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**D E C I S I O N**  
**of 16 March 2006**

**Case Number:** T 1071/02 - 3.3.09

**Application Number:** 93201978.9

**Publication Number:** 0582327

**IPC:** A23G 9/18

**Language of the proceedings:** EN

**Title of invention:**

Method and apparatus for freezing aqueous liquid

**Patentee:**

AIR PRODUCTS AND CHEMICALS, INC.

**Opponents:**

L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION  
DES PROCEDES GEORGES CLAUDE  
Unilever PLC  
Tetra Pak Hoyer

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56, 83

**Keyword:**

"Sufficiency of disclosure - (yes) "

"Novelty (yes) "

"Inventive step (yes) "

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 1071/02 - 3.3.09

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.09  
of 16 March 2006

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted 23 July 2002  
rejecting the opposition filed against European  
patent No. 0582327 pursuant to Article 102(2)  
EPC.**

**Composition of the Board:**

**Chairman:** P. Kitzmantel  
**Members:** J. Jardón Alvarez  
M.-B. Tardo-Dino

## Summary of Facts and Submissions

I. The grant of European patent No. 0 582 327 in respect of European patent application No. 93 201 978.9 in the name of AIR PRODUCTS AND CHEMICALS, INC., which had been filed on 6 July 1993, was announced on 22 September 1999 (Bulletin 1999/38) on the basis of 25 claims. Independent Claims 1, 2 and 17 read as follows:

"1. A method of making an aerated ice-cream or chocolate ice by freezing an aqueous liquid, which method comprises the steps of:

- a) pre-cooling a mould to a temperature which is sufficiently cold such that the frozen aqueous liquid can be readily released from said mould and which is at or colder than  $-60^{\circ}\text{C}$  but which is not so cold that the frozen aqueous liquid is subject to structural damage;
- b) introducing the aqueous liquid into said mould;
- c) allowing at least the aqueous liquid in contact with said mould to freeze; and
- d) releasing said frozen aqueous liquid from said mould.

2. A method of making an ice lolly by freezing an aqueous liquid, which method comprises the steps of:

- a) pre-cooling a mould to a temperature which is sufficiently cold such that the frozen aqueous liquid can be readily released from said mould and which is at or colder than  $-60^{\circ}\text{C}$  but which is not colder than  $-85^{\circ}\text{C}$  so that the frozen aqueous liquid is not subject to structural damage;

- b) introducing the aqueous liquid into said mould;
- c) allowing at least the aqueous liquid in contact with said mould to freeze; and
- d) releasing said frozen aqueous liquid from said mould.

17. An apparatus for carrying out a method according to Claim 2, said apparatus comprising a vessel (102), a mould (105) dividing said vessel (102) into an upper portion (103) and a lower portion (104), means (111) to admit a coolant into said lower portion (104), means (112) to withdraw coolant from said lower portion (104), means (120) for filling said cavities (106) with ice lolly solution, means (107) for moving said cavities (106), means for inserting sticks into said cavities downstream of said filling means (120), and means for withdrawing frozen ice lollies from said cavities (105), and means (108) for cooling said coolant with liquid nitrogen, characterized by said mould (105; 205) having cavities (106; 206) made from thermally conductive material and having an average thickness of at least 1 mm."

[The underlined term "1mm." at the end of Claim 17 did not appear in the granted English version of the claims due to a printing error.]

II. Notices of opposition were filed against the patent by:

- (i) L'Air Liquide, S.A., (Opponent 1) on 20 June 2000, on the grounds of lack of novelty and inventive step (Article 100(a) EPC), insufficient disclosure (Article 100(b) EPC), and extension

beyond the content of the application as originally filed (Article 100(c) EPC);

- (ii) Unilever PLC, (Opponent 2) on 22 June 2000, on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and on the ground of insufficient disclosure (Article 100(b) EPC); and
- (iii) Tetra Pak Hoyer, (Opponent 3) on 23 June 2000, on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC).

The oppositions were supported *inter alia* by the following documents:

D12: EP-A-0 132 412

D13: WO-A-90/06693

D15: GB-2 135 437

D22: I.A. Lakovskaya et al. Kholodil'naya Tekhnika  
1983 (11) pages 41 - 43

D22a: English translation of D22

D23: J. Maciejczyk, Chlodnictwo 1982, 17(6), pages 17  
- 20

D23a: English translation of D23

D24: F.J. Nicholson, "Freezing trends and techniques",  
Australian refrigeration, air conditioning and  
heating, May 1977, pages 46 - 49

D26: Experimental Report filed by Opponent II on  
20 June 2000 (Annex III of the opposition letter)

D32: GB-1 471 519 and

D33: US-4 505 121.

