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Datasheet for the decision of 16 July 2013

Case Number: T 1964/11 - 3.3.09

Application Number: 06837845.4

Publication Number: 1959755

IPC: A23L 1/236, A23L 1/305, A23L 1/308, A61K 38/01, A61P 3/04

Language of the proceedings: EN

Title of invention:
High-potency sweetener composition with c-reactive protein reducing substance and compositions sweetened therewith

Applicant:
The Coca-Cola Company

Headword:
-

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

Keyword:
"Main request: added subject-matter - yes"
"Auxiliary request: added subject-matter - no"
"Inventive step - yes - unexpected improvement shown"

Decisions cited:
-

Catchword:
-

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Case Number: T 1964/11 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 16 July 2013

Appellant: (Applicant)
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Patents
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted on 7 April 2011 refusing European patent application No. 06837845.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
F. Blumer

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division posted on 7 April 2011 refusing European patent application No. 06 837 845.4.

II. The decision was based on a main and a first auxiliary request filed on 28 February 2011 and a second auxiliary request filed on 28 March 2011 during the oral proceedings before the examining division. Claim 1 of the second auxiliary request, the only request relevant for the present decision, reads as follows:

"1. A functional sweetener composition comprising at least one functional ingredient, rebaudioside A with at least 50% rebaudioside A in a steviol glycoside mixture and erythritol, wherein:

the rebaudioside A is present in an amount ranging from 100 ppm to 3,000 ppm of the functional sweetener composition;

the erythritol is present in an amount ranging from about 5,000 ppm to about 40,000 ppm of the functional sweetener composition; and

the at least one functional ingredient comprises at least one C-reactive protein reducing substance."

The examining division refused the second auxiliary request for lack of inventive step. The examining division held that the claimed combination of rebaudioside A of a given purity and erythritol in the indicated concentrations did not provide any unexpected effect. It therefore considered them as options which were obvious for the skilled person having knowledge of any of D9, D10 and D11:

D9: JP 2003 180288 (English abstract);

D10: JP 2004 073197 A (English abstract); and

D11: JP 2000 236842 A (English abstract).

III. On 6 June 2011 the applicant (in the following: the appellant) filed a notice of appeal and on the same day paid the appeal fee. The statement setting out the grounds of appeal was filed on 11 August 2011. With the statement setting out the grounds of appeal the appellant filed a new main request based on the claims of the second auxiliary request before the examining division. The appellant also referred to comparative data in order to support its inventive-step arguments. These comparative data were disclosed in the document:

D12: WO 2007/061795 A1 (pages 108 to 110 and 205 to 208).

IV. With letter dated 2 September 2011 the appellant filed additional arguments and the following further documents:

D11': Full-text English translation of D11; and

D13: I. Prakash *et al.*, "Development of rebiana, a natural, non-caloric sweetener" Food and Chemical Toxicology, 46, (2008), pages S75 to S82.

V. On 8 February 2013 the board dispatched a summons to oral proceedings. In the annexed communication the

board indicated the points to be discussed during the oral proceedings.

VI. With its letter dated 13 June 2013, the appellant filed a main and an auxiliary request to replace its previous request and submitted further arguments in support of inventive step.

Claim 1 of the main request reads as follows:

"1. A functional sweetener composition comprising at least one functional ingredient, rebaudioside A having a purity from 80% to 100% by weight and erythritol, wherein:

the weight ratio of rebaudioside A and erythritol is from 1:4 to 1:800; and

the at least one functional ingredient comprises at least one C-reactive protein reducing substance."

VII. On 16 July 2013 oral proceedings were held before the board. After the discussion of the main request, the appellant filed an amended auxiliary request to replace its previous auxiliary request.

Claim 1 of the auxiliary request reads as follows:

"1. A functional sweetener composition comprising at least one functional ingredient, rebaudioside A having a purity of 50% to 100% by weight on a dry basis and erythritol, wherein:

the rebaudioside A is present in an amount ranging from 100 ppm to 3,000 ppm of the functional sweetener composition;

the erythritol is present in an amount ranging from 5,000 ppm to 40,000 ppm of the functional sweetener composition; and

the at least one functional ingredient comprises at least one C-reactive protein reducing substance."

Claim 2 is directed to a functional sweetened composition comprising the components as set out in claim 1; claim 3 is directed to a method for imparting a more sugar-like temporal/flavour profile to a functional sweetener/sweetened composition by using the components as set out in claim 1; claims 4 to 6 are dependent claims and claim 7 is directed to a functional beverage comprising the functional sweetener composition of claim 1.

VIII. The relevant arguments presented by the appellant may be summarised as follows:

- Main request: The weight ratio of rebaudioside A and erythritol had been specified to be from 1:4 to 1:800, in accordance with the original disclosure at page 88, line 23, to page 89, line 9 and at page 66, lines 5 to 9. Although in these passages of the description it was not specified that the ratio was the "weight" ratio, the appellant saw an implicit disclosure in this respect as the weight ratio was normally used in this field.

- Auxiliary request: Claim 1 had been amended to specify the purity of rebaudioside A in accordance with the disclosure in the paragraph bridging pages 14 and 15 of the application as filed.

– Concerning inventive step, the appellant saw the teaching of D11 as representing the closest prior art document. Documents D9 and D10 failed to disclose rebaudioside A. The objective technical problem underlying the invention was the provision of a functional sweetener composition having a more sugar-like temporal/flavour profile overcoming the prior-art drawbacks of unpleasant aftertaste (bitterness and sweetness linger). The solution according to claim 1 resulted in a sweetener composition with superior taste properties as demonstrated by the new experimental evidence. Taking account of the unpredictability in the sweetener art, the skilled person could not have foreseen that the claimed sweetener compositions would provide the desired flavour and/or taste profile.

IX. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request (claims 1 to 10) as filed with letter dated 13 June 2013 or, alternatively, on the basis of the auxiliary request (claims 1 to 7) as filed during the oral proceedings before the board on 16 July 2013.

Reasons for the Decision

1. The appeal is admissible.

MAIN REQUEST

2. *Amendments*

2.1 Claim 1 of the main request has been amended *inter alia* to indicate that "the weight ratio of rebaudioside A and erythritol is from 1:4 to 1:800". According to the appellant this amendment finds its support on page 89, lines 3 to 5 and on page 66, lines 5 to 9 of the application as filed.

2.2 It is correct that these passages disclose that "rebaudioside A and erythritol are present in the sweetener composition in a ratio from about 1:4 to about 1:800", but there is no mention in the cited passages of a "weight" ratio. Also the appellant admitted during the oral proceedings that there was no explicit support for the ratio to be a weight ratio, but argued that it was implicit from the application as filed because the weight ratio was normally used in the field.

2.3 The board cannot accept this argument. The appellant has not convincingly shown that the only possible interpretation of the term "ratio" had to be "weight ratio".

It is correct that weight ratio is used in the field, but this does not allow the skilled person to exclude

other conceivable interpretations such as the "mol" ratio.

2.4 Thus the above amendment to indicate that the "ratio" of sweeteners is the "weight ratio" is not supported by the application as filed and claim 1 of the main request does not meet the requirements of Article 123(2) EPC. For this reason alone the main request is not allowable.

2.5 The appellant offered during the oral proceedings to delete the word "weight" to overcome the above objection. Although such deletion would have overcome the objection under Article 123(2) EPC, the board indicated that the deletion would have led to a new objection under Article 84 EPC as it would not be clear whether the ratio was a weight or another ratio, e.g. a mol ratio.

AUXILIARY REQUEST

3. *Amendments*

3.1 Claim 1 is directed to the functional sweetener composition of claim 1 as originally filed wherein:

- the "at least one-high potency sweetener" has been limited to rebaudioside A (supported, for instance, by claim 12 and page 12, line 24); and

- the "at least one sweet taste improving composition" has been limited to erythritol (supported, for instance, by claim 14 and page 24, line 25).

It has been further limited to the preferred embodiment disclosed on page 88, lines 29 to 32, namely that rebaudioside A is present in an amount from 100 ppm to 3,000 ppm and erythritol in an amount from 5,000 ppm to 40,000 ppm. Finally, it has been specified that the rebaudioside A has "a purity of 50% to 100% by weight on a dry basis" as disclosed in the paragraph bridging pages 14 and 15 of the application as filed. It is clear that the purity referred in this passage applies to particular embodiments, i.e. also the embodiment of page 88 (see also page 88, line 24).

