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D E C I S I O N
of 2 October 2001

Case Number: T 0675/00 - 3.2.3
Application Number: 94116304.0
Publication Number: 0653593
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Language of the proceedings: EN

Title of invention:
Improvement in the steam control arrangement of a cooking oven

Patentee:
ELECTROLUX PROFESSIONAL S.p.A.

Opponent:
Rational Aktiengesellschaft

Headword:
-

Relevant legal provisions:
EPC Art. 054, 056, 113(1)

Keyword:
"Novelty and inventive step - yes"
"Basis of decision - opportunity to comment (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0675/00 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 2 October 2001

Appellant: Rational Aktiengesellschaft
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 10 April 2000
rejecting the opposition filed against European
patent No. 0 653 593 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 10 April 2000, to reject the opposition against European patent No. 0 653 593. The patent relates to an improvement in the steam control arrangement of a cooking oven and comprises a single independent claim which reads as follows:

"1. Steam-operated food cooking oven, comprising an access door (1), a cooking cavity (2), a motor-driven fan (3) located on the rear side of said cooking cavity and provided with an internal disk (15), a partition wall (4) to distribute the flow of air generated by said fan, a back-chamber (5) accom(m)odating said fan and delimited by said partition wall (4) on its front side and by the rear wall (6) of the oven on its rear side, a conduit (7) adapted to transfer steam from an external boiler (8) into said cooking cavity, and a tube (9) inserted between the outer and the inner side of said cooking cavity (2), where the same tube terminates with a nozzle (10), an appropriate temperature sensing means (11) connected with a thermostat means (12) being inserted in said tube (9), **characterized in that** said tube (9) enters said back-chamber (5) from the outside by passing through said rear wall (6), whereas its nozzle (10) is accom(m)odated in the interstice (13) formed between the rear wall (6) and the rear portion of the fan (3)."

II. The Appellant (Opponent) filed the notice of appeal on 9 June 2000 and paid the appeal fee on the same day. In the statement of the grounds of appeal, which was

submitted on 2 August 2000, he no longer relied on document EP-A-0 386 862 (D1) as destroying novelty and inventive step, as during the proceedings before the first instance, but argued that the subject-matter of claim 1 was devoid of novelty and inventive step with regard in particular to document EP-A-0 171 522 (D4) and a declaration by Mr Kohlstrung of 27 July 2000 (Dx in the following). He further offered the demonstration of a test arrangement and the hearing of Mr Kohlstrung as a witness.

With an annex to the summons to attend oral proceedings the Board informed the parties of its provisional opinion that the subject-matter of claim 1 was new and not obvious, mainly because the feature of accommodating the nozzle of the tube in the interstice formed between the rear wall and the rear portion of the fan was neither derivable from D4 nor suggested by Dx which, by the very fact that the measurements reported therein were made years after the priority date of the patent, could not be taken as evidence that a skilled person was aware, at the priority date of the patent, of the specific pressure and temperature conditions prevailing at the interstice between the fan and the rear wall, and of the suitability of this location for the nozzle of the tube. The demonstration of a test arrangement and the hearing of Mr Kohlstrung as a witness was not deemed useful by the Board. In response, the Appellant also referred to document US-A-4 856 422 (D3) cited in the proceedings before the first instance and additionally introduced the documents DE-U-88 14 925 (D12), DE-C-275 084 (D13), DE-C-242 704 (D14) and DE-U-81 31 827 (D15).

During the oral proceedings held on 2 October 2001,

which were not attended by the Respondent, the issue of novelty and inventive activity was discussed in particular with respect to document D4 and document DE-C-42 06 845 (D11), cited by the Appellant after the oral proceedings before the first instance.

- III. The Appellant requests that the decision under appeal be set aside and that European patent No. 0 653 593 be revoked.

The Respondent (Proprietor) requests that the appeal be dismissed.

