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**Datasheet for the decision
of 27 November 2018**

Case Number: T 1440/14 - 3.2.04

Application Number: 08700900.7

Publication Number: 2118483

IPC: F03D1/00, F03D1/06

Language of the proceedings: EN

Title of invention:

METHOD FOR MOVING A WIND TURBINE COMPONENT, SUCH AS A WIND TURBINE HUB, FROM A TRANSPORTATION POSITION TO A WIND TURBINE ASSEMBLY POSITION IN OR ON THE NACELLE, THE MAIN SHAFT OR THE HUB, A HANDLING UNIT, A WIND TURBINE HUB AND USE HEREOF

Patent Proprietor:

Vestas Wind Systems A/S

Opponent:

Senvion GmbH

Headword:

Relevant legal provisions:

EPC Art. 54(2), 56

Keyword:

Novelty - (no) - auxiliary request (yes)

Inventive step - auxiliary request (yes)

Decisions cited:

Catchword:



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Case Number: T 1440/14 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 27 November 2018

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
14 May 2014 concerning maintenance of the
European Patent No. 2118483 in amended form.**

Composition of the Board:

Chairman W. Van der Eijk
Members: G. Martin Gonzalez
C. Kujat

Summary of Facts and Submissions

I. The appellant-opponent lodged an appeal, received on 30 June 2014, against the interlocutory decision of the opposition division of the European Patent Office posted on 14 May 2014 concerning maintenance of European patent No. 2 118 483 in amended form, and simultaneously paid the appeal fee. The statement setting out the grounds of appeal was received on 24 September 2014.

The appellant-proprietor also appealed the interlocutory decision by notice of appeal received on 23 July 2014 and paid the appeal fee on the same day. The statement setting out the grounds of appeal was received on 24 September 2014.

II. Opposition was filed under Article 100(a) EPC based on lack of novelty and lack of inventive step and under Article 100(c) based on extension of subject-matter.

The opposition division held that the patent as amended complied with the provisions of Article 123(2) and (3) EPC and was new and inventive having regard *inter alia* to the following documents:

- (E2) EP 1 925 583 A1
- (E3) DE 102 25 025 A1
- (E4) EP 1 507 975 B1
- (E5) Prior use by the building of a REpower 5M turbine in Brunsbüttel
- (E6) DD 34146

III. The appellant-opponent filed the following further evidence during the appeal proceedings:

- (E7) DE 33 33 108 A1
- (E8) DE 101 48 590 A1
- (E9) US 5,795,101
- (E10) US 2,974,995

IV. The appellant-opponent requested that the decision under appeal be set aside and that European patent No. 2 118 483 be revoked.

The appellant-proprietor requested that the decision under appeal be set aside and that the patent be maintained as granted. Alternatively, they requested that the patent be maintained in amended form according to auxiliary requests 1 or 2 filed with the statement of grounds dated 24 September 2014, according to auxiliary request 3 (as upheld by the opposition division), or according to auxiliary requests 4 or 5 filed with the letter of 26 October 2018.

V. Oral proceedings were held on 27 November 2018.

VI. The independent claims according to the relevant requests read as follows:

(a) main request - as granted

1. "Method for moving a wind turbine component, such as a wind turbine hub, from a transportation position to a wind turbine assembly position, said method comprising the steps of:

attaching a handling unit to a structural part of the wind turbine component, operatively connecting the handling unit to a wire of a crane system, subsequently lifting the handling unit and there by the wind turbine component with the crane system to an

assembly position of the wind turbine, the handling unit and the wind turbine component being suspended from said wire, and rotating the wind turbine component with the handling unit while being suspended and during the lifting of the wind turbine component in order to orientate the wind turbine component for assembly."

10. "Handling unit (11) for moving a wind turbine component such as a wind turbine hub (4) from a transportation position to a wind turbine assembly position, said handling unit comprising at least one connection point (16) for connection to a wire of a crane system,
attachment means (12a, 12b) for attachment of the unit to a structural part (22) of the wind turbine component (4), and
actuating means (13-15, 23) for actuating the wind turbine component around a unit rotational centre (19) in order to perform the rotation of the wind turbine component according to the method of any of claims 1 to 9."

(b) first auxiliary request

Claim 1 reads as in the main request with the following feature added at the end of the claim:

"..., wherein the wind turbine component is rotated about a horizontal axis."

Claim 10 is amended as follows vis-à-vis claim 10 of the main request (emphasis added by the board to indicate added text):

"...(19) in order to perform the rotation of the wind turbine component about a horizontal axis according to the method of any of claims 1 to 9."

(c) second auxiliary request

Claim 1 reads as in the first auxiliary request, with the following feature added at the end of the claim: "..., and wherein said rotation is controlled by means of actuating means of the handling unit."

Claim 9 as claim 10 of the first auxiliary request, where the reference to previous claims 1-9 has been adapted to a new claims set as follows:

"... according to the method of any of claims 1 to 9
8."

VII. The appellant-opponent argued as follows:

All requests contain added subject-matter. Document E4 anticipates the subject-matter of claim 1 of the main request and first auxiliary request. The subject-matter of claims 1 and 9 of the second auxiliary request is either not new or does not involve an inventive step in the light of the evidence E3-E10 and common general knowledge.

VIII. The appellant-proprietor argued as follows:

None of the requests contains added subject-matter. Prior use E5 is not sufficiently proved. The subject-matter of the independent claims for all requests is new and involves an inventive step in the light of all the submitted evidence, irrespective of the question of proof.

Reasons for the Decision

1. The appeals are admissible.
2. Background

The invention relates to a method for moving a wind turbine component, such as a wind turbine hub, from a transportation position to a wind turbine assembly position, using a handling unit. It also relates to the handling unit *per-se* and the use of the handling unit. The very large and heavy parts - e.g. a steel hub - of a wind turbine often need to be transported in a vertical position and to be moved to a horizontal position for assembly. It is known to rotate such parts while hoisting them for assembly by making use of several cranes or using cranes having several wires. The invention seeks to provide a method with fewer demands to the crane use (see patent specification, paragraph [0008]). To this end, a handling unit is attached to the wind turbine component, the handling unit being in turn connected to a wire of the crane. The method further comprises the steps of lifting and rotating the wind turbine component with the handling unit, while being suspended from the wire. The wind turbine component can thus be lifted to the assembly position with just one crane wire, see specification paragraph [0010].

3. All requests - amendments
- 3.1 The opposition division held that the amendments by addition of the features "while being suspended" and a rotation about a "horizontal axis" were allowable, see section IV.1 and V.1.2 of the impugned decision. The

appellant-opponent contests these findings. The board is not convinced by the appellant-opponent's arguments, see below.

3.2 The appellant-opponent contends that a rotation of the handling unit together with the component while being suspended is not derivable from the original disclosure, as the rotation takes place partly before complete take off - and thus before being suspended - due to the wire pulling from a lateral side of the component. It is true that a first rotation is disclosed: this takes place while the turbine component is being lifted off the floor because the crane wire pulls from a lateral side of the component and tilts it while still being partly supported on the floor on the opposite side. But it is also directly and unambiguously disclosed that a second rotation, controlled by the actuating means of the handling unit, as now claimed, is performed while the load is being completely suspended. This is originally illustrated in the transition between the configurations according to figures 6c and 6d. It is also explicitly described on page 10, lines 2-4, of the original disclosure "[T]he control system may start the rotational movement after the component is lifted vertically and the necessary distance from a carrier surface 20 [carrier surface of the transport vehicle] is established". Thus the contested feature of a rotation while being suspended is directly and unambiguously derivable from the original documents.

3.3 With respect to the *horizontal* rotation, the arrow of original Figure 6c, also read in context with the description page 10, line 25 to page 11, line 9, clearly depicts a horizontal rotation. It is also apparent from a reading of the original application,

which generally refers to a starting point of the hub with vertical axis and an assembly point in horizontal position, e.g. page 1, lines 19-21 of the original description, that a horizontal rotation is a general feature common to all embodiments, and that also nothing else is intended or disclosed with a handling tool like the one exemplified. The skilled person would thus immediately recognise that the horizontal rotation applies to the general context and not only, as contended by the appellant-opponent, to the hub embodiment. The amendment is thus considered as allowable by the board.

The further argument of the appellant-opponent that due to, for example, misalignments in the assembly of the handling tool with the turbine component or hub, the originally disclosed rotation may also have a small vertical component and that thus the new claiming of a purely horizontal rotation brings new subject-matter is not convincing. Admitting for the sake of argument that a possible misalignment may introduce a small vertical rotational component, the skilled reader would immediately understand that the new feature of "horizontal rotation", in the context of a method for crane hoisting and associated precision or tolerances for that use, does not exclude a horizontal rotation with a small vertical component. Hence the board holds that also this feature does not introduce new technical information.

3.4 The board thus concludes that the contested amendment does not introduce new subject-matter not originally disclosed.

4. Main request - novelty

- 4.1 The opposition division held in section 2.1.2 of the written decision that claim 1 is not new over disclosure E4. Indeed, E4 discloses a method for moving a wind turbine blade 8 from a transportation position to an assembly position, as described in paragraphs [0058]-[0068], using the handling unit 10. The blade 8 with the handling unit 10 in the method of E4 are, in the transition between the steps depicted in Figures 2b to 2c, rotated while being suspended, see also paragraph [0068] of the description.
- 4.2 The board is not convinced by the argument of the appellant-proprietor, that the step of operatively connecting the handling unit to a wire of the crane is not disclosed in E4. This step, in the board's view, although not expressly described, is clearly and unambiguously contextually disclosed for the skilled person as a necessary step prior to hoisting the handling unit and the blade attached to it with the crane.
- 4.3 The board also reads the feature "...rotating the wind turbine component with the handling unit while being suspended..." of claim 1 as also claiming an embodiment in which the component together with the handling tool rotates, as is the case in E4, and is not limited only to meaning, as the appellant-proprietor contends, that the handling unit itself produces or causes the rotational movement (by way of actuating means). The board considers that the explicit wording of the claim is already clear enough in itself and comprises both options. This interpretation is further supported by the patent specification. In particular claim 3, as being dependent on claim 1, states that the actuating means of the handling unit are an optional feature of the main claim 1. It thus follows that alternative

options to the rotation being caused by the handling unit, such as the one described in E4 controlled by crane wires, are also encompassed by the method of claim 1, and that the disputed feature also means that the component and the handling unit rotate together.

4.4 The board thus concludes that the subject-matter of granted claim 1 is not new.

5. First auxiliary request - novelty

The only added feature of the first auxiliary request, i.e. that the component is rotated about a horizontal axis, is also disclosed by the method of E4, see transition between Figures 2b and 2c and paragraph [0073] of E4. The cited figures and paragraph describe that the blade is rotated from a horizontal - transport - position to a vertical - assembly - position, i.e. about a horizontal axis, during lifting. As the other claim features are also disclosed by E4 (see section 4. above) the board concludes that claim 1 of the first auxiliary request is anticipated by the method of E4.

6. Second auxiliary request - novelty

6.1 Both independent claims - method claim 1 and handling unit claim 9 - of the second auxiliary request include the feature that the rotation about a horizontal axis is controlled by means of actuating means of the handling unit. None of the submitted evidence discloses handling units for wind turbine components with actuating means for rotating about a horizontal axis.

6.2 The appellant-opponent submits that a second crane wire (of the same crane or of a second crane) that can produce, by pulling, the rotation of the handling tool

and turbine component is also to be considered an actuating means of the handling tool within the meaning of the patent and anticipates the claimed feature, because the skilled person may also consider those wires as part of the handling tool. However, contested claims 1 and 9 expressly require that the handling unit comprises connection points for connection to a wire of a crane, thereby explicitly defining the limits of the handling unit as excluding the crane wires. This understanding is also the only one supported by the description of the different embodiments of the invention that only describe actuators moving internal parts of the handling tool such as the lever arm 14 with respect to the fixed arm 13, both of the handling tool. The board thus concludes that, contrary to the arguments of the appellant-opponent, wires of the crane cannot be considered actuating means of the handling tool in the sense of the patent.

6.3 Consequently, the control wires producing the rotation described in E2, E3, E4 and E5 do not anticipate the claimed actuating means of the handling tool.

The "Drehwerkantrieb" described in E3, see paragraph [0029], is for rotation of the vertically rotating joint 12 and does also not anticipate the claimed actuating means for rotation about a horizontal axis.

The appellant-opponent also refers to Figures 17 and 18 on page 13 of E5 ("Erläuterung zur offenkundigen Vorbenutzung"). In those figures, the process of removing the handling tool from the turbine hub after the hub has been finally assembled to the turbine can be seen. In order to avoid dangerous and uncontrolled loose swinging of the main body of the tool hinged at one end of the handling tool arm during this operation,

two slings with tensioning members - such as ratchet buckles or similar - hold the lever arm to the main tool body, as can be seen in Figures 17 and 18. The appellant-opponent submits that it is immediately apparent for the skilled person that those tensioning elements could also rotate the wind turbine hub together with the handling tool while being suspended, thus, anticipating the claimed method step. The board is not convinced by the argument. As already submitted by the appellant-opponent, those slings and tensioning members are only assembled for the final dismantling of the tool. Therefore, it cannot be said that the method step of rotating the tool and the hub while both are suspended from the crane wire, in the contested claim 1, is disclosed by the prior use E5.

