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**Datasheet for the decision
of 18 December 2018**

Case Number: T 0438/14 - 3.4.02

Application Number: 04793809.7

Publication Number: 1678485

IPC: G01N25/66, H04N5/33

Language of the proceedings: EN

Title of invention:

METHOD AND IR-CAMERA FOR DETERMINING THE RISK OF CONDENSATION

Patent Proprietor:

Flir Systems AB

Opponent:

Testo AG, Testo AG

Headword:

Relevant legal provisions:

EPC 1973 Art. 56
EPC Art. 52(2) (c)

Keyword:

Inventive step - main request (yes)

Decisions cited:

Catchword:



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Case Number: T 0438/14 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 18 December 2018

Appellant: Testo AG, Testo AG
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted on
18 December 2013 concerning maintenance of the
European Patent No. 1678485 in amended form.

Composition of the Board:

Chairman R. Bekkering
Members: H. von Gronau
G. Decker

Summary of Facts and Submissions

- I. The appeal of the opponent is directed against the decision of the opposition division concerning maintenance of the European patent No. 1678485 in amended form. The opposition division in the contested decision came to the conclusion that the subject-matter of amended claim 1 involved an inventive step and that the patent and the invention to which it related met the requirements of the EPC.
- II. The appellant (opponent) requested that the patent be revoked, because the subject-matter of claim 1 did not involve an inventive step.
- III. The respondent (patent proprietor) requested that the patent as amended in first-instance opposition proceedings be maintained, i.e. that the appeal be dismissed (main request).
- IV. As an auxiliary measure, both parties requested oral proceedings.
- V. In a communication annexed to the summons to oral proceedings the board expressed its provisional opinion that *inter alia* the subject-matter of claim 1 involved an inventive step.
- VI. With a letter dated 16 November 2018 the respondent filed amended claims 1 to 4 according to an auxiliary request and requested maintenance of the opposed patent with these claims as an auxiliary measure.
- VII. Oral proceedings took place on 18 December 2018. At the end of the oral proceedings the parties confirmed their final requests as follows:

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested as a main request that the appeal of the opponent be dismissed and, as an auxiliary measure, that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the claims according to the auxiliary request filed with the letter dated 16 November 2018.

The chairman then announced the decision of the board.

VIII. The following documents are relevant for the present decision:

E1: GB 2 288 878 A

E2: JP 61 134 652 A

E3: English translation of document E2

E4a: Final report "IR-Thermographie im Bauwesen", Fraunhofer IRB Verlag, 2000, Stuttgart

E6: Operating instructions "VARIOSCAN compact, Modell 3011, 3011 - ST und 3012", JENOPTIC Laser, Optik, Systeme GmbH, October 1998, Jena

E13: JP 1 224 654 A

E14: US 6 033 107 A

IX. Claim 1 as maintained by the opposition division (main request) reads as follows:

"A method of determining at least one area of a surface in which there is an increased risk of condensation, comprising the steps of:

- a) using an IR camera to create an image of the temperature distribution in at least a part of the surface;
- b) inputting to the camera at least one value for the relative air humidity and at least one value for the air temperature in air surrounding the surface, wherein the step of inputting at least one value for the relative air humidity and at least one value for the air temperature in air surrounding the surface is performed manually;
- c) determining, on the basis of the input humidity and temperature values at least one condensation temperature at which there is a risk of condensation on the surface;
- d) comparing the temperature in at least one image point of the image to the condensation temperature;
- e) colouring any image points having a temperature lower than the condensation temperature in a particular colour, or grey tone, selected to indicate an increased risk of condensation; and
- f) simulating different conditions, by imaging the surface using different values for the air temperature and humidity in the preceding steps."

