

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)	27.09.2017
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Applicant's or agent's file reference 173283GP	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/CN2017/087384	International filing date (day/month/year) 07.06.2017	Priority date (day/month/year) 26.12.2016
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International Patent Classification (IPC) or both national classification and IPC
H02J3/48 (2006.01) i

Applicant
BEIJING GOLDWIND SCIENCE & CREATION WINDPOWER EQUIPMENT CO., LTD.

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/CN	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 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:

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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)	Claims	1-14	YES
	Claims	None	NO
Inventive step (IS)	Claims	2-7, 8-14	YES
	Claims	1, 8	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims	None	NO
2. Citations and explanations:			
	<p>[1] D1: CN 101860042 A (13 October 2010)</p> <p>[2] D1 discloses (see description, paragraphs [0014]-[0018], and figures 1-3): a method of allocating the active power of a wind farm, comprising:</p> <p>calculating an active power increment ΔP_{IT}</p> <p>according to a frequency offset Δf in order to</p> <p>obtain an active power value P_{ref} within an adjustment period; determining the amount of real-time predicted total wind power $P_{m1} + P_{m2}$ of the wind farm relative to P_{ref}; and if</p> <p>$P_{m1} + P_{m2} < P_{ref}$, i.e. total variation is greater than zero, a wind turbine outputs active power according to the maximum setting (equivalent to the individual-unit energy storage value); and,</p> <p>when $P_{m1} + P_{m2} \geq P_{ref}$, i.e. the variation is less</p>		

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

than zero, the turbine outputs an adjustment value. The P_{input} is converted into an input power reference value $P_{\text{reference}}$ of each wind turbine. For a group of wind turbines having a same level of power, if there are n turbines and P_{group} is the total active power output reference value of the group, then each wind turbine's input power reference value

$$P_{\text{reference},i} (i = 1, 2, \dots, n) = \frac{P_{\text{group}}}{n} .$$

- [3] It can be seen that the features distinguishing claims 1 and 8 from D1 are: when total variation is greater than zero, the current individual-unit active power variation of all of the wind turbines is equivalent, or the individual-unit active power of some of the wind turbines is equivalent and the individual-unit active power variation of other wind turbines is equal to the individual-unit energy storage value; when total variation is less than zero, the current individual-unit active power variation of all of the wind turbines is equivalent, or the individual-unit active power of some of the wind turbines is equivalent and the individual-unit active power variation of other wind turbines is equal to a power reduction value. On the basis of the described distinguishing features, the technical problem essentially to be solved by claims 1 and 8 can be determined to be: how to ensure the reasonable operation of wind

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Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

turbines.

[4] In view of the disclosure in D1 that a group of wind turbines having a same level of power uses the same active power variation, a person skilled in the art would have readily conceived of the individual-unit active power variation being equivalent across the group of wind turbines having a same level of power. In the disclosure of D1, when there is a plurality of groups of wind turbines using a same level of power, each group may be in a different operating state (see description, paragraph [0016]). On this basis, a person skilled in the art would have easily conceived of groups using other levels of power being in operating states that are determined, according to actual circumstances, on the basis of the individual-unit energy storage value and the power reduction value. Therefore, it would have been obvious to arrive at claims 1 and 8 on the basis of D1 and common general knowledge in the present field; thus, claims 1 and 8 comply with PCT Article 33(2), but do not comply with PCT Article 33(3).

[5] The additional features of claims 2, 3, 9 and 10 relate to ranking the individual-unit energy storage values or the power reduction values of wind turbines in ascending order and determining, on the basis of said order, whether the individual-unit energy storage value or the power reduction value is less than the unallocated

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average active power. The additional features are not disclosed by D1 and are not common general knowledge in the present field. Furthermore, said features have the technical effect of enabling the active power variations of individual units to be equal to the extent possible, so as to further ensure the reasonable operation of the wind turbines. Therefore, claims 2, 3, 9, and 10 comply with PCT Article 33(2) and PCT Article 33(3).

[6] Because claims 4-7 directly or indirectly refer to claims 2 and 3, and claims 11-14 directly or indirectly refer to claims 9 and 10, when claims 2, 3, 9, and 10 comply with PCT Article 33(2) and PCT Article 33(3), claims 4-7 and claims 11-14 also comply with PCT Article 33(2) and PCT Article 33(3).

[7] Therefore, claims 2-7 and 9-14 comply with PCT Article 33(2) and PCT Article 33(3).

[8] The technical solutions set forth in claims 1-14 are industrially applicable in the technical field of wind farm active power allocation; said claims therefore comply with PCT Article 33(4).