III. By its decision announced orally on 27 June 2002 and issued in writing on 23 July 2002, the Opposition Division held that the grounds of opposition did not prejudice the maintenance of the patent as granted and rejected the oppositions.

The Opposition Division held in the appealed decision that the patent specification disclosed the invention in a manner sufficiently clear and complete for it to be carried out by the skilled person. If, in spite of the several examples in the description, the skilled person should encounter failure, there was enough guidance in the specification of which parameters should be considered and optimized to achieve success.

The Opposition Division held further that the claimed subject-matter was novel over the cited prior art, especially over D13, essentially because it was necessary to make at least three choices within the disclosure of D13 in order to arrive at a method within the scope of the patent in suit.

D13 was also considered to represent the closest prior art. The problem to be solved with regard to this disclosure was to avoid structural damage of the aerated ice-cream or chocolate ice products according

to Claim 1 or the ice-lolly according to Claim 2. In the opinion of the Opposition Division the claimed solution to this problem was not suggested by the cited prior art.

- IV. On 17 September 2002 the Opponent 2 (Appellant) lodged an appeal against the decision of the Opposition Division and paid the appeal fee on the same day.

In the Statement of Grounds of Appeal filed on 22 November 2002, the Appellant requested the revocation of the patent in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and insufficient disclosure (Article 100(b) EPC).

By letter dated 10 February 2006, the Appellant filed further arguments in support of its objections of lack of novelty of Claim 2 and lack of inventive step of all claims.

- V. The Respondent (Patent Proprietor) presented its counter-statement in a written submission dated 27 June 2003 and corrected on 30 June 2003. The Respondent disputed the arguments submitted by the Appellant and requested oral proceedings in the event that the Board of Appeal be minded to make a decision adverse to the Respondent.



VI. On 17 November 2005 the Board dispatched the summons to attend oral proceedings. In the annexed communication pursuant to Article 11(1) of the Rules of Procedure of the Boards of Appeal, the Board acknowledged the novelty of the claimed subject-matter and drew the attention of the parties to the points to be discussed during the oral proceedings.

VII. Opponent 1 and Opponent 3, both parties as of right to the proceedings, did not file any substantive submissions during the present appeal proceedings and did not attend the oral proceedings held on 16 March 2006.

VIII. The arguments presented by the Appellant in its written submissions and at the oral proceedings may be summarized as follows:

- The patent failed to disclose the claimed invention in a sufficiently straightforward manner for it to be carried out by a person skilled in the art. There was not enough information in the specification concerning the key parameters of the invention such as the thickness of the mould, the thermal conductivity of the material of which it is made, the cooling rate to be used and the nature of the aqueous liquid to be frozen. Furthermore, the specification was also silent about other important parameters of the claimed methods such as the temperature of the aqueous liquid entering the mould and the method of measurement of the temperature of the mould surface.

- The Appellant furthermore relied on the experimental evidence (D26) submitted during the first instance opposition proceedings showing that it was possible to successfully produce ice lollies at temperatures outside the scope of the claims (i.e. at the temperature of liquid nitrogen), whereas it was not possible to demould the frozen products despite the mould temperature being within the claimed scope (at  $-80^{\circ}\text{C}$ ). The Appellant submitted further experimental evidence with the Grounds of Appeal investigating the influence (i) of the cooling time on the cooling rate (Appendix A), (ii) of the ambient temperature and the site of measurement on the measured value of the apparent mould temperature (Appendix B) and (iii) of the ingredients of the aqueous liquid to be cooled on the adhesive force to the surface of a stainless steel mould (Appendix C).
  
- D13 was novelty destroying for the subject-matter of Claim 2 of the patent because it disclosed a general process for freezing a food product including all the technical features of the claim. Although ice lollies were not explicitly mentioned in D13, the term "ice lolly" as used in the patent in suit embraced any frozen flavoured liquid, including those without sugar. According to the Appellant said definition of ice lollies would include sauces as described in D13.
  
- Concerning inventive step the Appellant considered D13 as the closest prior art as it related to the same technical field, i.e. frozen food products, and as it addressed the same problem, i.e. release

of frozen products from a supporting structure. D13 taught that easy release could be achieved without structural damage by using an aluminium mould at -60°C. The Appellant saw the problem to be solved by the patent in suit as the provision of a process for making ice creams or ice lollies wherein the product was easily released from the mould.

The skilled person would be motivated to apply the process disclosed in D13 to a wide range of food products including ice-creams arriving thereby at the claimed process. The lack of structural damage was in its opinion merely an inevitable "bonus effect" directly obtained by applying the teaching of D13 which could not justify the recognition of an inventive step.

IX. The arguments presented by the Respondent in its written submissions and at the oral proceedings may be summarized as follows:

- The specification described in detail the factors which should be taken into account to practice the invention successfully. The examples and comparative examples in the description clearly showed the relevant factors (temperature, thickness of the mould, composition of the ice cream, etc.) and how they should be modified in order to ensure that the ice cream did not adhere and did not suffer structural damage.
- D13 was not novelty destroying because it did not disclose ice lollies. Furthermore this document

did not teach that aqueous liquids could be frozen in a mould which had been pre-cooled to a temperature which was sufficiently cold, particularly  $-60^{\circ}\text{C}$  or colder, to ensure that the frozen aqueous liquid could be easily released from the mould, but which was not so cold that the product would suffer structural damage. Consequently, D13 did not disclose clearly and unambiguously each and every feature of claim 2.

- Concerning inventive step the Respondent pointed out that the technical problem of avoiding structural damage had not been recognized either in D13 or in any other prior art document in this field and that consequently the question of obviousness could not even arise. It further noted that the 'structural damage' occurring when food products, like fish, were frozen at very low temperatures which was referred to in some citations relied on by the Appellant related to a deterioration at a cellular level and not to the structural damage ("shattering") referred to in the patent, that is to say, to the breaking of the product in two or more separate pieces.
- X. The Appellant requested that the decision under appeal be set aside and that the European patent No. 0582327 be revoked.

The Respondent requested that the appeal be dismissed.

## Reasons for the Decision

1. The appeal is admissible.
2. *Sufficiency of disclosure (Article 83 EPC)*
  - 2.1 Article 83 EPC requires that a European patent application discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. In accordance with the case law of the Boards of Appeal the requirements of Article 83 EPC are met if:
    - (a) at least one way is clearly indicated in the patent specification enabling the skilled person to carry out the invention, and
    - (b) the disclosure allows the invention to be performed in the whole area claimed without undue burden, applying common general knowledge.
  - 2.2 Having regard to the disclosure of the patent including several working examples and a discussion of the parameters which have to be taken into account when carrying out the invention such as the thickness of the mould and the cooling rate, the Board is convinced that the first requirement cited above is met.
  - 2.3 Concerning the second requirement it is noted that in its most general form the present invention is expressed by method Claims 1 and 2 which define the steps of the claimed process. More specifically, these claims define the starting material and the process

steps which are necessary to make an aerated ice-cream, chocolate ice or ice lolly.

As stated in the present specification, the invention is based on the finding that there is a direct correlation between the rate at which the aqueous solution is cooled and the propensity of the frozen liquid to adhere to a surface and on the further finding that if the initial cooling rate is too high, the ice cream or the ice lolly cracks as it freezes (see [0006] to [0009]).

- 2.4 The specification also includes detailed information about the factors which have to be taken into account to practice the invention such as the rate of cooling (col. 5, lines 18 - 22, col. 6, lines 4 - 37), the thickness of the mould and the material of which it should be made ([0016] [0021], [0022] [0023] and [0034]), the composition of the ice lolly mixture ([0031]), etc.. Furthermore, the specification also provides experimental evidence concerning the influence of the mould temperature on the desired release and integrity maintenance properties of the frozen product (see col. 7, lines 6 - 39).

The specification thus includes appropriate guidance of how to balance the various factors influencing the desired outcome in order to achieve good mould release and still avoid structural damage.

- 2.5 The Appellant argued that the specification did not teach all the essential features which need to be considered in order to successfully carry out the claimed process, such that it was not possible for the

skilled person to perform the invention in the whole area claimed without undue burden. These arguments of the Appellant were essentially based on the experimental evidence (D26) submitted with the opposition letter and on the further evidence submitted with the Grounds of Appeal (see under point VIII above).

2.6 These arguments cannot be accepted by the Board for the following reasons:

2.6.1 In the experiments of example 1 of D26, moulds of 0.8 and 0.9 mm thickness were cooled by complete immersion in liquid nitrogen (-195,8°C). In each case the removal of the lollies was achieved without any problem, which in the view of the Appellant shows that removal of the lollies was also possible working outside the scope of Claim 2.

However it has been pointed out by the Respondent that the use of liquid nitrogen as refrigerant results in a mould temperature higher than that of liquid nitrogen because, when filling the mould with the relatively warm aqueous lolly solution, the liquid nitrogen surrounding the mould immediately vaporises and expands thus embedding the mould in gaseous nitrogen which acts as a very effective insulator. The temperature difference between the mould and the lolly composition is thus greatly reduced, leading to cooling conditions meeting the requirements of present Claim 2. In the Respondent's opinion, this explains that the ice lollies could be demoulded without breaking.

In view of this explanation, the Board is convinced that these experiments were not carried out with the excessively rapid cooling which would cause structural damage, and consequently the fact that the lollies could be demoulded undamaged cannot question the sufficiency of disclosure of the patent in suit.

- 2.6.2 In example 2 of D26 a series of experiments was performed with moulds of 0.8, 0.9 and 2.0 mm thickness and with the mould pre-cooled at  $-80^{\circ}\text{C}$  in a freezer overnight. In these examples no demoulding could be achieved. Thus, these results seem to cast doubt on the sufficiency of the disclosure of the claimed invention within the claimed scope.

However, the significance of these experiments is put in jeopardy by the further experimental evidence submitted by the Appellant itself during the Appeal proceedings. According to this evidence (Appendix C of the Grounds of Appeal), the same 10% gelatin solution used in example 2 of D26 is reported to exhibit an extremely low mould adhesion at a temperature of  $-60^{\circ}\text{C}$  pointing to the possibility of very easy demoulding.

Considering this contradictory evidence, the Board concludes that the Appellant has not discharged the burden of proof resting on it to establish that after cooling the aqueous lolly solution at the temperature conditions required by Claim 2, the desired easy demoulding could not be achieved.

- 2.6.3 The Appellant also pointed out that some essential parameters like the thickness of the mould and the cooling rate were not defined in the claims. Since this



is an objection under Article 84 EPC, it is not applicable to the granted version of the claims under consideration.

2.6.4 As to the Appellant's further criticism that the patent did not contain specific guidance enabling the skilled person to find the working temperatures for different lolly ingredients, the Board holds that the exact conditions for a given composition can be found out by routine experimentation by the skilled person with the instructions given in the specification. The Appellant itself had no problems to determine appropriate conditions for different solutions (see Appendix C).

2.6.5 In addition, the fact that the measurement of the mould temperature itself is not described in detail in the specification cannot question the sufficiency of disclosure of the invention. Claims 1 and 2 require the pre-cooling of the mould to a temperature of, or colder than,  $-60^{\circ}\text{C}$ . The fact that the measured apparent mould temperature can vary with the ambient air temperature as shown in Appendix B of the evidence submitted by the Appellant with the Grounds of Appeal has no significance. Reference is made again to Appendix C where the Appellant had apparently no problem in measuring the surface temperature of the moulds. In this context the Board is of the opinion that, in spite of the fact that special care is required when measuring the precise temperature of the cooled mould surface with a thermocouple when a large initial temperature difference between the cooled mould surface and the adjacent medium exists, the determination of appropriate conditions for the temperature measurement

does not go beyond the ordinary capacity of a skilled person.

2.7 The Board, therefore, concludes that, in the present case, sufficient information and guidance is at the skilled reader's disposal enabling him to successfully carry out the claimed processes within the whole ranges claimed. Hence, the requirements of Article 83 EPC are met.

3. *Novelty (Article 54 EPC)*

3.1 The novelty of Claim 2 of the patent in suit has been contested by the Appellant having regard to the disclosure of D13.

3.2 Claim 2 of the patent in suit is essentially directed to a method of making an ice lolly by freezing an aqueous liquid comprising the steps of:

- (a) pre-cooling a mould to a temperature between -60°C and -85°C;
- (b) introducing the aqueous liquid into said mould;
- (c) allowing it to freeze and
- (d) releasing the frozen aqueous liquid from the mould.

3.3 D13 discloses in Claim 1 a method for freezing a food product characterised by placing the product on a firm supporting structure which has previously been cooled to such a low temperature that the product will not freeze on it, maintaining the product on said surface to cause its surface layer to freeze and removing the

product from the supporting structure for final freezing in a separate freezer.

As food products, shaped ice figures, hamburgers, fish fillets, pieces of chicken, cut fruit and sauce portions are mentioned (page 4, lines 9 - 11). The supporting structure is maintained at a temperature below about  $-60^{\circ}\text{C}$ , preferably below about  $-90^{\circ}\text{C}$ , depending on the material of which it is made (see Claim 5 and the paragraph bridging pages 5 and 6). In the case of semi-liquid or liquid products the supporting structure suitably has depressions for receiving the product (page 6, lines 19 - 27).

- 3.4 There is however no reference in D13 to the preparation of ice lollies by freezing an aqueous liquid into a mould. The Appellant acknowledged that "ice lollies" are not disclosed in D13 but argued that the term "ice lolly" was defined in the description of the patent in suit as a frozen flavoured liquid which may or may not contain sugar (cf. [0002] and [0018]). In its opinion this definition encompasses any frozen flavoured aqueous liquid, and the method as claimed on Claim 2 would then include the freezing of sauce portions as disclosed in D13.
- 3.5 The Board does not agree with this interpretation of the scope of Claim 2 by the Appellant. The skilled person when considering a claim should rule out interpretations which are inconsistent with its genuine meaning. In the present case the subject-matter of Claim 2 is directed to the preparation of an ice lolly. It is incontestable that according to the well accepted meaning of this term an ice lolly is a sweet, flavoured

piece of ice on a stick and is therefore different from a frozen sauce, which moreover is not further specified in D13 with regard to its constituents. The fact that according to paragraph [0018] "sugar" may not be present in the ice lolly composition, merely expresses that another sweetener may be used and not that the subject-matter of the claims intends to cover other products than ice lollies. It follows that the scope of Claim 2 of the patent in suit does not embrace the term "sauce portions" as disclosed in D13.

3.6 It is furthermore pointed out that the reference to shaped ice figures on page 4, line 10 of D13 is also not novelty destroying for the subject-matter of Claim 2. The term "shaped" implies here that the starting material to be frozen already has a "shape" and cannot be an aqueous liquid as required by step b) of the method of Claim 2. Furthermore, the Appellant's suggestion, that the possibility of having "depressions" in the cooled supporting structure of D13 was equivalent to the disclosure of a mould for ice lollies which requires structural features undisclosed in D13 is also inconclusive. There is also no link in D13 between this design of the supporting structure and the disclosure of the shaped ice figures mentioned before.

3.7 For these reasons the subject-matter of Claim 2 is not anticipated by the disclosure of D13.

3.8 The novelty of the remaining claims was no longer disputed by the Appellant. The Board also agrees with the findings of the Opposition Division in the disputed

decision that the subject-matter of these claims is novel.

4. *Inventive step (Article 56 EPC)*

4.1 According to the established practice of the Boards of Appeal, the determination of the objective technical problem to be solved should normally take account of the problem acknowledged in the contested patent.

4.2 Closest prior art

4.2.1 The patent in suit relates to a method for making aerated ice-creams, chocolate ices and ice lollies.

4.2.2 According to the introductory section of the specification it was known in the production of ice-lollies or ice-creams that freezing moulds were filled with the material to be frozen and were then cooled to achieve freezing of their contents. Thereafter the mould was removed and warmed up in order to allow easy and intact demoulding (paragraph [0002]).

4.2.3 This known prior art method presented essentially two disadvantages:

- The surface of the frozen product and particularly its sculptured features became blurred due to surface melting of its outer layer and
- a significant energy was required due to the alternative warming and cooling of the moulds [paragraphs (0003) and (0008)].

4.2.4 In order to facilitate the removal of the ice-lollies without warming, several processes have been already suggested prior to the claimed invention. Thus, D12 avoids this successive heating and re-cooling by using a two part mould able to induce mechanical compression stresses on the surface zones of its frozen contents (see claims) and D32 uses moulds of elastomer material which are deformable at low temperatures (see Claim 1 and page 2, lines 81 - 88). Additionally, in D33 sharp shaped frozen products are obtained by using a frozen mould coating having a lower melting temperature than the material to be frozen, e.g. a water-ice coating, which upon melting serves as a release agent (see Claims 1 - 3).

