

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(PCT Rule 71.1)

Date of mailing
(day/month/year)

15.04.2021

Applicant's or agent's file reference
120190357

IMPORTANT NOTIFICATION

International application No.
PCT/EP2019/087130

International filing date (day/month/year)
30.12.2019

Priority date (day/month/year)
11.01.2019

Applicant
S.A. REVERTÉ PRODUCTOS MINERALES

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining authority:



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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 120190357	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2019/087130	International filing date (day/month/year) 30.12.2019	Priority date (day/month/year) 11.01.2019	
International Patent Classification (IPC) or national classification and IPC INV. A01N59/06			
Applicant S.A. REVERTÉ PRODUCTOS MINERALES			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (sent to the applicant and to the International Bureau) a total of <u>47</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ 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			
Date of submission of the demand 11.11.2020		Date of completion of this report 15.04.2021	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465		Authorized officer Marie, Gérald Telephone No. +49 89 2399-2571 	

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ 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 (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1, 3-10	as originally filed	
2, 2a	filed in electronic form on	11-11-2020

Claims, Numbers

1-5	filed in electronic form on	11-11-2020
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Drawings, Sheets

1/3-3/3	as originally filed	
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- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2019/087130

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 25.09.2020 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-5</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-5</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-5</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The documents to which this report refers are numbered in their order of appearance in the international search report.

1 Amendments (Article 34(2)(b) PCT)

The claimed subject-matter is based on original claims 1+2+4+p.3,l.25-26+p.5,l.17-21 and claims 3, 5, 6 and 7 respectively.

The requirements of Article 34(2)(b) PCT are thus met.

2 Novelty (Article 33(2) PCT)

The claimed subject-matter is novel over the cited documents **D1-D4** for the following reasons:

Document **D1** discloses reducing excessive heat and light without diminishing at the plant surface photosynthesis comprises application of a finely divided particulate material such as calcined calcium carbonate. In example 1, the use of microparticles of calcium carbonate (Supercoat®) allowed to reduce plant temperature, presumably due to increased transpirational cooling of the leaf related to increased stomatal conductance and the IR reflectance. Greater colour, yield, weight were observed.

Document **D2** discloses a fertilizer based on fines particles of substantially pure calcium carbonate in the form of precipitates. Suspension thereof are used.

Document **D3** discloses a method for protecting crops from arthropod infestation using finely divided particles of calcium carbonate (in particular Supercoat®), whereby up to 90% of the particles have a particle size of under about 10 microns.

Document **D4** discloses the use of calcium carbonate as a plant protection product for topical, pre-harvest application in controlling a pest during plant growth. Calcium carbonate is in form of particles having a weight median particle size of

from 0.1 to 200 microns and is used in form of a powder and/or an aqueous suspension.

The claimed subject-matter differs from said disclosures in the presence of a second use and in the nature of the composition. By means of supplementary data (see annex and letter dated 18.03.2021), it was shown that the present composition differs from the ones used in document **D3** (then also **D1**) and **D4** in the ionic ratio CO_3/Ca and in the nature of the ionic species that are present on the surface (see tables 1 and 4 and annex in which M1 corresponds to the present invention while M2 and M3 correspond to the calcium carbonate form used in **D3/D1** and **D4** respectively).

3 Inventive step (Article 33(3) PCT)

3.1 Closest prior art

D3 or D4

3.2 Technical effect and problem to be solved

The present composition has been shown to exhibit the enhanced effects as claimed (see tables 2-3 and 5-6 of the letter dated 18.03.2021) which can be linked to the higher measured calcium bioavailability.

The objective problem to be solved can thus be regarded as the provision of an improved method for the fertilisation and for the protection of agricultural crops against pests or fruit physiological disorders.

3.3 Solution

Applying the composition according to the method of claim 1

3.4 Why the solution is not obvious

None of the cited documents **D1-D4** suggests that the present composition in use would lead to an enhanced bioavailability/permanency of calcium in the plant as demonstrated, let alone in relation to both its fertilising activity as well as its protection against pests and fruit physiological disorders as demonstrated in tables 2-3 and 5-6 of the letter dated 18.03.2021.

4 Industrial applicability (Article 33(4) PCT)

Industrial applicability of the present invention as claimed is acknowledged.

