

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year)	26.04.2017
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Applicant's or agent's file reference 113681
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FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/BR2017/050055	International filing date (day/month/year) 14.03.2017	Priority date (day/month/year) 16.03.2016
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International Patent Classification (IPC) or both national classification and IPC C05F17/00 (2006.01), C05F15/00 (2006.01), C05G5/00 (2006.01), C05F11/02 (2006.01), C05F5/00 (2006.01), C05F7/00 (2006.01), C05F3/00 (2006.01)

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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 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

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/BR	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

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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(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:

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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)	Claims	11-22	YES
	Claims	1-10	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims	None	NO
2. Citations and explanations:			
<p>The aim of the application in question is the production of granulated fertilizers, the aim of the process being the production of spherical or circular fertilizers from organic compound waste (such as: animal waste, peat, various types of compost, bird waste, and wood, paper and sugar factory filter cakes, etc.), which are subjected to a step of separating particles with a diameter of 3 mm or less, which are conveyed to a mixer, where an agglomerating agent can be added (such as water, sugar, dextrose, acrylates, vinyl compounds, fermentation by-products, etc.) as well as other additives (macro- and micronutrients, hormones, fungi, bacteria, etc.), forming a homogeneous mixture with 10-40% humidity, which is sent to a low-pressure extruder (?) and transformed into pellets, which are conveyed while still green to a rotary spheroidizer that operates at a speed of 5-20 m/s, increasing the density of the granules - transforming the pellets into spheres - which may also be surface-coated, and finally dried until their humidity reaches a range of 5-25%. According to the application, the final granules exhibit rupture charge of 0.50-2.50 kgf and a density</p>			

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gain in relation to the organic compounds of 5-40%.

The technical problem addressed in the present application is that of improving the rheological and mechanical properties of the organomineral fertilizer granules, to reduce the amount of powder and problems of fluidity and segregation within the machine for applying the fertilizer to the crops, which is achieved by granulating the organic or organomineral fertilizer.

Analysis: Novelty, PCT Article 33(2)/inventive step, PCT Article 33(3)/industrial applicability, PCT Article 33(4)

Document US 6,287,496 (published on 11 September 2001), hereinafter document D1, discloses a method for granulating peat and compositions containing peat, with the aim of improving handling and transport of the granules, which, preferably, have less than 10% water content (column 1, lines 10-11 and column 2, lines 35-65). Figure 1 represents the process, in which the peat granules (11) are formed of ingredients comprising peat (12), a binder (14), optional additives (16), water (18) and optional water-soluble viscosifiers (20) (column 4, lines 26-33). Numerous types of peat can be used (column 4, lines 49-60), which should be previously ground (column 5, lines 26-30). The binders described include several types of starches (column 6, lines 11-14), and other binders such as casein, polyvinyl polymers, or the like (column 6, lines 17-22). The process described in document D1 comprises combining the peat (12) and the binder (14) in the mixer (22) for subsequent grinding (24), to which optional additives (16), such as

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fungicides, bactericides, bacterial cultures, carbon black, organic or inorganic fertilizer ingredients, minerals, ashes, limestone, humic acid, among other ingredients that may impart desirable properties to the granules, may be added (column 4, lines 34-56). During the step of grinding (24), the peat particles are sufficiently ground such that the longest length is less than or equal to the desired diameter of the granules (11) (column 7, lines 17-20). Following grinding (24), the additives that have not been added or have been previously only partially added can be added during the mixing step (30), with water also being added if necessary (column 7, lines 34-36 and lines 65-67). After mixing (30), the composition is extruded (35) under pressure of at least 500 psi, which, in order to preserve the properties of the peat (12), should be carried out under relatively mild conditions (column 10, lines 14-35). The thickness of the material is 1-50 mm, typically 2 mm (column 11, lines 1-6). Following extrusion (35), the extrudate is subjected to the granulating (36) and drying (41) step (column 11, lines 22-28 and lines 57-60), wherein grains that are larger or smaller than the desired size are recycled in the process to the grinding step (24) (column 11, lines 57-63).