3.2 Claims 2 and 3 are respectively based on claim 39 as filed and on the disclosure of page 3, lines 28 to 30 as filed, including the amendments made to claim 1.

3.3 Claim 4 finds support on page 14, lines 28 and 29 and claim 5 on page 89, lines 2 and 3.

3.4 Finally, claim 6 incorporates the substances recited in claim 2 as filed and claim 7 is based on the disclosure of claims 78 to 92 as filed.

3.5 Thus, the amendments are supported by the application as filed and fulfil the requirements of Article 123(2) EPC.

4. *Inventive step*

4.1 The application relates to a sweetener composition comprising a non-caloric high-potency sweetener, namely rebaudioside A, and a carbohydrate sweetener, namely erythritol, to improve the taste of ingestible compositions.

4.2 The use of high-potency sweeteners to replace natural sweeteners such as sucrose is already known. Sweetener compositions comprising a sweetener of high sweetness and a sugar alcohol are also disclosed in the prior-art documents D9, D10 and D11 cited in the appealed decision.

4.3 The board agrees with the appellant that document D11 represents the closest prior art, essentially because it is the only document relating to rebaudioside A.

Rebaudioside A presents, like other high-potency sweeteners, a taste problem that limits its use: it has an unpleasant "aftertaste" or, more specifically, a bitterness and sweetness linger worse than other known sugar substitutes, including sucralose and aspartame.

4.4 D11 aims to provide a stevia sweetener wherein the bitter and sweet aftertaste of stevia sweeteners is improved. Specifically, D11 teaches that the taste properties of α-glucosylated steviol glycoside sweeteners can be improved by purifying the stevia-extract starting material to contain a high (>90%) rebaudioside A concentration followed by enzymatic modification to produce functionalised α-glucosylated steviol glycosides, which are then combined with a polyol such as erythritol to produce a more complex synthetic sweetener composition with fewer taste problems due to the stevia extract starting material (see paragraphs [0011] to [0014] and [0042] of D11').

4.5 According to the appellant the problem to be solved by the application in view of this prior art can be seen

in the provision of a further sweetener composition having an improved, more sugar-like temporal/flavour profile (cf. page 3, line 20 to page 4, line 2 of the description). In particular, the application aims to provide compositions having improved taste properties such as decreased unpleasant bitterness and sweetness linger.

4.6 As a solution to this problem the application proposes the compositions of claim 1 comprising rebaudioside A in combination with erythritol in the amounts specified therein.

4.7 The appellant has referred to experimental evidence (D12) in the grounds of appeal to show that erythritol at the claimed amounts is necessary to modulate the flavour and temporal profile of rebaudioside A to obtain a sweetener composition with reduced aftertaste.

4.8 These experiments show that the claimed compositions provide superior taste properties over compositions containing only rebaudioside A.

4.8.1 In particular, it was found that a control sample containing sucrose had a sweetness linger of 0 (no sweetness linger) whereas a sample containing rebaudioside A in a quantity to give the equivalent sweetness had a sweetness linger of 5 (high sweetness linger). The addition of erythritol to rebaudioside A gave a sweetened composition having a sweetness linger of 1 (D12, Example B1), showing that the incorporation of erythritol decreased the sweetness linger of rebaudioside A from high to very low.

4.8.2 Moreover, comparative taste tests of certain sweetened compositions comprising rebaudioside A, erythritol and certain additional sweet taste-improving compositions exhibit less sweetness linger than compositions comprising just rebaudioside A and the sweet taste-improving composition (*i.e.* in the absence of erythritol), as shown in the following examples of D12:

- Example F132 describes that a sweetened composition containing rebaudioside A, sucrose, erythritol and D-tagatose had a sweetness linger of 0. In contrast, Example Fl33 describes that, in the absence of erythritol, the composition had a sweetness linger of 2.

