

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43*bis*.1)

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/EP2023/051898

International filing date (day/month/year)  
26.01.2023

Priority date (day/month/year)  
27.01.2022

International Patent Classification (IPC) or both national classification and IPC  
INV. C02F1/48 C02F1/52 ADD. C02F101/20 C02F101/32

Applicant  
CAPTOPLASTIC, S.L.

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

Authorized Officer

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**Box No. I Basis of the opinion**

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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:
- a. ☐ forming part of the international application as filed.
  - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),
    - ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
5. Additional comments:
- see separate sheet**

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

|                               |             |             |
|-------------------------------|-------------|-------------|
| Novelty (N)                   | Yes: Claims | <u>1-14</u> |
|                               | No: Claims  |             |
| Inventive step (IS)           | Yes: Claims |             |
|                               | No: Claims  | <u>1-14</u> |
| Industrial applicability (IA) | Yes: Claims | <u>1-14</u> |
|                               | No: Claims  |             |

2. Citations and explanations

**see separate sheet**

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**Box No. VIII    Certain observations on the international application**

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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**

**Re Item I**

**Basis of the report**

- 1       The applicant has requested to have the present application processed under PCT Direct (PCT-EPO Guidelines B-IV, 1.2.1). Account taken of the applicant's comments submitted with the PCT Direct letter of 26-01-2023, this Authority considers that the claims do not meet the requirements of the PCT for the following reasons.

**Re Item VIII**

**Certain observations on the international application**

- 2       The terms "optionally" and "preferably" used in claims 1, 4 and 13 indicate that a feature is optional. The feature is therefore not taken into account for the evaluation of novelty and inventive step.

**Re Item V**

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

- 3       Reference is made to the following document:

D1       WO 2020/240069 A1 (UNIV MADRID AUTONOMA [ES]) 3 December 2020 (2020-12-03) cited in the application

- 4       The present application does not meet the criteria of Article 33(3) PCT, because the subject-matter of claim 1 does not involve an inventive step.

- 4.1     The document D1 is regarded as being the prior art closest to the subject-matter of claim 1, and discloses (see table 1 and p.23, I.30 - p.24, I.3):

A process of

- a) providing a suspension of polystyrene (PS) microplastics in salt water (35g/l NaCl);
- b) adding magnetite particles, thereby forming a magnetic iron/organic particle aggregate; and
- c) separating the aggregate from the salt water by applying a magnetic field.

- 4.2 The subject-matter of claim 1 therefore differs from this known process in that saline water is added after the aggregate is formed and is therefore new (Article 33(2) PCT).
- 4.3 According to the applicant the method of the invention allows the breaking up of the aggregates and the recovery of the different components of the aggregate. This effect is not considered plausible. If this would be the case, it would also mean that the aggregate formed during step b above would decompose, because the aggregate is located in contact with a saline solution falling under the definition of the saline solution used in the method of claim 1. This is clearly not the case. An effect over the entire scope of the claim has therefore not been demonstrated.
- 4.4 The description of the application contains three examples of which only the example 1 describes a process for breaking up magnetic iron material/organic particle aggregates according to claim 1 on file. This example contains different experiments, but there is no basis to generalize the desired effect to the entire scope of claim 1. All the experiments have features in common that are not mentioned in claim 1. Only three types of plastics are used: PS, PP and PET. The microplastic particles have a size between 100-500 µm. Only magnetite (Fe<sub>3</sub>O<sub>4</sub>) with a specific mean particle diameter and a specific particle size distribution is used as the magnetic iron material. Only three salts are used: NaH<sub>2</sub>PO<sub>4</sub>, NaCl and NaI. In all the experiments the samples were vigorously mechanically shaken for 15 minutes and then placed in an ultrasonic bath for another 20 minutes, after which floating particles were separated.

- 4.5 In other words, the application does not contain any evidence that effective breaking up of aggregates is achieved if
- the magnetic iron material/organic particle aggregates are composed of other magnetic iron materials and other organic materials;
  - the organic materials have a size outside the 100-500 µm range and the magnetic iron having a mean other than 0.2 µm;
  - another saline solution is used than  $\text{NaH}_2\text{PO}_4$ , NaCl or NaI; or
  - the samples were not or not sufficiently long shaken and treated with ultrasound.
- 4.6 The subject-matter of claim 1 can therefore not be regarded as being inventive (Article 33(3) PCT).
- 5 Dependent claims 2-14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.
- 5.1 The claims 2-4 define subranges of organic particles. There does not appear to be a basis for a generalisation from the three specific microplastics used in the different experiments example 1.
- 5.2 The claims 5 and 6 define subranges of saline solutions. There does not appear to be a basis for a generalisation from the specific saline solutions used in the different experiments example 1.
- 5.3 The claims 7-11 define subranges of magnetic materials. There does not appear to be a basis for a generalisation from the specific magnetic material used in the different experiments example 1.
- 5.4 Claim 12: It is unlikely that stirring as such can cause a technical advantage. According to example 1, stirring has to last for a certain amount of time and must be followed by ultrasonic treatment.

- 5.5 Claim 13: The term "separating by density" is not clear, since no clear value of density is given. It is highly unlikely that any type of magnetic field of any desired magnitude can cause a separation.
- 5.6 Claim 14: the claim does not specify how the particles are to be characterized and also not how they are to be recovered. The features of the claim define a desired result and do not define the method steps which enable the achievement of this result.
- 5.7 The combination of claim 1 with any of the dependent claims 2-14 will therefore not result in an inventive claim (Article 33(3) PCT).