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**Datasheet for the decision
of 6 December 2024**

Case Number: T 0288/23 - 3.2.04

Application Number: 17189015.5

Publication Number: 3335564

IPC: A21B1/42, A21B1/48

Language of the proceedings: EN

Title of invention:

PROCESS TO CONTROL THE AIR-FLOW AND AIR-LEAKAGES BETWEEN TWO
CHAMBERS

Patent Proprietor:

GEA Food Solutions Bakel B.V.

Opponent:

Marel Further Processing B.V.

Headword:

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - non-obvious alternative

Decisions cited:

T 1179/16

Catchword:



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Case Number: T 0288/23 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 6 December 2024

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
21 December 2022 concerning maintenance of the
European Patent No. 3335564 in amended form.**

Composition of the Board:

Chairman A. Pieracci
Members: J. Wright
K. Kerber-Zubrzycka

Summary of Facts and Submissions

- I. The appeal was filed by the opponent against the interlocutory decision of the opposition division finding that, on the basis of the auxiliary request 1, the patent in suit met the requirements of the EPC.
- II. The opposition division decided that the subject-matter of this request involved an inventive step.
- III. The Board issued a communication dated 12 August 2024 setting out its preliminary opinion on the relevant matters. Oral proceedings before the Board were held on 6 December 2024.
- IV. The appellant (opponent) requests that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requests that the appeal be dismissed (main request), in the alternative that the decision under appeal be set aside and that the patent be maintained with an amended description (auxiliary request 1) or according to one of auxiliary requests 2 to 4 all refiled with the grounds of appeal.

- V. The independent claim of the main request reads as follows:

"Process to operate an oven (1) comprising:

- a first chamber (3) and a second chamber (4), which are separated by separation means (2)
- conveyor means (7) for guiding products from the inlet (10) through these chambers (3, 4) to the outlet (12),

- temperature control means (15-19, 22-66, 27, 28) for controlling the temperature and/or humidity in each chamber individually using a fluid, respectively, and
- a tube (2.1) in the separation means (2) through which the conveyor means are directed from the first chamber (3) to the second chamber (4), characterized in, that an air flow (26) is injected into the tube (2.1) to reduce fluid leakage between the first chamber (3) and the second chamber (4), which results in a higher pressure in the tube 30, wherein this higher pressure forces the air (26) to flow to the left towards the first chamber (3) and to the right towards the second chamber (4)".

VI. In the present decision, reference is made to the following documents:

D1: US2005/0092312 A1

D2: US2256003

D7: EP1221575 A1

D8: US4298341

VII. The arguments of the parties relevant to the decision are set out in the reasons for the decision presented below.

Reasons for the Decision

1. The appeal is admissible.
2. Background

The patent relates to a process for operating an oven. Ovens are known that have two chambers separated by a partition wall and through which food to be cooked is moved on a conveyor. In each chamber different

conditions of temperature and humidity can be set (see published patent specification, paragraphs [0001] and [0003]).

3. Main request, claim 1, inventive step starting from D1 with D2 and the skilled person's common general knowledge

D1 (see abstract and figure 1) discloses an oven having first and second chambers (indirect and direct cooking chambers 20 and 30) and how it is operated, thus it discloses a process to operate such an oven. The two chambers are separated by walls, which are a separation means. As described in paragraphs [0034] to [0035], products to be cooked are guided by a conveyor 70 from inlet 73, through the chambers to an outlet 77. Means are provided (see paragraphs [0026] and [0027]) for controlling different temperature and humidity regimes of fluid in each chamber. In the separation means a tube (tunnel 55) carries the conveyor between the chambers (see paragraphs [0028] and [0032]).

The opposition division (see the impugned decision, reasons point 21.4) found, and it is not in dispute, that D1 does not disclose the last claim feature, which reads as follows: *an air flow is injected into the tube to reduce fluid leakage between the first chamber and the second chamber, which results in a higher pressure in the tube wherein this higher pressure forces the air to flow to the left towards the first chamber and to the right towards the second chamber.*

Rather than disclosing an *air flow* injection to reduce leakage, D1 (see paragraph [0028] and figure 1) discloses a seal, such as a *steam* curtain seal 53, that is the injection of steam as a working fluid to isolate

the chambers and thus reduce fluid leakage between them. Moreover, the same paragraph discloses that the seal should be positioned *within the transition* [between chambers], of which the tube 55 is but a part, whereas figure 1 appears to show the seal 53 at the entrance to the direct cooking chamber 30. Neither of these is a direct and unambiguous disclosure of D1's seal being *in the tube* as claimed.

- 3.1 The Board agrees with the opposition division's assessment that the differing feature has two aspects with independent technical effects which can thus be treated separately for the purpose of assessing inventive step. These aspects are:
- (a) injecting [a fluid] into the tube leading to a higher pressure in the tube and fluid flows left and right and
 - (b) the injected fluid is air.

This has not been challenged by the respondent-proprietor, which commented only on aspect (b) - see its reply to the appeal of 14 August 2023, section IV.1.

- 3.2 Considering aspect (a), the patent does not attach any particular importance to where the isolating fluid [air] should be injected between the two chambers. Paragraphs [0010] to [0012] of the published specification explain that it is preferable to inject a fluid *in the vicinity* of the passage. With this in mind, the Board agrees with the opposition division's assessment that the associated partial objective technical problem can be formulated as how to provide a different [alternative] implementation of D1's steam [fluid] curtain. The Board also agrees that it would be obvious from the skilled person's general knowledge to

locate D1's steam curtain within the tube (tunnel 55). This would inevitably raise the pressure in the tube and, if it were to be effective in isolating the two chambers, send the fluid left and right into respective chambers as claimed.

- 3.3 Therefore, the question of inventive step turns on whether it would be obvious for the skilled person to modify D1's process by using air as the injected fluid (aspect b) instead of steam.
- 3.3.1 Neither the opposition division nor the respondent-proprietor proposed an objective technical problem associated with differing aspect b) (air as operative fluid). The appellant-opponent (see its appeal grounds, page 3, third from last complete paragraph) saw the problem in terms of *finding an alternative fluid to steam for isolating D1's two chambers*. The Board agrees with this because the patent does not explain any particular advantage to using air: In paragraph [0024], the effect of injecting air is merely explained in terms of raising the pressure in the tube, but a different fluid would also achieve this (cf. paragraphs [0011] and [0012]).
- 3.3.2 The Board agrees with the appellant-opponent that the skilled person would know of D2 which relates to proofing and then baking bread in a continuous process (see page 1, left hand column, lines 1 to 9). D2 discloses (see for example page 3, left hand column, lines 32 to 60 and figure 4), two chambers (a proof-box and an oven) through which dough is conveyed on a conveyor and in which different humidity and temperature conditions prevail. To preventing leakage between the chambers and so maintain conditions in respective chambers, an air curtain is arranged between

them (see figure 4, downward pointing arrows emerging from slit 73). Therefore, the skilled person would know that, as such, an air curtain offers an alternative way of isolating two chambers having different humidity and temperature conditions.

- 3.3.3 In accordance with established jurisprudence of the boards of appeal (see Case Law of the Boards of Appeal, 10th edition, 2022 (CLBA), I.D.4.5, and in particular T 1179/16, reasons 3.4.4) in the case where the skilled person seeks an alternative solution to a known problem, the skilled person would take into account any alternative known in the underlying technical field (*unless the closest prior art teaches away from it*).
- 3.3.4 Contrary to how the appellant-opponent has argued, in the Board's view, the present case is just such an exception where the closest prior art D1 *teaches away* from using air as the operational fluid to isolate its two chambers and therefore the skilled person would not, as a matter of obviousness, modify D1's process by replacing steam with air as the injected fluid in its curtain seal, even though an air curtain is known as such.
- 3.3.5 D1's upstream indirect cooking chamber 20, provides lower temperature higher humidity conditions compared to the downstream direct cooking chamber 30, directly heated by flame heaters 35 (see paragraph [0024] and [0025] with figure 1). Paragraph [0026] describes the indirect cooking chamber in more detail: Its air-vapour mixture is indirectly heated by a radiator 25 and its humidity may exceed 95%. The third sentence of this paragraph explains that the ability to maintain this high humidity may be attributed to a lack of combustion air in the chamber (the indirect heater 25 being a

radiator). The following sentence starts with the words "In addition", and thus links the concept of the ability to maintain high humidity conditions in the chamber 20 to a further way of achieving it: *In addition, minimising air infiltration into indirect cooking chamber 20 may result from improved containment.*

- 3.3.6 In the Board's view, the underlying message of this sentence is that, to maintain a high humidity in the indirect cooking chamber 20, there must be an effort to minimise the infiltration of air into it. What comes after this - that this *may result from improved containment* - merely suggests that, to minimise this air infiltration, containment, in other words sealing may be improved. Therefore, the sentence does not simply say that a seal should be used between the chambers as the appellant-opponent has suggested, but first and foremost teaches to *minimise air infiltration into the indirect cooking chamber 20.*
- 3.3.7 In contrast to D1's disclosure of *passively* minimising the penetration of air into the indirect cooking chamber 20 (with improved containment) by using a steam curtain seal 53, replacing this seal with D2's air curtain (see figure 4) would *actively* introduce untreated cold ambient air into the indirect cooking chamber 20. To do so would run contrary to D1's explicit teaching to minimise infiltration of air into the indirect heating chamber. Therefore, the skilled person would not use air instead of steam in D1's curtain seal.
- 3.3.8 The appellant-opponent has argued that this is not so because, just as D1 teaches that infiltration of unconditioned air into the indirect cooking chamber 20

is undesirable, it would also be undesirable to introduce steam into the drier direct cooking chamber 30, as D1's steam curtain 53 in fact does. Therefore, according to the argument, an air curtain and a steam curtain are equally valid alternatives for providing a seal between D1's oven chambers, each with its own inherent advantages and disadvantages. Put differently, the appellant pits a disadvantage it sees in D1's steam curtain for maintaining conditions in the direct cooking chamber against the explicitly disclosed teaching against infiltration of air, as an air curtain would cause, for the indirect cooking chamber and concludes that neither can be considered detrimental on balance, so D1 would not teach away from using an air curtain as a seal.