- Example Fl34 describes that a sweetened composition containing sucrose, erythritol and D-tagatose had a sweetness linger of 1. In contrast, Example Fl35 describes that, in the absence of erythritol, the composition had a sweetness linger of 2.

- Example F136 describes that a sweetened composition containing rebaudioside A, sucrose and erythritol had a sweetness linger of 0. Example Fl37 describes that, in the absence of erythritol, the composition had a sweetness linger of 2.

- Example F142 describes that a sweetened composition containing rebaudioside A, erythritol, fructose, KCl and KH_2P0_4 had a sweetness linger of 2. Example F143 describes that, in the absence of erythritol, the composition had a sweetness linger of 3.

- Example F144 describes that a sweetened composition containing rebaudioside A, erythritol and gum acacia Senegal had a sweetness linger of 2. Example F145 describes that, in the absence of erythritol, the composition had a sweetness linger of 3.

- Example F146 describes that a sample containing rebaudioside A, erythritol, glycine, KCl, KH_2PO_4 and D-alanine had a sweetness linger of 1. Example F147 describes that, in the absence of erythritol, the composition had a sweetness linger of 3.

4.8.3 Finally, concerning examples H37 to H41 in the present application which disclose compositions falling within the scope of claim 1 but having a rather high sweetness linger, the appellant stated during the oral proceedings that the same compositions without erythritol showed still higher sweetness linger. Consequently, H37 to H41 do not cast doubts on whether the alleged effect associated with the combination of rebaudioside A and erythritol is achieved.

4.8.4 In view of these results, the board is satisfied that the above technical problem is solved by the claimed combination of rebaudioside A and erythritol.

4.9 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 problem by the means claimed.

4.9.1 Document D11 itself does not provide any hint to the claimed invention. In fact D11 teaches away from sweetened compositions comprising rebaudioside A. As

indicated in point 4.4 above, D11 teaches that, to produce a sweetener product with an acceptable sweet-taste profile, rebaudioside A must be enzymatically modified by α-glucosylation to produce an α-glucosylated steviol glycoside and then combined with a polyol. If it had been obvious that the aftertaste of rebaudioside A could be modified by combining it with erythritol, the inventors of D11 would not have glycosylated the rebaudioside A before combining it with erythritol. Moreover, D11 also shows that not every combination of erythritol and a high-potency sweetener improves the aftertaste derived from the sweetener (see [0008]), confirming the arguments of the appellant concerning unpredictability in the sweetener field.

4.9.2 Documents D9 and D10 likewise do not suggest adding erythritol to rebaudioside A to solve the above problem.

4.9.3 D9 is directed to solving the bitter taste and sweet aftertaste of high-potency sweeteners and/or sugar alcohols in compositions by combining them with enzymatically treated gingko-leaf extract. D9 discloses, among other high-potency sweeteners, stevia which is a complex mixture including stevioside, rebaudiosides A, B, C, D, E and F, etc., each having distinct chemical structures and taste properties. Stevia is not equivalent to rebaudioside A and, as would be understood by the skilled person, the particular properties of one sweetener cannot be transferred to another.

4.9.4 D10 is directed to improving sweetness linger and texture problems associated with certain sweetener

compositions by the addition of L-arabinose. It discloses stevia and stevioside, among other high-potency sweeteners. The compositions may also comprise sugar alcohols, including erythritol. However, D10 does not teach or suggest the combination of erythritol with rebaudioside A, which is not even mentioned in D10.

4.9.5 In D9 and D10 the combination of a sugar alcohol and a high-potency sweetener is only optional. Faced with the technical problem identified above, the skilled person could not have deduced from these documents that the combination of rebaudioside A and erythritol would yield a sweetener composition with improved taste properties.

4.10 The examining division denied an inventive step essentially because the application did not provide any unexpected effect linked to the claimed sweeteners.

As set out above, this argument no longer applies in view of the experimental evidence filed during the appeal proceedings.

4.11 For these reasons, the board considers that the subject-matter of claim 1 and, by the same token, of claims 2 to 7 (see above point VII) involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent on the basis of the auxiliary request (claims 1 to 7) as filed during the oral proceedings before the board on 16 July 2013 and a description/figures to be adapted.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber