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Datasheet for the decision of 30 June 2023

Case Number: T 1688/21 - 3.2.04

Application Number: 09008602.6

Publication Number: 2138716

IPC: F03D1/06, B29C70/44

Language of the proceedings: EN

Title of invention:
Blade insert

Patent Proprietor:
SIEMENS GAMESA RENEWABLE ENERGY INNOVATION & TECHNOLOGY, S.L.

Opponent:
Vestas Wind Systems A/S

Headword:

Relevant legal provisions:
EPC Art. 100(c), 84, 83, 54, 56
RPBA 2020 Art. 12(4)

Keyword:
Grounds for opposition - subject-matter extends beyond content of earlier application (yes)
Claims - clarity - auxiliary request (yes)
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - auxiliary request (yes)
Amendment to case - amendment admitted (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1688/21 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 30 June 2023

Appellant: (Patent Proprietor)	SIEMENS GAMESA RENEWABLE ENERGY INNOVATION & TECHNOLOGY, S.L. Avenida de la Innovación 9-11 31621 Sarriguren (Navarra) (ES)
Representative:	SGRE-Association Siemens Gamesa Renewable Energy GmbH & Co KG Schlierseestraße 28 81539 München (DE)
Appellant: (Opponent)	Vestas Wind Systems A/S Hedeager 42 8200 Aarhus N (DK)
Representative:	Worthington, Richard Easton Withers & Rogers LLP 2 London Bridge London SE1 9RA (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 28 July 2021 concerning maintenance of the European Patent No. 2138716 in amended form.**

Composition of the Board:

Chairman	A. de Vries
Members:	S. Oechsner de Coninck
	K. Kerber-Zubrzycka

Summary of Facts and Submissions

I. The opponent and the patentee both appeal against the decision of the Opposition Division concerning maintenance of the European Patent No. 2138716 in amended form.

II. In its written decision the Opposition Division held that claim 1 as granted lacked inventive step but that the patent as amended according to auxiliary request 33 complied with the requirements of the EPC, having regard in particular to the following documents that also played a role in the present proceedings:

D1 WO 2006/002621 A1
D6 EP 1 878 915 A2
D7 US 2009/0114337
D8 US 2005/0106029 A1
D9 A. Dutton et al.: "Design concepts for sectional wind turbine blades", 1999 European Wind Energy Conference, 1-5 March 1999. Nice, France. pp285-288.
D11 WO 2007/010064 A2

III. The appellant patent proprietor requests that the decision under appeal be set aside and the patent be maintained on the basis of a main request or auxiliary requests 1-31 filed with the grounds of appeal of 8 November 2021, alternatively, based on the version as upheld by the opposition division, now numbered auxiliary request 32, or alternatively on the basis of one of the auxiliary requests 32A-32H, 33A-33H, 35A-35D, 36A-36D or 38E-38H filed with letter of 20 April 2022 in reply to the opponent's grounds of appeal.

Additionally, the appellant patent proprietor requests that the case be remitted to the opposition division for further prosecution on the basis of auxiliary requests 38E-38H.

IV. The appellant opponent requests that the decision under appeal be set aside and that the patent be revoked.

V. In a communication dated 14 February 2023 in preparation for oral proceedings the Board gave a provisional opinion on the relevant issues.

VI. Oral proceedings were held on 30 June 2023 by means of videoconference.

VII. The wording of the independent claim 1 of the relevant requests reads as follows:

Main request

"A wind turbine blade comprising a blade insert coupled in the solid lamination located in the top or bottom center part of the aerodynamic part of a blade of a wind turbine, characterized by comprising a head (2), to screw the blade insert to another structure (1', 2', 3'), and a body (3) that determines a cylindrical or conical shape with an internal conical cavity for joining the outer and inner surface of the blade insert's body (3) to the lamination (1) of the blade by means of an adhesive chemical double sheathed joint (4)."

Auxiliary request 32

Vis-a-vis claim 1 of the main request claim 1 of this request replaces the term "comprising" by the term "made of" after the expression "characterized by".