Reasons for the Decision

1. Main request - claim 1 - inventive step (Article 56 EPC 1973)

- 1.1 With the grounds of appeal the appellant challenged the inventive step of the claimed subject-matter.
- 1.2 The parties agree with the opinion of the opposition division that document E1 represents the closest prior art document and that the subject-matter of claim 1 differs from the disclosure of document E1 in that:
- i) an IR-camera is used;
 - ii) colours or grey tones are used to indicate risk of condensation;
 - iii) humidity and temperature values are manually input; and
 - iv) different conditions corresponding to different humidity/temperature values are simulated.
- 1.3 Furthermore, the parties agree with the opinion of the opposition division that the distinguishing features can be dealt with independently and that solutions (i) and (ii) represent normal technical developments in the field of thermography (cf. section I of the grounds of appeal; points 4.1 to 4.4 of the respondent's reply dated 23 September 2014).
- 1.4 According to the appellant, manually inputting measured data was part of the usual practice of a person skilled in the art, as evidenced by document E3 (cf. page 4, last line to page 5, line 2), document E6 (cf. page 22), where a setting of the emission value for the current measuring point was described, and document E14 (cf. column 8, line 61 to column 9, line 4), where key parameters of the disclosed detection algorithm were to be specified by the user.

The simulation at different environmental conditions by using different values not related to measured data as

defined in feature f) represented merely an instruction to the human mind ("Anweisung an den menschlichen Geist") within the meaning of Article 52(2)(c) EPC and did not contribute to inventive step. Feature f), therefore, included as the only technical feature the manual entry of the data and, therefore, was obvious in view of the common general knowledge of the person skilled in the art (cf. section III of the grounds of appeal).

During the oral proceedings the appellant added that according to features a) to e) measured data was input manually in an IR-camera and feature f) merely represented an instruction to the user. This feature did not further define the camera and therefore did not provide a technical contribution. Therefore, feature f) should not be considered for assessing inventive step.

If feature f) were nevertheless to be considered for the assessment of inventive step, the appellant in that case concurred with the opinion of the opposition division that simulation was generally used in various technical areas to show different conditions. The appellant contested however that the differing features iii) and iv) were not obvious in view of the common general knowledge of the person skilled in the art as it could be found in document E2/E3. In particular, document E2/E3 dealt with condensation on wall surfaces and methods indicating those condensations. It disclosed the use of an IR-camera for measuring the wall temperatures. These temperatures were used to detect condensation on the wall.

The appellant referred in particular to the passage from page 5, penultimate line to page 6, fifth line of document E3 where it was explained that the inside temperature of the wall was dependent on the outside

temperature of the wall. This relationship was generally known to a person skilled in the art as demonstrated by documents E13 and E4a, and with this relationship it was possible to simulate the temperature of the inner wall surface when the temperature on the outside of the wall varied so that the condensation could be displayed depending on these outside temperatures which could be input manually (cf. page 3, penultimate paragraph to page 5, third paragraph of the grounds of appeal). The subject-matter of claim 1 differed from the combination of document E1 with the common general knowledge as disclosed in document E2/E3 in that it was not the inner wall temperature that varied in response to the outside temperature, but the temperature and humidity in the air surrounding the inner wall surface was varied. Since the outside temperature was already varied, it was evident to the person skilled in the art to vary the other parameters as well to simulate the influence of the inside air parameters on the condensation.

During the oral proceedings the appellant emphasised that just one prior art document and common general knowledge were necessary to arrive at the claimed invention without an inventive step. Document E2/E3 was simply evidence of the common general knowledge in the art. The common general knowledge as evidenced by document E2/E3 comprised simulating the inner wall temperature depending on the outside temperature. The person skilled in the art knew that inside temperature and humidity were also relevant for the assessment of the dew point. Starting from document E1, the claimed invention solved the problem of enabling simulation of different conditions and the person skilled in the art using their common general knowledge would arrive without inventive step at a simulation in which the

inside air temperature and humidity were varied.

The appellant also maintained the line of argument it put forward in the grounds of appeal, according to which the claimed subject-matter was obvious in view of the combination of documents E1 and E2/E3 and common general knowledge.

- 1.5 According to the respondent the differing features iii) and iv) had the technical effect of enabling the indication of the risk of condensation on a surface for various environmental conditions which might occur during the service life thereof. At oral proceedings the respondent considered feature f) to be technical not only because of the implied act of manually inputting data, but also because the input values were used in a simulation to determine the risk of condensation. The method of determining the risk of condensation with the IR-camera was defined in steps a) to e), which were technical, and feature f) defined that the previous steps were also performed with different values. Therefore, feature f) was likewise technical.

