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**Datasheet for the decision
of 9 November 2022**

Case Number: T 1129/18 - 3.4.01

Application Number: 14776115.9

Publication Number: 2972126

IPC: G01P5/10, H01R4/50, H02G1/02

Language of the proceedings: EN

Title of invention:
SYSTEMS AND METHODS FOR DETERMINING WIND SPEEDS

Applicant:
Hubbell Incorporated

Headword:
Wind Speed determination system/Hubbell Inc

Relevant legal provisions:
EPC Art. 56, 84
RPBA 2020 Art. 13(1), 13(2)

Keyword:

Sufficiency of disclosure (yes)

Inventive step - Main Request (No) - Auxiliary request 2a (yes)

Amendment after summons - taken into account - auxiliary request 1 (no), auxiliary requests 2, 2a (yes)

Claims - clarity - Auxiliary request 2 (no), Auxiliary request 2a (yes)

Definition by reference to another entity (not clear)



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Case Number: T 1129/18 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 9 November 2022

Appellant: Hubbell Incorporated
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 12 December
2017 refusing European patent application No.
14776115.9 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman P. Fontenay
Members: A. Medeiros Gaspar
R. Winkelhofer

Summary of Facts and Submissions

- I. The appeal is against the decision of the Examining Division to refuse the European Patent application 14776115.
- II. The Examining Division found the sole request before them not to be allowable for lacking an inventive step having regard to the disclosure of document D1.
- III. With the statement of grounds of appeal, the applicant (appellant) requested that the decision be set aside and that a patent be granted on the basis of the request on which that decision was based (main request), or on the basis of one of six auxiliary requests filed with the statement of grounds of appeal. Oral proceedings were also conditionally requested.
- IV. In a communication accompanying the summons to oral proceedings, the Board expressed a provisional opinion. The Board noted that the impugned decision erroneously indicated document US 5 140 257 A as D1, while it was clear, also to the appellant as underlined in their appeal, that the document meant to be mentioned was WO 2012/039767 A1 referred to as D1 in the European search opinion and during examination. The Board expressed agreement with the Examining Division's assessment of the main request as lacking an inventive step in view of D1 (WO 2012/039767). It considered, additionally, that the main request was also not allowable for other reasons and raised, accordingly, further objections under Articles 83, 84 and 123(2) EPC, which were said to apply also to the auxiliary requests.

- V. In reply, the appellant submitted four new auxiliary requests numbered 1 to 4, in replacement of the auxiliary requests filed with the grounds of appeal.
- VI. During oral proceedings, the appellant submitted auxiliary request 2a.
- VII. Upon closure of the debate at the oral proceedings before the Board, the appellant's requests consisted then of a main request, corresponding to the request on which the contested decision is based, and five auxiliary requests, numbered 1, 2, 2a, 3 and 4, in this order.
- VIII. Claim 1 of the main request reads:

*A system for determining an effective wind speed along a transmission line comprising:
a main housing (50) configured to enclose electronics for monitoring the conductor;
electrical conductors extending from the main housing (50) to a first detector (610) and a second detector (620) disposed externally with respect to the main housing;
the first detector (610) comprising:
 a heated temperature-sensing element (503a) having a heater (518) and a first temperature sensor (516); and
 a first housing (512) at least partially housing the heated temperature-sensing element (503a);
the second detector (620) comprising:
 a non-heated temperature-sensing element (503b) having a second temperature sensor (556); and
 a second housing (552) at least partially housing the non-heated temperature-sensing element (503b);
and*

a processing unit (505) at least one of electrically coupled and communicatively coupled to at least one of the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b), the processing unit (505) adapted to determine the effective wind speed according to a difference between a temperature at the heated temperature-sensing element (503a) and a temperature at the non-heated temperature-sensing element (503b); and a shield (650) coupled to the housing (50) and having a substantially horizontal portion extending from the housing (50) to prevent or reduce precipitation from collecting on the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b) and their respective first housing (512) and second housing (552); wherein the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b) and their respective first housing (512) and second housing (552) are arranged to be collinear with respect to each other, and configured to be proximate and parallel to the transmission line for which the effective wind speed is being determined.

