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D E C I S I O N
of 3 November 2005

Case Number: T 0079/03 - 3.3.09

Application Number: 90916488.1

Publication Number: 0500640

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Language of the proceedings: EN

Title of invention:

Hard candy containing xylitol and a process for the
manufacture thereof

Patentee:

XYROFIN OY

Opponent:

ROQUETTE FRERES, S.A.

Headword:

-

Relevant legal provisions:

EPC Art. 84, 54, 56, 123(2)(3)

Keyword:

"Main request and auxiliary requests I-IV: inventive step (no):
obvious to try"

Decisions cited:

-

Catchword:

-



Case Number: T 0079/03 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 3 November 2005

Appellant: XYROFIN OY
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
19 November 2002 concerning maintenance of
European patent No. 0500640 in amended form.

Composition of the Board:

Chairman: P. Kitzmantel
Members: A.-T. Liu
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. Opposition was filed against the subject-matter of Claims 1 to 3 of the European patent No. 500640 relating to "Hard candy containing xylitol and a process for the manufacture thereof" on the grounds of Articles 100(a) and (b) EPC.

II. Of the documents cited by the parties in the course of the opposition proceedings, reference will be made to the following in the present decision:

D1: EP-A-370 761

D2: Pepper and Olinger, Food technology, October 1988, pages 98 to 106

D4: Schiweck and Krüger, Süßwaren 5, pages 204 to 210, 1982

The interlocutory decision of the opposition division, taken at the oral proceedings on 8 October 2002, was based on a main request filed by letter of 13 July 2001, a first auxiliary request filed by letter of 9 September 2002, and second to fifth auxiliary requests filed at the oral proceedings. In essence, the opposition division held that the property of the claimed candies, namely "substantially crystallised throughout", was not distinguishable from the property of the hard candies made according to Examples 2 and 3 of D1, namely "partially crystallised". In view of this and since the compositions of the hard candies of D1 fell within the ranges defined in Claim 1 according to the main and first to third auxiliary requests, these

candies were novelty-destroying of the subject-matter of all these claims. Since the candies *per se* lacked novelty, the additional feature that they were obtainable by certain processes according to Claim 1 of the fourth auxiliary request could not establish novelty with regard to D1.

Since the subject-matter of the granted process claims 4 to 11 had not been opposed, the patent was maintained by the opposition division on the basis of the fifth auxiliary request, which was in substance restricted to this subject-matter.

III. Appeal was lodged by the patentee on 3 January 2003 against the interlocutory decision posted on 19 November 2002. With the Statement of the grounds of appeal of 26 March 2003, the appellant filed a Test Report and amended claims as bases for a main request and new first to sixth auxiliary requests. The main request was subsequently amended by the filing of a new Claim 1 during the oral proceedings of 3 November 2005.

IV. Claim 1 of the main request on file read as follows:

"Hard candy containing xylitol, characterized in that it is substantially crystallized throughout and the sweetener thereof consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of sorbitol, maltitol, isomalt, lactitol or a mixture thereof, and that it can contain up to 3 % by weight of water, any water present in the hard candy being derived from crystal water present in the raw materials of the sweetener, and up to 3 % by weight of conventional processing agents and additives such as vegetable fat, emulsifiers,

colourings and aromatic substances, and intensive sweeteners, provided that a product is excluded the sweetener of which consists of 35 % by weight of lactitol and 65 % by weight of xylitol and which is obtainable by heating the lactitol and a proportion of 2/13 of the total amount of xylitol and small amounts of water to 170°C, adding the remaining portion of 11/13 of the total amount of the xylitol as powdered xylitol and mint aroma in an amount 1 ml per 325 g of xylitol to the mixture when the humidity of the mixture was 1.3 %, the temperature of the resulting mixture being maintained below 65°C, thereafter cooling the mixture to about 42°C, and shaping the mass in a cold rolling machine."

