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D E C I S I O N
of 15 May 2000

Case Number: T 0242/96 - 3.3.2

Application Number: 90901068.8

Publication Number: 0452356

IPC: A23L 3/36

Language of the proceedings: EN

Title of invention:
Method and arrangement for freezing

Patentee:
AGA AKTIEBOLAG

Opponent:
Buse Gase GmbH & Co

Headword:
Freezing method/AGA

Relevant legal provisions:
EPC Art. 123(2),(3); 54(3),(4); 56; 158(1),(2);
PCT Art. 22(1); 39(1)

Keyword:
"Novelty - yes - published international application no prior art under Article 54(3) EPC"
"Inventive step - yes - unexpected effect"

Decisions cited:
-

Catchword:
-

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Case Number: T 0242/96 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 15 May 2000

Appellant: (Opponent)
Buse Gase GmbH & Co
Sprudelstrasse
D-53557 Bad Hönningen (DE)

Representative:
Liesegang, Roland, Dr.-Ing.
FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38
D-80801 München (DE)

Respondent: (Proprietor of the patent)
AGA AKTIEBOLAG
SE-181 81 Lidingö (SE)

Representative:
Berglund, Gustav Arthur
AWAPATENT AB
Box 5117
SE-200 71 Malmö (SE)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 29 December 1995 concerning maintenance of European patent No. 0 452 356 in amended form.**

Composition of the Board:

Chairman: P. A. M. Lançon
Members: J. Riolo
M. B. Günzel

Summary of Facts and Submissions

I. European Patent No. 0 452 356 based on application No. 90 901 068.8 was granted on the basis of 14 claims comprising a method claim with 6 dependent claims and a claim relating to an arrangement for carrying out the method with 6 dependent claims.

Claim 1 read as follows:

"1. Method for freezing a food product, characterised by placing the product on a firm supporting structure which has previously been given such a low temperature that the product when contacting said supporting structure will not freeze on to it, maintaining the product on the supporting structure for a sufficient time to cause its surface layer nearest the supporting structure to pass into the frozen state, and removing the product from the supporting structure for final freezing in a separate freezer."

Claim 8 read as follows:

"8. Arrangement for carrying out the method as claimed in claim 1 for freezing a food product, characterised by a firm supporting structure (1) on which the product is intended to be placed, means (2-4) for giving said supporting structure such a low temperature that the product when contacting the supporting structure will not freeze on to it, and a separate final freezer to which the product is intended to be fed for a final freezing as soon as its surface layer nearest the supporting structure has been passed into the frozen state."

II. Notice of opposition was filed against the granted patent by the appellant.

The patent was opposed under Article 100(a) EPC for lack of novelty and lack of an inventive step.

The following documents were cited inter alia during the proceedings.

(1) Pohlmann, Taschenbuch der Kältetechnik, 17. Edition, 09/1988, pp. 584, 606 and 607

(2) WO-A-9006693

(3) Welcher Froster für welche Lebensmittel? Gas aktuell/ Messer Griesheim, 08/85, pp. 1-8

(4) WO-A-8810072

III. The interlocutory decision of the Opposition Division posted on 29 December 1995 established that the patent could be maintained on the basis of claims 1, 5 and 8 as amended during the oral proceedings on 25 June 1996, claims 2 to 4, 6, 7 and 9 to 14 as filed and granted and the accordingly adapted description.

Said amended claims 1 and 8 differ from corresponding claims 1 and 8 of the patent as granted in that the "low temperature" mentioned in the claims has been further defined by introducing the wording "said temperature being maintained below -60°C".

Claim 5 has been adapted accordingly by deleting the preferred temperature value of -60°C.

As regards novelty, the Opposition Division was of the opinion that none of the available prior art documents disclosed a method for freezing comprising the steps of finally freezing the product in a separate freezer and of maintaining the temperature of the supporting structure on which the product is to be placed below -60°C during the first freezing step. The same conclusions applied to the apparatus used for carrying out the method.

Accordingly, compliance with Article 54 EPC was acknowledged by the Opposition Division.

The Opposition Division defined the problem to be solved as the provision of a method and of an apparatus which prevented the freezing on to the supporting structure of the product to be frozen. As the available documents were silent about the critical temperature of -60°C for the supporting structure to that end, the Opposition Division concluded that the problem was solved in a non-obvious way by implementing said measure.

IV. The appellant (opponent) lodged an appeal against the said decision. By a letter dated 12 May 2000 the appellant informed the Board of its decision not to attend the oral proceedings.

V. Oral proceedings were held before the Board on 15 May 2000.

VI. The written submissions of the appellant can be summarised as follows:

For the question of novelty the appellant took the view

that all the features of the claimed process were disclosed in the international application (4). It therefore concluded that the subject-matter of the patent in suit was not novel.

