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Datasheet for the decision of 30 March 2021

Case Number: T 1260/17 - 3.5.03

Application Number: 10757532.6

Publication Number: 2480939

IPC: G05B19/042

Language of the proceedings: EN

Title of invention:
Industrial process control transmitter with multiple sensors

Patent Proprietor:
Rosemount, Inc.

Opponent:
Endress+Hauser (Deutschland) AG+Co. KG

Headword:
Equaliser circuit for voltage potentials/ROSEMOUNT

Relevant legal provisions:
EPC Art. 56, 123(2)
EPC R. 103(1)(a)
RPBA 2020 Art. 13(2)

Keyword:

Added subject-matter - main and auxiliary requests I to V (yes)
Admittance of auxiliary requests filed after summons - (no): no exceptional circumstances and no clear allowability
Reimbursement of the appeal fee - (no): appeal not allowable

Decisions cited:

T 1067/97

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Beschwerdekammern

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Case Number: T 1260/17 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 30 March 2021

Appellant: (Patent Proprietor)	Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317 (US)
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Representative:	Andres, Angelika Maria Endress+Hauser Group Services (Deutschland) AG+Co. KG Colmarer Straße 6 79576 Weil am Rhein (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 29 March 2017 revoking European patent No. 2480939 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chair	K. Bengi-Akyürek
Members:	R. Gerdes
	C. Almberg

Summary of Facts and Submissions

I. The appeal is against the decision of the opposition division to revoke the present European patent on the grounds of extension of subject-matter beyond the content of the application as filed (Articles 100(c) and 123(2) EPC), lack of an inventive step (Articles 52(1) and 56 EPC) and lack of clarity (Article 84 EPC). The finding of lack of inventive step was based on the following prior-art documents:

E1: WO 01/88644 A2
E4: JP 61-88400 A
E4t: a translation of E4 in English.

II. In the statement setting out the grounds of appeal, the patent proprietor (appellant) requested that the decision under appeal be set aside and that the patent be maintained as granted, i.e. that the opposition be rejected (**main request**). In the alternative, the patent should be maintained as amended according to one of **auxiliary requests I to V** on which the decision under appeal was based. Further, the appellant requested reimbursement of the appeal fee according to Rule 103(1)(a) EPC.

III. In their reply, the opponent (respondent) requested that the appeal be dismissed.

IV. In reply to the summons to oral proceedings, the appellant submitted further **auxiliary requests II-1 and IV-1**.

V. Oral proceedings before the board were held on 30 March 2021 by means of videoconference at the

request of the parties. The parties upheld their requests on file including auxiliary requests II-1 and IV-1.

VI. Claim 1 of the **main request** reads as follows (with a numbering of features as indicated by the opposition division in their communication annexed to the summons to attend oral proceedings):

"a1: An industrial process control transmitter (16) comprising:
b1: a first input configured to couple to a first sensor;
c1: a second input configured to couple to a second sensor;
d1: a multiplexer (66) configured to selectively couple the first and second inputs to a measurement circuit (68),
e1: the measurement circuit (68) providing an output related to a sensed process variable; and
f1: an equaliser circuit (100)
f1': coupled to the output of the multiplexer (66) and
f1": configured to bring the selectively coupled first or second input and the measurement circuit (68) to a common voltage potential."

VII. Claim 1 of **auxiliary request I** contains the following amendments (indicated by underlining):

"b1: a first input configured to couple to a first sensor<u>, wherein the first input comprises a first connection to a first terminal of the first sensor and a second connection to a second terminal of the first sensor</u>; ...
f1: an equaliser circuit (100)

f1': which during sensor reading is coupled to the output of the multiplexer (66) and ...".

VIII. Claim 1 of auxiliary request II is based on claim 1 of auxiliary request I with feature f1" being amended to read:

"f1": configured to momentarily connect the output of multiplexer (66) to a circuit voltage reference potential (104) prior to a sensor measurement in order to bring the selectively coupled first or second input and the measurement circuit (68) to a common voltage potential."

IX. Claim 1 of **auxiliary request III** is based on claim 1 of the main request with the following amendments:

"f1: an equalizer circuit (100)
f1': which during sensor reading is coupled to the output of the multiplexer (66)
f1": and configured to bring the selectively coupled first or second input and the measurement circuit (68) to a common voltage potential for equalizing an input channel and the measurement circuit (68), wherein the equalizer circuit (100) is adapted to eliminate or shorten the equalizing, if a sensor to be measured is similar to a previously measured sensor."

X. Claim 1 of **auxiliary request IV** is based on claim 1 of auxiliary request III and includes the amendments to feature f1" according to auxiliary request II.

XI. Claim 1 of **auxiliary request V** reads as follows:

"A method of measuring sensor values from the first and second sensors in an industrial process control transmitter (16), the method comprising:
providing an industrial process control transmitter (16), comprising:
first input configured to couple to a first sensor;
a second input configured to couple to a second sensor;
a multiplexer (66) configured to selectively couple the first and second inputs to a measurement circuit (68), the measurement circuit (68) providing an output related to a sensed process variable; and
an equalizer circuit (100) which during sensor reading is coupled to the output of the multiplexer (66) and configured to momentarily connect the output of multiplexer (66) to a circuit voltage reference potential (104) prior to a sensor measurement in order to bring the selectively coupled first or second input and the measurement circuit (68) to a common voltage potential,
coupling the first sensor through multiplexer (66) to the measurement circuit (68);
measuring a value of the first sensor using the measurement circuit (68);
disconnecting the measurement circuit (68) from the first sensor;
coupling the second sensor through the multiplexer (66) to the measurement circuit (68);
coupling the measurement circuit (68) to the circuit voltage reference potential (104) for equalizing an input channel and the measurement circuit (68);
disconnecting the measurement circuit (68) from the circuit voltage reference potential (104); and
measuring a value of the second sensor using the measurement circuit (68),

wherein the equalizing is eliminated or shortened, if a sensor to be measured is of the same type to a previously measured sensor."

XII. Claim 1 according to **auxiliary request II-1** corresponds to claim 1 of auxiliary request II, except that the wording "which during sensor reading is" in feature f1' has been cancelled (deletions struck-through):

"f1': ~~which during sensor reading is~~ coupled to the output of the multiplexer (66) and ...".

XIII. Similarly, claim 1 according to **auxiliary request IV-1** is based on claim 1 of auxiliary request IV, with the following amendments:

"f1: an equalizer circuit (100)
f1': ~~which during sensor reading is~~ coupled to the output of the multiplexer (66)
f1": and configured to momentarily connect the output of the multiplexer (66) to a circuit voltage reference potential (104) prior to a sensor measurement in order to bring the selectively coupled first or second input and the measurement circuit (68) to a common voltage potential for equalizing an input channel and the measurement circuit (68), wherein the equalizer circuit (100) is adapted to eliminate or shorten the equalizing, if a sensor to be measured is ~~similar~~ <u>of the same type</u> to a previously measured sensor."

Reasons for the Decision

1. Main request - added subject-matter

1.1 The opposition division held in the decision under appeal that features f1 to f1" were not disclosed in the application as originally filed. The application as originally filed only defined the use of the equaliser circuit during sensor reading, when the multiplexer bus was momentarily connected to a circuit voltage reference. No hints could be found in the originally filed disclosure which described the use of the equaliser circuit in other circumstances than during a sensor reading performed prior to a sensor measurement.

1.2 According to the established jurisprudence of the Boards of Appeal, if a claim is restricted to a preferred embodiment, it is normally not allowed under Article 123(2) EPC to extract isolated features from a set of features which have originally been disclosed in combination for that embodiment. Such an amendment would only be justified in the absence of a clearly recognisable functional or structural relationship among said features (cf. T 1067/97, Reasons, point 2.1.3).

1.3 In the present case, claim 1 was amended by features f1' and f1" in the examination proceedings. The application as filed discloses that the equaliser circuit is dedicated to "bringing the connected input channel and the signal conversion circuitry to a common voltage potential" by a momentary connection between the multiplexer bus and a circuit voltage reference occurring in conjunction with sensor reading (see paragraphs [0028] and [0029], also read in the light of

paragraphs [0025] and [0026] of the description as originally filed).

1.4 In other words, the original disclosure teaches that the connection between the circuit voltage reference and the multiplexer bus is not a permanent one but only established for a short time period until the "components are at the same potential" (see paragraph [0029]). Including elements of those embodiments into features fl' and fl", without the reference to the transitory nature of the connection, leads to an unallowable intermediate generalisation.

1.5 The appellant argued that it was crucial to make a distinction between a device and its intended use, which formed the subject-matter of the accompanying method claims. The fact that the equaliser circuit only brought the other components to a common voltage potential at certain times of the measurement process, had no bearing on the fact that it was configured to do so at all times.

1.6 The board understands these arguments such that an independent apparatus-type claim does not require similar limitations as a claim directed to a method. However, a sequence of steps in a method claim specifying the operation of an electronic device is reflected in a corresponding control circuitry of the apparatus. A functional or structural relationship between the sequence of steps of the method corresponds to control circuitry of the apparatus being set up to generate control signals in a technically sensible chronological order. Hence, when considering apparatus-type claims, no different conditions apply with respect to intermediate generalisations than for method claims.

1.7 Therefore, the board agrees with the decision under appeal that features f1' and f1" of claim 1 of the main request infringe Article 100(c) in conjunction with Article 123(2) EPC.

2. Main request – inventive step

2.1 The above objection under Article 123(2) EPC notwithstanding, the board judges that present claim 1 lacks an inventive step (Article 56 EPC).

2.2 The appellant has not contested that document **E1** may be considered as the closest prior art and that claim 1 differs only in the equaliser circuit (features f1, f1' and f1") from E1. However, the appellant argued that the skilled person would not have combined E1 with **E4**, because "their scope is going to different directions". If the two documents were combined, the skilled person would have used multiple equalisers and multiplexers instead of the circuit of claim 1. There was no motivation to extract only the equaliser circuit portion from E4.

At the oral proceedings, the appellant submitted the following additional arguments: E4 disclosed a *biasing* circuit and not an *equaliser* circuit within the meaning of the patent in suit. The biasing circuit was foreseen to solve the problem of shortening the setting time caused by stray capacitances. In contrast, the equaliser of the patent in suit served to increase the accuracy of the measurements (referring to E4t, bottom of page 6, and patent in suit, paragraph [0032]). In addition, in E4 the biasing was carried out *during* sensor measurement whereas, in the opposed patent, the equalising was carried out *prior to* sensor measurement.

2.3 The board is not convinced by these arguments. Similarly to E1, document E4 is targeted at "industrial control applications" (see **E4t**, page 3, lines 23 to 31). The board also agrees with the appealed decision that the skilled person would have extracted those components from E4 "that can shorten the setting time when measurement data of a low voltage signal is input after high voltage application" (see point 5.4.5 of the decision under appeal).

Regarding the argument that E4's bias circuit solved a different problem by shortening the setting time instead of enabling higher-accuracy measurements, the board notes that both circuits achieve a compromise between the aspects of speed and accuracy (see patent in suit, paragraph [0026] and E4t, page 6, second and third paragraphs). The timing diagrams of E4, Figures 8A and 8B, also show that the A/D conversion is effected at the end of a cycle (T) when the switch SW is not activated (see E4t, third paragraph from the bottom of page 16 to page 17, second paragraph). Finally, as argued by the respondent, the biasing circuit TC of E4 (see Figure 7A) provides the same functionality using the same components as "equaliser 100".

2.4 Hence, the board agrees with the decision under appeal that the subject-matter of claim 1 of the main request lacks an inventive step in view of E1 in combination with E4 (Article 56 EPC).

3. Auxiliary requests I to V - added subject-matter

3.1 Claim 1 of auxiliary request I was amended in feature f1' to specify "[an equaliser circuit] which

during sensor reading is coupled to the output of the multiplexer".

3.2 The wording "during sensor reading" was allegedly based on paragraph [0028] of the description as filed. However, the passage refers to a connection between the multiplexer bus and the circuit voltage reference and not between the output of the multiplexer and the equaliser circuit. The application as filed distinguishes between a circuit voltage reference (104) and an equaliser circuit (100), "comprising a plurality of switches" (see for example figure 3 and paragraph [0030]). Hence, the equaliser circuit is coupled to the output of the multiplexer (see paragraph [0010]), but this connection is permanent and not only active during sensor reading.

3.3 Therefore, the amendment to feature f1' of claim 1 of auxiliary request I contravenes Article 123(2) EPC.

3.4 Each claim 1 of auxiliary requests II to IV contains the same feature f1' as claim 1 of auxiliary request I. Moreover, claim 1 of auxiliary request V contains the corresponding method step "providing an industrial process control transmitter (16), comprising: ... an equalizer circuit (100) which during sensor reading is coupled to the output of the multiplexer (66) ...".

Hence, with respect to these auxiliary requests, the same arguments apply as for the higher-ranking auxiliary request I.

3.5 It follows that the subject-matter of claim 1 of auxiliary requests II to V likewise contravenes Article 123(2) EPC.

4. Auxiliary requests II-1 and IV-1 - admission

4.1 According to Article 13(2) RPBA 2020, "[a]ny amendment to a party's appeal case made ... after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned". In the application of Article 13(2) RPBA 2020, also the criteria of Article 13(1) RPBA 2020, such as *prima facie* allowability of an amended patent, may be used.

4.2 In auxiliary requests II-1 and IV-1, which were filed after notification of the summons to oral proceedings, the independent claims have been amended by deletion of the wording "which during sensor reading is". In addition, claim 1 of auxiliary request IV-1 has been amended by replacement of the wording "similar to" with "of the same type to".

4.3 The appellant argued that by removing the wording "which during sensor reading is" the patent claims according to auxiliary requests II-1 and IV-1 overcame the objection under Article 123(2) EPC. The appellant had only been made aware of this objection with the summons to oral proceedings. Additionally, the amended claims according to auxiliary request IV-1 had been further specified stating that the sensor to be measured was "of the same type to a previously measured sensor". This amendment overcame the objection under Article 84 EPC that the expression was unclear.

4.4 The board notes that the objection regarding the omitted wording "which during sensor reading is" was raised in the respondent's letter dated 11 October 2017 (see page 3, second to fourth paragraphs) thus prior to

notification of the summons to oral proceedings. The objection to the wording "similar to" was already discussed in the decision under appeal (see Reasons, point 7.3). Hence, both amendments when submitted after notification of the summons were not made in reaction to new objections, with the effect that there are no "exceptional circumstances" within the meaning of Article 13(2) RPBA 2020.

4.5 As to the clear allowability of claim 1 of **auxiliary request II-1**, it is *prima facie* apparent to the board that at least the objection raised under Article 56 EPC in point 2 above cannot be considered overcome, since the amended claims do not resolve the above considerations with respect to lack of inventive step (Article 56 EPC). Regarding **auxiliary request IV-1**, the objections on clarity and added subject-matter (Articles 84 and 123(2) EPC) cannot be considered overcome for the following reasons.

4.5.1 As far as the replacement wording "of the same type" is concerned, the respondent argued that it could be understood in various ways, for example relating to the measured quantity, the employed measuring principle, etc. In addition, there was no direct and unambiguous disclosure of the amendment.

4.5.2 The board finds that the expression "similar to" in the context of shortening the equalisation step is only disclosed in paragraph [0032] of the application as filed. As an example of similar sensors, the application refers to taking "multiple temperature measurements from a single device". Previous paragraphs, in particular paragraph [0031], may be understood such that the *similarity* of the *measured voltage* is essential and not the *type of sensor*.

Therefore, the board agrees with the respondent that the amendment is, *prima facie*, not clear (Article 84 EPC) and not directly and unambiguously derivable from the application as filed (Article 123(2) EPC).

4.6 Hence, the board decided not to admit auxiliary requests II-1 and IV-1 into the proceedings (Article 13(2) RPBA 2020).

5. Reimbursement of the appeal fee - Rule 103(1)(a) EPC

5.1 The appellant requests reimbursement of the appeal fee by dint of an alleged substantial procedural violation committed by the opposition division.

5.2 According to Rule 103(1)(a) EPC, the appeal fee shall be reimbursed in full where the board of appeal deems an appeal to be allowable. This condition is not fulfilled in the present case. Hence, for this reason alone, the request for reimbursement has to be refused.

6. Conclusion

Since there are no allowable requests on file, the appeal of the patent proprietor has to be dismissed.

Order

For these reasons it is decided that:

1. The request for reimbursement of the appeal fee is refused.

2. The appeal is dismissed.

The Registrar: The Chair:

B. Brückner K. Bengi-Akyürek

Decision electronically authenticated