Claim 1 of the first auxiliary request read as follows:

"Hardy (sic) candy containing xylitol, characterized in that it is substantially crystallized throughout and the sweetener thereof consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of sorbitol, maltitol, isomalt, lactitol or a mixture thereof, and that it can contain up to 3 % by weight of water, any water present in the hard candy being derived from crystal water present in the raw materials of the sweetener, and up to 3 % by weight of conventional processing agents and additives such as vegetable fat, emulsifiers, colourings and aromatic substances, and intensive sweeteners, provided that a product is excluded the sweetener of which consists of 35 % by weight of lactitol and 65 % by weight of xylitol."

Claim 1 of the second and third auxiliary requests read as follows:

"Hardy (sic) candy containing xylitol, characterized in that it is substantially crystallized throughout and the sweetener thereof consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of sorbitol, maltitol, isomalt, or a mixture of sorbitol, maltitol, isomalt and/or lactitol, and that it can contain up to 3 % by weight of water, any water present in the hard candy being derived from crystal water present in the raw materials of the sweetener, and up to 3 % by weight of conventional processing agents and additives such as vegetable fat, emulsifiers, colourings and aromatic substances, and intensive sweeteners.

Claim 1 of the fourth auxiliary request read as follows:

"Hardy (sic) candy containing xylitol, characterized in that it is substantially crystallized throughout and the sweetener thereof consists of 40 to 65 % by weight of xylitol and 60 to 35 % by weight of sorbitol, maltitol, isomalt, lactitol or a mixture thereof, and that it can contain up to 3 % by weight of water, any water present in the hard candy being derived from crystal water present in the raw materials of the sweetener, and up to 3 % by weight of conventional processing agents and additives such as vegetable fat, emulsifiers, colourings and aromatic substances, and intensive sweeteners, obtainable by melting a portion of 60 to 80 % of the substances constituting the sweetener, the main part of said portion being xylitol, at 120 to 160°C, cooling the melt to 100 to 115°C, at which temperature the remainder of the substances

constituting the sweetener is added thereto as a crystalline or powdered solid, cooling the mixture while mixing to 60 to 80°C, and moulding in hard or starch moulds."

Claim 1 of the fifth auxiliary request read as follows:

"Hardy (sic) candy containing xylitol, characterized in that it is substantially crystallized throughout and the sweetener thereof consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of sorbitol, maltitol, isomalt, lactitol or a mixture thereof, and that it can contain up to 3 % by weight of water, and up to 3 % by weight of conventional processing agents and additives such as vegetable fat, emulsifiers, colourings and aromatic substances, and intensive sweeteners, provided that a product is excluded the sweetener of which consists of 35 % by weight of lactitol or maltitol and 65 % by weight of xylitol."

Claim 1 of the sixth auxiliary request read as follows:

"Hardy (sic) candy containing xylitol, characterized in that it is substantially crystallized throughout and the sweetener thereof consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of sorbitol or isomalt, or a mixture of sorbitol, maltitol, isomalt and/or lactitol, and that it can contain up to 3 % by weight of water, and up to 3 % by weight of conventional processing agents and additives such as vegetable fat, emulsifiers, colourings and aromatic substances, and intensive sweeteners."

V. The arguments of the appellant can be summarised as follows:

- The generic disclosure of D1 was directed to the production of amorphous candies.
- The crystalline products according to the specific disclosure in Examples 2 and 3 of D1 were no longer encompassed by the wording of the present claims.
- For the assessment of inventive step, D2 should be considered to comprise the closest prior art teaching.
- When pure xylitol was used as sweetener as in D2, a large amount of heat was generated during the manufacture of hard candies, resulting in candies with holes. The technical problem to be solved with respect to the teaching of D2 was therefore the provision of hard candies without these defects and with improved taste.
- D2 neither mentioned the present technical problem(s) nor suggested the solution comprising admixing sorbitol to the sweetener.
- D2 did not disclose sufficient information enabling the skilled person to produce a crystallised hard candy with a sweetener mixture consisting of xylitol and sorbitol in the proportion as stipulated in Claim 1.

