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**Datasheet for the decision
of 21 September 2021**

Case Number: T 0095/16 - 3.2.06

Application Number: 08848052.0

Publication Number: 2217748

IPC: D03D15/02, B29C70/08, B29C70/34

Language of the proceedings: EN

Title of invention:

METHOD FOR MANUFACTURING A WIND TURBINE BLADE AND USE OF A
STRUCTURAL MAT FOR REINFORCING A WIND TURBINE BLADE STRUCTURE

Patent Proprietor:

Vestas Wind Systems A/S

Opponent:

ENERCON GmbH

Headword:

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - main request (yes)

Decisions cited:

Catchword:



Beschwerdekammern
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Case Number: T 0095/16 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 21 September 2021

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 6 November 2015
rejecting the opposition filed against European
patent No. 2217748 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman M. Harrison
Members: M. Hannam
E. Kossonakou

Summary of Facts and Submissions

- I. An appeal was filed by the appellant (opponent) against the decision of the opposition division rejecting the opposition to European patent No. 2 217 748. It requested that the decision under appeal be set aside and the patent be revoked.
- II. In its letter of response, the respondent (patent proprietor) requested that the appeal be rejected as inadmissible or that the appeal be dismissed.
- III. The following documents, referred to by the appellant in its grounds of appeal, are relevant to the present decision:
- | | |
|----|-------------------|
| D1 | US-A-2004/0253114 |
| D2 | US-A-2007/0193491 |
| D3 | WO-A-2005/011964 |
| D4 | US-A-5 716 686 |
- IV. The Board issued a summons to oral proceedings including a communication containing its provisional opinion, in which it indicated *inter alia* that the appeal appeared to be admissible and that the inventive step attacks starting from D3 and D4 against the subject-matter of claims 1 and 19 of the main request failed to indicate why the decision of the opposition division in this respect was incorrect. It further indicated that the inventive step attack starting from D1 in combination with the teaching of D2 appeared not to be persuasive.
- V. Oral proceedings were held before the Board on 21 September 2021, during which the respondent withdrew

its objection that the appeal was inadmissible. At the close of the oral proceedings, the parties' requests were thus as follows:

The appellant requested that the decision under appeal be set aside and the European patent No. 2 217 748 be revoked.

The respondent requested that the appeal be dismissed.

VI. Claim 1 of the main request reads as follows (with paragraph annotation as used by the opposition division in its decision):

"M1 A method for reinforcing a wind turbine blade structure, wherein said method comprises the steps of
M2 forming at least a part of said blade structure by one or more layers of blade material (23),
M3 reinforcing said blade structure by adding one or more structural mats (6) to said blade structure
M4 wherein said structural mats (6) comprises two or more groups (7) of bonded fibres (21),
M5 optionally adding further blade material (23) to said blade structure,
M6 infusing a resin into at least a part of said blade material (23) and said structural mats (6) and
M7 curing said infused resin to rigidly connect said structural mats (6) to said blade material (23), characterized in that
M8 said fibres (21) being bonded by a matrix (8) substantially preventing relative movement of said fibres (21) and
M9 wherein said groups (7) are connected to each other by connection means (9) limiting the relative movement of said groups (7) and
M10 wherein said structural mat (6) is substantially

dry."

Claim 19 of the main request reads as follows:

"Use of one or more structural mats (6) to reinforce a wind turbine blade structure wherein said structural mats (6) comprise two or more groups (7) of bonded fibres (21), characterized in said fibres (21) being bonded by a matrix (8) substantially preventing relative movement of said fibres (21) and wherein said groups (7) are connected to each other by connection means (9) limiting the relative movement of said groups (7) and wherein said structural mat (6) is substantially dry."