2a

US6069112 discloses a method for preventing sunburn and other physiological disorders such as watercore, corking and bitterpit, without diminishing photosynthesis, comprising applying to at least a portion of a surface of a plant an effective amount of a finely divided heat treated particulate material that can comprise calcined calcium carbonate.

5

NZ280358 discloses a fertilizer comprising fine particles of substantially pure calcium carbonate in the form of precipitates.

2a

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AU7601491 refers to a liquid fertilizer composition comprising a deposit lime which is composed of shell, coral, etc. and which is found in cliffs, along rivers and creek beds or other places where such lime may have been deposited. The amount of calcium carbonate disclosed in the examples is of 84.30%, 83.75% or 81.8%.

DE10021029 discloses a process for preparing an agent for improving plant growth and/or for reducing pesticide residues obtained by stirring limestone powder with at least one binder and optionally other additives.

JP2013087091 refers to a controlling agent for safely and economically controlling codling moths. The controlling agent is applied to the surface of the fruits to prevent the codling moths from depositing eggs. The product comprises calcium carbonate or magnesium carbonate and a fixing agent for fixing the agent to the surface of the fruit. The average particle size of the inorganic powder is in the range of 0.1 to 3 μm .

EP3033944 discloses the use of calcium carbonate as a plant protection agent against pests during plant growth. The calcium carbonate is used in the form of particles having a particle size between 0.1 and 200 μm .

WO9838867 discloses a method for protecting surfaces from arthropod infestation which involves treating the surfaces with an effective amount of finely divided calcined kaolins, hydrophobic calcined kaolins, hydrous kaolins, hydrophobic hydrous kaolins, hydrophobic calcium carbonates, calcium carbonates or mixtures thereof.

Finally, JPH0680511 refers to a product against insect pests comprising powdery calcium carbonate.

Based on the inventions disclosed in the state of the art, it can be concluded that even if calcium carbonate has been described as an effective fertilizer, the already known and currently available fertilizing products have different drawbacks such as their short permanence in the crops or the risks associated with their application methods. The short permanence is an important disadvantage since it implies that the composition is lost each time there are bad weather conditions such as heavy winds, dew or rain. This has important economic consequences, requiring applying the composition each time it is lost, with the consequent costs. The product object of the present invention solves this problem and avoids the need of applying the composition to the crops in multiple applications. The present invention offers the advantage that, with only one application, the composition is able to remain in the crops even after bad

CLAIMS

1. Method for the fertilization and either for the protection of agricultural crops against pests or against fruit physiological disorders or both for the protection of agricultural crops against pests and against fruit physiological disorders by applying a solid calcium composition comprising more than 98.5% weight of calcium carbonate, characterized in that it comprises applying between 1% and 12% weight of the solid calcium composition dispersed in an aqueous suspension, at a foliar level; and wherein the surface chemical composition of the solid calcium composition comprises Ca^{2+} , CO_3^{2-} and the following ionic species: CaOH^+ , CO_3H^- and CO_3CaOH^- under humidity conditions, providing a calcium bioavailability in the range of 62 ppm to 132 ppm.
2. Method according to claim 1, wherein the agricultural crops are pear and/or apple crops.
3. Method according to claim 1 or 2, wherein the application of the aqueous suspension of the solid calcium composition is applied by micro-pulverization at a pressure between 7 and 10 bar, generating a spray of micro-droplets having a diameter equal to or smaller than 80 μm .
4. Method according to any one of claims 1 to 3, wherein the aqueous suspension of the solid calcium composition is applied during the whole agricultural cycle.
5. Method according to claim 4, wherein the application comprises:
 - a) a first treatment in January consisting of applying to the crops a 5% w/w aqueous suspension of the solid calcium composition in an amount of 50 kg/Ha;
 - b) a second treatment from the end of April until the beginning of May consisting of applying to the crops a 6% w/w aqueous suspension of the solid calcium composition in an amount of 60 kg/Ha;
 - c) a third treatment in June consisting of applying to the crops a 2% w/w aqueous suspension of the solid calcium composition in an amount of 20 kg/Ha and an additional application in July consisting of applying to the crops a 1% w/w aqueous suspension of the solid calcium composition in an amount of 10 kg/Ha;
 - d) a fourth treatment from October to November consisting of applying to the crops a 1% w/w aqueous suspension of the solid calcium composition in an amount of 10 kg/Ha.