- The Test Report submitted with the Statement of the grounds of appeal was evidence that the process according to the patent in suit would yield hard candies which were more crystalline as compared to the one according to Example 3 of D1, and consequently also as compared to the ones according to D2.
- During the oral proceedings the appellant withdrew its request originally submitted with the Statement of grounds of appeal for reimbursement of the appeal fee.

VI. The arguments of the respondent can be summarised as follows:

- The subject-matter of claim 1 of the main request was not sufficiently delimited against the disclosure of D1.
- D2 disclosed the production of crystallised hard candies using as sweetener either pure xylitol or a mixture of 85 % sorbitol and 15 % xylitol. It therefore contained sufficient information for the skilled person to produce hard candies with a sweetener system consisting of sorbitol and xylitol.
- The selection of a mixture of sorbitol and xylitol in the claimed range for improving the taste was the result of pure routine, in particular since the range of 40 % sorbitol and 60 % xylitol was already suggested in D2 for chewing gum compositions.

- The degree of crystallinity was not defined in the claims. The samples referred to in the Test Report were made under specific processing conditions; thus no conclusion could be made in general for the entire ranges of parameters defined in Claim 1. Furthermore, even under these specific conditions, the Report did not show substantial differences between the various samples. As a consequence, the process parameters defined in Claim 1 of auxiliary request 4 could not be construed as an additional delimitation for the claimed product over that of D2.

VII. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of Claim 1 of the main request filed during the oral proceedings and Claims 2 to 11 as granted, or alternatively, on the basis of one of the auxiliary requests 1 to 6 filed with the Statement of grounds of appeal.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

Main request

1. *Amendments*

- 1.1 Claim 1 of the main request has been amended with respect to Claim 1 as granted by the specification that "any water present in the hard candy being derived from

crystal water present in the raw materials of the sweetener" and the provision that "a product is excluded the sweetener of which consists of 35 % by weight of lactitol and 65 % by weight of xylitol and which is obtainable by heating the lactitol and a proportion of 2/13 of the total amount of xylitol and small amounts of water to 170°C, adding the remaining portion of 11/13 of the total amount of xylitol as powdered xylitol and mint aroma in an amount 1 ml per 325 g of xylitol to the mixture when the humidity of the mixture was 1.3 %, the temperature of the resulting mixture being maintained below 65°C, thereafter cooling the mixture to about 42°C, and shaping the mass in a cold rolling machine."

- 1.2 For the purpose of further discussion, the board accepts that the wording of present Claim 1 satisfies the requirements of Articles 84, 54, and 123(2) and (3) EPC. This finding also applies to the first to sixth auxiliary requests. The reasons for these findings, however, need not be expanded here since the main request is refused on the ground of lack of inventive step, as can be seen below.

2. *Inventive step*

- 2.1 Claim 1 of the main request is directed to hard candy essentially characterised in that:

- (i) it is "substantially crystallised throughout" and

(ii) its sweetener consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of sorbitol, maltitol, isomalt, lactitol or a mixture thereof (for brevity hereinafter "other sugar alcohols").

2.2 The board concurs with the appellant in that document D2, directed to the use of xylitol in sugar-free confections, comprises the closest prior art. For the manufacture of hard candies by recrystallisation, it specifically discloses candies using xylitol as sole sweetener or a mixture consisting of 85% sorbitol and 15% xylitol (page 101, right hand column, last two full paragraphs, under subtitle: "Hard Candies").

2.3 In formulating the technical problem to be solved with respect to D2, the appellant submitted that pure xylitol entails the generation of a large amount of heat during the manufacture of hard candies, thereby creating holes in these products. To the board, however, given the fact that D2 already discloses candies containing mixtures of xylitol and sorbitol, it is of no consequence whether or not a problem might exist in relation with the use of pure xylitol as sweetener. Therefore, in the board's judgment, the technical problem to be solved with respect to D2 can be seen in the provision of hard candy with an improved mouth feeling and taste as originally set out in the patent in suit (see paragraph bridging columns 2 and 3: "to provide a hard candy ... which has a smooth structure and dissolves slowly in the mouth.").

