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**Datasheet for the decision
of 20 March 2007**

Case Number: T 1398/04 - 3.2.03

Application Number: 98913778.1

Publication Number: 0979378

IPC: F26B 3/30

Language of the proceedings: EN

Title of invention:

Method and apparatus for extracting moisture and/or mold from
a structure of a building

Patentee:

Pohjois-Suomen Kuivausteknikka OY

Opponent:

Cramo Oyj

Headword:

-

Relevant legal provisions:

EPC Art. 123(2), 84, 56

Keyword:

"Amendments - broadening of claim by inclusion of a functional
feature (no)"

"Clarity of claims - functional features (yes)"

"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 1398/04 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 20 March 2007

Appellant:
(Opponent)

Cramo Oyj
Kalliosolantie 2
FI-01740 Vantaa (FI)

Representative:

Langenskiöld, Tord Karl Walter
Oy Jalo Ant-Wuorinen Ab
Iso-Roobertinkatu 4-6 A
FI-00120 Helsinki (FI)

Respondent:
(Patent Proprietor)

Pohjois-Suomen Kuivausteknikka OY
Lohenpyrstö 12
FI-87700 Kajaani (FI)

Representative:

Tanskanen, Jarmo Tapio
Papula Oy
P.O. Box 981
FI-00101 Helsinki (FI)

Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 13 August 2004
rejecting the opposition filed against European
patent No. 0979378 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
M. Vogel

Summary of Facts and Submissions

I. European patent EP-B1-0 979 378 concerns a method and apparatus for extracting moisture and/or mould from a structure of a building. Grant of the patent had been opposed on the grounds that the subject-matter of the patent lacks novelty and/or inventive step. This appeal lies from the decision of the opposition division, posted on 13 August 2004, to reject the opposition. The appeal, together with the appeal fee, was filed by the appellant (opponent) on 28 September 2004; a statement containing the grounds of appeal was filed on 9 December 2004.

II. In a communication dated 27 October 2006, the Board issued, together with a summons to attend oral proceedings, a preliminary opinion pursuant to Article 11(1) of Rules of Procedure of the Boards of Appeal. In response to this communication, the respondent filed with the letter dated 19 January 2007 amended claims according to a main and four auxiliary requests. Oral proceedings were duly held on 20 March 2007.

III. Requests

During the oral proceedings, the parties confirmed their requests to be as follows.

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

The respondent requested that the appeal be dismissed and the patent be maintained in amended form on the basis of

- claims 1 to 25 filed as the first auxiliary request with the letter of 19 January 2007;
- description pages 3 to 5, filed as the description of the first aux request of 19 January 2007 and page 2 filed during the oral proceedings;
- figures 1 to 5 as granted.

IV. Prior Art

The opposition was based, amongst others, on the following documents:

D2: WO-A-92 08084

D4: D. Björkholtz, "Rakennuksen kuivattaminen", pages 60 to 62, Rakentajain Kustannus 1990 (together with an English translation).

V. Claims

VI. Claim 1 reads as follows:

"1. Procedure for removing moisture and/or mould from a structure in a building, e.g. from a floor, wall or equivalent, in which procedure air is circulated in the vicinity of the structure to be dried and/or the structure is heated by applying periodic heating and cooling phases to it, wherein, using infrared radiation

generated by an infrared radiator, the structure is heated through its essential thickness to a raised temperature that is sufficient for removing moisture and possible mould, and the surface of the structure is cooled via air flushing, wherein the air flow flushes the surface of the structure to be dried over the whole area under the infrared radiator, so that the surface temperature of the structure becomes lower than its inside temperature raised by heating, with the result that the moisture in the warm structure tends to drift towards the cooler surface and is removed from the surface by the air flushing."

Dependent claims 2 to 14 describe preferred embodiments of the procedure of claim 1.

Independent claim 15 is directed to an apparatus:

"15. Apparatus for implementing a procedure as defined in any one of claims 1 - 14 for the removal of moisture and/or mould from a structure, such as a floor, wall or equivalent, said apparatus comprising a box-like casing (1), which is open on one side to be placed against the structure to be dried, and a heating element (2) mounted in the space inside the casing, and means (3, 4) for generating a negative and/or positive pressure to create an air flow inside the casing, wherein the heater element (2) is a planar infrared radiator provided with a central through opening (11) for air flushing the surface of the structure; and that the apparatus comprises a controller (5) arranged to control the operation of the heating element (2) and the means (3) for creating an air flow inside the casing in accordance with a predetermined precept, such

that, in use, the structure is heated through its essential thickness to a raised temperature that is sufficient for removing moisture and possible mould, and the surface of the structure is cooled via air flushing so that the surface temperature of the structure becomes lower than its inside temperature raised by heating."

Dependent claims 16 to 25 concern preferred embodiments of the apparatus of claim 15.

VII. Submissions of the Parties

(a) Article 123(2) EPC

The respondent amended claim 1 as granted to include the feature that the infrared radiation is generated by an infrared radiator and that the air flow flushes the surface of the structure to be dried over the whole area under the infrared radiator. The respondent referred to column 3, lines 24 to 26 and column 7, lines 21 to 24 of the disputed patent as support for the amendment.

The appellant submitted that hole 11 in the radiator panel is essential for achieving the required air flow, and that the application does not disclose any means other than a central opening as being able to create an air flow over the whole area under the radiator. The consequence of failing to define a central opening in claim 1 is that the scope of protection is broadened to include any means by which the defined air flow is created; since such a generalisation is not disclosed

in the application as originally filed, the amendment is contrary to Article 123(2) EPC.

(b) Article 84 EPC

The appellant argued that the requirement that the air flow flushes the surface of the structure to be dried over the whole area under the infrared radiator defines a result to be achieved. Whilst the patent specification disclosed one means for achieving the result, there is no teaching as to how the effect in general can be obtained.

The respondent replied that the feature, as defined in the claim, clearly instructs the skilled person what to do. He is aware of the area under the heater and must arrange that the whole surface corresponding to this area is flushed by the air flow.

(c) Claim 1 - Inventive Step (Article 56 EPC)

Claim 1 differs from D4 in that it explicitly states that the air flow flushes the whole area under the infrared radiator. This however, according to the appellant, would inevitably happen in the process of D4 where infrared radiator are used in combination with ventilation, since the skilled person would not go to the trouble of shielding-off part of the area under the radiator to prevent movement of the air flow.

In addition, D2 discloses a heater that is equipped with a ventilation device that flushes the area under the heater. At page 6, lines 33 to 34 of D2 it is stated that there is free ventilation air flow, and the

figure shows an exhaust aperture (11) in the lower part of the heater that would ensure that the air flow covers the whole area of the surface to be dried. Given that the air is flowing from the ventilation fan (5) to exhaust aperture (11) it is a moving stream and would inevitably have a cooling effect on the surface being dried.

Consequently the claimed procedure lacks an inventive step in light of either D4 alone, or D4 in combination with D2.

The respondent argued that D4 does not disclose how the ventilation is achieved. Without making some special arrangement, the air flow under the heater is uneven and hot spots can develop on the surface being dried. By flushing the whole area, uniform cooling over the whole surface results, and there is no indication of this in D4.

The disputed patent concerns a process involving alternating heating and cooling steps, whereas D2 is concerned with drying a surface in one go, which involves holding the surface at a given temperature (page 3, lines 19 to 27 and claims 4 to 6 of D2). D2 does not concern infrared heating but microwave heating, and the air flow referred to in D2 is used for cooling the magnetrons and is not for cooling the surface in sense of the disputed patent. Given the differences between the processes of D4 and D2, the skilled person would not consider combining the documents.

(d) Claim 15 - Inventive Step (Article 56 EPC)

The appellant submitted that the claimed apparatus lacks inventive step in light of D2 and D4.

D2 discloses a box-like structure with an open side to be directed against the target surface, an internal radiation source, active ventilation means, means for control, and periodic heating may be used for moisture removal in building structures. The view of the opposition division was that D2 does not disclose a radiator with a opening for providing flushing in the sense of the invention. The appellant disputed this, arguing that the figure of D2 shows an opening (10) for admitting air and exhaust opening (11); the air flow path between these openings is across the whole target surface.