- IV. The essential arguments of the Appellant can be summarized as follows:

Document D4 disclosed a cooking appliance according to the first part of claim 1 and further mentioned, on page 5, first paragraph, an arrangement of the tube in the upper region of the cooking cavity, including the rear wall. Since according to normal understanding the fan chamber was part of the cooking cavity, D4 included an embodiment whereby the tube passes through the upper region of the rear wall of the fan chamber, whereby the nozzle of the tube was accommodated in the interstice between this rear wall and the fan. It was evident from document Dx that the flow velocity in this interstice was sufficient for temperature measurement, owing to the measured pressure difference of at least 187 Pascal prevailing between the rear wall and the rear side of the fan. The mention, on page 8 of D4 and, similarly, in column 1, lines 41 to 62 of D3, of an effective suction effect would suggest that any lower pressure region was suitable for locating the nozzle of the tube. Being made aware, for example by D12, that the

region behind the fan wheel was such a lower pressure region, the skilled person striving to further improve the maintenance and cleaning conditions would consider arranging the tube between the outside and the interstice between the rear wall and the fan. D11 describing pressure measurements made in this interstice was further evidence indicating the suitability of this location for positioning the nozzle of the tube.

- V. The Respondent submitted essentially the following counterarguments:

Document Dx could not be used as evidence since the measurements reported therein were made almost seven years after the priority date of the patent. The patent did not claim the existence of the lower pressure region behind the fan but makes use of this phenomenon for arranging the nozzle of the tube. A general reference to a location of the tube in the "upper part" of the cooking cavity could not disclose the specific teaching of passing the tube through the back wall behind the fan.

Reasons for the Decision

1. The appeal meets the requirements of Articles 106 to 108 EPC and of Rules 1(1) and 64 EPC and is therefore admissible.
2. *Novelty*

According to the decision under appeal document D4 discloses a cooking oven comprising the features

defined in the precharacterising portion of claim 1, with the exception of the nozzle at the inner end of the tube. The Appellant argues that the description, on page 4, third paragraph, of D4, of the tube as having a "small, possibly undercut opening" defines a nozzle-shaped opening. In the judgement of the Board this argument is not convincing because the small opening is described on page 4 of D4 as being in a cap covering the tube, rather than in the tube itself. However, this question need not be answered because the term "nozzle", as used in the patent, does not seem to imply a flow constriction. Indeed, apart from the fact that such a constriction is neither shown nor mentioned in the patent, the patent is concerned with repositioning the "small-bore tube" of the prior art (see column 1, line 54) serving as a conduit for flow both into and out of the cooking cavity and aims at "minimum pressure differences across the tube" (see column 4, lines 5 and 6), whereas a nozzle with a flow constriction would increase the pressure difference. The skilled reader of the patent will therefore understand the term "nozzle" in a more general sense to mean an open end of the tube. Since D4 likewise shows a communication of the tube with the cooking cavity at an open inner end of the tube, there is no difference between D4 and the patent in this respect.

As to the location of the tube, D4 on page 5, first paragraph generally refers to the "upper region" of the cooking cavity which is said to include the side walls and the back wall of the cooking cavity. In the specific embodiments shown in the figures the corresponding sensor tubes 2, 64, 164, 264, 364 are connected either with the top wall (Figure 1) or with the upper portion of a side wall 62 (Figures 2 to 4)

opposite to a chamber 10,40 housing the fan. On page 7, last paragraph, and page 13, third paragraph, this chamber is described as being separated from the cooking cavity 1 by a separating wall 9. Hence, the Board comes to the conclusion that D4 teaches to locate the inner end of the sensor tube in a side wall or in the top wall of the cooking cavity, rather than in a wall of the separate fan chamber or, according to the language of the patent, the back chamber. In view of this clear teaching in D4 the argument of the Appellant, that normally the fan chamber is considered to form part of the cooking cavity and, therefore, the teaching of D4 also includes locating the inner end of the tube at the side wall of the fan chamber adjacent to the fan, is not convincing. In addition it should be noted that, even if the scope of D4 was considered to include locating the inner end of the tube in any of the walls of the fan chamber by a general reference to the walls of the cooking cavity, for example in claim 4, this scope must be distinguished from the information content of D4, and the general reference could not in principle be taken as a disclosure of a specific location at a particular wall, as in claim 1 of the patent.