The argument is predicated on the idea that D1 might present the infiltration of air into the indirect cooking chamber as equally disadvantageous as the infiltration of steam into the direct heating chamber. In the Board's view, this is not the case. Paragraph [0027] describes the direct cooking chamber 30 but says nothing about how best to maintain the conditions inside it, let alone does it suggest that the ingress of steam might be disadvantageous. Thus, the idea that a steam curtain would be detrimental to the direct cooking chamber is purely hypothetical. This is all the more true since the next paragraph, [0028], proposes a steam curtain for isolating the two chambers. This contrasts with the explicit information in paragraph [0026] that the infiltration of air into the indirect cooking chamber 20 is to be minimised. Therefore, although D1 discloses (paragraph [0028]) that *any means* known to the skilled person for isolating the two chambers may be used, the skilled person would not read D1 as disclosing that the ingress of steam into the

direct cooking chamber would be just as disadvantageous as the infiltration of air into the indirect cooking chamber. Rather, with its explicit teaching to minimise the latter, D1 teaches away from an air curtain as a viable alternative to a steam curtain.

- 3.3.9 The appellant-opponent has also argued that the dimensions of D1's chambers are large compared to those of the tube between them, so that any air infiltrating the indirect cooking chamber from an air curtain would have negligible impact on conditions in the chamber. Accordingly, so the argument goes, the skilled person would not be dissuaded from replacing D1's steam curtain with an air curtain. The Board disagrees. D1 discloses neither absolute nor relative dimensions for its chambers or the tube between them, so no conclusions as to their possible influence can be drawn.
- 3.3.10 It follows that the appellant-opponent's arguments that the information given in D1 does not teach away from using an air curtain to seal the two chambers is moot. The Board therefore confirms its opinion that the skilled person would not, as a matter of obviousness, modify D1's process by replacing steam with air as the injected fluid in its curtain seal.
- 3.4 From the above, the Board holds that the appellant-opponent's arguments have not demonstrated that the combination of D1 with D2, taking into account the common general knowledge of the skilled person, takes away inventive step of the subject matter of claim 1.
4. Main request, claim 1, inventive step starting from D1 with the skilled person's common general knowledge

4.1 The Board agrees with the appellant-opponent that the skilled person would know of air curtain seals as such. Therefore, whether they know of air-curtains from D2, as discussed above or from their common general knowledge, the considerations of inventive step remain as outlined above in the preceding section.

5. Main request, claim 1, inventive step, starting from D1 with D7

5.1 In its communication (see section 3), the Board commented on this issue as follows:

3.1 In the Board's view, the combination of D1 and D7 would not appear to take away inventive step of the subject matter of claim 1.

3.2 Starting from D1 the differing feature (e') is the same as has been explained above. It follows that the partial objective technical problems are also the same, amongst other things, finding an alternative fluid to steam for isolating D1's two chambers. In this regard, the Board agrees with the finding of the opposition division (see reasons, section 22.4) that the effect of browning food mentioned at the end of paragraph [0003] of the published patent specification is not presented as being achieved by injecting an air flow into the tube between two chambers. Therefore, the appellant-opponent's argument (grounds of appeal, page 4) that the skilled person would consult D7 and find a solution to this problem is irrelevant.

3.3 D7 discloses an oven with two chambers 3 and 4 separated by a partition 2, air jet nozzles 22, which the appellant-opponent argues equate to the differing claim feature e', may extend (according to figure 2) as

far as the partition 2 which may constitute a tube between chambers 3 and 4. However, D7 does not suggest the jet nozzles 22 force air left and right into both chambers. Nor does D7 teach that they are there to reduce leakage between chambers or play any role in isolating the environments in D7's two chambers. Rather they are provided for browning and crisping food, see paragraph [0025].

3.4 Therefore, faced with the objective technical problems developed by the Board (alternative fluid to D1's steam for isolation), the skilled person would have no reason to combine the teachings of D1 and D7.

For these reasons, the appellant-opponent's inventive step objection based on D1 with D7 is not convincing.

5.2 Neither in writing nor at the oral proceedings did the parties comment on this part of the communication. After having reconsidered all the relevant issues of the case, the Board sees no reason to change its preliminary opinion on this matter and concludes that the combination of D1 and D7 does not take away inventive step of the subject matter of claim 1 of the main request.

6. It follows from the above that the appellant-opponent's inventive step objections against the main request which have been maintained all fail. Therefore, the appeal fails.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



G. Magouliotis

A. Pieracci

Decision electronically authenticated