For the assessment of inventive step the appellant contended that the subject-matter of claim 1 of the patent in suit was obvious because, as shown in the features analysis of annex E2 filed with its letter dated 3 May 1996, all the process features resulted from the combination of document (1) with document (3).

In its view, the skilled person just needed to apply a temperature below -60°C, as used in the method of document (3), to the process of document (1) to end up with the process of the contested patent.

VII. By a communication dated 10 May 2000, referring to citation (4) the Board drew the attention of the parties to the requirements of Article 158(2) EPC for international published applications to be comprised in the state of the art in accordance with Article 54, paragraph 3.

VIII. The respondent’s arguments submitted both in the written procedure and at the oral proceedings can be summarised as follows:

The respondent confirmed that the international application (4), which also belonged to it, could not be novelty destroying for the subject-matter of claim 1 of the patent in suit because this document did not belong to the state of the art according to Article 158(2) EPC as the national fee for entering the European phase had not been paid.

As regards inventive step, the appellant further maintained that the method and the apparatus according to the patent in suit involved an inventive step because the available documents were silent about the critical temperature of -60°C for the supporting structure as a means for solving the problem of freezing on to the supporting structure of the product to be frozen.

It also referred to the results of experimental data accepted by the Opposition Division during the oral proceedings, as apparent from its decision, demonstrating that the temperature of the belt in the embodiment disclosed in document (3) was above -60°C. It further contended that the freezing on to the conveyer belt was even needed to a certain extent for the transportation of the products through the nitrogen bath in the embodiment according to said document.

IX. The appellant requested that the decision under appeal be set aside and that European patent No. 0 452 356 be revoked.

The respondent requested that the appeal be dismissed and that the patent be maintained.

Reasons for the Decision

1. The appeal is admissible.

2. *Article 123 EPC*

There are no objections under Article 123(2) and (3) EPC to the set of claims of the patent as maintained by

the Opposition Division in the interlocutory decision. The claims are adequately disclosed in the original description and do not extend the protection conferred when compared to the claims as granted. This was not contested by the appellant and, therefore, need not be further pursued here.

3. *Novelty*

Document (4) has been cited as being prejudicial to the novelty of the subject-matter of the patent in suit according to Article 54, paragraphs 3 and 4, EPC.

Since this document is an international application, it can only be considered as comprised in the state of the art in accordance with Article 54, paragraphs 3 and 4, if the national fee provided for in Article 22, paragraph 1, or Article 39, paragraph 1, of the Cooperation Treaty has been paid in accordance with to Article 158, paragraphs 1 and 2, EPC.

As pointed out by the Board and confirmed by the respondent during the oral proceedings, the international application (4) did not enter the European phase as no national fee was paid. Accordingly, this document is not comprised in the state of the art within the meaning of Article 54, paragraph 3 EPC.

Novelty of the subject-matter of the contested patent over the available state of the art has been acknowledged by the Opposition Division. No further novelty objections have been raised by the appellant. The Board sees no reasons to depart from these findings.

4. *Inventive step*

4.1 The patent provides for a method and an arrangement for freezing a food product.

Document (1), which is a textbook about freezing technique, relates to several freezing methods and apparatuses.

The Board agrees with the parties that document (1) represents the closest prior art.

4.2 On page 584 of this document, a freezing tunnel using cool air is described. The size of this freezing equipment may vary between 50 m^2 to 500 m^2. Mechanical means to prevent the product to be frozen from freezing fast on the supporting structure during freezing are also disclosed (lines 13, 14 and 21 to 23). Although not disclosed *expressis verbis*, it is however obvious that the frozen product will be then stored in a separate freezer.

Such freezing tunnels are mentioned as prior art in the description of the patent in suit. They are said to suffer the disadvantage of requiring considerable space, and the process cannot be modified or discontinued until the product has been transformed into solid phase.

Accordingly, the problem to be solved as against document (1) can be seen as the provision of a further method which prevents the freezing on of the products to be frozen and provides for a less bulky freezing arrangement.

4.3 This problem is solved by the subject-matter of claim 1. According to the process of the patent in suit, the supporting structure, on which the product to be frozen is placed, is previously given such a low temperature that the product will not freeze on to it and the product is furthermore removed from the supporting structure for final freezing in a separate freezer once its surface layer nearest the supporting structure has passed into the frozen state (ie after a few seconds) (page 2, left column, lines 12 to 22; page 2, left column, line 56 to page 2, right column, line 8 and claim 4). In the light of the disclosure in the description of the patent in suit, it is plausible that the problem has been solved.

4.4 Thus, the question to be answered is whether the proposed solution, ie to give the supporting structure such a low temperature in advance that the product will not freeze on to it, maintaining said temperature below -60°C and removing the product for freezing in a separate freezer once its surface layer nearest the supporting structure has passed into the frozen state, was obvious to the skilled person in the light of the prior art.

