

**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>14.04.2015</b>
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Applicant's or agent's file reference <b>240643W</b>
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<b>FOR FURTHER ACTION</b> See paragraph 2 below
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International application No. <b>PCT/JP2015/051188</b>	International filing date (day/month/year) <b>19.01.2015</b>	Priority date (day/month/year) <b>27.03.2014</b>
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International Patent Classification (IPC) or both national classification and IPC <b>D04H1/4242 (2012.01) i, D04H1/74 (2006.01) i, H01M4/96 (2006.01) i, H01M8/18 (2006.01) i</b>
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Applicant <b>SUMITOMO ELECTRIC INDUSTRIES, 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 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)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Claims</td> <td style="border-bottom: 1px solid black;">3, 4</td> <td style="width: 10%; text-align: right;">YES</td> </tr> <tr> <td>Claims</td> <td style="border-bottom: 1px solid black;">1, 2</td> <td style="text-align: right;">NO</td> </tr> </table>	Claims	3, 4	YES	Claims	1, 2	NO	
Claims	3, 4	YES							
Claims	1, 2	NO							
	Inventive step (IS)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Claims</td> <td style="border-bottom: 1px solid black;">_____</td> <td style="width: 10%; text-align: right;">YES</td> </tr> <tr> <td>Claims</td> <td style="border-bottom: 1px solid black;">1-4</td> <td style="text-align: right;">NO</td> </tr> </table>	Claims	_____	YES	Claims	1-4	NO	
Claims	_____	YES							
Claims	1-4	NO							
	Industrial applicability (IA)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Claims</td> <td style="border-bottom: 1px solid black;">1-4</td> <td style="width: 10%; text-align: right;">YES</td> </tr> <tr> <td>Claims</td> <td style="border-bottom: 1px solid black;">_____</td> <td style="text-align: right;">NO</td> </tr> </table>	Claims	1-4	YES	Claims	_____	NO	
Claims	1-4	YES							
Claims	_____	NO							

2. Citations and explanations:

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/cm<sup>2</sup> 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

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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.