4.2.5 In contrast to this background prior art, the Appellant relies on D13 as the closest prior art because it has the most technical features in common with the subject-matter of the patent (see point 3.3 above).

4.2.6 In the Board's judgment, the Appellant's approach to assess inventive step when starting from D13 is flawed, because this document does not address the objectives of the claimed invention, but rather seeks to provide a freezing method, especially for products having a soft consistency or a soft or moist surface, which avoids fast freezing on to the supporting structure. If this occurs, the product must be scraped off or broken loose leaving remnants of the product on the supporting structure (see page 1, lines 3 - 17 and 28 - 30 of D13).

Thus, D13 does not relate in any way to the preparation of ice-creams or ice lollies starting from an aqueous liquid which is the very purpose of the patent in suit,

nor does it make reference to the freeze-shaping of liquids in a mould and to any demoulding problems associated therewith.

It follows, that D13 does not qualify as the closest prior art regardless of the number of technical features it might have in common with the subject-matter of the patent.

4.2.7 In the Board's judgment, therefore, the prior art mentioned in the introductory section of the patent in suit as discussed above under point 4.2.4 represents the closest prior art for the assessment of inventive step of the present subject-matter.

4.3 The objective problem to be solved and its solution.

4.3.1 The technical problem to be solved by the patent in relation to said prior art can thus be formulated as to provide a further or alternative method of making an aerated ice-cream or an ice lolly by freezing an aqueous liquid wherein the ice-cream or ice lolly separates easily from the mould (it does not adhere to its surface) and does not suffer structural damage (it does not shatter), i.e. is easily demouldable as an intact frozen product.

4.3.2 This problem is solved by the methods according to Claims 1 and 2, wherein the aqueous liquid is introduced into a mould which has been pre-cooled to a temperature between  $-60^{\circ}\text{C}$  and a temperature wherein the frozen aqueous liquid is not subjected to structural damage (see Claim 1, step (a)) or a temperature of  $-85^{\circ}\text{C}$  (see Claim 2, step (a)).

- 4.3.3 The results of the examples in the specification credibly demonstrate that by working within a narrow band of low temperatures, meeting the respective requirements of Claim 2, easy removal of the ice lolly from the mould can be obtained without structural damage. Thus, as shown by examples 5 and 6, pre-cooling of the moulds to a temperature of  $-70^{\circ}\text{C}$  allows easy removal of the ice-lollies from the moulds. In contrast, pre-cooling to temperatures of  $-20^{\circ}\text{C}$ ,  $-50^{\circ}\text{C}$  or  $-196^{\circ}\text{C}$  (see examples 1 - 4) results in an ice-lolly remaining adhered to the mould. Moreover examples 7 to 9 show that if the moulds are excessively pre-cooled then the frozen product shatters within the mould.
- 4.3.4 As set out in section 2 above, the evidence submitted by the Appellant intended to prove that the examples in the specification are unreliable to show that the existing technical problem is effectively solved by the claimed subject-matter is inconclusive and cannot question therefore that the above problem has indeed effectively been solved.
- 4.3.5 Concerning the preparation of ice creams or chocolate ices (Claim 1) it is noted that although there is no experimental evidence in the specification concerning their preparation, the Respondent stated during the oral proceedings that they show a similar behaviour to the ice lollies, i.e. that too low a mould temperature leads to structural damage due to the formation of cracks. This was not contested by the Appellant. The definition of this characteristic in Claim 1 in a functional manner without recourse being made to a



concrete numerical temperature value is not objectionable under the requirements of Article 56 EPC.

#### 4.4 Obviousness

4.4.1 It remains to be decided whether, in view of the available prior art documents, it would have been obvious for the skilled person to solve this technical problem by the means claimed, namely by working at the claimed temperature conditions.

4.4.2 There is no hint to this solution in the prior art documents dealing with the preparation of ice creams or ice lollies. According to this state of the art freezing is usually carried out with brine at "relatively high" temperatures, in the range of -12 to -30°C (see eg D12, page 2, lines 3 - 4). The lowest temperature disclosed for the preparation of ice-cream is the "very low temperature of about 40-45°C below zero" mentioned in D32 (page 3, lines 78 - 79); but this temperature is still quite distant from the range of -60°C and below now claimed. Consequently, the use of lower temperatures in order to facilitate demoulding of ice creams or ice lollies is not suggested by this prior art.