Thus, the technical features given in claim 15 largely correspond to those of the apparatus disclosed in D2, with the exception of the nature of the source of radiation. The use of infrared radiation is, however, mentioned in D2 (page 1, line 11) as an alternative source. In addition, D4 provides the teaching of periodic infrared heating and appropriate ventilation for moisture removal in building structures. Since both D2 and D4 deal with the problem of moisture removal in building structures, the skilled person would consider their combined teachings, and in doing so would derive an apparatus as defined in claim 15.

The respondent argued that D2 fails to provide any encouragement for the skilled person to replace the magnetrons by infrared heaters, since D2 mentions

(page 1, lines 18, 19, 25 and 26) that the use of infrared heaters leads to slow progress and has high energy requirements, as well as causing significant problems and costs. Since replacing the magnetrons of D2 by infrared heaters is acting against the teaching of D2, the claimed apparatus is inventive.

Reasons for the Decision

1. The appeal is admissible.
2. *Claim 1 - Procedure*
 - 2.1 Article 123(2) EPC

Compared with claim 1 of the granted patent, claim 1 of the main request has been amended to contain the feature that the air flow flushes the surface of the structure to be dried over the whole area under the infrared radiator. The application as originally filed (WO-A-98 045653) states that (see page 11, lines 20 to 24) "Fig. 4 shows a hole 11 in the infrared radiator panel 2, which ensures that the air flow will uniformly flush the surface of the structure to be dried over the whole area of under the infrared radiator 2." Therefore the amendment to granted claim 1 is disclosed in the application as originally filed.

The feature can be seen as a functional feature, but its inclusion in claim 1 does not lead to an objection under Article 123(2) EPC, since the function is itself described in the application (that the air flow uniformly flushes the surface of the structure to be

dried over the whole area of under the infrared radiator). The disclosure of a specific structural feature (a hole (11) in the infrared radiator panel) that enables the function to be realised does not detract from the disclosure of the general function itself. The Board therefore does not agree with the argument of the appellant that the feature concerns a generalisation not supported by the original disclosure.

Consequently, amendment of granted claim 1 to include this feature does not lead to an infringement of Article 123(2) EPC.

2.2 Article 84 EPC

A functional feature defined by a technical result does not attract any objection under Article 84 EPC, so long as the skilled person knows what must be done in order to obtain the required result and how to determine whether or not the required result has been obtained. In the present case the wording and meaning of the functional feature defined in the claim is clear. As argued by the respondent, the skilled person is aware of the area under the heater and must arrange that the whole surface of the structure under this area is subjected to air flow. This instruction is clear, and there is no undue burden in determining what is to be done to obtain the required result and to establish whether or not it has been achieved, as the patent specification discloses that this can be brought about by means of a central opening in the infrared heater. Although there may be other ways in which the air flow could be made to flush the whole area under the heater, the skilled person has a sufficiently clear

understanding of this feature having read the example in the specification; there is no doubt that the skilled person can determine, using readily available technical means, whether the whole surface or only part of it, has been flushed by air. The amendment therefore does not contravene Article 84 EPC.

2.3 Inventive Step (Article 56 EPC)

Document D4 describes a process for removing moisture from a structure in a building using an infrared radiator and by applying periodic heating and cooling phases. It is clear that novelty is not in issue here, and this has not been contested by the appellant. The process described in D4 is seen by the parties and the opposition division as being the closest prior art to that of claim 1, and the Board sees no reason to depart from this view.

Compared with the disclosure of D4, the procedure of claim 1 differs in that, during the cooling phase, an air flow flushes the surface of the structure to be dried over the whole area under the infrared radiator, so that the surface temperature of the structure becomes lower than the inside temperature raised by heating.

D4 mentions that when carrying out the process, the general rules of drying should be adhered to, ie if the relative humidity exceeds 50%, ventilation must be increased. Whereas ventilating means that air flows to a greater or lesser extent across the surface to be dried, there is no clear indication in D4 that air flows over the whole area under the infrared radiator.

Starting from D4, the problem to be solved is seen as how improve the ventilation.

The arrangement of air flow, as defined in claim 1, cannot be derived from D4 alone, as the document simply indicates that ventilation is controlled; this may merely involve opening and closing a window in the building. In addition, there is no information about the infrared radiator, which after the heating phase could be moved away, so that there is no air flow over the surface to be cooled beneath the radiator.