Document RU2121489 C1 (published on 10 November 1998), hereinafter document D2, describes a peat-based granular fertilizer with improved leaching stability and high mechanical strength, which can be produced from any type of peat and natural zeolite, which also provides the plants with trace elements (Zn, Cu, Mn, Mo, Co, B). In the embodiment, 29% peat, containing 17% ashes and 60-70%

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humidity, is mixed with 61% of materials such as urea, triple superphosphate and potassium sulphate (1:1:1) and 27% natural zeolite, with a size of 0.5-1.0 mm, which are mixed and granulated in an extruder under pressure of 0.55 kg/cm², the granules being dried to 20-22% humidity. According to document D2, the zeolite content of the mixture allows the mechanical strength variation of the granules to be controlled, wherein contents above 40% result in values of strength below 10 kg/cm².

Document CN102515897 (published on 27 June 2012), hereinafter document D3, describes a cow dung powder organic fertilizer. The powdered dry cow dung organic fertilizer, which is in the form of granules, is prepared from the following components, by mass, 78-90% dry cow dung powder, 8-20% biological organic matter and 1-3% of an adhesive. The invention also describes a method for preparing the fertilizer. The preparation method comprises the following steps: 1 - collecting fresh cow dung, air-drying it, dehydrating it, drying it in an oven, and crushing it to produce the dry cow dung powder; 2 - mixing the dry cow dung powder with the biological organic matter and a nitrogen-phosphorus-potassium fertilizer, according to the mass proportions above to obtain a mixture; and 3 - adding the adhesive to the mixture obtained, uniformly mixing them, and granulating them using an extrusion granulator or a disc granulator to produce the fertilizer.

In the previously highlighted text fragments, document D1 discloses the set of technical features defined in claims 1-10 of the present application. Consequently, in view of

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document D1, said claims are not considered to be novel and therefore do not meet the requirement in respect of inventive step either, contrary to PCT Article 33(2) and (3), respectively.

Document D1 is considered to be the most representative of the prior art with regard to the fertilizers claimed in claims 11-22. However, D1 does not disclose the mechanical strength of the fertilizer granules produced. The subject matter defined in claims 11-22 is therefore considered to be novel and complies with PCT Article 33(2).

Document D2 discloses that the mechanical resistance of the fertilizer granules is a result of the composition thereof. It is considered to be obvious for a person skilled in the art to arrive at the features defined in claims 11-22 by combining the teachings of documents D1 and D2, which describe the use of a series of organic and inorganic materials to produce granulated organic or organomineral fertilizers. Said claims therefore do not comply with PCT Article 33(3).

Analogously, it is considered to be obvious for a person skilled in the art to arrive at the features defined in claims 11-22 by combining the teachings of documents D2 and D3. Said claims therefore do not comply with PCT Article 33(3).

The subject matter of claims 1-22 is considered to be industrially applicable and therefore complies with PCT Article 33(4).

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:

Claims 1 and 11 contain a reference to the description ("protocol mentioned in example 1"). Pursuant to PCT Rule 6.2(a), claims should not contain such references, except where absolutely necessary, which is not the case here.

Claim 1 does not meet the requirements of PCT Article 6, since the subject matter for which protection is sought is not clearly defined. Claim 1 attempts to define the subject matter in terms of the result achieved, i.e. resistance of the fertilizer granules to rupturing, which equates to simply mentioning the outlined problem, without, however, describing the technical features (process steps and conditions) necessary for achieving said result.

Claims 6 and 7 use terminology/definitions that are unclear (that are subjective), given that said claims mention that the extrusion step occurs at "low pressure" and that "the humidity of the pellet is partially increased" without, however, defining the pressure and humidity content in numerical terms, which does not meet the requirements of PCT Article 6.