As to the other documents under consideration, novelty is not in dispute. D3 corresponds to D4 as regards the positioning of the inner tube end in the cooking cavity, preferably in the region of a flow creating a static pressure drop and, therefore, a pressure difference between the ambient and the cooking cavity. As to D1, the Board fully agrees with the assessment expressed in the decision under appeal. In particular, the tube 70 does not have, and in fact does not need, a temperature sensor. Furthermore, the openings 320

formed in the wall of the fan chamber serve the different purpose of allowing dry ambient air to enter the fan chamber for controlling the humidity in the cooking cavity and, therefore, do not have a temperature sensor either.

Thus, claim 1 is considered to meet the requirement of novelty.

3. *Inventive step*

3.1 There is no dispute that, as also acknowledged in the decision under appeal, document D4 is the closest prior art and, therefore, the suitable starting point for deciding on the presence of inventive step. It follows from the comments made above in connection with the question of novelty that the subject-matter of claim 1 differs from the cooking oven described in D4 by the characterising features. Instead of connecting the ambient with some point in the upper portion of the cooking cavity, as in D4, the tube connects the ambient with the back chamber housing the fan in such a manner that its "nozzle", i.e. its open inner end, is accommodated in the interstice between the rear wall and the rear portion of the fan. As a consequence, the inner open end of the tube is not directly exposed to the food within the cooking cavity, whereby less cleaning operations are required and the maintenance of the oven is thereby further facilitated. This advantage can therefore form the basis for the objective problem underlying the invention as defined in claim 1 of the patent.

3.2 The Board agrees with the decision under appeal regarding the assessment of inventive step in view of

the documents D4 and D1. D4 touches upon the cleaning or maintenance problem by mentioning, on page 4, second paragraph, a cap which could be placed over the inner tube opening to prevent condensate, molten fat or juices from entering the tube. This solution is rather different from that proposed in claim 1 of the patent. In fact, the location of the inner tube end in the oven of D4 is determined by the condition that the tube should detect changes in the conditions in the upper region of the cooking cavity (see page 6, last paragraph), preferably using an internal flow stream in the cooking cavity to create an aspirating effect (see page 8, first paragraph, and page 13, first paragraph). A skilled person would therefore choose a suitable location meeting these conditions from those available within the cooking cavity and disregard any location outside of this cavity because neither the conditions in the upper region of the cooking cavity nor any flow streams prevailing within the cooking cavity could be expected to exist outside of the cooking cavity, in particular not in the interstice between the rear wall of the back chamber and the fan disk.

As correctly pointed out in the decision under appeal, document D1 deals with the problem of controlling the cooking atmosphere, more specifically the humidity, in the cooking chamber by controlling the admission of dry ambient air through openings 320 positioned in the rear wall of the fan chamber behind the fan disk. Thus, the function of the openings of D1 is quite different from that of the tube 2, 64, 164, 264, 364 in D4 with the consequence that also the pressure requirements are different: whereas in D1 an inflow of ambient air under all conditions within the cooking chamber shall be enabled by providing a suitable sucking pressure which

is, therefore, considerably lower than the pressure within the cooking cavity, the pressure at the inner end of the tube of D4 should correspond to the pressure within the cooking cavity and must be such as to allow a flow in both directions in order to determine the temperature difference between the gas flowing in different directions through the tube. Hence, the skilled person has no reason to assume that the conditions behind the fan wheel are suitable for positioning the inner tube end of D4.

- 3.3 In a first line of argument, the Appellant introduced document Dx as further evidence of an alleged obviousness of placing the inner tube end behind the fan. Dx reports measurements of a pressure difference between the ambient and a location at the interstice between the rear wall of the fan chamber and the rear portion of the fan disk for four different types of fans. The measurements were made in the year 2000, i.e. after publication of the patent, and cannot represent relevant prior art for this very reason. Even if it was assumed that the existence of the measured pressure difference was known before the priority date of the patent, no comparison could be made between this pressure difference and the slight pressure decrease described in D4 as useful for creating an aspirating effect, and it would therefore not be evident that the reduced pressure behind the fan disk could be used for the same purpose. Moreover, the location behind the fan is rather remote from the cooking cavity and is, therefore, a place which normally would not be considered by a skilled person if, as in D4, the temperature and pressure conditions at the inner tube end should correspond to those within the upper portion of the cooking cavity. Thus, no indication for

relocating the inner tube end from a position at the upper portion of the cooking cavity to a position behind the fan disk could be derived from Dx even if the measurements reported therein were prior art.

- 3.4 A second line of argument is based on D4 and D12. The latter document discloses a food storage appliance with a heat exchanger for controlling the temperature in the appliance. In the embodiment shown in Figure 4 a portion of the air circulating within the appliance is forced across the heat exchanger in a separate chamber by auxiliary vanes provided on the back side of a fan. Thus, a pressure difference is created by the auxiliary vanes at the back side of the fan for the purpose of inducing a flow across the heat exchanger. This is, apart from the different problem to be solved, in contrast with the teaching of D4 where the inner tube end should be located in the vicinity of a flow prevailing within the cooking cavity for the purpose of creating a pressure difference. Thus, the Board cannot see why a skilled person faced with the problem of improving the cleaning and maintenance conditions of D4 should consider D12, and, even if he would do so, how he could combine the teaching of D12 with that of D4.

- 3.5 With his third line of argument the Appellant points out that D11, disclosing pressure measurements made at the back side of a fan, provided an indication that a location behind the fan was suitable for positioning the inner tube end of D4.

Document D11 was cited by the Appellant with a letter of 17 February 2000 submitted to the EPO after the date of the oral proceedings before the first instance which disregarded it according to Article 114(2) EPC. In

Appeal Proceedings the Appellant did not refer to this document until the oral proceedings which were not attended by the Respondent. The question therefore arises whether this document can at all be taken into consideration without contravening the Respondent's right to be heard, as laid down in Article 113(1) EPC. However, it is apparent from the arguments presented in the letter of 17 February 2000 and from the discussion of D11 herebelow that this document forms evidence which merely supports previous assertions of the Appellant based on other documents such as D1 and D12. The Respondent therefore did in principle have an opportunity to present his comments on these assertions. Furthermore, the following discussion will make clear that the decision to be taken is not based on D11 in the sense that it would be different if D11 had not been taken into consideration.

D11 refers to an apparatus for determining the amount of water vapor in the gas within a cooking oven by measuring a pressure difference between two radially spaced positions at the rear side of a fan wheel provided with auxiliary vanes, and transforming the measured pressure difference into a density value from which the steam content can be derived. Thus, a pressure gradient is created in the same manner as in D1 or in D12, but for a different purpose. In D1 the pressure gradient created by the fan wheel sucks dry air into the cooking cavity, in D12 it circulates a portion of the atmosphere through a heat exchanger chamber, and in D11 it is used for calculating the steam content. Since none of these purposes is related in any manner to the problem to be solved by the invention as defined in claim 1, a skilled person will have no more reason to take D11 into consideration than

D1 or D12. Even if he did, he could not find any indication in D11 for positioning the inner tube end behind the fan wheel. In fact, the pressure measuring points of D11 are provided at radially spaced positions 4,5 of the rotating fan wheel, which may be a possible location for the piezoelectric sensors described in D11 but is incompatible with a fixed tube entering the fan chamber from the outside, as in D4 and defined in claim 1. Furthermore, the sensors of D11 measure a local pressure difference in the interstice between the rear wall and the fan which has no relation to the pressure difference relevant for the flow in the sensor tube of D4 and of the patent, which is the pressure difference between the space behind the fan wheel and the ambient. Thus, D11 no more than D1 or D12 can provide an indication that the pressure conditions at the interstice between the rear wall and the fan are similar enough to those found in the cooking cavity to encourage a skilled person to position the inner tube end in this interstice.

3.6 The further documents considered in the appeal proceedings do not render the subject-matter of claim 1 obvious either. D3 corresponds to D4 in particular as regards the positioning of the inner tube end in the upper region of the cooking cavity and proposes specific measures for creating a disturbance in the air flow within the cavity to improve the aspirating effect. Thus, this document confirms the teaching of D4. Documents D13 and D14 correspond to D11 in that a pressure gradient produced by a fan wheel is used for analysing gases or gas mixtures, and the considerations concerning D11 therefore also apply to D13 and D14.

3.7 For the reasons set out above claim 1 is considered to

also meet the requirement of inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

A. Counillon

C. T. Wilson