- IX. Claim 1 of the first auxiliary request differs from claim 1 of the main request in that it defines the system as further comprising a clamp, in that it no longer contains the feature defining the electrical conductors, and in that the wording of the claim was modified in several parts, such that the amended parts now read (modifications underlined):

A system for determining an effective wind speed along a transmission line having a conductor (30) comprising: a clamp (110) having a central channel (112) along its length the conductor (30) can be placed;

a main housing (50) coupled to the clamp (110) and configured to enclose electronics for monitoring the conductor (30);
a first detector (610) comprising:
 (...)
a second detector (620) comprising:
 (...); and
a processing unit (505) at least one of electrically coupled and communicatively coupled to the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b),
wherein the processing unit (505) is adapted to determine the effective wind speed according to a difference between a temperature at the heated temperature-sensing element (503a) and a temperature at the non-heated temperature-sensing element (503b); and
a shield (650) having a first portion coupled to the housing (50) and second portion extending orthogonal from the first portion from the housing (50) to prevent or reduce precipitation from collecting on the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b) and their respective first housing (512) and second housing (552);
wherein the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b) and their respective first housing (512) and second housing (552) are arranged to be collinear with respect to each other, and configured to be proximate and parallel to the central channel (112).

X. Claim 1 of auxiliary request 2 adds to claim 1 of auxiliary request 1 the feature:

wherein the first housing (512) and the second housing (552) having a diameter equal to a diameter of the conductor (30).

XI. Claim 1 of auxiliary request 2a differs from claim 1 of auxiliary request 2 in that it defines a system comprising a conductor and a system for determining an effective wind speed, instead of just the latter, and in that the features defining the clamp and the shield were further amended, so that the amended parts now read (modifications underlined):

A system comprising a conductor (30) and a system for determining an effective wind speed indicative of the effectiveness of wind in cooling the conductor, the system for determining an effective wind speed comprising:

a clamp (110) having a central channel (112) along its length on to which the conductor (30) can be placed;
(...)

a shield (650) having a first portion coupled to the housing and a second portion continuous with the first portion and extending orthogonal to said first portion, so as to prevent or reduce precipitation from collecting on the heated temperature-sensing element (503a) and the non-heated temperature-sensing element (503b) and their respective first housing (512) and second housing (552);
(...)

XII. Claim 1 according to auxiliary requests 3 and 4 incorporate further limitations compared with claim 1 of the auxiliary request 2. Said requests are not relevant for the present decision and are thus not reproduced.

Reasons for the Decision

The invention

1. The invention generally relates to a system for determining an effective wind speed indicative of the effectiveness of wind in cooling a conductor, such as a power transmission conductor of a power grid (application, paragraph [0002], Figure 1).
2. Current limits on a conductor depend on its temperature. This temperature depends not only on the resistance of the conductor and current passing through it, but also on the effectiveness of ambient factors, such as ambient temperature, precipitation, and wind speed and direction in cooling the conductor (application, paragraph [0024]).
3. The system for measuring an effective wind speed disclosed in the present application (paragraphs [0068] and [0075, 0076]; figures 5 and 9), comprises a clamp (110) with a central channel for receiving a conductor (30), a main electronics housing (50) and first and second temperature detectors enclosed in respective housings (54 in figure 5). The first detector comprises a heater and first heated temperature sensor and the second detector comprises a second non-heated temperature sensor. The effective wind speed is determined by a processing unit (CPU 505 in figure 9) based on the difference between the temperatures determined by the two temperature sensors using the same principle as a hot wire anemometer (paragraphs [0075, 0076]).

4. Protecting the system for measuring an effective wind speed from precipitation ensures that the cooling effect measured is the one due to the wind (paragraphs [0083], [0084] and [0097]). Employing detector housings of a diameter equal to that of the conductor and arranging them collinear to each other and parallel to the conductor, ensures that the cooling effect produced by the wind on the detection system will be similar to the one produced on the conductor (paragraphs [0076] and [0087]).

Sufficiency of disclosure

5. As correctly argued by the appellant, the application discloses, in its paragraph [0076], that the wind speed detector operates using the same principle as a hot wire anemometer. This disclosure teaches the skilled person to employ the well known expressions used in hot wire anemometry to determine the effective wind speed.
6. The skilled person would understand, from this disclosure and common general knowledge, that the wind speed determined in this way is not the actual speed of the wind, but one indicative of the effectiveness of the wind in cooling the conductor. This is also consistent with the disclosure of paragraph [0002], last sentence, of the application and the use of the adjective "effective" when defining the speed.
7. The skilled person would also understand that it is indeed this cooling effect that is the relevant parameter for the invention, as rendered apparent in the application. Whether this effect is achieved by a low flow wind blowing perpendicularly to the wire or by

a strong flow wind blowing parallel to the wire is, for that purpose, not relevant.

8. Thus, the skilled person understands the meaning of the term effective wind speed defined in the claims as determined based on the two temperature measurements. The information provided in the application is hence sufficient for the skilled person to implement the invention without undue burden.
9. Article 83 EPC is, hence, complied with.

Main Request: novelty and inventive step in view of D1

10. Figures 5 and 9 and paragraphs [0057], [0064] and [0065] of D1 comprise the same disclosure as figures 5 and 9 and paragraphs [0068], [0075] and [0076] of the present application.
11. As correctly found by the Examining Division, claim 1 of the main request differs from the above mentioned disclosure of D1 exclusively in that the system of claim 1 further comprises *a shield comprising a substantially horizontal portion extending from the main housing to prevent or reduce precipitation from collecting on both sensors and their respective housings.*
12. The appellant's arguments as to the existence of further differences are not convincing. There is nothing in D1 which would suggest that the detector housings 54 of the system of D1 (figure 9, paragraph [0065]) differ from the first and second detector housings defined in claim 1 and disclosed in the

present application (figures 5 and 9, paragraph [0076]).

13. The shield defined in the claim is disclosed in the application as protecting the sensor elements from weather (application: paragraph [0097]). This, in turn, can also be seen to influence the accuracy of the results obtained based on the temperature readings, as argued by the appellant and disclosed in the application (paragraphs [0083] and [0084]).
14. The appellant argues that the skilled person would not see the need to protect the temperature detectors of D1 from precipitation, given that the temperature sensing element of each of the detectors is already enclosed by a respective housing element.
15. However, D1 teaches, as the present application, the temperature detectors as being employed for the determination of an effective wind speed using the same principle as a hot wire anemometer (D1, paragraph [0065]).
16. The skilled person would, in such a context, as for the present application, understand that it would be important to protect from precipitation also the detector housings, on which the wind blows directly, thereby generating the cooling effect intended to be measured.
17. Therefore, starting from the outdoor system of D1 and seeking to avoid incorrect or inaccurate measurements, the skilled person would be aware of the impact of precipitation hitting directly the detector housings and would hence provide a shield as defined in the claim to prevent that from happening.

18. Also the arguments as to the non-obviousness of the placement and orientation of the shield are not convincing, since the positioning and orientation defined in the claim, in essence, extending over the detectors, are those that would immediately be contemplated by the skilled person willing to implement a precipitation protection for the detectors.
19. Therefore the Board agrees with the Examining Division in that claim 1 of the main request lacks an inventive step in view of D1 (Article 56 EPC).
20. Consequently, the main request is not allowable.

Admission and consideration of the auxiliary requests 1 and 2

21. All the auxiliary requests were submitted after notification of the summons for oral proceedings before the Board.
22. Their admission and consideration is subject to the Board's discretion, which is to be exercised taking into account the provisions of Article 13(2) RPBA 2020, requiring consideration of whether exceptional circumstances are present.
23. In the present case, auxiliary requests 1 and 2, submitted ahead of the oral proceedings, constitute attempts at overcoming the objections under Articles 84 and 123(2) EPC raised against all requests, for the first time in the preliminary opinion of the Board (items 16 to 22 and 29 of the preliminary opinion).

24. That new objections raised in the preliminary opinion to which it is reacted, may be relevant under Article 13(2) RPBA 2020, is explicitly indicated in the explanatory remarks on the RPBA 2020 (EPO OJ Suppl. 1/2020). The explanatory remarks further clarify that, at that stage, the Board may also rely on the criteria as set out in Article 13(1) RPBA 2020.

25. In the present case, the introduction in independent claim 1 of auxiliary request 1 and 2 of a reference to *a clamp having a central channel along its length where the conductor can be placed*, while directed at addressing the clarity objections raised in the preliminary opinion of the Board, effectively amounts to incorporating in the claim a feature that the system of D1 also comprises (D1, figure 5, paragraph [0047]).

26. Hence, the amendment *prima facie* does not overcome the issue of lack an inventive step, having regard to the disclosure of D1 identified above with regards to claim 1 of the main request.

27. The same does not hold true for auxiliary request 2. Even though it still has to be established whether the introduction of the clamp with its channel where the conductor is to be placed satisfactorily solves all the clarity issues raised in the preliminary opinion, the added feature appears - at least on a *prima facie basis* - to constitute a constructive attempt to address these objections. It furthermore seems, in view of the previous findings with regards to the main request, that this added feature, together with the further limitation that the first housing and the second housing have a diameter equal to a diameter of the conductor, might imply a technical effect which would be relevant when assessing whether the claimed subject-

matter entails an inventive step over the disclosure of D1.

28. Therefore, as result of the exercise of discretion under Article 13(2) RPBA, auxiliary request 1 was not to be admitted into the appeal proceedings, for being clearly not allowable, but auxiliary request 2 was.

Auxiliary request 2: clarity

29. Claim 1 of auxiliary request 2 includes the additional limitation that the first housing and the second housing have a diameter equal to a diameter of the conductor on which the effective wind speed is to be determined.
30. The definition of the diameter of housings of the temperature detectors by reference to the diameter of a conductor that is not defined as part of the system claimed renders the scope of claim 1 not clear.
31. The appellant argues by reference to the Guidelines for Examination (F-IV, 4.14.2) that it is allowed to define a dimension by reference to another entity (conductor) that is not part of the claimed system, if the claimed subject-matter and the other entity are related through use.
32. In this context, the appellant further argues that, by defining the system as comprising a clamp having a central channel along its length onto which the conductor can be placed, the reference to the conductor or its diameter rendered it clear.

33. The Board does not dispute that it might be possible, in certain cases, to clearly define a limitation to the subject-matter claimed by reference to an entity that is not part of the subject-matter defined, as explained in the mentioned passage of the guidelines for examination.
34. In the present case, the definition of the system as comprising a clamp having a central channel onto which the conductor can be placed, is, for instance, successful in rendering clear the subsequent definition of detector housings as oriented parallel to said central channel (and hence to the conductor the clamp is adapted to receive).
35. That definition, however, is not sufficient to render clear the further definition of the diameter of the housings as equal to the diameter of the conductor. That is the case because the channel defined by the clamp is itself not defined in the claim (or disclosed in the application for that matter) as having a well defined fixed diameter, or as being exclusively adapted to receive a conductor of a certain predetermined diameter. The same clamp could, hence, be adapted to receive conductors of different diameters. This appears all the more true considering that the presence of springs in the clamp in order to allow the conductor to float within said channel (application, paragraph [0059]), *de facto* makes it adapted to receive conductors of different diameters.
36. Consequently, by defining the diameter of the detector housings as equal to the diameter of a conductor which is itself not part of the system claimed, with said diameter of said conductor not being uniquely defined

by the features of the system claimed, the limitation added to claim 1 of auxiliary request 2 is not clear.

37. Therefore claim 1 of the second auxiliary request does not comply with Article 84 EPC.
38. Consequently, the second auxiliary request is also not allowable.

Admission and consideration of auxiliary request 2a

39. Auxiliary request 2a was submitted during the oral proceedings before the Board, in reaction to the discussion on clarity of claim 1 of auxiliary request 2.
40. It *prima facie* renders moot the issue of lack of clarity of claim 1 of auxiliary request 2 discussed above by defining a system comprising a conductor and a system for measuring the effective wind speed on said conductor, instead of just the latter. As in this request the conductor itself is part of the system claimed, its diameter constitutes an inherent feature of the claimed subject-matter. Consequently, also the diameter of the detector housings, said to be equal to the diameter of the conductor, is well-defined.
41. This request furthermore appears to define subject-matter inventive over the disclosure of document D1, thereby solving the previously identified issue with the main request (and auxiliary request 1).
42. Additionally, it does not introduce any new issue and, hence, its consideration is not seen to impose an undue additional burden on the Board.

43. All of the above having been taken into consideration under Article 13(2) RPBA, auxiliary request 2a was to be admitted into the proceedings.

Auxiliary request 2a: novelty and inventive step in view of D1

44. Claim 1 of auxiliary request 2a differs from the disclosure of D1 in that the system it defines comprises a shield extending from the main housing over the detector housings so as to protect the detectors from precipitation and, furthermore, in that the diameter of the detector housings are equal to the diameter of the conductor.
45. The two differences contribute to increase the accuracy of the effective wind speed determined (application, paragraphs [0083],[0084] and [0087]).
46. In fact, as already indicated, protecting the detector housings from precipitation avoids that an additional cooling effect due to precipitation affects the temperature measurements and renders the effective wind speed therefrom determined inaccurate.
47. Likewise, by employing detector housings of a diameter equal to the diameter of the conductor of the system, the conditions in which cooling effects due to wind are measured are similar to the conditions on the conductor, thereby further contributing to the accuracy of the results obtained.
48. The skilled person, starting from the disclosure of document D1, and willing to improve the accuracy for effective wind speed obtained based on the temperatures

measured would, for the reasons already indicated under paragraphs 15 to 18 with regards to the main request, consider providing a shield as defined claim 1 to protect the detector housings from precipitation.

49. In doing so they would however not additionally consider modifying the diameter of the detector housings of the system of D1, which in figure 5 of D1 are depicted clearly smaller than the diameter of the conductor, to make them equal to the diameter of the conductor.
50. This is because even though D1 mentions the relevance of making the detector housings collinear and arranged proximate and parallel to the conductor, it makes no reference to the relevance of the diameter of said housings, for the purpose of the measurements carried out, and because increasing the diameter would be seen to conflict with the need to protect the detectors from precipitation.
51. Therefore, the particular combination of features defined in claim 1 of auxiliary request 2 entails an inventive step over the disclosure of document D1 (Article 56 EPC).

Auxiliary request 2a: Article 123(2) EPC

52. Claim 1 of auxiliary request 2a is based on the combination of original claims 1 and 2 and comprises further limitations, for which basis exists in the original application as follows:
 - (a) definition of a system comprising a conductor and a system for determining effective wind speed

(paragraph [0002], first sentence; figure 5; paragraph [0056], first sentence);

- (b) further definition of the effective wind speed as being indicative of the effectiveness of wind in cooling the conductor (paragraph [0002], last sentence);
- (c) further definition of the system for determining effective wind speed as comprising a clamp as defined in the claim (figure 5, paragraph [0058], first sentence);
- (d) further definition of the shield as having a first and second portions arranged as defined in the claim (paragraph [0097]); and
- (e) limitation of the diameter of the first housing and the second housing to being equal to the diameter of the conductor (paragraphs [0081] and [0087]).

53. The features defined in the dependent claims were also among those defined in the other original dependent claims.

54. Hence auxiliary request 2a additionally complies with Article 123(2) EPC.

Conclusion

55. There are also no further objections that would stand in the way of granting a patent on the basis of auxiliary request 2a.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of auxiliary request 2a, filed during the oral proceedings before the board, and the description and drawings to be adapted.

The Registrar:

The Chair:



D. Meyfarth

P. Fontenay

Decision electronically authenticated