

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 240643W	FOR FURTHER ACTION		See item 4 below
International application No. PCT/JP2015/051188	International filing date (<i>day/month/year</i>) 19 January 2015 (19.01.2015)	Priority date (<i>day/month/year</i>) 27 March 2014 (27.03.2014)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant SUMITOMO ELECTRIC INDUSTRIES,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 6 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 27 September 2016 (27.09.2016)
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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)	14.04.2015
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Applicant's or agent's file reference 240643W

FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/JP2015/051188	International filing date (day/month/year) 19.01.2015	Priority date (day/month/year) 27.03.2014
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International Patent Classification (IPC) or both national classification and IPC D04H1/4242 (2012.01) i, D04H1/74 (2006.01) i, H01M4/96 (2006.01) i, H01M8/18 (2006.01) i
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Applicant SUMITOMO ELECTRIC INDUSTRIES, LTD.
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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.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2015/051188

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:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No. PCT/JP2015/051188
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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
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1. Statement			
Novelty (N)		Claims <u>3, 4</u>	YES
		Claims <u>1, 2</u>	NO
Inventive step (IS)		Claims _____	YES
		Claims <u>1-4</u>	NO
Industrial applicability (IA)		Claims <u>1-4</u>	YES
		Claims _____	NO

2. Citations and explanations:	
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Document 1: JP 2001-313070 A (MITSUBISHI RAYON CO., LTD.) 09 November 2001

Document 2: JP 01-239767 A (TORAY INDUSTRIES, INC.) 25 September 1989

Document 3: JP 63-021755 A (TORAY INDUSTRIES, INC.) 29 January 1988

The invention as in claims 1 and 2 lacks novelty and does not involve an inventive step in the light of document 1 cited in the ISR.

(1) Invention as in claim 2

The examples of document 1 disclose a method for manufacturing carbon fiber felt in which the fibers of a web of acrylonitrile-containing fibers (carbon fiber precursor fibers) are laid down and layered in a widthwise direction so that the fibers are oriented in the widthwise direction of a belt, the web is needle-punched at a density of 400 needles/cm² to obtain a carbon fiber precursor felt, and the carbon fiber precursor felt is carbonized in a nitrogen atmosphere

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

(inert atmosphere).

Although document 1 does not disclose the feature of layering the carbon fiber precursor fiber web at a layering angle in a range of 0-60° or 120-180°, inasmuch as the fibers of the web are laid down and layered so as to be oriented in the widthwise direction of the belt, the layering angle is found to be 0°.

Therefore, there is no difference between the invention as in claim 2 of the present application and the invention disclosed in document 1.

(2) Invention as in claim 1

The examples in the description of the present application indicates that carbon fiber felt obtained according to the method for manufacturing carbon fiber felt as defined in the invention as in claim 2 of the present application has a fiber orientation level as defined in the invention as in claim 1 of the present application. This being the case, the carbon fiber felt disclosed in document 1 is found to have a fiber orientation level within the range defined in the invention as in claim 1 of the present application.

The invention as in claims 3 and 4 does not involve an inventive step in the light of documents 1-3 cited in the ISR.

Paragraph [0001] of document 1 discloses the feature of the carbon fiber felt being used in an electrode material for a sodium-sulfur battery. In addition, the practice of a carbon-fiber-containing material normally used in sodium-sulfur battery electrodes being used in an

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2015/051188

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

electrode of a redox flow (liquid flow) battery was already known in the art prior to the filing of the present application, as disclosed in document 2 (claims, page 1, lower right column, lines 8-12) and document 3 (claims, page 1, lower left column, lines 11-16).

This being the case, it would not present any particular difficulty to use the carbon fiber felt disclosed in document 1 for one of the uses defined in the invention as in claims 3 and 4 of the present application.