4.4.3 It is further to be examined whether the claimed solution could have been deduced from the other documents cited by the Appellant which are not restricted to the preparation of ice creams or ice lollies but which relate to the freezing of different food products (D13, D22, D23 and D24).

Document D13 describes a method for freezing a food product using temperatures below  $-60^{\circ}\text{C}$  (see claims). It discloses on page 2, lines 12 - 26 that there is a critical temperature for each product to be frozen below which temperature there is no tendency to freeze on the supporting structure, that is to say there is no tendency to adhere to its surface. This phenomenon is said to vary with the composition of the product, the properties of the material and how the temperature decrease is achieved.

Documents D22, D23 and D24 also describe the reduction of the adhesion by using very low temperatures during freezing of meat products (see D22a, page 3, lines 16 - 27) or fish products (see D23a, page 4, last paragraph and D24, page 48, left column, third paragraph).

4.4.4 Thus, although not specifically dealing with the freezing of ice-creams, these documents already teach the use of very low freezing temperatures to avoid adhesion of a food product to a supporting material. If the skilled person turned to this prior art he would possibly find therein a hint to solve the first aspect of the technical problem as defined above under 4.3.1, namely to allow easy demoulding.

4.4.5 However, he would not find any hint in this prior art how to also solve the second aspect of the existing technical problem, namely which measures are to be taken in order to obtain structurally intact frozen products, i.e. to avoid shattering of the ice cream/ice lolly when very low temperatures are used.

D13, the document on which the Appellant mostly relied on, does not recognize that when freezing ice-creams or ice-lollies, there is only a certain range of temperatures where low adhesion is achieved without causing structural damage. In fact, the preferred freezing temperature of  $-90^{\circ}\text{C}$  disclosed in connection with the use of aluminium as mould material (see Claim 5; sentence bridging pages 5 and 6) would result in shattering of the ice lollies as demonstrated by example 7 of the patent in suit. The same shattering effect would occur with the ice-cream and chocolate ice of Claim 1 (see 4.3.5 above).

Taking account of these facts, namely that D13 does not recognize the problem of structural damage when working at very low temperatures and that working at the preferred temperatures of D13 would result in structural damage of ice lollies, no "one way street" situation can arise. The skilled person, following said preferred teaching of D13, would arrive at a situation wherein the ice lolly would crack, and the same would occur with ice-cream or chocolate ice at somewhat lower temperatures, without there being any warning in D13. Therefore the lack of structural damage to the ice lollies of the claimed process cannot be seen as a "bonus effect" as suggested by the Appellant.

The skilled person would also not be encouraged by D22 - D24, none of which relates to the fabrication of ice-cream or ice lollies either, to use very low freezing temperatures for every foodstuff as a general rule. None of them deals with demoulding of a foodstuff and/or with the problem of shattering which arises at very low temperatures. The reference to mechanical

damage of the outer shell of deep frozen fish at very low temperatures (immersion into cryogenic liquids) in D24 (page 48, third paragraph of the left column) is apparently unrelated to the shattering of ice lollies, because, as opposed to the present situation, this damage is reported to be recognizable only in the thawed product.

4.4.6 Thus, the finding that a certain range of temperatures has to be respected wherein the ice-cream or ice-lolly can be easily released from its mould without suffering structural damage is not a teaching the skilled person being confronted with the task to find a solution to the existing technical problem, would find in the available prior art.

4.5 Hence, the Board considers that, in the light of the cited prior art, it would not have been obvious to a person skilled in the art, to arrive at the methods as claimed in Claims 1 and 2.

4.6 The subject-matter of Claims 1 and 2 as well as the subject-matter of Claim 17 which relates to an apparatus adapted for carrying out the method according to Claim 2, therefore involves an inventive step within the meaning of Article 56 EPC. Claims 3 to 16 and 18 to 25 are dependent claims and therefore also satisfy the requirements of Article 56 EPC.

5. In summary, the Board concludes that the grounds of opposition raised by the Appellant/Opponent do not prejudice the maintenance of the patent as granted.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

G. Röhn

P. Kitzmantel