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D E C I S I O N
of 30 March 2004

Case Number: T 0633/02 - 3.2.3

Application Number: 94115945.1

Publication Number: 0647819

IPC: F24D 5/08

Language of the proceedings: EN

Title of invention:
Device for heating enclosed spaces

Patentee:
OFFICINE TERMOTECNICHE FRACCARO O.T.F. S.r.l.

Opponent:
CarliEUklima SpA

Headword:
-

Relevant legal provisions:
EPC Art. 56, 111(1)

Keyword:
"Inventive step - (yes) in view of written prior art"
"Remittal to the first instance for investigation of alleged prior use"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0633/02 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 30 March 2004

Appellant: (Opponent)
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Respondent: (Proprietor of the patent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 22 April 2002 rejecting the opposition filed against European patent No. 0647819 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: U. Krause
J. P. B. Seitz

Summary of Facts and Submissions

I. The appeal contests the decision of the Opposition Division, dated 30 March 2002 and posted 22 April 2002, to reject the opposition against European Patent No. 0 647 819. The single independent claim of this patent reads as follows:

"1. Device for heating enclosed spaces, comprising at least one closed-circuit pipeline (2) which acts by heat radiation, a burner (3) for providing a flame at the pipeline (2) for direct heating of a heating medium, and a fan (4) arranged upstream of said burner (3) at said pipeline for producing a negative pressure therein, said heating medium being constituted by a mixture of combustion gas and air, characterized in that said burner (3) is a multiple-flame Venturi-tube burner providing a joint flame extending into a flame tube (16) which laterally surrounds said joint flame so as to provide a chamber (7) wherein the heating medium is delivered laterally to the flame tube (16), and is circulated thereabout, whereupon the heating medium mixes, downstream of said flame tube (16), with flame combustion gas and air drawn from outside due to the negative pressure created by said fan (4) and by the jets of pressurized combustible gas inside said multiple-flame Venturi-tube burner."

II. The opposition was based on the grounds of Article 100(a) EPC, lack of novelty and inventive step, in view of the following patent documents:

D1: FR-A-0 606 020

D2: EP-A-0 079 526

D3: EP-A-0 509 155

D4: FR-A-2 339 134

D5: EP-A-0 503 489

D6: AT-B-0 386 885

Further, the following documents were submitted as evidence for an alleged prior use:

D7: Statutory declaration of Mr Mario Smiderle, dated 22 August 2000, with invoice No. 168/89 and delivery notes of the company Fraccaro Elettronica, with corresponding English translations

D8: Copy of invoice No. 05 of the company EUKlima, dated 26 February 1993, with English translation

D9: Copy of invoice No. 06 of the company EUKlima, dated 1 March 1993, with English translation

D10: Statutory declaration of Mr Gastone Martorel, dated 9 October 2000, with English translation and attached drawing RK002_GM

D11: Statutory declaration of Mr Diego Smiderle, dated 11 February 2002, with English translation and two pages containing Figures 8 to 11, allegedly taken

from an instruction manual published by the patent proprietor

D12: Statutory declaration of Mr Davide Smiderle, dated 11 February 2002, with English translation

Having disregarded documents D11 and D12 as late-filed and not sufficiently relevant, the first instance considered the alleged prior use as not proven and came to the conclusion that the subject-matter of claim 1 was neither anticipated nor rendered obvious by the prior art according to patent documents D1 to D6.

III. The Opponent (hereinafter denoted Appellant) filed the notice of appeal on 21 June 2002 and paid the appeal fee on the same day. The statement of the grounds of appeal, received on 21 August 2002, included a new copy of invoice 168/89 showing the addressee MECC ALTE and the prices of the various parts.

In response to a communication of the Board pursuant to Article 11(1) RPBA the Appellant made reference to document GB-A-1 448 073 (D0) cited in the patent in suit and submitted the following further evidence relating to the alleged prior use (D13 to D16) and to the heating device of D5 (D17 to D19):

D13: invoice No. 397 of Fraccaro Renzo to Mario Smiderle dated 30 September 1989

D14: invoice No. 402 of Fraccaro Renzo to Mario Smiderle dated 31 October 1989

D15: A request of Gimmi Fraccaro for an opinion from the Fire Brigade Headquarters of Vicenza, dated 17 February 1991

D16: A report on an intervention by Fraccaro Elettronica in the name of Mr Mario Smiderle dated 31 October 1989

D17: A page "Scheda Tecnica" of PHEBA s.r.l. relating to the pressure variation along the heating tube of a heating device "Pender Vario"

D18: a copy of invoice No. 041/90 of PHEBA s.r.l. to Carli Mario, dated 14 December 1990

D19: a page "Pender Nastro Radiante Vario" by PHEBA s.r.l.

English translations of the essential parts of these documents were also furnished.

With its reply dated 27 February 2004 the Proprietor of the patent (hereinafter denoted Respondent) submitted a photograph "PO1" relating to the alleged prior use and four sets of claims corresponding to auxiliary requests 1 to 4.

With a fax dated 15 March 2004 the Board informed the parties that it did not intend to hear the witnesses offered for proving the alleged prior use and that it intended, if the technical details of this prior use turned out, during the forthcoming oral proceedings, to be decisive, to remit the case to the first instance to clarify these details.

During the oral proceedings held on 30 March 2004 only the patent documents were taken into consideration as prior art.

IV. The Appellant requests that the decision under appeal be set aside and that the European patent No. 0 647 819 be revoked.

The Respondent requests that the appeal be dismissed and that the patent be maintained as granted (main request), or that the impugned decision be set aside and that the patent be maintained in amended form according to one of its auxiliary requests 1 to 4.

V. The essential arguments of the parties in support of their requests can be summarized as follows:

Appellant:

The subject-matter of claim 1 was rendered obvious by document D5 taken in combination with the common general knowledge and/or with document D6, or by the prior use taken in combination with the common general knowledge, document D0 or document D5.

As to the first combination based on D5, it was evident from various parts of the description of D5 (e.g. page 2, lines 1 to 4, and page 3, lines 7 to 18) that it related to a heating device having a closed circuit heating pipeline connecting the mixing chamber with the return chamber. The type of burner was not specified. However, since the heating device was said, in lines 50 and 51 of page 2, to be operable at an underpressure

within the heating pipeline and a confirmation of this operation was found in D17 relating to the same type of heating device, the skilled person would consider all types of burners suitable for such conditions, including Venturi-tube burners which were commonly known for their simplicity and ease of operation. A suitable Venturi-tube burner was disclosed in D6 having a plurality of parallel Venturi tubes producing a joint flame at the outlet of the combustion chamber to which the Venturi tubes were attached.

The basis of the second combination was formed by the prior use consisting in the purchase of a heating device from the company Fraccaro Renzo Termotecnica by the firm Smiderle Mario and its installation at MECC ALTE S.p.A. in 1989. It was demonstrated by evidence D7, D11 and D12 and in particular by the Figures 8, 9 and 11 taken from the instruction manual of this heating device (included in D11) that the heating device installed at MECC ALTE S.p.A. in 1989 comprised an open-circuit heating pipeline having a multiple flame Venturi-tube burner providing a joint flame at its inlet end and a fan at its outlet end for discharging the heating medium to the ambient. Thus, the fan created a "negative" pressure which sucked the primary air, together with the combustion gas, from outside through the Venturi tubes. It was obvious that an open circuit was less energy efficient than a closed circuit and that the same components as in the prior use could be as well used in a closed circuit, in particular as it was known from D0 (Figure 5) or D5 to operate a closed circuit heating system with the (under-)pressure conditions in the combustion chamber prevailing in the open system of the prior use.