As regards the first aspect, the Board notes that documents (1) to (3) are all silent about any possible effect of the temperature on the freezing on to the supporting structure of the products to be frozen. In fact, document (1) is the only disclosure which deals with the freezing on (page 584, lines 13 and 14). The mechanical means in order to prevent the freezing on to the supporting structure described therein represent however a different and remote technical solution to this aspect.

The second embodiment of document (1) relates to an apparatus wherein the products are frozen by contact with a 18 m long belt made of steel which is cooled by a brine and maintained at a temperature of -40°C (page 606, page 607, lines 1 to 11 and example). According to the patent in suit, practical tests have however demonstrated that, in the case of a supporting structure made of steel, a temperature of -90°C is required in order to prevent products freezing on to the supporting structure (column 4, lines 39 to 49). It can be therefore assumed that the products do also stick on to the conveyer belt in this process.

In the third apparatus described in this document, freezing is achieved by using cool air. No temperature is disclosed and it is indicated in the relevant passage that the products freeze on to the supporting structure (page 607, line 19).

Concerning the second aspect, no hint is to be found with respect to the possibility of interrupting the freezing procedure on the conveyer belts for a final freezing in a separate freezer for sake of saving space.

Document (2) is primarily directed to the thawing of frozen products. Although the document recites that the thawing apparatus can also be used for freezing with liquid gases or cold gases as cooling agents, no indications relating to any temperature or freezing-on effect are to be found in the disclosure (page 1, column 2, lines 64 to 67, and column 3, lines 3 to 5).

Document (3) concerns freezing and cooling techniques using liquid gases. On page 7 and table 9, a conveyor

belt is described which is used to freeze extruded products having a temperature of 100°C in a liquid bath of nitrogen. No further information is to be found in this document for this process.

Accordingly, the Board is satisfied that the skilled person faced with the problem of preventing the freezing on of the products to the supporting structure had no hint to try to avoid such freezing on by lowering the temperature of the supporting structure and maintaining it below -60°C.

On the contrary, it would appear that the skilled person would always, as a rule, try to use the highest possible freezing temperature for the sake of saving energy. The lowering of the temperature of the supporting structure as a solution to prevent the freezing on problem represents therefore a non-obvious step to take.

Concerning the simplification of the freezing arrangement, the Board notes that none of the processes disclosed in documents (1) to (3) are concerned with methods wherein the products are frozen stepwise.

4.5 The main argument raised by the respondent was that the subject-matter of claim 1 was not inventive over the combination of document (1) with document (3) because the skilled person merely needed to implement the temperature below -60°C of the freezing process according to (3) (page 7, table 9) in the freezing process of (1) (page 606 and 607) in order to end up with all the features of the contested patent.

4.6 The Board cannot share the opinion of the respondent.

As regards the disclosure in document (3) on page 7 and table 9, which concerns a freezing process using a bath of liquid nitrogen, the Board notes that neither the temperature of the conveyer belt nor any possible effect of its temperature on the freezing-on phenomena are mentioned.

Accordingly, the skilled person had no incentive in the light of document (3) to decrease the temperature of -40°C used in the second process disclosed in document (1) as it would merely expect an increase of the energy costs by implementing such a measure.

Moreover, the Board sees no reason to have doubts as to the respondent's allegations, made before the Opposition Division and repeated before the Board, that the temperature measurements carried out in the process of document (3) indicate that the temperature between the products and the conveyer belt was not maintained below -60°C and that the products do also stick on to the belt.

Of course, the Board agrees with the appellant that, since the temperature of the nitrogen bath is -196°C and since the conveyer belt transports the products though the bath in a closed container, the temperature of the belt must therefore remain very low once it leaves the nitrogen bath. These considerations are however not sufficient to refute the respondent's allegations. In that respect, the appellant had moreover enough time to provide the Board with concrete evidence since this aspect had already been dealt with during the oral proceedings before the Opposition Division.

Having regard to the drawing of table 9, it is also quite clear that the products must stick on to the conveyer belt in order to be transported through the nitrogen bath as its steep gradient is such that the products would otherwise slide into the nitrogen bath.

Finally, neither document (1) nor document (3) are concerned with a stepwise freezing method. The methods of these documents foresee only the possibility of a complete freezing of the products on the conveyer belt. Therefore, there is nothing in the prior art pointing towards the simplification of the bulky prior art freezing tunnels, which results moreover from the solution provided to the freezing on problem enabling the use of a shorter conveyer belt for a first freezing step.

In view of the foregoing the Board judges that the subject-matter of claim 1 and of its dependent claims 2 to 7 of the set of claims of the patent as maintained by the Opposition Division in the interlocutory decision involves an inventive step as required by Article 56 EPC.

The same applies to the subject-matter of claim 8 and its dependent claims 9 to 14 relating to the freezing arrangement for carrying out the process.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Dainese P. A. M. Lançon