VIII. The appellant-proprietor argued as follows:
- All requests should be admitted,
- Claim 1 of the main request does not contain added subject-matter,- Claim 1 according to auxiliary request 32 is clear and sufficiently disclosed,
- The subject-matter of claim 1 of auxiliary request 32 is novel over D8 or D11, and involves an inventive step starting from D9 with D11 or from D11 with the skilled person knowledge.

IX. The appellant-opponent argued as follows:
- The main request and auxiliary requests 1 to 15 should not be admitted,
- Claim 1 of the main request contains added subject-matter,
- Claim 1 according to auxiliary request 32 does not comply with the requirements of Articles 83 and 84 EPC,
- The subject-matter of claim 1 of auxiliary request 32 lacks novelty with respect to D8 or D11, and does not involve an inventive step starting from D9 applying the insert structure of D11, or by using the insert of D11 in a central part of a wind turbine blade.

Reasons for the Decision

1. The appeals are admissible

2. Background

The patent concerns an improved connection to join two parts of a wind turbine blade made of composite. An insert having a -threaded- head to be bolted to an adjacent part is further provided with an "anchor" in the form of a cylindrical body having an inner conical surface to be adhesively connected within the lamination of the wind turbine blade.

3. Main request

3.1 Admission of the amended main request into the proceedings.

In its communication in preparation for the oral proceedings, section 3.1, the Board gave the following provisional opinion regarding admission of the main request:
"The main request is identical with the main request filed on 30 April 2020 in opposition, but for the deletion of claim 13 that was held to offend Article 123(2) EPC. Because this request overcomes by simple deletion of a claim an objection without changing the subject-matter of the independent claims 1 and 6, the Board, in the exercise of its discretionary power pursuant Art. 12(4) RPBA, is inclined to admit this new request."
Concerning this question the parties referred to their written submissions.

Absent any further argumentation in this respect, especially from the appellant-opponent, the Board sees no reason to change its provisional view, and confirms its decision to admit the main request into the proceedings.

3.2 Added subject-matter

In its communication in preparation for the oral proceedings, section 3.2, the Board stated:

"The objection of added subject-matter concerns the replacement in the as filed claim 1 of the insert being made of a head and a body by the broader expression comprising the same head and body. The appellant proprietor considers the originally used term "made of" not to limit the scope of the insert to these two parts and thus the term "comprising" to have the same non limiting scope as the originally filed.
The Board considers that the skilled person interprets the term "made of" in its usual sense as consisting of or composed of and thus listing the constituent or component parts of a thing, , cf. OED, Meaning 5.a., here the blade insert. This reading which is perfectly clear of itself and does not need to be interpreted in the light of the description, is supported thereby, as in all embodiments detailed there the insert is shown to have only these two parts, head 2 and body 3. This is so in the embodiments of figures 1 and 2 and also applies to all other embodiments of figures 3,7-9 which depict an insert made exclusively of these two parts: head and body. This applies also to paragraph [0010] which may use the more open formulation "comprises" but then states "two different parts" (namely the head and body). Where "comprising" is seen by the appellant proprietor to encompass an insert having other parts

such as a neck (first paragraph on page 4 of the proprietor's grounds) this seems to represent an undisclosed embodiment."

The appellant proprietor refrained from further comment at the oral proceedings. Absent any further comment the Board sees no reason to change its provisional view regarding granted claim 1. It therefore confirms the opposition division's findings on Article 123(2) EPC, that the subject-matter of granted claim 1 has been extended beyond the content of the application as filed.