Respondent:

As to D5, the underpressure mentioned on page 2 referred to the heating tube which did not mean that a similar underpressure prevailed in the combustion chamber. D17 to D19 could not be taken into consideration because there was no evidence that these documents concerned the same heating device as D5. It had to be assumed that the discharge side of the fan was at an overpressure, which would prevent replacing the blast type burner of D5 by a Venturi-tube burner. D6 was concerned with the problem of air aspiration in multiple Venturi-tube burners and a solution by choosing different lengths for the adjacent Venturi tubes. D6 did not mention that a common or single flame was produced and there was no reason to presume this to happen, especially as there was a considerable spacing between the Venturi tubes for reducing the mutual disturbances therebetween, and as the various combustion chambers in the embodiment of Figures 1 and 2 or the various outlet holes of the single combustion chamber in the embodiment of Figure 3 would generate individual flames. Any common knowledge concerning Venturi-tube burners would have to be supported by evidence such as textbooks to be taken into consideration, and no such evidence was submitted.

The prior use was not proven mainly because the invoice 168/89 included in D7 had a different appearance from the corresponding debit note filed with the statement of the grounds of appeal, and it was disputed that the Figures 8, 9 and 11 attached to D11 were taken from an instruction manual of Fraccaro. Further, these figures

showed a Venturi-tube burner with a single Venturi tube supported by two tube portions below, as shown in the photograph "P01", rather than a multiple-flame Venturi-tube burner.

Since a Venturi-tube burner as claimed in the patent in suit was disclosed neither in D6 nor by the prior use, if this had occurred, and no other document disclosing a Venturi-tube burner was available, the appeal had to be dismissed.

Reasons for the Decision

1. The appeal complies with the provisions of Articles 106 to 108 EPC and of Rules 1(1) and 64 EPC and is, therefore, admissible.

2. The first instance considered the alleged prior use as being not proven and based its decision on novelty and inventive step only on the prior art represented by the patent documents D1 to D6. The Appellant formally maintained the objection of lacking novelty but argued essentially that the subject-matter of claim 1 was devoid of an inventive step in view of either document D5 taken in combination with the common general knowledge and/or with document D6 (which will hereinafter be denoted as "first approach"), or the prior use taken in combination with the common general knowledge, document D0 or document D5 (hereinafter denoted "second approach").

3. *"First approach"*

3.1 As regards the first approach, only the patent documents D1 to D6 will have to be considered. The issue of novelty in view of these documents was dealt with in detail on pages 6 and 7 of the impugned decision and it was convincingly concluded that this prior art did not destroy the novelty of the subject-matter of the patent in suit. This conclusion was not challenged by the Appellant and the Board sees no reason to call it into question.

3.2 Regarding inventive step the first approach concurs with the finding, in the appealed decision, that document D5 forms the pertinent prior art among the available patent documents. The Board endorses this view because the heating device disclosed in D5 is clearly more closely related to the patent, as regards its overall structure and specific issues such as the combustion chamber, than the other available patent documents.

3.3 It is not disputed that document D5 discloses a heating device comprising, in the language of claim 1 of the patent in suit, a pipeline which acts by heat radiation, a burner for providing a flame at the pipeline for direct heating of a heating medium consisting of a mixture of combustion gas and air, and a fan arranged upstream of the burner at the pipeline. According to the description in the first paragraph of page 2 the heating tube or "pipeline" is interposed between a mixing chamber communicating with the burner and a return chamber communicating with the fan, so as to form, in combination with a mixing chamber housing

providing a flow path between the fan and the mixing chamber, a closed-circuit pipeline including the burner and the fan.