D2 is a document describing a process for drying structures, in which ventilation air flows over the surface to be dried that is under the heater. The question is therefore whether the skilled person starting from D4 would consult D2 in expectation of finding the solution to the posed problem.

Although D2 refers to periodic and partial drying steps, the intention is not to create a cyclic heating/cooling process in the sense of D4 or the disputed patent, but instead to maintain the object to be dried at a substantially constant temperature (see D2, page 3, lines 18 to 27 and claim 6).

Rather than an infrared radiator, which D2 regards as being slow and having a comparatively high energy requirement (see page 1, lines 8 to 19), the process of D2 employs a magnetron and drying is achieved using microwave radiation.

A ventilation means (5) blows air over the magnetrons (4) in order to cool them, and an exhaust aperture (11) is located in the wall of the chamber below the magnetrons (see the figure of D2). After cooling the magnetrons, the air flows over the surface to be dried removing moisture that has been evaporated from the surface (page 6, lines 8 to 11). However, it is not clear from the figure or the description of D2 how the air flows from the space containing the magnetrons to that above the surface to be dried, and in particular whether the air flow would flush the whole of the area beneath the magnetrons. In addition, having passed over the magnetrons, the air will have increased in temperature, and it is not apparent that the resulting effect would be a lowering of the surface temperature of the structure compared with the interior temperature; D2 merely teaches that the air is used to remove evaporated moisture and, as mentioned above, the purpose of the apparatus of D2 is maintain a fairly constant temperature.

Since D2 is concerned with a different type of process using a different type of heating means, the Board considers that the skilled person would not consult the document in expectation of finding a solution to the problem of improving the ventilation mentioned in D4. Further, even if he were to do so, D2 does not provide any teaching that would lead to the solution defined in claim 1.

The effect of the claimed air flow is to provide uniform cooling and prevent the formation of hot spots on the surface of the structure to be dried. Since, starting from the process described in D4, the feature

of flushing the surface of the whole area under the infrared radiator is not rendered obvious, the claimed process has an inventive step.

3. *Claim 15 - Apparatus - Inventive Step (Article 56 EPC)*

Novelty of claim 15 was not disputed. Whereas D4 discloses a process for removing moisture from a structure, D2 is directed to an apparatus for this purpose, and hence provides the more suitable starting point for the assessment of inventive step.

D2 discloses an apparatus comprising a box-like casing, which is open on one side, and which is to be placed against the structure to be dried. There is a means (5) for blowing air into the box, and hence for generating a positive pressure. Heat is provided by means of a microwave source (4) connected to a control circuit (13).

The apparatus of claim 15 differs from that of D2 in that the heating element is an infrared radiator with a central opening, as compared with the microwave source of D2. As set out above, the effect of the opening is to provide a more uniform air flow over the whole area under the infrared heater. Starting from D2 the problem to be solved is seen as how to provide an improved apparatus for drying structures in a building.

D2 acknowledges that it is common practice to use infrared radiators, but states that they have relatively high energy requirements and the process can be slow, therefore recommends the use of microwaves. Even if the skilled person is aware that the use of

infrared heaters is common practice, there is no incentive on reading D2 to replace the microwave source by an infrared radiator, and none of the cited prior art points to using an infrared heater with an opening or any advantages associated with a uniform air flow. The appellant refers to opening (10) of D2, but this is in the box cover and not in the heater (see the figure and the sentence spanning pages 5 and 6) and cannot be equated to the opening in the infrared heater of claim 15. D2 does not disclose how the air flows from the space around the magnetrons through the supporting structure (14) to the space above the surface to be dried, hence D2 does not disclose a heater provided with a central through opening.

Since, starting from D2, it is not obvious to replace the magnetrons by an infrared radiator having a central opening, the apparatus of claim 15 has an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of the following documents:
 - claims 1 to 25 filed as the first auxiliary request with the letter of 19 January 2007;
 - description pages 3 to 5, filed as the description of the first auxiliary request of 19 January 2007 and page 2 filed during the oral proceedings;
 - figures 1 to 5 as granted.

The Registrar:

The Chairman:

A. Counillon

U. Krause