The objective technical problem that was solved by the invention was therefore how to enable the indication of the risk of condensation on a surface for various environmental conditions which might occur during the service life thereof (cf. point 4.4 of the reply dated 23 September 2014).

During the oral proceedings the respondent was of the opinion that, in view of the disclosure of document E1, the claimed subject-matter solved the problem of enabling the indication of the risk of condensation on the surface during the service life thereof. The

inclusion of the reference to the "various environmental conditions which might occur" in the previously formulated problem could be regarded as a hint to the claimed solution.

The respondent submitted that document E2/E3 disclosed the estimation of the temperature on the inside of the wall when the temperature on the outside of the wall varied. It did not disclose accounting for various conditions which were different from those at the time of determination, as the opposition division put it correctly on page 10, last but two paragraph of the contested decision. Furthermore, inside air humidity was not used as an input parameter, but rather outside air temperature was measured. Hence, document E2/E3 did not contribute to the claimed solution of how to enable the indication of the risk of condensation on a surface for various environmental conditions which might occur during the service life thereof. The appellant's combination of document E1 with document E2/E3 and in addition with the common general knowledge of the person skilled in the art was a sign of inventive step (cf. point 4.7 of the reply dated 23 September 2014).

During the oral proceedings the respondent furthermore stressed that a single patent document such as document E2 and its translation E3 could not represent evidence for the common general knowledge of the person skilled in the art.

But even if document E2/E3 were considered as evidence for the common general knowledge of a person skilled in the art and the person skilled in the art were to use this knowledge to solve the above problem, starting from document E1 the skilled person would arrive at a method in which variations of the inner wall temperature depending on the outside temperature would

be considered, as suggested by document E2/E3. The combination of the disclosure of documents E1 and E2/E3 and/or common general knowledge did not suggest simulating different conditions by varying the values for the inside air temperature and humidity. Therefore, for a person skilled in the art a lot more steps were necessary to arrive, with the defined problem, at the claimed method.

- 1.6 The board is of the opinion that step f) of simulating different conditions by imaging the surface using different values for the air temperature and humidity in the preceding steps does not constitute an instruction for a mental act within the meaning of Article 52(2)c) EPC. A mental act, if there were one, would be limited to the selection of suitable values for the air temperature and humidity in the claimed method to indicate a risk of condensation under varying conditions. However, step f) implies technical means for manually entering values and for calculating and displaying the surface areas that develop the risk of condensation at different parameter values. Method step f) therefore implies technical means and does not represent a mental act as such.

The board agrees with the parties' assessment of the closest prior art document and the differing features. With respect to the differing features iii) and iv) the board agrees with the respondent that they provide the effect of enabling the indication of the risk of condensation on a surface for various environmental conditions which might occur during the service life thereof. The objective technical problem that is solved by the invention is, therefore, enabling the indication of the risk of condensation on a surface for various environmental conditions which might occur during the

service life thereof. The board considers that the reference to the "various environmental conditions which might occur" does not lead to the claimed invention as submitted by the respondent. By contrast, the problem suggested by the appellant of enabling simulation of different conditions already includes parts of the solution and is therefore not considered appropriate by the board.

The board is of the opinion that a single patent document such as document E2 and its translation E3 does not represent evidence for the common general knowledge of the person skilled in the art (cf. Case Law of the Boards of Appeal, 8th edition 2016, I.C. 2.8.2).

