulated Stevia sweetener is made from a Rebaudioside A powder; paragraphs [0035], [0042]), Rebaudioside B, Rebaudioside C, Rebaudioside D, Rebaudioside E, Rebaudioside F, Rebaudioside M, Rebaudioside N, Rebaudioside O, Steviolbioside, Dulcoside A, Rubusoside, other minor glycosides found in Stevia rebaudiana plants, and a mixture thereof

As per claim 7, Purkayastha discloses the method of claim 1, and Purkayastha further discloses further comprising the step of combining the Stevia sweetener powder with an additional ingredient before introducing the powder to the roll compaction apparatus (the treated Stevia powder is mixed with other ingredients to form a powder blend prior to introducing the blend into granulation initiated by compacting the blend in order to apply the size reducing granulator; paragraphs [0037], [0062]).

As per claim 8, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein the additional ingredient is selected from the group consisting of: a high intensity sweetener; a natural sweetener; a sugar alcohol; a flavoring agent; a flavor modifying agent; a taste modifying agent; a bulking agent; or a combination thereof (natural and synthetic high intensity sweeteners, natural sweeteners, sugar alcohols, taste modifying agents, bulking agents, and combinations thereof; paragraph [0062]).

As per claim 9, Purkayastha discloses the method of claim 1, and Purkayastha further discloses wherein the dissolution rate of the granulated Stevia sweetener is at least about 5% greater than the dissolution rate of the high solubility Stevia powder (the dissolution rate of the granulated Stevia sweetener is from 8.6 to 163% greater than the dissolution rate of the high solubility Stevia powder; table 6).

Claims 1-9 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.