6.4 With respect to claim 9, it is also not unambiguously disclosed by the prior use that the sling and tension buckles of E5 for dismantling the handling tool are suitable for rotating the lever arm of the tool when suspended with the turbine hub from the crane wire. It is not apparent that the slings and buckles for holding the handling tool for dismantling are sufficiently dimensioned for producing, let alone producing without damage, the required rotational movement of a part with the weight and dimensions of the hanging hub. It is also not apparent how the manual ratchet buckle - or similar - could be controlled or commanded while the tool and hub are being suspended. The board thus concludes that the tool in E5, including the slings and tension members of Figures 17 and 18, is not suitable for moving a turbine component according to the method of any of claims 1 to 8, as required by the contested claim 9.

6.5 The argument that the tool described in E10 anticipates the handling tool of claim 9 is also not convincing. To satisfy the claim, the tool must be suitable for carrying out the method of claim 1 (see last feature of claim 9). The appellant-opponent submits that the tool of E10 is suitable for the method of claim 1 as it is at least suitable for moving a tower segment to its assembly position. The board, on the contrary, considers that the tool of E10 is too small for bringing a wind turbine tower segment to its assembly position, and is thus not suitable for the claimed use. Such known tool achieves the vertical orientation of a cylindrical segment (assembly position for a turbine tower segment) by aligning the single hoisting point 20 vertically with the centre of gravity of the cylindrical hoisted part, see Figure 1 of E10. The known tool of E10 for handling strip metal coils in storage areas is of a much more compact size than a wind turbine tower segment and would fail to reach the above-explained, necessary alignment for the vertical orientation of such a hanging tower cylindrical segment of larger dimensions.

The appellant-opponent alternatively submits that there are other turbine components of more compact size for which the tool of E10 would be able to achieve the assembly position, without citing any concrete example or instance of such a turbine component. However, it is not immediately apparent to the skilled person that the tool of E10 has the proper dimensions to handle components of wind turbines or that the wind components can be gripped with the gripping shoes 98, 115 of E10. Thus on the evidence before the board, it can only conclude that the handling tool of E10 does not clearly and unambiguously anticipate the feature required by

claim 9 that it be suitable for moving a wind turbine component as in the method of claim 1.

6.6 From the above, the board concludes that having regard to the submitted prior art and without prejudice to the issue of proof of E5, the subject-matter of claims 1 and 9 is new within the meaning of Article 54(2) EPC.

7. Second auxiliary request - inventive step

The appellant-opponent contests the findings of the opposition division that independent claims 1 and 9 involve an inventive step, see section V.4. of the impugned decision. As explained in the following the board is not convinced by the arguments of the appellant-opponent.

7.1 In one line of argument, the appellant-opponent submits that the subject-matter of claims 1 and 9 is rendered obvious by a combination of either E4 or E5 as starting point together with any of documents E6-E10 or common general knowledge. In detail, the appellant-opponent argues that E4 discloses a method for the assembly of a turbine rotor blade, and E5 for the assembly of the three rotor blades and the hub as a unit onto the nacelle of the wind turbine. The rotation of the turbine blade or the hub unit with three blades is controlled by means of a second crane wire either of the same hoisting crane or of another secondary crane. Both documents also disclose the corresponding handling tool for the method. Neither document discloses a handling unit comprising actuating means - or the corresponding method step that the rotation is controlled by means of actuating means of the handling unit.

With actuating means of the handling tool controlling the rotation, the wind turbine component can be lifted and rotated to the assembly position with just one crane wire, see specification paragraph [0010]. Hence the associated technical problem can be formulated as how to provide a method with fewer demands to the crane use and the corresponding handling tool for carrying out the method, see patent specification, paragraph [0008].

