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**Datasheet for the decision
of 3 December 2010**

Case Number: T 0511/10 - 3.2.04

Application Number: 00926412.8

Publication Number: 1173919

IPC: H02K 16/00

Language of the proceedings: EN

Title of invention:
Powertrain for power generator

Applicant:
Clipper Windpower, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-



Case Number: T 0511/10 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 3 December 2010

Appellant:

Clipper Windpower, Inc.
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 23 September 2009
refusing European patent application
No. 00926412.8 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: M. Poock
Members: A. de Vries
T. Bokor

Summary of Facts and Submissions

I. The Appellant lodged an appeal, received 12 October 2009, against the decision of the Examining Division posted 23 September 2009, refusing the European patent application No. 00 926 412.8 and simultaneously paid the appeal fee. The statement setting out the grounds of appeal was received 18 January 2010.

In its decision the Examining Division held that the application did not meet the requirements of Article 52(1) in combination with Article 56 EPC for lack of inventive step departing from the following document :

D4: DE-A-42 21 488

(The decision confuses the notation for D4 and D5 (DE 35 44 669), though the notation is otherwise correctly used in the rest of the procedure. Which documents are meant is however clear from the reasoning and has also been understood by the Appellant as is apparent from his written submissions.)

II. With the annex to the summons to oral proceeding before the Board pursuant to Article 15(1) RPBA, the Board made preliminary observations concerning the issue of inventive step for claim 1 of the sole request on file.

III. The Appellant informed the Board per fax of 2 December 2010 that he would not attend the oral proceedings scheduled for 3 December 2010. These were held in his absence.

IV. The Appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 13 filed with the letter dated 9 July 2007. The wording of claim 1 is as follows :

"An electric power generating device that converts fluid flow of wind or water to electricity, comprising: a rotor having blades that rotate in response to fluid flow;

 a main power input shaft coupled to said rotor;
 a single-stage torque-dividing gearbox (20, 30, 320, 330, 501, 502, 504) consisting of a gear (501) coupled to said main power input shaft (10, 500) and a plurality of pinions (330, 502), the teeth of said pinions directly engaging the teeth of said gear; and,
 a plurality of torque-reducing gearboxes (50, 350, 510), each having an input shaft connected to one of said pinions, said plurality of torque-reducing gearboxes being located around a perimeter of said main power input shaft."

V. In his written submissions the Appellant argued as follows:

D4 is not directed at the same objective or purpose as the invention and should not be considered as closest prior art. Even if the skilled person would depart from D4 and assuming that he is faced with the problem of making a more reliable generator system at reduced costs he would not have thought about adding additional gearboxes to each generator. D4 does not contain any prompt to do so, and this would in fact add to the overall complexity and cost of the system. The skilled person would rather modify existing gears to provide

further torque reduction. From D4 two steps would be necessary: first having only torque division in the first stage, then moving torque reduction to a second stage.

Reasons for the Decision

1. The appeal is admissible.
2. Background

The invention relates to an electric power generator for a wind or water turbine in which the output torque is first divided or split, using a gearbox with main shaft coupled gear and surrounding pinions, and then reduced via torque reducing gearboxes each connected to a pinion and arranged around the main shaft. This effectively splits the power-train into a plurality of smaller drive trains providing redundancy and increased reliability, see page 2, lines 17 to 23. In the embodiment of figures 1-4,6 some reduction takes place with the splitting using reduction pinions, but this need not be so (page 6, final paragraph).

3. Inventive Step
 - 3.1 In section 1 of the annex to the summons the Board made preliminary observations regarding inventive step. It firstly held that D4 in its view *did* represent the closest prior art: "D4 divides output torque between parallel smaller generators 4 via a sun-gear 2 and pinions 3, and thus already achieves important objectives of the application - redundancy and

reliability - in the same way the application does. In the Board's view it thus represents an appropriate starting point for assessing inventive step."

3.2 The Board then identified the differences with regard to D4 as follows: "With respect to D4 the device of claim 1 features an additional separate reduction gearbox between each generator and its pinion gear. In the application reduction may also take place in the first stage, see figures 1 to 3, page 3, line 30 to 31, or page 5, lines 16 to 27. In the light of this embodiment claim 1 is read as meaning that *part or all* of the reduction now takes place in a *separate* stage, a reduction gearbox. In D4 *all* reduction is carried out in the first and only stage together with splitting by means of accordingly dimensioned pinion gears (see the figure, it follows also from "abgestuft" in col.2, ln.49-51). In the Board's view this represents the only difference between claim 1 and D4."

3.3 The Board found the associated technical effect and the technical problem to be solved by the invention to depend on the particular embodiment:

"The effect of a *separate* reduction gearbox (in each of the drive train branches) *per se* is not expressly stated in the application. In the Board's opinion this difference does not appear to contribute to redundancy, which is a result only of the splitting of torque between parallel generators. It must therefore be sought elsewhere. Page 8 of the description mentions various factors which apply differently to the different embodiments."

"Considering the embodiment discussed on page 6, final paragraph, where *all* reduction takes place in the reduction gear box, this would appear to have the sole effect (over D4 with reduction in the first stage) of reducing size and associated costs (e.g. serviceability) of individual components, see for example page 8, point 6. The technical problem can be formulated accordingly. The question to be answered is then whether the proposed solution, which effectively adopts a modular design concept, is obvious in light of the prior art or belongs to common knowledge of the skilled person, a mechanical engineer designing and developing wind turbines."

"Considering the embodiments of figures 1-4 and 6 with division and reduction in the first stage and *further* reduction in a separate gear box, this benefits from the further advantage over D4 that it allows high gear ratios to be practically achieved, see for example page 8, point 10. Here it may be necessary to consider also, whether it is obvious for the skilled person, in the light of the prior art or his common knowledge, starting from D4 to carry out reduction in individual steps to achieve a high gear ratio, for example because of practical gearing ratio constraints that exist for individual gear sets. In a similar power distribution context D2, see figures, shows reduction first from flywheel 2 driven belt 5 to pinion 6 then via reduction gears 7,8."

In either case, the issue of inventive step in the Board's opinion thus hinged on whether the respective measure was known to the skilled person from his common general knowledge or the prior art.

3.4 The Appellant has chosen not to respond. The Board must therefore decide the questions as formulated above on the basis of the information already on file.

3.4.1 Without any evidence to the contrary the Board finds that the skilled person would indeed as a matter of obviousness draw on common general knowledge to apply the basic design principle of modularity to a wind turbine as in D4 to reduce size and costs of individual components. In so doing he will divide the dual tasks of torque division and reduction between two *separate* units, thus arriving at a device in accordance with the first embodiment of the invention defined in claim 1 without an inventive step. The Board adds that component size and cost are routine concerns in the design of wind turbines and require no explicit mention in D4. These routine concerns provide his motivation to apply a routine measure, and explain why the skilled person would rather than could do so.

3.4.2 Alternatively - and again without any evidence to the contrary - the Board holds that the skilled person would use this common general knowledge of gearing practice to provide additional reduction gearing in a separate gearbox to achieve a sufficiently high gearing ratio in a turbine as in D4. For example, if he needs to convert low rotational speed input into a high frequency output of the individual generators - say, for very large blade length and converting to grid frequency - practical gearing constraints such as cost and space require him to gear up in smaller steps via additional gears rather than in a single big one between pinion and sun gear. Such standard gearing

practice for standard gearing situations does not require any specific prompt in D4. It prescribes what the skilled person should and would do under certain circumstances. Applying standard practice in such circumstances is obvious and results in the invention of claim 1 as realized in the second embodiment mentioned above.

- 3.4.3 The Board concludes that the subject-matter of claim 1 of the sole request on file lacks inventive step in view of D4 taking common general knowledge into account, Articles 52(1) and 56 EPC.

4. As claim 1 of the sole request does not meet the requirements of the EPC, the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

G. Magouliotis

M. Poock