The burner itself is not described in detail but, judging from the representation in Figure 1, seems to be a blast, or ventilated, burner aspiring and compressing ambient air from outside and mixing it with fuel for combustion with a flame within a flame tube within the mixing chamber. The heating medium is delivered from the fan through a flow control flap into the mixing chamber in a radial or "lateral" direction to the flame tube so as to circulate about the flame tube and mix with the combustion gas and air coming from the burner downstream of the flame tube. According to page 2, lines 48 to 51, of D5 the flow control flap may be utilised to adjust "a pressureless state of the combustion chamber or underpressure operation within the heating tube" (literal translation of the sentence starting with "Hierbei..." in lines 50 and 51). Thus, the pressure within the combustion chamber may be adjusted, by generating a pressure drop between the fan discharge side and the combustion chamber by means of the flow control flap, to correspond to the ambient pressure whereby the pressure within the heating tube, being downstream of the combustion chamber, is lower than the ambient pressure or "negative", as defined in claim 1 of the patent in suit.

3.4 The subject-matter of claim 1 therefore differs from the heating device disclosed in D5 in that the burner is a multiple-flame Venturi-tube burner providing a joint flame, whereby the combustion air is drawn from outside due to the negative pressure created by the fan

and by the jets of pressurized combustible gas inside the multiple-flame Venturi-tube burner. In contrast to the ventilated burner of D5, the primary combustion air required for combustion in the claimed Venturi-tube burner is aspired by the low pressure or partial vacuum prevailing in the combustion chamber in combination with the entraining effect of the combustion gas jets. This requires a corresponding low pressure level within the combustion chamber but eliminates the problems encountered with ventilated burners according to paragraph 0008 of the patent, for example with regard to the required maintenance work and costs. The efficiency of the Venturi burners is enhanced by providing a type with multiple flames, i.e. multiple adjacent Venturi tubes as shown in Figure 3 of the patent in suit, joining into a single flame which thereafter smoothly mixes with the recirculated heating medium delivered by the fan.

3.5 The Appellant argues that the skilled person would consider all types of burners suitable for the pressure conditions prevailing in the combustion chamber of the heating device of D5, including Venturi-tube burners which were commonly known for their simplicity and ease of operation. The Board can follow this argument to the extent that Venturi-tube burners as such, as well as the required operating conditions and advantages thereof, form part of the common general knowledge of a skilled person working in the field of heating devices. This knowledge does not, however, lead the skilled person directly to the subject-matter of the patent in suit. In fact, a typical Venturi-tube burner having a single Venturi-tube would be rather inefficient in the environment of document D5 because all the primary air

required for combustion with the fuel must be aspired by entrainment with the fuel jet injected into the Venturi tube if, as in D5, the combustion chamber is "pressureless" and, therefore, no pressure difference is available for drawing primary air from the ambient into the combustion chamber. In the patent in suit this problem is overcome by two measures: first, the "negative pressure" created by the fan aids in drawing the air for combustion from outside, which requires a certain subpressure in the combustion chamber for creating a pressure difference as additional driving force for the flow of primary combustion air into the combustion chamber, and, second, by a multiple-flame Venturi-tube burner having a plurality of parallel Venturi tubes providing a joint flame extending into the flame tube. These measures certainly require additional considerations beyond the common general knowledge of Venturi-tube burners.

3.6 According to the Appellant the skilled person would, in a search for a suitable burner, turn to document D6 disclosing a burner with a plurality of parallel Venturi tubes. It is true that, by utilising the parallel Venturi tubes, the efficiency and power of the burner could be enhanced. However, it should not be disregarded that there is no indication in D6 either to this effect or to the environment in which the burner could be utilised. Indeed, D6 is only concerned with an improvement of a Venturi-tube burner having a plurality of parallel tubes with a view to reduce the detrimental effects of adjacent tubes on the aspiration of ambient air (see page 2, lines 18 to 28). The various tubes of different lengths are connected either to one combustion chamber for each tube (Figures 1, 2) or to a

common combustion chamber (Figure 3). Whilst both arrangements could be applied to a furnace or the like, it remains unclear how they should be integrated into the specific heating device of document D5. If this was done by substituting the flame tube of D5 for example by the common combustion chamber shown in Figure 3 of D6, the resulting device would not be in conformity with the subject-matter of the patent because the burner flame generated at the exit apertures of the combustion chamber would be outside the flame tube or combustion chamber, as set out in lines 7 to 9 of page 2 of D6, rather than extending into the flame tube within the combustion chamber, as defined in claim 1 of the patent. Similar differences would be obtained by applying the version of D6 having separate combustion chambers to D5. Thus, the integration of the burner of D6 into the heating device of D5 requires further considerations of the skilled person, for example by retaining the combustion chamber(s) of D6 as an additional combustion chamber upstream of the combustion chamber housing the flame tube in D5. Even if the skilled person came to such a solution, which seems to require a knowledge of the invention, it is very doubtful whether the flames issuing from the separate combustion chambers or from the outlet apertures of the common combustion chamber would combine to form a common flame. In fact, D6 mentions, in line 9 of page 2, a plurality of burner flames and the lateral distances sketched in the figures of D6 between the combustion chambers would seem to confirm that the burner flames are separate flames.

3.7 The other patent documents D0 and D1 to D4 relate to closed circuit heating devices having a combustion chamber operating at ambient pressure (D2), overpressure (D0) or subpressure (D0, D1), to an open circuit heating device (D3), or to an injection burner for furnaces (D4). These documents are not concerned with specific burner designs suitable for the heating device of D5 and do not disclose Venturi-tube burners. They cannot, therefore, provide a suggestion to the skilled person to replace the burner of D5 by the specific Venturi-tube burner defined in claim 1 of the patent.

3.8 Based on the above considerations the Board concludes that, contrary to the argument of the Appellant in its "first approach", the subject-matter of the claims of the patent as granted is not rendered obvious by the available patent documents. The claims of the auxiliary requests will not, therefore, have to be considered under the "first approach" but it is evident that, inasmuch as these claims include all the features of the granted claims, the reasons set out above for the granted claims will also apply for the auxiliary requests.

4. *"Second approach"*

4.1 The second approach is based, as closest prior art, on a prior use allegedly consisting in the purchase of a heating device as shown in the Figures 8, 9 and 11 of the instruction manual enclosed in document D11 from the company Fraccaro Renzo Termotecnica by the firm Smiderle Mario and its installation at MECC ALTE S.p.A. in 1989. Among the evidence submitted by the Appellant

during the proceedings before the first instance only documents D7, D11 and D12 are related to this subject, whereas documents D8, D9 and D10 seem to concern a separate alleged use by sale of a heating device, which appears to correspond to that shown in D5, by the firm EUKlima in 1993. Documents D11 and D12 have been disregarded by the first instance as not containing any relevant new information, in particular as the feature of the multiple-tube burner was not derivable from the figures included in D11. The Appellant has now submitted further evidence D13, D14, D15 and D16 on this prior use and offered the hearing of the authors of the declarations D07, D11 and D12 as witnesses to confirm *inter alia* the statements relating to the particular design of the burner. On the other hand, the Respondent has submitted the photograph "PO1", showing a single tube supported on two tube portions below, as counterevidence. All that additional evidence, as well as D11 and D12 and possible further corroborating evidence submitted by the parties, will have to be taken into consideration in investigating the alleged prior use and especially in establishing whether the allegedly sold and installed heating device had a multiple-flame Venturi-tube burner providing a joint flame, and, if this was prior art, whether it rendered obvious, either taken alone or in combination with the prior art exhibited in the patent documents and in particular in documents D0 or D5, the subject-matter of the patent as granted, as argued by the Appellant in its "second approach", or as amended according to any of the auxiliary requests.

4.2 Since the circumstances and facts of the alleged prior use have not been examined by the first instance in the light of all the evidence available, and since any possible additional evidence, as well as additional auxiliary requests, submitted after issuing the impugned decision may have to be taken into consideration, the Board exercises its discretion pursuant to Article 111(1) EPC, second sentence, to remit the case to the first instance for examination of the "second approach" in the light of the entire evidence submitted by the Appellant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution.

The Registrar: The Chairman:

A. Counillon C. T. Wilson