But even if, *arguendo*, document E2/E3 were considered as evidence for the common general knowledge, the person skilled in the art would not arrive at the claimed solution when looking for a solution to the above problem. Document E2/E3 does not suggest inputting different values for the inside air temperature and humidity to simulate different conditions of condensation at a given wall temperature distribution. The person skilled in the art would know from their common general knowledge as evidenced by document E2/E3 that the outside temperature of the wall can be considered to simulate variations of the inside temperature of the wall. The word "simulated" on page 6, first paragraph of document E3 is used to indicate that the temperature of each part of the inside wall surface is determined or calculated by applying a previously stored relational expression when the temperature on the outside of this wall surface varies. The board agrees with the opinion of the opposition division and the respondent that document E3 does not disclose the input of various values that are different

from the actual outside temperature, as the appellant suggested. According to the board the passage from page 5, penultimate line to page 6, fifth line, of document E3 only discloses that the temperature of each part of the inner wall surface can be calculated when the actual temperature on the outside of this wall varies, without measuring the temperature on the inner wall. Combining the method of document E1 with the common general knowledge as evidenced by document E2/E3 would result in a method in which the apparatus also calculates the influence of the actual outside temperature on the inside temperature of the wall. However, document E2/E3 does not suggest inputting different outside temperature values independent from the actual outside temperature or inputting different inside temperature and humidity values and calculating the respective dew points on the wall. The person skilled in the art would have to find out without any specific hint from document E2/E3 or the corresponding common general knowledge in the art that manually inputting values for the relative air humidity and temperature could provide a solution if different input values were used. The board is of the opinion that without the knowledge of the claimed invention the person skilled in the art would not input different temperature and humidity values in the method disclosed in document E1 in view of the common general knowledge based on the teaching of document E2/E3.

In the board's view, the appellant's further line of argument, according to which the claimed subject-matter is obvious in view of the combination of documents E1 and E2/E3 and common general knowledge, is not convincing either. As demonstrated above, the combination of documents E1 and E2/E3 would result in a method in which the apparatus also calculates the

influence of the varying outside temperature on the inside temperature of the wall. Document E2/E3 does not suggest inputting different inside values and calculating the respective dew points on the wall. The person skilled in the art would have to find out solely from their common general knowledge in the art that inputting manually different values for the relative air humidity and the temperature could also provide a solution. The board is of the opinion that without the knowledge of the claimed invention the person skilled in the art would not input different temperature and humidity values in the method resulting from a combination of document E1 and document E2/E3. Furthermore, the line of argument presented by the appellant in which the combined features of documents E1 and E2/E3 were identified and the objective technical problem was determined from the difference between this combination of features and the claimed solution is not in line with the problem-solution approach applied at the EPO (cf. Case Law of the Boards of Appeal, 8th edition 2016, I.D.2). The board does not consider this line of reasoning to be convincing.

1.7 Therefore, the subject-matter of claim 1 involves an inventive step in view of document E1 in combination with the common general knowledge in the art, even if document E2/E3 were to be considered as evidence of the common general knowledge as well as in view of the combination of documents E1 and E2/E3 and common general knowledge.

1.8 The other prior art documents do not suggest using different values for air and humidity in the air surrounding the inner wall surface either.

Document E4a concerns the calculation of the temperature distribution of an outside wall considering the inside temperature and the structure and defects of the wall. The temperature at the outside of the wall can be calculated depending on the temperature difference between the outside temperature and the inside temperature and the solar radiation. Thus, it is not necessary to measure the wall temperature at cold outside temperatures to detect defects in the wall. The dew point is not considered in the disclosed calculations and different temperature and humidity values are not input to estimate the risk of condensation. Therefore, the person skilled in the art does not find the claimed solution in document E4a for the above-identified problem starting from E1.

In the method of document E13 the wall temperature is measured by a raster scanner, outside temperature T_b and room temperature T_a and humidity C are also measured, and a map is created indicating at which part of the wall and at which temperature condensation starts (cf. abstract). This document does not suggest inputting values other than the measured temperature and humidity values.

Document E14 deals with the creation of temperature maps to find hot spots on an object surface. Basic parameters of the algorithm can be specified by the user, so that valid hot spots can be detected. The user therefore manually enters an environment parameter. A variation of temperature and humidity for the determination of condensation is not suggested by this document.

1.9 The board therefore concludes that the subject-matter of claim 1 involves an inventive step.

2. The appellant did not raise any further objections which could prevent the maintenance of the patent in amended form. Neither are further objections apparent to the board. Therefore, the appeal of the opponent is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



M. Kiehl

R. Bekkering

Decision electronically authenticated