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**Datasheet for the decision
of 29 April 2024**

Case Number: T 0986/22 - 3.5.05

Application Number: 13163021.2

Publication Number: 2615776

IPC: H04L12/24, H04W16/18,
H04W40/10, H04W40/16,
H04L12/733

Language of the proceedings: EN

Title of invention:

Configuring and Optimizing a Wireless Mesh Network

Patent Proprietor:

Fisher-Rosemount Systems, Inc.

Opponent:

ABB Schweiz AG

Headword:

Wireless mesh network/ABB

Relevant legal provisions:

EPC Art. 123(2)
RPBA 2020 Art. 12(4), 13(1), 13(2)

Keywords:

Added subject-matter - main request (yes)

Admittance of claim amendments filed on appeal - 1st and 2nd auxiliary requests (no): fallback requests + not suitable to address the relevant issues

Admittance of claim amendments filed later - 3rd, 4th and 5th auxiliary requests (no): no clear allowability + no exceptional circumstances



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Case Number: T 0986/22 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 29 April 2024

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
23 February 2022 concerning maintenance of the
European Patent No. 2615776 in amended form.**

Composition of the Board:

Chair K. Bengi-Akyürek
Members: P. Tabery
C. Almberg

Summary of Facts and Submissions

- I. The appeal of the opponent is directed against the interlocutory decision of the opposition division to maintain the patent in amended form according to the then "first auxiliary request".
- II. The opposition division found that the ground for opposition under Article 100(c) EPC prejudiced the maintenance of the patent as granted (main request). On the other hand, the claims of the then first auxiliary request were held to fulfil the requirement of Article 123(2) EPC and to involve an inventive step (Article 56 EPC) over the cited prior art.
- III. Oral proceedings were held before the board on 29 April 2024. The final requests of the parties were as follows:
- The appellant-opponent (henceforth "the opponent") requested that the appealed decision be set aside and that the patent be revoked.
 - The respondent-proprietor (henceforth "the proprietor") requested that the appeal be dismissed, i.e. that the patent be maintained in amended form as found allowable in the appealed decision (**main request**).

In the alternative, the proprietor requested that the patent be maintained in amended form based on the claims of one of

- the **first and second auxiliary requests** filed with the written reply to the statement of grounds of appeal,

- the **third and fourth auxiliary requests** filed with letter dated 1 March 2022, and
- the **fifth auxiliary request** filed with letter dated 28 March 2024.

At the end of the oral proceedings, the board's decision was announced.

IV. Claim 7 of the **main request** reads as follows:

"A method for designing an optimized wireless communication network (14, 200) that includes a plurality of devices (212-218, 242) operating in a process plant, the method comprising:

using an interactive network design tool (45) to receive input data provided by a user to create or modify a model (324) of the wireless communication network (14, 200) including the plurality of devices (212-218, 242), wherein the model (324) is stored as data on a computer readable medium;

characterized by providing, by the interactive network design tool (45), a graph generator (302) to define a set of directed graphs (210, 240) of the model (324) of the wireless communication network (14, 200), the definition of the set of directed graphs based on relative priorities of a set of optimization rules corresponding to one or more optimization strategies, the set of optimization rules corresponding to at least one of: minimizing a number of hops between pairs of communicating devices, preferring routing based on relative reliability of power sources of devices, avoiding node overload, or limiting a total number of connections to a certain node, and each directed

graph (210, 240) included in the set of directed graphs (210, 240) having:

a head, the head being a particular device (212) at which data is originated and the particular device (212) included in the plurality of devices (212-218, 242),

a tail, the tail being a terminating endpoint of the each directed graph (210, 240) at which the data originated by the head is received, and

one or more routing devices (214-218, 242) disposed between the head and the tail via which the data originated by the head is routed to the tail, the one or more routing devices (214-218, 242) included in the plurality of devices (212-218, 242); and

automatically generating, by an engine module (300) of the interactive network design tool (45), configuration data for operating the wireless communication network (14, 200) based on the model (324); wherein the network configuration data includes a routing scheme defined as a set of communication paths connecting pairs of the plurality of devices (212-218, 242) and a communication schedule to define timing of communication of the plurality of devices (212-218, 242)."

- V. Claim 7 of the **first auxiliary request** differs from claim 7 of the main request in that the beginning of the characterising part reads as follows (board's underlining):

"characterized by providing, by the interactive network design tool (45), a graph generator (302)

to define a set of directed graphs (210, 240) of the model (324) of the wireless communication network (14, 200), the definition of the set of directed graphs based on relative priorities of a set of optimization rules corresponding to one or more optimization strategies, the set of optimization rules corresponding to at least one of: minimizing a number of hops between pairs of communicating devices, preferring routing based on relative reliability of power sources of devices wherein the devices with more reliable power sources are preferred, avoiding node overload, or limiting a total number of connections at a certain node, and each directed graph (210, 240) included in the set of directed graphs (210, 240) having:"

VI. Claim 7 of the **second auxiliary request** differs from claim 7 of the first auxiliary request in that the alternative feature "avoiding node overload" has been deleted from the characterising part.

VII. Claim 7 of the **third auxiliary request** differs from claim 7 of the main request in that the beginning of the characterising part reads as follows (board's underlining):

"characterized by providing, by the interactive network design tool (45), a graph generator (302) to define a set of directed graphs (210, 240) of the model (324) of the wireless communication network (14, 200), the definition of the set of directed graphs based on relative priorities of a set of optimization rules corresponding to one or more optimization strategies, the set of optimization rules corresponding to at least one of: minimizing a number of hops between pairs of

communicating devices, preferring routing based on relative reliability of power sources of devices wherein the devices with more reliable power sources are preferred, avoiding node overload, or limiting a total number of connections to a certain node, and each directed graph (210, 240) included in the set of directed graphs (210, 240) having:"

VIII. Claim 7 of the **fourth auxiliary request** differs from claim 7 of the first auxiliary request in that the alternative feature "avoiding node overload" has been deleted from the characterising part.

IX. Claim 7 of the **fifth auxiliary request** differs from claim 7 of the main request in that the alternatives

"preferring routing based on relative reliability of power sources of devices, avoiding node overload, or limiting a total number of connections to a certain node,"

have been deleted. The beginning of the characterising part thus reads as follows:

"characterized by providing, by the interactive network design tool (45), a graph generator (302) to define a set of directed graphs (210, 240) of the model (324) of the wireless communication network (14, 200), the definition of the set of directed graphs based on relative priorities of a set of optimization rules corresponding to one or more optimization strategies, the set of optimization rules corresponding to at least one of: minimizing a number of hops between pairs of communicating devices and each directed graph (210,

240) included in the set of directed graphs (210, 240) having:"

Reasons for the Decision

1. The present patent concerns a network design tool for designing an optimised wireless communication network.
2. Main request
- 2.1 Subject-matter under consideration

The claims of the main request are identical to those of the first auxiliary request considered in the decision under appeal.

Claim 7 of the main request includes the following limiting features:

1. A method for designing an optimised wireless communication network that includes a plurality of devices operating in a process plant, the method comprising:
 2. using an interactive network design tool to receive input data provided by a user to create or modify a model of the wireless communication network including the plurality of devices,
 3. wherein the model is stored as data on a computer readable medium;
 4. providing, by the interactive network design tool, a graph generator to define a set of directed graphs of the model of the wireless

communication network,

5. the definition of the set of directed graphs based on relative priorities of a set of optimisation rules corresponding to one or more optimisation strategies, the set of optimisation rules corresponding to at least one of:
 - 5.1 minimising a number of hops between pairs of communicating devices,
 - 5.2 preferring routing based on relative reliability of power sources of devices,
 - 5.3 avoiding node overload, or
 - 5.4 limiting a total number of connections to a certain node, and

6. each directed graph included in the set of directed graphs having:
 - 6.1 a head, the head being a particular device at which data is originated and the particular device included in the plurality of devices,
 - 6.2 a tail, the tail being a terminating endpoint of the each directed graph at which the data originated by the head is received, and
 - 6.3 one or more routing devices disposed between the head and the tail via which the data originated by the head is routed to the tail, the one or more routing devices included in the plurality of devices; and

7. automatically generating, by an engine module of the interactive network design tool, configuration data for operating the wireless communication network based on the model; wherein the network configuration data includes

- 7.1 a routing scheme defined as a set of communication paths connecting pairs of the plurality of devices and
- 7.2 a communication schedule to define timing of communication of the plurality of devices.

2.2 Added subject-matter (Article 123(2) EPC)

2.2.1 The board concurs with the appellant that **feature 5.2** of claim 7 extends beyond the original disclosure of the patent. The description as originally filed discloses in paragraph [0017] the principle of "preferring routing through those devices which have a more reliable power source". In contrast, claim 7 merely specifies in feature 5.2 that "routing based on relative reliability of power sources of devices" is preferred. This evidently comprises the - undisclosed - cases of selecting a route through a device having a less reliable, or equally reliable, power source.

2.2.2 The board cannot subscribe to the argument that the undisclosed case ("less reliability") would have been discarded by the skilled reader, since it did not make any sense from a technical point of view. As argued by the opponent, a "less reliable power source" might provide better performance and thus indeed constitutes a sensible selection. In this context, the board notes that, according to the notoriously known rule "good, fast, cheap: pick any two - you can't have all three", a lower reliability usually implies advantages having regard to a different property. Thus, using their common knowledge, the skilled reader having a mind willing to objectively construe claim 7 would not necessarily rule out the selection of a "less reliable power source", or an equally reliable power source. The board would like to emphasise that the skilled reader

would only discard those parts of the claimed scope that do manifestly not make any technical sense, but not those parts merely requiring more intellectual effort than the scope covered by the description.

2.2.3 In this context, it has no bearing that the description of the patent in suit does not mention any advantages for the undisclosed scope of claim 7. Using the description in this way would effectively lead to a situation where a limitation being only present in the description was used to determine the matter for which protection was sought. To the contrary, the fact that the description as filed explicitly mentions in paragraph [0017] the rule of "preferring routing through those devices which have a **more** reliable power source" even reinforces the opponent's interpretation that feature 5.2 indeed comprises the case of routing through devices having a **less** reliable power source. When noting the difference between the wording of this feature and paragraph [0017] of the opposed patent, the skilled reader's mind willing to objectively construe the claim wording would assume that this difference was intentional. On this basis, the skilled reader would come to the conclusion that the claimed subject-matter also comprised the case of routing through devices having a "**less** reliable power source", or an equally reliable power source, i.e. the interpretations that are contested by the proprietor.

2.2.4 The board does also not subscribe to the proprietor's argument that, since feature 1 of claim 7 explicitly mentioned an "optimised wireless communication network", the skilled reader would necessarily understand that feature 5.2 was relating to more reliable power sources because that constituted an "optimisation". Rather, the board concurs with the

opponent's observation that feature 5 of claim 7 recites several criteria and that it is not possible to optimise one of these criteria without making it worse according to another criterion. Hence, the skilled person would not have discarded the interpretation of feature 5.2 that less reliable, or equally reliable power sources may also be selected.

2.2.5 Lastly, the board is likewise not convinced by the proprietor's argument that, since feature 5 defined "relative priorities", a hierarchy of the optimisation rules was implied. To the contrary, the board considers that the formulation "the set of optimisation rules corresponding to at least one of" in feature 5 evidently relates to an unordered and non-exhaustive list of rules.

2.3 Therefore, the main request is not allowable under Article 123(2) EPC.

3. First and second auxiliary requests - admittance

3.1 These claim requests were filed for the first time with the written reply to the statement of grounds of appeal. Their admittance is thus at the board's discretion under all relevant parts of Article 12 RPBA.

3.2 Claim 7 of the **first auxiliary request** differs from claim 7 of the main request in that it further specifies in feature 5.2 that the devices with more reliable power sources are preferred and in that feature 5.4 now specifies "connections at a certain node".

3.2.1 Claim 7 of the **second auxiliary request** differs from claim 7 of the first auxiliary request in that the

alternative feature 5.3 has been deleted.

3.2.2 The board is not convinced by the proprietor's argument that these requests should be admitted, since they were filed in anticipation of a potential objection pursuant to Article 123(3) EPC. Rather, the board concurs with the opponent that the mere hypothetical possibility of an objection is not a valid reason for admitting a claim request. In the absence of the respective objections, the justification for admittance of such a request is effectively baseless. There is simply no such objection to counter.

3.2.3 Second, the board concurs with the opponent that the amendment made in feature 5.4 ("at a certain node") of claim 7 of both claim requests actually reverts the amendment filed during the oral proceedings before the opposition division, i.e. reintroduces an already disqualified feature. This is not to "address the issues which led to the decision under appeal", it is to ignore them. Hence, the first and second auxiliary requests lack "suitability" within the meaning of Article 12(4), fifth sentence, RPBA.

3.3 As to the further amendment of the second auxiliary request, the appellant argued that the deletion of one alternative provided a more solid basis for arguing in favour of an inventive step. However, the board concurs with the opponent that the deletion of a single criterion from the list of four criteria is not suitable to overcome the objections raised in the decision under appeal.

3.4 In view of the above, the board has decided not to admit the first and second auxiliary requests into the appeal proceedings (Article 12(4) RPBA).

4. Auxiliary requests 3 and 4 - admittance

4.1 These claim requests were filed for the first time *after* the filing of the written reply to the statement of grounds of appeal. Their admittance is thus at the board's discretion under Article 13(1), and all relevant parts of Article 12 RPBA.

4.2 Claim 7 of the **third auxiliary request** differs from claim 7 of the main request in that it further specifies in feature 5.2 that "the routing devices with more reliable power sources are preferred". As opposed to claim 7 of the first auxiliary request, feature 5.4 of claim 7 is unamended versus claim 7 of the main request.

4.3 Claim 7 of the **fourth auxiliary request** differs from claim 7 of the third auxiliary request in that the alternative feature 5.3 has been deleted.

4.4 The board is not convinced by the proprietor's argument that the third auxiliary request is to be admitted since it was a reaction to the opponent's *reformatio in peius* allegation raised with respect to the first and second auxiliary requests. In fact, this situation was caused by the proprietor in the first place, as these requests reverted the amendment filed during the oral proceedings.

4.4.1 Therefore, the proprietor has not provided (cf. Article 12(4), third sentence, RPBA), and the board cannot itself perceive, any legitimate reason why this claim request was submitted at this stage of the appeal proceedings rather than with the statement of grounds of appeal.

4.4.2 Moreover, the board holds that the amendments are not even suitable to address the issue of inventive step which was raised by the board in its preliminary opinion (cf. Article 12(4), fifth sentence, RPBA). Notably, the board indicated therein that it did not consider that the technical effect of "optimising the performance of the wireless communication network" brought forward by the proprietor was credibly caused by the distinguishing features. Rather, claim 7 related to providing network configuration data which was created based on a set of so-called "optimisation rules", i.e. an undefined combination of several distinct mathematical algorithms. However, each algorithm aimed at a *different* optimisation goal. Thus, following a particular one of these rules yielded an optimisation according to the respective criterion, but a *non-optimal* configuration according to *another* criterion. This became even more evident in the case of combining two or more of these algorithms. Then, it could not be determined whether an overall optimisation was actually achieved according to either criterion. In the absence of a technical effect which was credibly achieved by the distinguishing features, no objective technical problem was solved and thus an inventive step could not be acknowledged.

4.4.3 However, the amendments to the third auxiliary request address neither the number nor the ordering of the claimed "optimisation rules". Moreover, the board does not subscribe to the proprietor's argument that an ordering of the rules was specified, as "relative priorities" were mentioned in feature 5 of claim 7 (see also point 2.2.5 above). Thus, the proprietor has failed to demonstrate that these amendments *prima facie* overcome the issues raised by the board (Article 13(1), fourth sentence, RPBA).

- 4.5 In view of the above, the board has decided not to admit the third and fourth auxiliary requests into the appeal proceedings (Article 13(1) RPBA).
5. Fifth auxiliary request
- 5.1 This claim request was filed for the first time *after* notification of the board's communication issued under Article 15(1) RPBA. Thus, its admittance is at the board's discretion under Article 13 RPBA, in its entirety, and all relevant parts of Article 12 RPBA.
- 5.2 Claim 7 of this request includes none of the amendments presented with the higher-ranking auxiliary requests. Hence, even if there were "exceptional circumstances", which is not the case, the board could not see any justifying cogent reasons within the meaning of Article 13(2) RPBA.
- 5.3 At any rate, the sole optimisation criterion which is explicitly mentioned in claim 7 is "minimising a number of hops between pairs of communicating devices". The board notes that the formulation "the set of optimisation rules corresponding to at least one of" in feature 5 of claim 7 specifies a non-exhaustive list of rules. However, since only a single rule is mentioned subsequently, the impression prevails that the subject-matter of claim 7 is to be understood as being limited by further - unmentioned - rules. These could however comprise precisely those rules which gave rise to the objections raised with respect to the main request (see point 2.2.4 above) and which were excised from claim 7 with the amendments of the fifth auxiliary request. For these reasons, the proprietor has not demonstrated that the amendments, *prima facie*, overcome

the objections raised in the board's preliminary opinion (Article 13(1), fourth sentence, RPBA).

- 5.4 Consequently, the board has decided not to admit the fifth auxiliary request into the appeal proceedings (Article 13(2) RPBA).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated