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Datasheet for the decision of 16 October 2009

Case Number: T 0644/07 - 3.2.03

Application Number: 02075021.2

Publication Number: 1221575

IPC: F24C 15/32, A21B 1/48

Language of the proceedings: EN

Title of invention:
Oven with fluid jet device

Patentee:
Koppens B.V.

Opponent:
Stork Titan B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 84, 123(2), 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Clarity (yes)"
"Extended subject-matter (no)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0644/07 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 16 October 2009

(Opponent) Stork Titan B.V.
Handelstraat 3
NL-5831 AV Boxmeer (NL)

Representative: Volmer, Johannes Cornelis
Exter Polak & Charlouis B.V.
P.O. Box 3241
NL-2280 GE Rijswijk (NL)

Respondent: Koppens B.V.
(Patent Proprietor) Beekakker 11
P.O. Box 1
NL-5760 AA Bakel (NL)

Representative: van Westenbrugge, Andries
Nederlandsch Octrooibureau
Postbus 29720
NL-2502 LS Den Haag (NL)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 12 February 2007 concerning maintenance of European patent No. 1221575 in amended form.**

Composition of the Board:

Chairman: U. Krause
Members: C. Donnelly
K. Garnett

Summary of Facts and Submissions

I. The appeal lies from the interlocutory decision of the opposition division, posted on 12 February 2007, to maintain European patent no. EP-B-1221575 in amended form.

II. In its decision the opposition division reasoned that the subject-matter of claim 1 as granted lacked novelty in view of EP-B-528593 (D1). However, it was held that the subject-matter of claim 1 according to the first auxiliary request filed during the oral proceedings on 10 November 2006 met the requirements of the EPC.

III. The opponent (hereinafter the "appellant") filed a notice of appeal against this decision on 12 April 2007 and paid the fee on the same day. In the grounds of appeal received on 12 June 2007 it was requested that the contested decision be set aside and the patent revoked. In support of its case the appellant cited the following state of the art:

D1: EP-B-528593;
D4: US-A-6146678
D5: WO-A-8809124;
D6: WO-A-0013528;
D7: US-A-6065463;
D8: WO-A-8505546;
D12: EP-A-558151;
D15: Proctor brochure "Continuous Cooking Systems, 1988;
D16: US-A-4737373

A general reference was made to the other documents cited in the opposition procedure.

IV. In its letter of 1 November 2007 the proprietor (hereinafter "the respondent") requested that the decision of the opposition division be upheld.

Both parties made auxiliary requests for oral proceedings to be held.

V. In a communication dated 8 May 2009 pursuant to Article 15(1) RPBA annexed to the summons to oral proceedings, the Board informed the parties of its provisional opinion. In particular, the Board mentioned that the indication of the date of the public availability of D15 appeared tenuous.

VI. With letter of 16 September 2009, in response to the Board's provisional opinion, the respondent filed auxiliary requests 1 to 4.

With its letter of 16 September 2009 the appellant filed a further document EP-A-1106 067 (D17) as well as a full colour copy of D15.

VII. During the oral proceedings, held before the Board on 16 October 2009, the appellant concluded its case by requesting that the impugned decision be set aside and the patent revoked. The respondent requested that the appeal be dismissed or alternatively the patent be maintained in amended from on the basis of one of auxiliary requests 1 to 4 filed with letter of 16 September 2009.

VIII. Claim 1 as maintained in amended form by the opposition division (main request) reads:

"Oven comprising a housing (1), a conveyor belt (7) for guiding products through the interior space (3,4) of the housing (1) and heating means (16-19) for heating the products (24) in the interior space (3,4) of the housing (1) using a fluid, such as hot air and/or steam, which conveyor belt (7) extends between an entrance (10) and an exit (12) of the housing (1) and, between these two points, follows at least one helical path (8,9), the helical path being provided around a drum (15,16) rotatable about a vertical axis and at least one fluid jet device (20) being provided generating a hot flow of fluid (25) in jet form, which fluid jet device (20) is positioned in such a manner with respect to at least one section of the conveyor belt (7) that the hot flow of fluid (25) in jet form impinges on the products (24) situated on that section, characterised in that
the products situated on that section move through beneath the fluid jet device (20)."

IX. The arguments of the parties relevant to the decision can be summarised as follows:

Main request

(a) *Article 123(2) EPC*

The appellant argued that in the originally filed documents the fluid jet device is only specified as being *directly* above the top turn and/or the straight

conveyor belt section which follows this top turn - paragraph [0025], column 4, lines 35 to 38 of the published application. Thus, if the expression "the products situated on that section move through beneath the fluid jet device" is taken as meaning that the fluid jet device is positioned *directly* above the conveyor belt, as the opposition division had done in its decision, then there is no basis for generalising the location of the fluid jet device to any point above the length of the conveyor belt. Thus, Article 123(2) is infringed.

The respondent maintained that support for this amendment can be found in the application as published at paragraph [0006] which states "The fluid jet device can be arranged at various locations of the conveyor belt" and "Nevertheless, the fluid jet device may also be arranged elsewhere, for example between the turns, if the heating means are in a different, lower position". Also paragraph [0005] states that a fluid jet device of this type "may be situated above straight and/or curved sections of the conveyor belt".

(b) *Clarity, Article 84 EPC*

The appellant considered that the expression "the products situated on that section move through beneath the fluid jet device" is in any case not clear since it could cover the situation where the products move directly beneath the fan since this is also part of the fluid jet device.

The respondent was of the opinion that it is clear that this expression means the hot air jets come into

contact with the products moving through beneath the air jet device (see column 1, lines 49 to 52 of the A-doc).

(c) Inventive step, Article 56 EPC

Appellant

Starting out from D1 as the nearest prior art, the only distinguishing feature of claim 1 is that of the characterising portion, i.e.

- the products situated on that section move through beneath the fluid jet device.

Therefore the objective technical problem is one of how to improve browning of the food products in a spiral oven.

Insufficiency of browning or colouring of the outer product surface may be a problem, but is not restricted to one type of oven. Thus, the food processing scientist facing the problem of unsatisfactory browning in a spiral oven would ask the mechanical engineer to adapt the oven to enable the provision of browning means. The most obvious design would be to provide impingement means at a location where there is sufficient space directly above the conveyor section.

In terms of the food treatment process itself and the process conditions the selection of a spiral oven instead of a linear oven makes no difference.

Documents D4, D5, D6, D15 and D16 all show oven systems with browning by direct impingement of hot fluid jets on the products.

The application of these known direct impingement means to the device of D1, particularly those described in the browner of D16, to solve the problem of unsatisfactory browning is therefore obvious.

Thus, the subject-matter of claim 1 does not involve an inventive step in view of the teachings of D1 in combination with either D4, D5, D6, D15 or D16.

Furthermore, since the "shadowing" effect is already mentioned in D1 it would be obvious for the skilled person faced with this problem to seek to eliminate the shadow effect by placing the nozzles directly above the conveyor belt and thus improve browning.

Similarly D12 describes all the features of the preamble of claim 1 as granted. Thus, all the distinguishing features relate to the addition of the at least one fluid jet device.

The objective technical problem in this case is therefore one of how to provide (rather than improve) browning of the food-products in a spiral oven.

Since linear impingement ovens (e.g. D4,D5 and D6) and spiral ovens (e.g. D1 and D12) have coexisted and been applied together in one system by oven manufacturers (e.g. D15, D16) it is clear that their common essential parts can be transferred freely from one type of the oven to the other.

In particular D16 teaches that, to avoid cleaning problems that arise with certain fatty foodstuffs, browning may be carried out in a separate unit by means of fluid jet devices providing high temperature, high velocity fluid impingement on the products for a short length of time. However, at column 1, lines 11 to 14 this document also states that it is known to cook and brown in the same oven atmosphere. Thus, when cleaning is not a problem, as is the case with a great number of foods, it would be obvious to carry out cooking and browning in the same oven by placing the browning nozzles towards the end of the conveyor in the spiral oven instead of having them in a separate unit.

The fact that a common conveyor belt speed would be imposed when the two units are combined is not a hinderance because this can be compensated for by adjusting the length over which the impingement nozzles are placed.

A similar reasoning can be made taking the spiral ovens described in D2 or D3 as the nearest prior art.

Thus, the subject-matter of claim 1 does not involve an inventive step in view of the teachings of D12 or either D2 or D3 in combination with either D4, D5, D6, D15 or D16 or D16 alone.

Respondent

Neither D1 nor D12 show the feature wherein the fluid jet device is positioned in such a manner with respect to at least one section of the conveyor belt that the

hot flow of fluid in jet form impinges on the products situated on that section moving through beneath the fluid jet device.

In D1 the fluid jet devices ("nozzles" 54) are not positioned in this manner since they are located in the baffles 52 which are offset from the conveyor belt. These nozzles are also arrayed in order to create turbulence rather than impinge directly on the products positioned on the conveyor belt.

The apparatus according to D12 does not comprise any device producing a hot fluid jet which impinges on the food products.

It would also not be obvious to combine the browning units shown in any of the documents D4, D5, D6, D15 or D16 with either D1 or D12 since these devices are more than a simple plate containing hot fluid nozzles and in all cases comprise complicated hot fluid-recirculation ducting which is necessary to maintain the high temperatures required for operation. Thus, the integration of such units into a spiral oven is not straightforward and is the reason why in all of the prior art documents they are housed in a separate unit.

Furthermore, the fact that since there is only one conveyor belt in a spiral type oven it is not possible to alter the dwell-time in the browning zone independently of the rest of the cooking process, also speaks against executing the two operations in the one oven.

The passage in D16 at column 1, lines 11 to 14 cited by the appellant is not an indication that such units have been combined with spiral ovens in the past since no details of the prior art oven are given.

Reasons for the decision

1. The appeal is admissible.

2. *Main request, Clarity, Article 84 EPC*

2.1 The question of whether the requirements of clarity are met applies to the claim as a whole and not just to individual features taken in isolation.

2.2 Accordingly, the feature of the characterising portion specifying that: "the products situated on that section move through beneath the fluid jet device" should be read in conjunction with the rest of the claim. In particular, the final feature of the preamble of claim 1 specifies: "which fluid jet device (20) is positioned in such a manner with respect to at least one section of the conveyor belt (7) that the hot flow of fluid (25) in jet form impinges on the products (24) situated on that section".

2.3 Thus, the Board considers the claim as a whole is clear in that it requires the fluid jet device to be positioned in such a manner with respect to at least one section of the conveyor belt that the hot flow of fluid in jet form impinges on the products situated on that section moving through beneath the fluid jet device.

2.4 The appellant's argument that the claim could cover the situation where the products move directly beneath the fan because this is also part of the fluid jet device is not convincing since it neglects the further requirement imposed by the claim for the fluid in jet form to impinge on the products moving through beneath.

3. *Main request, Article 123(2) EPC*

3.1 The disputed feature: "the products situated on that section move through beneath the fluid jet device" is based on the passage at column 1, lines 49 to 51 of the published application, where it is stated: "The hot air jets come into contact with the products moving through beneath the air jet device".

3.2 The description of the application as published also makes it clear that "the fluid jet device can be arranged at various locations of the conveyor belt" (see column 1, lines 56 to 57). This fact is reiterated at column 2, lines 7 to 9 which confirms "Nevertheless, the fluid jet device may also be arranged elsewhere, for example between the turns, if the heating means are in a different, lower position". Also the passage at column 1 lines 44 to 46 states "which may be situated above straight and/or curved sections of the conveyor belt".

3.3 Furthermore, the disputed feature does not contain the word "directly", which only appears once in the description at column 4, lines 35 to 36 in connection with the preferred embodiment.

3.4 Hence, the requirements of Article 123(2) are met.

4. *Main request, Inventive Step, Article 56 EPC*

4.1 Taking D1 as the nearest prior art.

4.1.1 The Board agrees with the parties that the only feature of the apparatus specified in claim 1 distinguishing it from the ovens described in D1, in particular that shown in figures 3 to 5, is the requirement for the fluid jet device to be positioned in such a manner with respect to at least one section of the conveyor belt that the hot flow of fluid in jet form impinges on the products situated on that section moving through beneath the fluid jet device.

4.1.2 This feature has the technical effect of ensuring that the food products placed on the conveyor belt are uniformly browned. Therefore the objective technical problem facing the skilled person is one of how to improve browning of products cooked in a spiral oven.

4.1.3 It is not possible to formulate the objective technical problem as being one of how to modify a spiral oven in order to improve browning of products cooked therein since this definition already anticipates part of the solution.

4.1.4 The spiral ovens described in D1 are intended for both cooking and browning (see page 3, lines 12 to 13) which is to be achieved by "turbulent vapor flow over the food product" (page 3, line 14). When further considering the teachings of D1 the passage at page 9, lines 24 to 30, which the Board considers to relate to

both embodiments since it concludes with the phrase ".....from oven**s** constructed in accordance with the principles of this invention", is of particular relevance. Here it is explained that the area of the discharge nozzles is chosen so as to cause a large measure of stimulated turbulence in order to promote even heat transfer to the food products which has the effect of promoting a uniformly appearing and uniformly cooked food product. It is expressly stated that "this is in contrast to high velocity, direct impingement of process vapor upon the product which is not the intention of the inventors".

4.1.5 In view of this, it is considered that D1 teaches a different approach to solving the problem of improving browning or obtaining "uniformly appearing" food products by advocating the generation of turbulent fluid flow which, by virtue of swirling through the tiers of the conveyor system, not only achieves a uniformly cooked product but also provides sufficient impingement to obtain browning.

4.1.6 Consequently, the Board does not see it as obvious to modify the postion of the nozzles 54 of the oven according to figure 3 of D1 such that a hot flow of fluid in jet form impinges on the products situated on the conveyor moving through beneath. On the contrary, the skilled person would see that any attempt to mount the nozzles 54 other than on the baffles 52 delimiting the plenums 53 supplying the hot fluid would require a complete rethink of the hot fluid supply system. Moreover, within the philosophy of the invention behind D1 other options, such as adjusting jet outlet speed, exit angle and interaction between jets of adjacent

nozzles, are open to the skilled person for investigation with a view to stimulating or modifying the turbulent flow to mitigate further the shadowing effect in the search to improve browning.

4.1.7 D16 describes a spiral oven apparatus 14 combined with an additional browning unit 16. Thus, the fundamental instruction of this document is to carry out the browning operation in a separate unit. Given the difficulties associated with modifying the nozzle array of D1, the skilled person would see no reason to depart from this concept. The same considerations apply to D15 which also shows an installation with a separate browning oven.

4.1.8 Similarly the skilled person would not integrate the linear impingement ovens shown in documents D4, D5, D6 into the spiral oven of D1.

4.2 Taking D16 as the nearest prior art

4.2.1 The appellant has asserted that the passage in D16 at column 1, lines 11 to 13, mentioning ovens which cook and brown in the same atmosphere, would suggest to the skilled person to abandon the concept of a separate browner unit when cooking foodstuffs which are not messy or fatty since, in this case, the cleaning problems the separate browner is intended to solve never arise. However, the Board does not find this convincing since the nature of the oven providing both cooking and browning is not described in D16. In fact the only ovens of the available prior art which claim to achieve both cooking and browning are those detailed in D1 discussed above. Thus, reverting to some vaguely

identified prior art oven by abandoning the concept of a separate browner oven in D16 would not inevitably lead the skilled person to an oven according to the subject-matter of claim 1.

4.2.2 Nor would it be obvious to incorporate the separate browner oven of D16 into its spiral oven. The browner oven unit 16 depicted in figures 2 to 4 of D16 can be seen to consist of more than just an array of nozzles since it further comprises the heat exchanger, blower and ducting necessary to supply the nozzles with the hot fluid for impingement on the food products. This equipment is indispensable for bringing the impingement fluid up to a temperature of between 399°C to 538°C (750°F to 1000°F see column 3, line 47) required for browning purposes. As opposed to this, the temperature required for through cooking in the spiral oven is of the order of 71°C to 107°C (160°F t 225°F see column 4, line 20). Thus, the skilled person would learn from D16 that in order to provide for these two contrasting sets of process conditions within the one oven all aspects of the browning unit would need to be integrated into the spiral oven unit. Furthermore, if it is desired to maintain the process flexibility available in the split unit installation by virtue of having separately driven conveyor belts, it would also be necessary to modify the product conveyance system of the spiral oven. Even if it might be possible to compensate for a single conveyor speed by adjusting the fluid-jet heating intensity and length over which the impingement nozzles are arrayed, this is in itself represents a further complication. For these reasons the Board is of the view that the skilled person would be dissuaded from

attempting to integrate the browning and spiral ovens into one unit.

4.3 Taking D12 as the nearest prior art

4.3.1 D12 describes all the features of the preamble of claim 1 as granted. Claim 1 according to the main request differs from this known oven in that:

at least one fluid jet device is provided generating a hot flow of fluid in jet form, which fluid jet device is positioned in such a manner with respect to at least one section of the conveyor belt that the hot flow of fluid in jet form impinges on the products situated on that section moving through beneath the fluid jet device.

4.3.2 The objective technical problem is therefore one of how to provide browning of the food-products.

4.3.3 It would also not be obvious for the skilled person faced with this problem to combine the browning units shown in any of the documents D4, D5, D6, D15 or D16 with the oven of D12 since, as explained above in connection with D16, all of these devices are more than a simple plate containing hot fluid nozzles and in all cases comprise complicated hot fluid-recirculation ducting which is necessary to maintain the high temperatures required for operation. Thus, the integration of such units into a spiral oven is not straightforward.

4.3.4 The appellant's assertion that since linear impingement ovens (e.g. D4,D5 and D6) and spiral ovens (e.g. D1 and

D12) coexist and are applied together in one system by oven manufacturers (e.g. D15, D16) their common essential parts can be transferred freely from one type to the other is not supported by the prior art citations.

4.3.5 On the contrary, as explained above in connection with D16, there are good technical reasons to believe that this is not the case. Further, D15 and D16 can only be understood as recommending that the browning of food products be carried out in a separate unit. Moreover, the fact that linear impingement and spiral ovens have coexisted for so long yet the opponent has been unable to find an explicit indication or even suggestion as to their integration would rather speak for the presence of an inventive step.

4.3.6 The appellant has also argued, without elaborating any particular aspects, that EP-A-804878(D2) or EP-A-953286(D3) could have been taken as the nearest prior art instead of D12. Indeed D2 and D3 were not cited explicity in the grounds of appeal and only mentioned cursorily in the letter of 16 September 2009. In view of this, the Board considers that the same arguments developed in connection with D12 also apply.

4.3.7 Thus, the subject-matter of claim 1 as maintained by the opposition division involves an inventive step.

4.3.8 Since the respondent's main request has been deemed allowable there is no need to examine the auxiliary requests.

Order:

For these reasons it is decided that:

The appeal is dismissed.

Registrar: Chairman:

A. Counillon U. Krause