

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PC-24817	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/JP2018/000506	International filing date ( <i>day/month/year</i> ) 11 January 2018 (11.01.2018)	Priority date ( <i>day/month/year</i> ) 16 January 2017 (16.01.2017)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant TOMOEGAWA CO., LTD.			

<p>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 bis.1(a).</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p>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.</p>																								
<p>3. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></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><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.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 44bis .2).</p>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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	Date of issuance of this report 16 July 2019 (16.07.2019)
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**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)	<b>27.02.2018</b>
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Applicant's or agent's file reference <b>PC-24817</b>
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<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/JP2018/000506</b>	International filing date (day/month/year) <b>11.01.2018</b>	Priority date (day/month/year) <b>16.01.2017</b>
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International Patent Classification (IPC) or both national classification and IPC <b>D04H1/4234 (2012.01) i</b>
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Applicant <b>TOMOEGAWA CO., LTD.</b>
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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/JP	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 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:

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<b>Box No. V</b>	<b>Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</b>
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1. Statement			
Novelty (N)	Claims	1-5	YES
	Claims	_____	NO
Inventive step (IS)	Claims	_____	YES
	Claims	1-5	NO
Industrial applicability (IA)	Claims	1-5	YES
	Claims	_____	NO

2. Citations and explanations:	
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Document 1: JP 61-225400 A (TOMOEGAWA CO., LTD.) 07  
October 1986

Document 2: JP 2007-533865 A (NVBEKAERT SA) 22 November  
2007

Document 3: JP 61-289200 A (AISIN SEIKI CO., LTD.) 19  
December 1986

Document 4: JP 8-232187 A (KAWASAKI STEEL CORP.) 10  
September 1996

Claims 1-5: Document 1

See in particular the claims; page 1, right column to page 2, upper right column and page 3, upper left column; example 1; etc. in document 1. In regard to an invention of a highly compounded metal fiber sheet, document 1 discloses that the metal fiber used in the highly compounded metal fiber sheet has a fiber diameter of 2-16 μm and a fiber length of 2-12 mm, that the highly compounded metal fiber sheet is used as a electrically conductive material, and that e.g. a stainless steel fiber or a copper fiber is used as the metal fiber; as well an example in which, using a specified stainless

**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**

steel fiber in the metal fiber sheet, weight per unit of area is  $56 \text{ g/m}^2$  and thickness is  $31 \text{ }\mu\text{m}$ ; and thus is found to satisfy the numeric range for space factor stipulated in claim 3 of the present application.

Document 1 does not indicate in particular that the coefficient of variation in the weight per unit of area is 10% or less, but since the problem of the invention described in document 1 is found to be to improve the uniformity in density, thickness, and smoothness of a fiber sheet (page 1, right column to page 2, upper right column and page 3, upper left column), no particular difficulty is found in setting an upper limit for the coefficient of variation in the weight per unit of area in the invention described in document 1, in order to further enhance the abovementioned properties; thus, a person skilled in the art could easily do so.

Nor, as regards the effect thereof, would there be a notable effect that a person skilled in the art could not have predicted.

Claims 1-5: Document 2

See in particular the claims; paragraphs [0004], [0006]-[0010], [0013]-[0015], and [0030]; the examples; etc. in document 2. In regard to an invention of a non-sintered metal fiber medium, document 2 discloses that the non-sintered metal fiber medium employs a metal fiber whereof the fiber diameter is less than  $6 \text{ }\mu\text{m}$ , the fiber length is less than 10 mm, and the L/D is less than 110; that the non-sintered metal fiber medium is used for e.g. an electromagnetic interference (EMI) shielding layer; and that e.g. a stainless steel fiber or a copper fiber is used as the metal fiber; as well as an example in

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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

which, using a specified stainless steel fiber in the metal fiber sheet, weight per unit of area is  $127 \text{ g/m}^2$ , and thickness is  $251 \text{ }\mu\text{m}$ ; and thus is found to satisfy the numeric range for space factor stipulated in claim 3 of the present application.

Document 2 does not indicate in particular that the coefficient of variation in the weight per unit of area is 10% or less, but since the problem of the invention described in document 2 is found to be to improve the uniformity in the distribution of metal fiber on the surface and in the depth direction of the metal fiber medium (paragraphs [0006]-[0010]), no particular difficulty is found in setting an upper limit for the coefficient of variation in the weight per unit of area in the invention described in document 2, in order to further enhance the abovementioned properties; thus, a person skilled in the art could easily do so.

Nor, as regards the effect thereof, would there be a notable effect that a person skilled in the art could not have predicted.

Claims 1, 2, 4, and 5: Document 3

See in particular the claims; page 1, right column to page 2, upper right column, line 3; example 3; etc. in document 3. In regard to an invention of a conductive metal fiber sheet, document 3 indicates that the metal fiber used in the conductive metal fiber sheet has a fiber diameter of  $2\text{-}10 \text{ }\mu\text{m}$  and a fiber length of  $1\text{-}10 \text{ mm}$ ; that the conductive metal fiber sheet is used in e.g. radio wave-reflecting material, and various types of business equipment with a built-in CPU; and that e.g. a stainless steel fiber or a copper fiber is used as the

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metal fiber.

Document 3 does not indicate in particular that the coefficient of variation in the weight per unit of area is 10% or less, but since the problem of the invention described in document 3 is found to be to manufacture an extremely thin metal fiber sheet with uniform dispersion of metal fibers and good electrical conductivity (page 1, right column to page 2, upper right column, line 3), no particular difficulty is found in setting an upper limit for the coefficient of variation in the weight per unit of area in the invention described in document 3, in order to further enhance the abovementioned properties; thus, a person skilled in the art could easily do so.

Nor, as regards the effect thereof, would there be a notable effect that a person skilled in the art could not have predicted.

Claims 1 and 2: Document 4

See in particular the claims; paragraphs [0001], [0004], and [0029]; etc. in document 4. In regard to an invention of a fiber-reinforced thermoplastic resin sheet, document 4 indicates that the metal fiber used in the fiber-reinforced thermoplastic resin sheet has a fiber diameter of approximately 10  $\mu\text{m}$  and a fiber length of approximately 10 mm.

Document 4 does not indicate in particular that the coefficient of variation in the weight per unit of area is 10% or less, but since the problem of the invention described in document 4 is found to be to improve the uniformity in the distribution of weight per unit of area in the width direction in a web (paragraph [0004]), no particular difficulty is found in setting an upper limit

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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

for the coefficient of variation in the weight per unit of area in the invention described in document 4, in order to further enhance the abovementioned properties; thus, a person skilled in the art could easily do so.

Nor, as regards the effect thereof, would there be a notable effect that a person skilled in the art could not have predicted.