

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 633406WO01	FOR FURTHER ACTION		See item 4 below
International application No. PCT/JP2015/058344	International filing date (<i>day/month/year</i>) 19 March 2015 (19.03.2015)	Priority date (<i>day/month/year</i>) 19 March 2014 (19.03.2014)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant MITSUBISHI ELECTRIC CORPORATION			

<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 border="0"> <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 20 September 2016 (20.09.2016)
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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)	26.05.2015
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Applicant's or agent's file reference 633406W001	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/JP2015/058344	International filing date (day/month/year) 19.03.2015	Priority date (day/month/year) 19.03.2014
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International Patent Classification (IPC) or both national classification and IPC
H04J11/00 (2006.01) i, H04B1/10 (2006.01) i

Applicant
MITSUBISHI ELECTRIC CORPORATION

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/JP2015/058344

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:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No. PCT/JP2015/058344
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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>1-4</u>	YES
		Claims _____	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 2011-234259 A (SHARP CORP.) 17 November 2011, paragraphs [0091], [0092]

Document 2: JP 2013-539266 A (QUALCOMM INC.) 17 October 2013, paragraph [0056] & US 2012/0201152 A1 ([0070])

Document 3: JP 2002-135230 A (MITSUBISHI ELECTRIC CORP.) 10 May 2002, paragraph [0086] & US 2004/0109419 A1 ([0124])

Document 1 (paragraphs [0091], [0092]) discloses a reception device that receives a signal that includes a null symbol, and is provided with a no-signal state detection unit 512 (corresponding to the null extraction means that extracts null symbols from a received signal) and a reception power measurement unit 507 (corresponding to the power calculation means that calculates the power of null symbols extracted by the null extraction means and the average value thereof).

Document 2 (paragraph [0056]) discloses a means for determining interference power using a plurality of types

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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

of methods, and a means for obtaining an accurate interference power value by selecting one from among the determined interference power values (corresponding to the filtering means for executing a plurality of filtering operations and performing nonlinear processing).

Document 3 (paragraph [0086]) discloses a use for an interference power value in obtaining satisfactory communication quality by normalizing data included in a received signal on the basis of an interference power value.

The invention as in claims 1, 2, and 4 does not involve an inventive step in the light of documents 1-3 cited in the ISR.

Document 1 does not disclose a technical means for executing a plurality of filtering operations and performing nonlinear processing. However, since acquiring the accurate transmission path state is a goal as a matter of course, in order to obtain the accurate interference power value in the reception device disclosed in document 1, a person skilled in the art could easily use the means disclosed in document 2.

Further, using an interference power value is a feature that could be used appropriately by a person skilled in the art, and on the basis of the interference power values disclosed in document 3, a person skilled in the art could easily use interference power values for normalization of data included in a received signal.

The invention as in claim 3 does not involve an

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INTERNATIONAL SEARCHING AUTHORITY

International application No.

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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

inventive step in the light of documents 1-3 cited in the
ISR.

A person skilled in the art could appropriately
determine the kind of interference to assume, and
assuming well-known interference falls within the normal
creative ability of a person skilled in the art.