VII. The appellant's arguments relevant to the present decision may be summarised as follows:

The subject-matter of claims 1 and 19 of the main request lacked an inventive step. Starting from D1, paragraphs [0001], [0002], [0006], [0008], [0010], [0028], [0046], [0079], [0080] in combination with claims 24, 25 and 48 together disclosed all features of claim 1 save for M9. Fig. 3 also visualised this, with the metal mesh (11) connecting the pultrusion strips (2) together which resulted in a structural mat being formed. The pre-fabricated strips of claim 24 and 48 of D1 were the same strips since claim 48 referred directly to claim 24. Even if, as held by the respondent, only features M1 and M2 were known from D1 due to no structural mat being recognised therein, the essential differentiating feature was solely feature M9 since connecting groups of bonded fibres together would automatically result in a structural mat as defined in the patent.

The objective technical problem to be solved was thus how to improve the handling of the material pieces in a method for reinforcing wind turbine blades.

The claimed solution was known from D2 (see e.g. paragraph [0052]), which disclosed unbonded batches of fibres (2) that could be secured to a carrier layer (3) with threads (6, 11). Being joined together, the batches of fibres were easier to handle during assembly of the blade. Paragraph [0040] of D2 also referred to the batches of fibres having to be separated in order for resin to impregnate the batches which was a further indication of how the threads being secured by threads would ease handling.

D3 also disclosed features M1 to M8 and M10 of claim 1 such that its subject-matter also failed to involve an inventive step when combined with the technical teaching of D2. D4 disclosed features M1 to M7 of claim 1, the differentiating features M8 to M10 also being known from D2.

For the same reasons, the subject-matter of claim 19 lacked an inventive step.

VIII. The respondent's arguments relevant to the present decision may be summarised as follows:

The subject-matter of claims 1 and 19 involved an inventive step.

D1 failed to disclose the claimed structural mat. Paragraph [0046] indicated that the metal mesh (11) was simply applied to the pultrusion strips (2) such that no connection of the strips was disclosed prior to the resin being injected. D1 thus simply disclosed an arrangement of separate elements in a mould rather than

the claimed 'adding one or more structural mats to the blade structure'.

Claims 24 and 48 were unrelated despite the cross-reference since claim 48 did not describe the steps of a pultrusion process and thus could not concern the pre-fabrication of the pultruded strips of claim 24. The objective technical problem to be solved was how to improve handling of the strengthening components of the wind turbine blade.

D2 did not provide a hint to the claimed solution since the stitching disclosed therein did not improve handling, rather its purpose was to avoid undulations of the batches of fibres caused by zig-zag stitching. The pultruded fibres of D1 suffered no undulations, since they were in moulded strips, such that the teaching of D2 was not relevant to the problem to be solved. Even though claim 1 was not limited to a particular size or weight of structural mat, when starting from D1 the disclosed component dimensions were relevant since D2 related to significantly different component sizes and weights which could then not be successfully used for the D1 components. Even if the skilled person were to combine the teaching of D2 with D1, the thread stitching of D2 was lightweight and would not be suited to the strength requirements of connecting the wood strips and pultrusion strips of D1. Ensuring that the resin impregnated into spaces between the components of D1 was important, but the stitching of D2 did not facilitate this and was also not disclosed as relevant for ease of handling the resultant fibre mat.

Since no separate arguments had been made against claim 19, the same arguments applied as for claim 1.

Reasons for the Decision

Main request

1. Article 56 EPC

1.1 D1 in combination with the teaching of D2

1.1.1 D1 solely discloses the following features of claim 1:

M1 A method for reinforcing a wind turbine blade structure (see paragraphs [0005] and [0046] of D1), wherein said method comprises the steps of

M2 forming at least a part of said blade structure by one or more layers of blade material (see paragraph [0046] and Fig. 3).

1.1.2 D1 fails to unambiguously disclose a structural mat as defined in features M3, M4, M6, M7, M8, M9 and M10 of claim 1. Not least this is because feature M3 requires the adding of one or more structural mats to the blade structure which, at least linguistically, implies that the structural mat must be a discrete entity which can be physically added to the blade structure. In D1, conversely, individual strips of material (wood and pultrusion strips) are positioned in a mould (see paragraph [0046]) prior to being infused with resin such that any structural mat (if indeed present at all) is only present together with the final blade, rather than being a structural mat, i.e. an entity, which is

'added' to the blade structure. In this regard it should be noted that claim 1 is directed to a 'method for reinforcing a wind turbine blade structure' comprising multiple method steps and, even if the method described in D1 were finally to result in a structural mat integrated with a blade (i.e. a product having identical features to that resulting from the claimed method), the use of a structural mat (i.e. something already existing) to reinforce, and the method step of adding a structural mat to, the blade structure is not disclosed in D1.

- 1.1.3 Paragraph [0017] of the patent, albeit somewhat circularly, defines a 'mat' as being 'any kind of mat-like structure' which, in the common understanding, is for this to be an essentially two-dimensional structurally discrete entity. The appellant's reference to Fig. 3 of D1 and its argument that the metal mesh (11) bonded the wood and pultrusion strips together to thereby form a structural mat can therefore not be accepted for two reasons. Firstly, the metal mesh of D1 is solely disclosed as being 'applied' to the wood and pultrusion strips (see paragraph [0046]), which fails to suggest any form of tangible connection between the metal mesh, wood and pultrusion strips and thus fails to allow this amalgamation of components to be regarded as a structurally discrete entity. Secondly, as already found in point 1.1.2 above, even if this combination of metal mesh, wood and pultrusion strips could in some way be equated with a structural mat at some later stage, it is not added to the blade structure as required in feature M3 of claim 1, rather the components are individually placed into the blade and could only be regarded as becoming a structural mat once the resin has been injected and bonds the

components together.

1.1.4 The Board does not accept the appellant's argument that a combination of claims 24, 25 and 48 of D1 resulted in the adding of a pre-fabricated structural mat to the blade to be recognised. Claim 24 is directed to a wind turbine blade constituted by a number of pre-fabricated pultruded strips. Claim 48 is ostensibly a 'method for manufacturing a pre-fabricated strip for a blade according to claim 24', yet this method simply defines assembly and resin infusion of material strips and fails to describe method steps resulting in the pre-fabrication of pultruded strips. As a consequence, the reference in claim 48 back to claim 24 cannot be clearly interpreted to mean that the pultruded strips of claim 24 would correspond to a plurality of strips of claim 48, which results in the combination of claims 24, 25 and 48 failing to unambiguously disclose a method of adding pre-fabricated pultruded strips (in the appellant's opinion, this being a structural mat) to a blade structure.

1.1.5 In its written submissions, the appellant had also contended that all features of claim 1 save for M9 were known from D1 by a combination of paragraphs [0001], [0002], [0006], [0008], [0010], [0028], [0046], [0079], [0080] together with claims 24, 25 and 48. The cited paragraphs, however, come from disparate portions of D1 including the background of the invention, the general description of the invention as well as a specific embodiment, such that these portions are not linked one to another to form a single disclosure, and thus fail to provide a direct and unambiguous disclosure of features M1 to M8 and M10 of claim 1.

1.1.6 Based on solely features M1 and M2 of claim 1 being known from D1 and the remaining features all being related to the structural mat, its composition and its incorporation into the blade structure, the objective technical problem to be solved may be seen as how to improve the handling of the materials (of D1) in a method for reinforcing wind turbine blades. At oral proceedings this objective problem was also accepted by both parties.

1.1.7 The appellant's contention that D2 taught the skilled person how to modify D1 in the light of the technical problem in order to reach the subject-matter of claim 1 is not accepted. First, the skilled person would have had no reason to resort to D2 for finding the solution to the posed problem, since D2 does not mention such a problem (see points (a) and (b) below). And, even if they were to take it into account, they would not be guided to the claimed subject-matter without becoming inventively active (see point 1.1.8 below).

(a) D2 would not be considered by the skilled person for finding a solution to a problem of handling because, contrary to the argument of the appellant, D2 fails to disclose ease of handling materials as a benefit achieved by its disclosure. D2 is directed to avoiding undulations in batches of fibres caused by zig-zag stitching together of fibre batches with thread, such undulations reducing strength of the final product (see paragraphs [0003] and [0004] of D2. Even though such stitching can be seen as a potential type of the claimed connection means of feature M9 of claim 1, it is purely by way of hindsight of the invention that the skilled person would consider D2 for the purpose of providing a solution to the

posed problem. This is therefore not a document which the skilled person would consider without prior knowledge of the invention such that taking any technical teaching from D2 in order to modify D1 would not be an obvious step.

- (b) The appellant's reference to paragraph [0040] of D2 to suggest that the stitching promotes the separation of the fibre batches allowing resin to be impregnated into the structure, which can be seen as an improved handling and equivalent to the separation of the pultruded strips in D1, is also not accepted. The separation of the fibre batches to allow resin to easily impregnate all the batches has no benefit with respect to handling of the materials since the separation fails to change the interconnectedness of the fibre batches, these being equally connected, and thus easily handleable, even when no separation is provided between the fibre batches.

1.1.8 Even if the skilled person were to consider D2 for a teaching as to how to improve the handling of the materials, they would still not be guided to the claimed subject-matter without becoming inventively active.

- (a) D2 fails to disclose features M4 and M8, i.e. that the structural mats comprise two or more groups of fibres bonded by a matrix. Such a matrix, according to claim 1, is clearly distinct from, and bonds the groups of fibres (in the structural mats) prior to the subsequent resin infusion of the structural mats (see feature M6). The fibre batches of D2, however, are not bonded by a matrix of any kind prior to being infused with resin, features M4 and

M8 thus not being disclosed in D2. As a consequence, even after combining the teaching of D2 with D1, at least features M4 and M8 would remain unrealised in the resultant method for reinforcing a wind turbine blade structure.

- (b) The stitching disclosed in D2 is for connecting batches of fibres (2) by way of threads (6, 11; see paragraph [0052] of D2). It is not clear how such lightweight stitching, suited for connecting the fibre batches of D2, would be used as connection means for the wood and pultrusion strips forming the structural layer in D1. This layer in D1, depicted in Fig. 1 and described in paragraph [0042], has 40x40mm section strips of wood (1) and 6x40mm section strips of carbon fibre pultrusion (2) for which it is not evident how the stitching of D2 could successfully provide the requisite connection allowing a structural mat to be formed. It is evident that only with hindsight of the invention would the skilled person contemplate the teaching of D2 to give a hint to stitching together the pultruded strips of D1 and would even then have to resort to further changes to make this possible.

1.1.9 In summary, therefore, starting from D1 and wishing to solve the objective technical problem, even if the skilled person were to consider D2, they would not be led to the claimed subject-matter without exercising an inventive step.

1.2 *D3 or D4 in combination with the teaching of D2*

Rule 99(2) EPC states that the appellant shall, in the statement of grounds of appeal, 'indicate the reasons for setting aside the decision impugned'. As indicated

in the Board's preliminary opinion (see item 2), the objection in the grounds of appeal to the presence of an inventive step in the subject-matter of claim 1 starting from D3 or D4 fails to indicate why the opposition division's decision was incorrect, such that the Board saw no reason to overturn the opposition division's decision in this regard. To this preliminary opinion the appellant submitted no counter-argument and confirmed at oral proceedings that it relied solely on its written submissions. With no arguments presented requiring it to reconsider its preliminary finding, the Board herewith confirms that the inventive step objections starting from D3 or D4 and combining either of these with the technical teaching of D2 do not provide the Board with any reason to overturn the opposition division's decision as stated in items 13 and 14 thereof.

- 1.3 The subject-matter of claim 1 thus meets the requirement of Article 56 EPC.
- 1.4 The appellant relied upon the same objections and arguments used against claim 1 to object to the presence of an inventive step in the subject-matter of claim 19 (see e.g. page 9 of the grounds of appeal, item 3.4 last paragraph); during the oral proceedings it was also confirmed that the same arguments applied to claim 19 as had been made for claim 1. Thus, for the same reasons as given for claim 1, the Board therefore finds that the subject-matter of claim 19 also involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Grundner

M. Harrison

Decision electronically authenticated