- 7.1.1 However, in the context of this formulated technical problem, the board finds itself in accord with the argument put forward by the appellant-proprietor, that the skilled person would not as a matter of obviousness eliminate the secondary wires from any of the known methods of E4 and E5. Indeed, both known methods are directed to the assembly of turbine blades, which are large components and also highly responsive to wind loads. They are thus bound to generate, in the hanging position, high leverage forces due to the rotor blades' dimensions, especially in windy areas where wind turbines are usually erected. Thus, in the board's view, as also submitted by the appellant-proprietor, the skilled person when tasked with reducing crane demands for the known methods would not consider abandoning the second or control wires of those methods as a matter of obviousness, due to the difficulty of controlling the blades if they were hanging from a single hoisting point. He would rather consider instead other solutions without sacrificing the secondary wires. As rotation in the known methods of E4 or E5 is controlled by those secondary wires, the skilled person is consequently not motivated to seek a further or alternative means to control that rotation, whether such means are taught or not by other available prior art, i.e. by documents E6-E10 or common general

knowledge. The board thus concludes that it would not be obvious for the skilled person, starting from either E4 or E5, to modify the methods and handling tools disclosed therein to include actuating means in the handling tool for controlling the rotation. The skilled person would thus not arrive at the subject-matter of claims 1 or 9 in an obvious manner.

- 7.1.2 The appellant-opponent submits in rebuttal that the skilled person would consider controlling possible sudden blows due to wind gusts of the hanging rotor blades with secondary wires from the ground by human operators while controlling the horizontal rotation with an actuator of the handling unit. It is however not apparent for the board that, in view of the dimensions and potentially arising leverage forces, the skilled person would implement such a solution in the methods of E4 and E5 as a matter of obviousness as a substitute for the known wire control mechanically controlled by cranes.
- 7.2 The appellant-opponent also cites E3 as a possible starting point. E3 discloses rotating a turbine component about a vertical axis. The board considers, that the skilled person when tasked with improving the method described in E3 in an obvious development of that method would only arrive at a method still rotating the component about a vertical axis. It is not obvious that they would choose a rotating axis (horizontal instead of vertical) that is not demanded for the assembly of the particular wind turbine tower and components of E3.
- 7.3 The board is also not convinced by the appellant-opponent's further line of argument that the subject-matter of the independent claims would not involve an

inventive step starting from common general knowledge in combination with the teaching of E10. It is undisputed that methods for moving wind turbine components, such as a hub, a gearbox or a ring generator using a crane, belong to the common general knowledge of the skilled person. The board however considers that it would not be obvious for the skilled person to turn to the teachings of E10 to improve any of the known methods. E10 teaches a tool for moving elements such as strip metal coils that are of more compact dimensions than the components of a wind turbine. The metal coil handling of E10 is furthermore carried out in the context of storage areas and associated shipping. It is thus used to handle unfinished products, that generally require lower handling care. In contrast, wind turbine components are finished products, requiring a different handling standard. The claimed method and handling tool also call for achieving a final position for assembly, which requires a positioning precision of different nature than the known storing of unfinished products in a storage area. In conclusion, the two contexts of the claimed method and handling tool for assembling wind turbine components, and handling of strip metal coils in storage areas, are therefore of very different nature. For all of the above reasons, the board concludes that the skilled person would not consider, as a matter of obviousness, the teaching of E10 in order to modify a known method in the area of erecting wind turbines. Therefore the board holds that the claimed method and handling tool involve an inventive step also in the light of E10, when starting from common general knowledge.

7.4 In conclusion, without prejudice to the question of proof of E5, none of the lines of argument of the

appellant-opponent succeeds. The board therefore confirms the finding of the opposition division regarding inventive step of the subject-matter of claims 1 and 9 (see section V.4. of the impugned decision) which holds also for claims 1 and 9 of the present second auxiliary request.

8. For the above reasons the board finds that the claims as amended according to the second auxiliary request meet the requirements of the EPC. The board is satisfied that the consequential amendments to the description according to pages 1-8 as filed during oral proceedings on 12 February 2014 before the opposition division are in line with the amended claims and are also unobjectionable. These were also not objected to by the appellant-opponent. The board concludes that the patent can be maintained as amended pursuant to Article 101(3)(a) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form as follows:
 - Claims:
claims 1-13 according to auxiliary request 2, filed with the statement of grounds on 24 September 2014,
 - Description:
pages 1-8 as filed during oral proceedings on 12 February 2014 before the opposition division,
 - Drawings:
Figures 1-6d of the published patent specification.

The Registrar:

The Chairman:



G. Magouliotis

W. Van der Eijk

Decision electronically authenticated