2.4 As pointed out by the respondent, the stipulation that the candy be "substantially crystallized throughout" does not imply a particular degree of crystallinity. This technical feature is therefore not suitable for distinguishing the claimed candy over the hard candies of D2, which are also described as crystallised. The solution proposed in Claim 1 is thus only characterised by the composition of the sweetener admixture consisting of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of other sugar alcohols.

2.5 There is no evidence on file showing that the candy as claimed exhibits an improved taste compared to the candies according to D2. For the sake of discussion, however, the board accepts in favour of the appellant that the technical problem indicated above is effectively solved by the subject-matter of Claim 1.

Nevertheless, the solution to the technical problem as proposed in Claim 1 is not considered to involve an inventive step for the reasons which follow.

2.6 D2 discloses that crystallized hard candies containing 15% xylitol admixed with 85% sorbitol have a pleasing sweetness and a mouthfeel which is superior to a solely sorbitol sweetened recrystallised candy (page 101, right hand column, last full paragraph). One can thus infer from D2 that the replacement of part of the sorbitol by xylitol in the sweetener system has a positive effect on the taste of the candy. With this knowledge, the skilled person, in an endeavour to possibly further improve the mouth feeling and taste of hard candy, would not hesitate to investigate sweetener

compositions having different sorbitol/xylitol weight ratios.

In this exercise the skilled person would consider sweetener systems used for other sugar-free confections similar to candies, in particular those referred to in the same document. By doing so, the skilled person would encounter chewing gum compositions comprising a combination of 60% xylitol and 40% sorbitol in the sweetener system reported to produce a sweetness approximately equal to the sweetness of sucrose (see D2, page 101, left hand column, under subtitle: "Sweetness equivalence" and point V above).

As a consequence, the skilled person would have an incentive not only to modify the hard candy compositions specifically disclosed in D2 but also to investigate the suitability for candies of this particular composition specifically described to impart a high sweetness. The skilled person would thus directly arrive at a hard candy composition which contains a sweetener admixture falling within the range of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of other sugar alcohols, sorbitol inclusive, as stipulated in Claim 1.

The subject-matter of Claim 1 therefore lacks an inventive step with regard to D2 (Article 56 EPC).

- 2.7 The appellant contested this conclusion by asserting that D2 does not contain information which would enable the skilled person to obtain a hard candy that was crystallised throughout, because the high sorbitol content in the candy mass would, at the crystallisation

temperature of 90°C, essentially lead to the crystallisation of sorbitol only. In support of this assertion, reference was made to D4.

The board notes that this document addresses the formation of amorphous hard candies and states that, to prevent crystallisation from taking place upon cooling, the starting melt comprising saccharose as sweetener must include a "doctoring agent", which could for example be glucose syrups or inverted sugars (D4, page 206, left hand column second full paragraph: "Glasartige Hartkaramellen können ... nicht durch Einkochen einer Lösung von nur einer Zuckerart oder einem Zuckeralkohol hergestellt werden. Es ist immer ein Kristallisationsverhinderer, oder wie im angelsächsischen Sprachraum gesagt wird, ein "doctoring agent" erforderlich. Für die Kombination mit Saccharose kommen dafür bekanntlich in erster Linie Glukosesirupe oder manchmal auch noch Invertzucker in Frage"). The cited passage thus is not in any way directed to the recrystallisation of a candy mass containing a sweetener system consisting of xylitol and sorbitol. The board therefore cannot deduce from the teaching of D4 any pertinent information concerning the disclosure of D2.

On the other hand, D2 describes a process for manufacturing crystallised hard candies with xylitol as the sole sweetener, which consists of inducing crystallisation by adding about 25% by weight of milled xylitol as crystallisation seed to the xylitol melt, a technique which corresponds to the statement in the patent in suit: "However, it has been found more preferable in view of the controllability of the

crystallization to crystallize the mass by means of seed crystals, whereby part of the sweetener is added as a crystalline or powdered substance to the remainder of the sweetener, which is in a molten state" (paragraph [0016], column 3, lines 47 to 52). By stating that "A similar procedure incorporating a ratio of 85% sorbitol and 15% xylitol can be utilized to make a sorbitol/xylitol recrystallized candy" (page 101, right hand column, penultimate full paragraph) D2 clearly extends the crystallization seeding technique to sorbitol/xylitol sweetener mixtures.

In consequence, the appellant's assertion that D2 does not contain information which would enable the skilled person to obtain a hard candy that is crystallised throughout is at variance with the facts. This argument is therefore not apt to change the above finding of obviousness (see point 2.6 above).

Auxiliary requests 1 to 3 and 5 to 6

3. The text of Claim 1 of the auxiliary requests 1 to 3 and 5 to 6 each reflects a different attempt to delimit the claimed subject-matter against the disclosure of D1. However, Claim 1 of each of these auxiliary requests is still directed to a crystallised hard candy essentially characterised in that the sweetener thereof consists of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of other sugar alcohols. It is thus undisputed that, compared to Claim 1 of the main request, the situation with respect to D2 remains unaffected by these different amendments to Claim 1. As a consequence, the finding of lack of inventive step with regard to D2 applies *mutatis mutandis* to the subject-matter of

Claim 1 of all these auxiliary requests, which do not, therefore, relate to patentable subject-matter.

Auxiliary request 4

4. Claim 1 of this request corresponds to that of the main request insofar as it also relates to a crystallised hard candy essentially characterised by a sweetener composition of 30 to 70 % by weight of xylitol and 70 to 30 % by weight of other sugar alcohols, the only difference being that the claimed product is further defined by the process of its preparation (see point V above). The appellant submitted that these additional product-by-process features would be relevant for the assessment of inventive step on the ground that the candies obtained by the process as defined had higher crystallinity and hardness as compared to those obtained according to the process of D2. Reference was made to the Test Report submitted with the Statement of the grounds of appeal of 26 March 2003 as evidence for this assertion (see point IV above).

4.1 The report concerns a reproduction of Example 3 of D1 and two examples according to the patent in suit. It contains data on the crystallinity of the resulting samples, as measured by Differential Scanning Calorimetry (DSC), and of the moisture content. It does not comprise any data relating to a sample made precisely under the conditions as disclosed in D2.

The board notes that the analytical data show (i) only slight differences between the various samples and (ii) that these differences exist as much between the sample according to D1 and those made according to the patent

in suit, as between the latter two. In the board's judgment, these data thus demonstrate that the crystallinity of the analysed samples may differ in degree, but not in kind. Furthermore, in view of the variations which are possible over the whole range of process parameters as defined in present claim 1, it is doubtful as to whether any such - ever so small - difference would be a consistently reliable parameter distinguishing the claimed candies from hard candies according to D1.

Under these circumstances, and furthermore considering that the Test Report is not even concerned with the disclosure of D2 itself, the board does not see any reason for accepting that these data could be used as proof that a hard candy obtainable under the process conditions of Claim 1 will be more crystalline than a hard candy made according to D2.

- 4.2 The appellant has not submitted any convincing argument, let alone evidence, with respect to the hardness of the candies. The board therefore cannot accept that the candies as claimed will have a higher hardness as compared to those of D2.
- 4.3 As a corollary of the above, the board holds that the incorporation of these product-by-process features into Claim 1 does not further delimit the resulting product claim, as compared to Claim 1 of the main request. In consequence, the finding of lack of inventive step for the subject-matter of Claim 1 of the main request applies *mutatis mutandis* to the subject-matter of Claim 1 of the present auxiliary request 4 (see point 2.6 above).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Röhn

P. Kitzmantel