4. Auxiliary request 1-31 admissibility

In its communication in preparation for the oral proceedings, section 5.1, the Board indicated its preliminary opinion as follows:

"Auxiliary requests 1-31 correspond to the auxiliary requests 1-31 before the opposition division but with claim 13 held to violate the requirements of article 123(2) EPC in the decision under appeal deleted. Admission of these requests is contested. Though these requests were subject of the decision under appeal and the appellant proprietor has argued why the decision was wrong to find them not allowable for added subject-matter, the appellant proprietor fails to explain how these requests address the other objections admissibly raised and maintained by the appellant opponent against the main request. Thus for these requests no complete case appears to have been stated as required by Art 12(3) RPBA. Further, the Board sees the conditions for admission under Art. 12(4), 4th sentence, RPBA not fulfilled."

The appellant proprietor did not further comment at the oral proceedings, and the Board thus decided not to admit any of the auxiliary requests 1-31 into the proceedings.

5. Auxiliary request 32 : added subject-matter

This request corresponds to the auxiliary request 33 upheld in the decision under appeal. Vis-a-vis claim 1 of the main request claim 1 of this request replaces the term "comprising" by the term "made of" after the expression "characterized by". Reverting to the original term used in the application as filed, claim 1 thus overcomes the objection of added subject-matter discussed above in section 3.2.

6. Auxiliary request 32: Clarity

6.1 The appellant opponent considers that the use of the term "made of" without further specifying that the insert is made of two parts is ambiguous because it is unclear whether it is formed of only the head and body or whether another part of the insert would also be present.

6.2 For reasons of consistency, the Board uses the same interpretation of the term "made of" as for assessing added subject-matter. As indicated in item 3.2 above, in its usual sense, "made of" is understood as meaning "consisting of" or "composed of" and thus listing the constituent or component parts of a thing, cf. OED, Meaning 5.a., here the blade insert. This reading is perfectly clear in itself and does not need to be interpreted in the light of the description. In addition this interpretation is also supported by the description because in all embodiments detailed there

the insert is shown to have only these two parts, head 2 and body 3. Thus no inconsistency can derive from its presence in claim 1.

6.3 The other objection of lack of clarity was made in respect of claim 5. Because the claim 5 is now directed to a "method for placing *the* blade insert", whereas the first step refers to "an insert" it would no longer be clear which inserts are meant throughout the claim and whether they refer to the same insert.

Because this alleged lack of clarity arises from an amendment to the granted claims (the indefinite article in the opening line was replaced by the definite article) it is open to examination in accordance with G3/14. However, the objection fails to convince. Though one can say the claim language is not ideally or perfectly clear - in a semantic or a grammatical sense - the Board considers it to be sufficiently clear to the skilled person intent on making sense of the claim and using normal reading skills. Thus, even if in the claim wording the articles are not used in a grammatically consistent manner, the skilled person will be able to understand with little effort that where the claim talks of inserts they are the same inserts, namely those defined in claims 2 to 4 to which the claim now refers.

7. Auxiliary Request 32: Sufficiency

7.1 Sufficiency is contested in relation to the unusual term "double sheathed joint" which only appears in claim 1 of the patent to define the joint between insert and blade lamination. The appellant opponent considers this term to be clear in its own right as each of its composite terms is clear. In that

understanding the term would require this joint to be an arrangement of two sheaths. However, because the description is not concerned with this type of joint, with which the skilled person is moreover unfamiliar, they would not however be able to reproduce such a joint.

7.2 According to established jurisprudence, sufficiency is assessed on the basis of the whole patent, claims, description and figures (see also CLBA, 10th edition 2020, II.C.3.1).

In this case, it seems to be common ground that the term *double sheathed joint* does not correspond to standard terminology in the relevant field of joining. Thus, the skilled person who has knowledge of relevant joint technology and is familiar with the relevant terminology will not recognize the term as describing a joint they know. The Board does not believe they will then try to break the term down into its constituent parts and try to make sense of it without referring to description and drawings. Rather, they might suppose that the term refers to a new type of joint; or they may already note that it is phonetically close to a term - *double shear joint* - that they are very familiar with. Whatever the case may be, exactly because they do not know what the term means exactly, they will look to the description for a better understanding. From the description and drawings it will become immediately clear to them that the joint concerned must be a *double shear joint*. That term appears repeatedly, in paragraphs 005, 010 and 017 of the patent. Especially in paragraph 017, which describes the joint in detail, it is unambiguously clear that the joint is in fact a double shear joint in which "part of the load is transmitted from the insert directly to the lamination

and another part of the load is transmitted from the insert to the inner part to subsequently pass onto the lamination via the inner part's surface". Consequently, from the entirety of the disclosure it will be clear to the skilled person what is meant by the claim, in particular the claimed joint, and they will have no difficulty whatsoever in carrying it out. The claimed invention is thus sufficiently disclosed, Article 83 EPC, as also held by the opposition division.

8. Auxiliary Request 32: Novelty

8.1 The question of novelty turns on the interpretation of the position of the insert within a wind turbine blade. According to claim 1 the insert should be provided in the solid lamination located in the top or bottom center part of the *aerodynamic* part of a blade. For the person skilled in the field of wind turbines, the aerodynamic part of the blade is that part that exhibits a shape able to produce an aerodynamic lift effect, i.e. having distinct different pressure and suction sides. This is the manner in which it is conventionally used in the field to describe the part of a blade that is specifically designed to provide lift. The Board is thus unconvinced that, as argued by the appellant opponent, the skilled person would understand *aerodynamic* in a much broader sense as referring to any part of the blade that affects airflow in some way. Such a broad reading would render the term technically meaningless in describing different parts of the blade.

The Board thus understands the claim as referring to a wind turbine blade which has an insert placed in an aerodynamic part of the blade, that is that part designed to provide lift. This does not include the

root portion, which is normally cylindrical and has no aerodynamic properties, and which the skilled person would not normally describe as an aerodynamic part of the blade. It could however include transitional regions between blade portion and the fully aerodynamic blade portions.

8.2 Both D8 and D11 cited against novelty concern inserts used for joining a cylindrical root portion to either the blade (D11) or the hub (D8), and thus do not disclose a wind turbine blade with a blade insert coupled in the solid lamination in the top or bottom center part of the aerodynamic part of the blade. Thus, D11 (corresponding to post published D7 used to interpret D11) discloses manufacturing a tubular root 8 of a wind turbine blade (D7, paragraph 032) made of composite laminates by winding. The open annular end of this blade root 8 that is to be connected to the blade itself, final line of paragraph 0044, is shown in figure 5, with apertures corresponding to axial housing 32 receiving inserts 33.

D8 similarly only concerns connection of the cylindrical root portion of a blade to the hub as is immediately evident from figure 8, see also paragraph 029.

8.3 The Board concludes that the division was right to find novelty vis-a-vis D8 and D11, Articles 52 and 54 EPC.

9. Auxiliary Request 32: Inventive step

9.1 D9, figure 3, as starting point

9.1.1 D9 is a conference paper relating to design concepts for wind turbine blades constructed from several (lengthwise) sections (page 1, "abstract") and explores different types of joints to connect those sections. Chapter 2.1 bridging pages 1 and 2 reviews two candidate concepts that are already used in rotor blades to connect the rotor to the hub, namely the T-Bolt connection (figure 1) and two connection types using embedded bushings, one with a two flange connection (figures 2) and another combining embedded bushings with stud bolts (figure 3). The latter type is considered in more detail in a further practical application in section 4.1, where the bushing with stud bolt was embedded in a test coupon and subjected to testing. In particular the embedded bushing with stud bolts as applied to (non root portion) blade sections and as illustrated in figure 3 represents a suitable starting point for assessing inventive step.

9.1.2 There is no dispute that the wind turbine of claim 1 differs from this embodiment of D9 by the provision of an internal conical cavity forming an inner surface joined with adhesive to the blade lamination (i.e. second "sheathed joint"). This provides the technical effect of improving load transfer of the insert, paragraph 004, and the associated objective technical problem of improving connection between an insert and lamination of a wind turbine blade may be formulated.

9.1.3 Striving to improve such an insert the person skilled in the manufacture of wind turbine blades made of composite may well consider the teaching of D11(D7). This teaching would indeed appear relevant to them as it relates to forming inserts in a wind turbine blade, even if in a different part (the root portion) than that claimed. In particular, the insert 33 of D11(D7)

has an internal conical cavity receiving the conical core 39 (paragraph 049) which in the Board's understanding will be most likely be joined by the same adhesive 35, paragraph 045, as in the outer section 37, 38, to the blade laminate. This is especially so, as the insert is inserted in the housing by continuous rotation. This rotation will spread the adhesive along the whole exposed surface of the insert as the whole space between housing and insert reduces during insertion.

9.1.4 The Board, however, considers that the skilled person person would not obviously apply the more complex shape of the insert taught by D11 to modify the bushing of D9. Indeed D9 is based on the concept of providing a simple cylindrical bushing having a through hole for receiving the stud bolt. Both ends of the stud bolt project beyond the respective extremity of the bushing to receive the coupling nut on their threaded portions. In the Board's view it would however not be possible to realize such a stud bolt connection for the insert of D11 because both the conical cavity delimited by the conical section 38 and the conical core 39 prevent access to a nut. Thus the bushing of D11 cannot simply replace the insert of D9 without further modification. Given that the space within the internal conical section 38 (see figure 6 of D11/D7) is limited, tapering towards the stopper 42 which will be coincident with and of the same diameter as the end of the bolt that is to be threaded into the insert, it is not at all apparent to the Board how a nut to engage with the end of the stud bolt could be accommodated in this very confined space with sufficient space for tightening. This is compounded by the fact that the internal conical section will need to accommodate the internal core 39 of the base or laminate to realize the

second interface of the double shear joint: providing a through hole for the nut would interfere with that function. Any such modifications to the D11/D7 insert to adapt it for use in the embedding bushing with stud bolt connection as in figure 3 of D9 are therefore far from straightforward - if at all possible - and in the Board's view therefore well beyond routine practice.

9.1.5 Similar considerations apply if the skilled person looks to D8. It is assumed for the sake of argument that the inner conical surface 20' (figure 3) defines the inner conical cavity of claim 1. Because it is so much shorter (in axial direction) compared to the conical cavity in D11/D7 (figure 6), the problem of finding enough space for an opening to accommodate an adjustable nut is compounded, and would require modifications well outside the skilled persons normal workshop skills.

9.2 D9, figure 2, as starting point

9.2.1 The appellant opponent also argued obviousness starting from the flanged joint of figure 2 of D9. In this joint design, see the figure, each section has a flange bolted to an insert embedded in the front end of the section wall; the two sections are then connected by bolting together the two flanges.

9.2.2 First of all it is questionable whether the skilled person would really seriously consider this type of joint mid-span. As evident from figure 2 the flange would project outwardly from the blade and thus be detrimental to aerodynamic efficiency. Furthermore, flanges are normally annular (metal) rings or of simple geometric shape (oval, square); in this case the flange would need to have a complex shape to correspond to the

aerodynamic blade profile mid-span, which would be difficult and costly to manufacture as well as adding to the weight of the blade, see also table 1. Thus, although D9 does include the flange design in its review of possible joint designs, probably because it is a known, favoured type of embedded bushing design (page 286, 2nd left hand paragraph), that inclusion seems to be entirely speculative in view of its evident disadvantages for use mid-span. Ultimately, section 3.2, D9 rejects that design as too costly, but other factors must also be at play, see table 1, where the flange design scores 2nd lowest overall. It then pursues the joint designs it considers most promising, the embedded bushing with stud bold (section 4.1) and connecting tubes (section 4.2).

9.2.3 Moreover, even if the skilled person did consider this design as a viable starting point for mid-span joints, and wanted to improve the connection, the Board is unconvinced they would then simply replace the embedded bushings by the inserts of D11/D7 or D8. In both cases the overall joint designs in D8 or D11/D7 appear specific for their placement in the root portion. Neither D8 or D11/D7, which only show the inserts, also show the completed joint. It is assumed that these joints are asymmetric with a (headed) bolt connecting an integrated flange in the other element (hub or blade) to the root portion. Both inserts further appear to be dimensioned and shaped to fit within the relatively thick shell of the root (see figure 4 of D11/D7 showing the root portion in cross-section). In either case the skilled person would have to realize that they could extract the insert from the specific joint design to apply it in a rather different symmetrical joint concept as in figure 2 of D9 while also adapting the insert dimensions so that it can be

integrated into the thinner mid span shell. The Board considers both that realization, which requires a certain level of abstraction or insight on the part of the skilled person, and the consequent adaptation of the insert to go beyond routine skill.

9.3 Starting from D11(D7) or D8

9.3.1 As follows from the discussion above for novelty over D11/D7, the subject-matter of claim 1 differs from this disclosure at least by the location of its insert at the root to connect to the hub instead of in the top or bottom center part of the aerodynamic part of a blade.

It is firstly questionable whether a document teaching how to connect a blade rotor portion to the hub is a suitable starting point for a skilled person wishing to join other parts of the blade. According to established case law the skilled person is free to choose their starting point, but is then bound by that choice, cf. CLBA, 10th edition 2022, I.D.3.6. In this case the skilled person starting from a root-hub joint would as a matter or normal development further develop such a joint, but the end result would still be a root-hub joint. Furthermore, it is not immediately apparent to the Board how the root-hub joint of D11, in which headed bolts feed through a hub-side flange into the single threaded root-side insert, can be simply adapted for use to connect mid-span sections of a blade. If the joint design is to be transferred in analogous manner, the relevant parts - flange and insert - would need to be embedded within the (laminated) shell of the respective sections. In the Board's view, incorporation of a flange in the end face of a mid-span section is neither routine nor usual.

9.3.2 Similar considerations apply to D8 as starting point as it also concerns a root-hub connection. Here, see figures 7 and 8 of D8, hub and root are connected via a stud bolt in the insert in the root portion and which is (taken to be) secured to the hub-side flange with nuts. Again it is unclear to the Board how this flange-insert arrangement can be simply transferred to a mid-span joint. This would require insights and modification beyond routine skill.

9.4 In the light of the above, the Board confirms the opposition division's finding that the subject-matter or claim 1 involves an inventive step over the cited prior art, Articles 52 and 56 EPC.

9.5 Further attacks : admissibility

9.5.1 The appellant opponent also relies on D6 as further alternative starting point in combination with D5,D6 or D9. These further attacks were not considered in the decision under appeal, and are thus not part of appellant opponent's appeal case, Art 12(2) RPBA. The appellant opponent submits that these attacks were raised in their notice of opposition. The Board however finds that neither the minutes (see page 4, chapter Art. 56 EPC) nor the decision indicate that these attacks were admissibly raised and more particularly maintained pursuant to Article 12(4) RPBA. Therefore the Board decided not to admit this amendment of the appellant opponent's case that was not maintained during opposition.

9.5.2 D12 to D16 were filed for the first time together with the appellant opponent's grounds and thus represent an amendment of their case the admission of which is at the Board's discretion pursuant Article 12(4) RPBA. These documents are said to be filed to address the narrow interpretation of the aerodynamic part of a blade (page 2 of the appellant's opponent grounds). However, this question appears to have been a contentious issue already early on in the opposition proceedings (e.g. opposition division communication of 23 November 2020, items 10.1 and 10.2), so that the appellant had ample opportunity to respond thereto before the oral proceedings by citing further prior art. Therefore the Board decided not to admit evidence which could and should have been filed during opposition pursuant Article 12(6) RPBA.

10. Both the proprietor and the opponent fail to convince the Board that any of the decision's findings, either for the main request or the request upheld, were wrong.

Order

For these reasons it is decided that:

The appeals are dismissed

The Registrar: The Chairman:

G. Magouliotis A. de Vries

Decision electronically authenticated