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**Datasheet for the decision
of 9 October 2024**

Case Number: T 1295/22 - 3.3.09

Application Number: 16816521.5

Publication Number: 3383192

IPC: A23L27/20, A23G1/32, A23G3/32

Language of the proceedings: EN

Title of invention:
CRUMB CHOCOLATE FLAVOR COMPOSITIONS

Patent Proprietor:
Mars, Incorporated

Opponents:
Société des Produits Nestlé S.A.
Firmenich SA
Kraft Foods Schweiz Holding GmbH

Headword:
Crumb chocolate flavor composition/MARS

Relevant legal provisions:
RPBA 2020 Art. 12(6), 13(2)
EPC Art. 54(2), 56, 83, 123(2)

Keyword:

Main request: added subject-matter - (no); sufficiency of disclosure, novelty and inventive step - (yes)

Decisions cited:

T 0939/92

Catchword:



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Case Number: T 1295/22 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 9 October 2024

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
6 May 2022 concerning maintenance of the
European Patent No. 3383192 in amended form.**

Composition of the Board:

Chairman N. Obrovski
Members: A. Veronese
 C. Meiners

Summary of Facts and Submissions

I. Appeals were filed by opponents 2 and 3 (appellants 2 and 3) against the opposition division's decision finding that the patent as amended according to the main request filed during the oral proceedings before the opposition division met the requirements of the EPC.

II. Claims 1, 10 and 15 of the request considered admissible by the opposition division read:

"1. A chocolate composition comprising dry milk chocolate and an extraneous flavor composition, wherein the extraneous flavor composition comprises a) a highly volatile compound, b) a lactone compound, and c) a caramelic composition, wherein the caramelic composition comprises dimethylhydroxy furanone, phenylacetaldehyde, and maltol; wherein the lactone compound is selected from the group consisting of δ -dodecalactone, δ -decalactone, γ -nonalactone, δ -octalactone, γ -undecalactone, δ -valerolactone, γ -valerolactone, δ -hexalactone, γ -hexalactone, δ -heptalactone, γ -heptalactone, γ -octalactone, δ -octenolactone, δ -nonalactone, γ -decalactone, δ -decenolactone (massoia lactone), δ -undecalactone, γ -dodecalactone, 5-butylidihydro-4-methylfuran-2(3H)-one (whiskey lactone), 6-pentylpyran-2-one, and combinations thereof; and wherein the highly volatile compound is methanethiol."

"10. A flavor composition comprising a) a highly volatile compound, b) a lactone compound, and c) a caramelic composition, wherein the caramelic composition comprises dimethylhydroxy furanone,

phenylacetaldehyde, and maltol, wherein the lactone compound is selected from the group consisting of δ -dodecalactone, δ -decalactone, γ -nonalactone, δ -octalactone, γ -undecalactone, δ -valerolactone, γ -valerolactone, δ -hexalactone, γ -hexalactone, δ -heptalactone, γ -heptalactone, γ -octalactone, δ -octenolactone, δ -nonalactone, γ -decalactone, δ -decenolactone (massoia lactone), δ -undecalactone, γ -dodecalactone, 5-butylidihydro-4-methylfuran-2(3H)-one (whiskey lactone), 6-pentylpyran-2-one, and combinations thereof; wherein the highly volatile compound is methanethiol, and wherein the flavor composition provides enhanced creaminess to a chocolate composition."

"15. A flavor composition comprising:

(i) between about 0.1% w/w and about 20% w/w dimethylhydroxy furanone;

(ii) between about 5% w/w and about 80% w/w δ -dodecalactone;

(iii) between about 0.005% w/w and about 1% w/w phenylacetaldehyde;

(iv) between about 0.1% w/w and about 5% w/w maltol;

(v) between about 0.001% w/w and about 0.1% w/w methanethiol;

(vi) between about 0.5% w/w and about 15% w/w δ -decalactone;

(vii) between about 0.1 % w/w and about 3% w/w δ -octalactone;

(viii) between about 0.05% w/w and about 5% w/w γ -nonalactone; and

(ix) between about 0.01% w/w and about 1% w/w γ -undecalactone."

III. With their notices of opposition, the opponents had requested revocation of the patent in its entirety on the grounds of opposition under Article 100(a) (lack of novelty and lack of inventive step), Article 100(b) and Article 100(c) EPC.

IV. The documents submitted during the opposition proceedings included:

D3: GB 2 370 213 A

D4: EP 0 940 085 A2

D7: WO 03/037100 A1

D10: P. Schnermann et al., *Journal of Agricultural and Food Chemistry*, 1997, vol. 45, pp. 867-872

D12: L. Yi-Hsuan, "Volatile changes caused by different factors in different types of chocolate", 2010, thesis work presented at The Ohio State University

D13: EP 2 389 815 A1

D25: E.O. Afoakwa et al., *Critical Reviews in Food Science and Nutrition*, 2008, vol. 48, pp. 840-857

D26: J. Liu et al., *Journal of the Science of Food and Agriculture*, 2015, vol. 95, pp. 1362-1372

D33: R. Schmitt, "On the role of ingredients as sources of key aroma compounds in crumb chocolate", 2005, extract from thesis work at the TU München

D34: Declaration by Mr Baines

D36: Fenaroli's Handbook of Flavor Ingredients, 1975, pp. 190-191

D37: B. Schlutt et al. *Journal of Agriculture and Food Chemistry*, 2007, vol. 55, pp. 9634-9645

D38: Declaration by Ms Robineau

V. The opposition division found *inter alia* the following.

- The claimed invention was sufficiently disclosed. The patent provided sufficient information to prepare the claimed composition without undue burden and described working examples.
- The claimed subject-matter was novel over D4, D10, D12, D25 and D26. These documents did not disclose compositions comprising methanethiol. This compound was not inevitably formed during the manufacture of the claimed chocolate compositions.
- The claimed subject-matter involved an inventive step starting from any of D3, D7 or D13 as the closest prior art. Starting from these documents the technical problem was to provide an alternative flavor composition imparting crumb characteristics on a chocolate product. The cited documents did not suggest preparing a flavor composition comprising methanethiol and adding it to a chocolate product to solve this problem.

VI. With its statement setting out the grounds of appeal, appellant 3 filed four new documents:

D40: Wayback Machine web page <http://www.thegoodscentcompany.com/data/rw1008781.html>

D41: Fenaroli's Handbook of Flavour Ingredients, 5th Edition; 2005, 5th ed., pp. 390, 391, 513, 514, and others

D41a: Fenaroli's Handbook of Flavour Ingredients, 5th Edition; 2005, Whiskey lactone

D42: Dairy Science and Technology, 2006, pp. 307-311, 314-317

VII. With its statement setting out the grounds of appeal, appellant 2 filed:

D43: Declaration by Ms Robineau (filed as D40) including an experimental report

VIII. With its reply to the appellants' appeals, the respondent filed auxiliary requests 1 to 4 and:

D44: Declaration by Mr Didzbalis

IX. With its letter of 13 September 2024, appellant 3 filed:

D45: Declaration by Mr Ende and experimental evidence

D46: Experimental report on chocolate samples

D47: Witness statement by Mr Brown, commenting on the experimental report described in D46

X. The opponents' arguments which are relevant for the decision can be summarised essentially as follows.

- D43, filed with opponent 2's statement setting out the grounds of appeal, and D45 to D47, filed by opponent 3 with its letter of 1 September 2024, should be admitted. D44, filed by the proprietor, should not be admitted.

- Claims 6, 10 and 14 contained originally undisclosed subject-matter. Claim 10 was not based on either claim 19 as filed, which contained a shorter list of lactones, or on page 2, lines 25 to 36 as filed. The combination of features in

claims 6 and 14 was not disclosed in the application as filed.

- The invention in claim 10 was not sufficiently disclosed because the claimed effect was not achieved across the entire scope claimed. The patent did not teach how to provide a flavor composition enhancing the creaminess of chocolate, in particular if this chocolate comprised a low amount of fat or no fat at all. Furthermore, the patent showed that some compounds of claim 10 did not influence creaminess.
- The wording "extraneous flavor" in claim 1 did not distinguish a chocolate to which the flavor was added as an "extraneous" component from one which inherently contained it. This was confirmed by D46 and D47. The wording "flavor composition" in claim 10 defined a composition comprising the listed ingredients. This wording encompassed a food product, including a chocolate crumb, suitable for enhancing the creaminess of a chocolate.
- The subject-matter of claims 1 and 10 lacked novelty over D4, D10, D12, D25 and D26. None of these documents mentioned methanethiol. However, as could be inferred from the opposed patent, and in particular from paragraphs [0011] and [0012] and from the examples, the claimed flavors, including methanethiol, were formed during the production of crumb chocolate. This was confirmed by the tests described in the patent and in the experimental reports D43 and D45. Thus, methanethiol was inevitably present in the chocolates disclosed in all the cited prior art documents.

- The claimed subject-matter lacked an inventive step over D3, D7 or, alternatively, over "another source of information focusing on crumb chocolate". The claimed compositions differed from D3 and D7 on account of the presence of methanethiol. There was no evidence that methanethiol increased chocolate creaminess across the entire scope claimed, e.g. at any methanethiol concentration and/or using all the compositions falling under that scope. The problem was to provide an alternative chocolate composition. The claimed solution, involving the use of methanethiol, was rendered obvious by D37 and D38, which disclosed using methanethiol to increase creaminess. As explained in the declaration D34, the invention was simply the outcome of an analysis identifying the flavor compounds contained in a crumb.

XI. The proprietor's arguments which are relevant for the decision may be summarised essentially as follows.

- D40 to D43 and D45 to D47 should not be admitted. D44 should be admitted.
- Claim 10 did not contain originally undisclosed subject-matter; its basis was in claim 19 and on pages 2 and 4 as originally filed. The basis for claims 6 and 14 was the claims and page 3 as originally filed.
- The invention in claim 10 was sufficiently disclosed. The patent made it credible that the claimed flavor composition comprising methanethiol increased the creaminess of the claimed chocolate compositions. There was no evidence that the effect did not occur in low-fat chocolate.

- The wording "extraneous flavor composition" required the flavor composition to be added as a separate ingredient to a chocolate. This wording distinguished the claimed chocolate from one inherently containing that flavor composition. The wording "flavor composition" in claim 10 identified a cocktail of flavors added to a food product. It did not encompass a food product or crumb as such.

- The claimed subject-matter was novel over D4, D10, D12, D25 and D26. None of these documents explicitly or implicitly disclosed compositions comprising methanethiol. This compound was not detected in any of the chocolates analysed in these documents, despite the fact that the documents focused on identifying aroma compounds in chocolate. D43 and D45, which allegedly disclosed the presence of methanethiol in chocolate, should not be admitted.

- The claimed subject-matter involved an inventive step over D3 and D7, the closest prior art. The claimed subject-matter differed from the teaching of D3 and D7 at least on account of the fact that the compositions comprised methanethiol. The patent showed that methanethiol increased the crumb creaminess of chocolate. The problem was to provide an alternative flavor composition that imparted crumb characteristics, and in particular crumb creaminess, on a chocolate product. The cited documents, and in particular D37 and D38, did not provide any hint towards the proposed solution.

Requests

- XII. The appellants requested that the decision under appeal be set aside and that the patent be revoked.
- XIII. The patent proprietor requested:
- that the appeals be dismissed and that the patent be maintained on the basis of the request found allowable by the opposition division (main request), or alternatively
 - that the case be remitted to the opposition division for consideration of auxiliary requests 1 and 2, or alternatively
 - if the board does not agree to the remittal, that the patent be maintained on the basis of auxiliary requests 1 to 4

Reasons for the Decision

Main request

1. *Amendments*

- 1.1 Appellant 2 submitted that claim 10 of the main request derived from claim 19 as filed yet contained originally undisclosed subject-matter. Claim 10 of the main request defined a flavor composition comprising at least one lactone selected from among a specific list of lactones. However, this list was not disclosed in claim 19 as filed, which recited a shorter list of lactones. Pages 2 and 22 as filed disclosed the relevant list of lactones but related to an "extraneous

flavor composition" present in a chocolate, rather than to a flavor composition as such, as defined in claim 10. Thus, neither claim 19 nor pages 2 and 22 provided a basis for claim 10.

1.2 These arguments are not convincing. The list of lactones recited in claim 10 is indeed longer than that recited in claim 19 as filed. Claim 18 as filed, on which claim 19 depends and which simply refers to "a lactone compound", does not disclose the list either.

1.3 However, analogously to what was decided by the opposition division, the skilled person reading the application as filed would understand that the lactones recited in the list disclosed in the application as filed on page 2, lines 25-33 and on page 22, lines 16-28 were the same as those which should be used to prepare the flavor composition mentioned on page 4, line 5 and in claim 18 as filed. This is the composition which is then used as the "extraneous flavor composition" in a chocolate to provide creaminess. In other words, the skilled person would understand from the application as filed that the lactones listed on pages 2 and 22 were not only those making up the "extraneous flavor composition" in the chocolate composition of claim 1 as filed, but also those comprised in the "flavor composition" disclosed on page 4 and in claim 18 as filed, on which claim 19 depends.

1.4 For this reason, claim 10 of the main request does not contain originally undisclosed subject-matter (Article 123(2) EPC).

1.5 Appellant 3 argued that claims 6 and 14 of the main request also contained originally undisclosed subject-

matter. In its opinion, the combination of features defining the amounts of the highly volatile compound, the lactone compounds and the caramelic composition was not disclosed in the application as filed, let alone on page 3, lines 11 to 16 as filed. The objection in relation to claim 6 was related to the "and" embodiment in that claim.

1.6 These arguments are not convincing either. Claims 6 and 14 define compositions comprising the relevant ingredients, namely the extraneous flavor, the lactone and the caramelic composition defined in the preceding claims, and their respective amounts. These amounts are disclosed in separate dependent claims and sentences of the application as filed, namely claims 10 to 12 and 22 to 25, and page 3, lines 11 to 16 as filed.

1.7 However, reading the application as filed, the skilled person would understand that these parts of the application as filed defined preferred amounts of the relevant ingredients and that the application foresaw compositions comprising each of those ingredients in those preferred amounts.

1.8 Hence, claims 6 and 14 do not contain originally undisclosed subject-matter (Article 123(2) EPC).

2. *Sufficiency of disclosure*

2.1 Appellant 2 submitted that the invention defined in claim 10 was not sufficiently disclosed. Appellant 2 did not dispute that a flavor composition comprising the ingredients mentioned in claim 10 could be prepared. It argued, however, that the patent did not teach how to prepare a flavor composition which also

provided "enhanced creaminess to a chocolate composition", as specified in claim 10.

- 2.2 The patent described experiments demonstrating that the claimed composition increased the creaminess of fat-based chocolate. However, since creaminess was influenced by the fat content, this effect could not be achieved in a chocolate which did not comprise fat.
- 2.3 Moreover, the patent taught that some of the compounds listed in claim 10, e.g. some highly volatile compounds, did not influence creaminess. Some others were not even tested. Hence, in appellant 2's opinion, the claimed effect was not achieved across the entire scope claimed.
- 2.4 These arguments are not persuasive. As noted by the respondent, the "omission experiments" and the "spiking experiments" in examples 5 and 6 of the patent demonstrate that including the highly volatile compound methanethiol in a "dry mix chocolate" (DMGC) increases its creaminess. Examples 7 to 9 of the patent describe examples of crumb chocolate flavor compositions comprising this compound.
- 2.5 Since the flavor composition of claim 10 comprises methanethiol, the aforementioned experiments make it credible that this composition is suitable for increasing the creaminess of chocolate, irrespectively of whether the flavor composition might comprise further compounds which do not contribute to this effect.
- 2.6 As noted by appellant 2, paragraph [0062] of the patent states that "creaminess" can be "influenced by fat content". However, this statement does not necessarily

imply that the composition of claim 10 will not have any effect in a low-fat or fat-free chocolate. No evidence of this has been provided.

2.7 Furthermore, chocolate typically contains a fat component. This is confirmed by paragraph [0045] of the patent which describes numerous chocolate types, including dark chocolate and low-fat chocolate, all comprising fat. Therefore, it would be clear to the skilled person reading the patent that the flavor composition of claim 10 is intended essentially for use in these chocolate types. As mentioned above, the patent teaches that the claimed composition is suitable for enhancing creaminess in these chocolates.

2.8 Appellant 2 submitted that the tests in example 6 of the opposed patent were carried out using only one concentration of methanethiol and one specific chocolate type. Hence, the skilled person would not have sufficient guidance to put the invention into practice over the whole scope claimed. The board does not agree because the patent indicates suitable amounts of methanethiol (see claim 3) as well as chocolate types suitable for carrying out the invention (see paragraphs 45 to 47).

2.9 For these reasons, the invention defined in claim 10 is sufficiently disclosed (Article 83 EPC).

3. *Novelty*

3.1 Claim 1 defines a chocolate composition comprising dry milk chocolate and an "extraneous flavor composition" which comprises at least five specific compounds, namely:

- a highly volatile compound (methanethiol)
- a "caramelic composition" comprising maltol, dimethylhydroxy furanone and phenylacetaldehyde
- a lactone compound, selected from a list of 20 specific γ or δ lactones

3.2 Claim 10 defines a "flavor composition" comprising the same aforementioned at least five specific compounds and further specifies that the composition imparts enhanced creaminess on a chocolate composition. Claim 15 defines a flavor composition comprising specific amounts of the relevant compounds.

The term "extraneous flavor composition" and non-admittance of D44

3.3 During the appeal proceedings the respondent argued that the wording "extraneous flavor composition" used in claim 1 implied that the claimed chocolate differed from a comparable chocolate which inherently comprised the claimed flavor compounds without them being included as "extraneous" ingredients. It also argued that the wording "flavor composition" in claim 10 identified a cocktail of individual flavors which were added to a food product. The cocktail did not encompass a food product as such, or an intermediate food product, like a crumb, comprising those compounds. To support its interpretation of the aforementioned wording, the respondent filed D44, a declaration from a technical expert, with its reply to the appellants' statements setting out the grounds of appeal.

3.4 Since, for the reasons given below, the board decided that none of the documents relied on for the novelty attacks disclosed the claimed combination of flavor compounds, there is no need to address whether the

expressions "extraneous flavor composition" in claim 1 and "flavor composition" in claim 10 further distinguish the claimed compositions from those of the prior art. For the same reason, D44 is irrelevant for the outcome of the proceedings and is not admitted into the appeal proceedings (Article 12(4) RPBA).

Some premises of the novelty attacks

- 3.5 The opposed patent relates to the preparation of a chocolate capturing the distinct aroma and creaminess of a crumb chocolate, without the need to prepare a chocolate crumb. As noted by the appellants, paragraphs [0010] to [0012] of the patent teach that the chocolate can be produced by including, in a dry mix chocolate, the flavors which impart the aroma and creaminess on a chocolate crumb. To this end, the flavors common to crumb chocolate were identified and quantified in the experiments described in the patent. The identified flavor compounds are listed in Tables 10 to 13. The claimed flavor compounds are among those identified in those tables.
- 3.6 The appellants argued that, according to paragraph [0012] of the patent, these compounds were common to crumb chocolate. Hence, in their opinion, they were inevitably present in any crumb or crumb chocolate.
- 3.7 Furthermore, according to appellant 3, since these compounds, including methanethiol, were produced in milk or cocoa products subjected to heating, they were necessarily present in any chocolate composition. Methanethiol and the other relevant flavor compounds were inevitably formed from products of the Maillard reaction and the Strecker degradation from compounds, e.g. methionine, that are present in the cocoa beans

and in the milk used to prepare chocolate. This opinion was supported by paragraph [0092] of the patent and by the declarations D28 and D34 by Mr Baines, an expert in the field.

- 3.8 On this basis, the appellants argued that, contrary to the opposition division's decision, the compositions of claims 1, 10 and 15 were not novel over the crumbs and chocolates disclosed in documents D4, D10, D12, D25 and D26. These objections are dealt with here below.

Novelty over D4

- 3.9 Appellant 2 submitted that the subject-matter of claims 1, 10 and 15 was anticipated by the crumbs and the chocolate compositions disclosed in examples 1, 3 and 4 of D4.
- 3.10 These examples describe the preparation of chocolate crumbs obtained by mixing skimmed milk powder, sucrose, cocoa liquor and water. The mixture of ingredients was heated and dried to reduce the moisture content to below 1%, resulting in a crumb powder. This powder was then used to produce a chocolate having a caramel, milky and creamy crumb flavor.
- 3.11 The appellants argued that although D4 did not mention methanethiol and the other flavor compounds specified in claim 1, these compounds were necessarily present in the disclosed crumb and chocolate. In their opinion, the ingredients and the processing steps described in the examples of D4 were fully in line with those which, according to paragraph [0010] of the patent, were commonly used to prepare a crumb chocolate. Thus, those ingredients had to be the same as those used to prepare the chocolates used to carry out the experiments

described in the patent. It followed that the flavor compounds identified in those experiments were necessarily also present in the crumbs and chocolates exemplified in D4.

- 3.12 The board does not agree. The appellants' assumption that all flavor compounds identified in the experiments described in the patent are common to all crumbs and crumb chocolates, irrespectively of the ingredients and conditions used to prepare them, is not generally valid. The experiments in the patent show that there are numerous compounds which can influence the aroma and creaminess of crumb chocolate. Furthermore, paragraph [0066] of the opposed patent states that the complex composition of chocolate aroma is affected by the genotype of the cocoa beans used, by the added ingredients and by each production step. As noted by the respondent during the oral proceedings, this is confirmed by D10 and D25. D10 teaches, in fact, that "[d]epending on the cocoa variety used, the conditions of cocoa fermentation and roasting, and conching process, different qualities were observed" (page 867, first paragraph of the introduction). D25 then states that "[c]ocoa bean fermentation is crucial not only to the formation of key volatile fractions (alcohols, esters, and fatty acids) but also the provision of flavor precursors (amino acids and reducing sugars) for important notes contributing to chocolate characters" and that "[h]owever, a comparison of flavor characters in chocolate is complicated by variations caused by different genotypes, geographical origin, pod differences, fermentation and drying methods, and subsequent processing (roasting, alkalization, and conching)" (page 854, right-hand column).

- 3.13 As stated in paragraph [0092] of the opposed patent, methanethiol and the other claimed flavor compounds are formed from products of the Maillard and/or the Strecker reaction occurring during the thermal treatment of the ingredients used to prepare chocolate crumb. These reactions occur within a very complex mixture of compounds originating from the cocoa beans, the milk and any other ingredient used to produce crumb. As mentioned above, the composition of cocoa beans can vary depending on the genotype, geographic origin and fermentation conditions, for example. A similar variability can also be expected for the milk used to prepare the crumb. This renders it impossible to predict the exact composition obtained when a crumb or a chocolate are manufactured.
- 3.14 Furthermore, D28 teaches that methanethiol is highly volatile and very sensitive to oxidation and heat. This means that even if it is accepted that methanethiol is formed during the manufacture of a crumb, it may evaporate, be oxidised or react with other ingredients. This becomes more likely in consideration of the aforementioned complex nature of the mixture generated upon heating.
- 3.15 It is also worth noting that none of D10, D12, D25 and D26, which describe scientific investigations focused on identifying volatile flavors present in chocolates, mentions methanethiol despite a large number of such flavors being detected. This is despite the fact that the chocolates were manufactured from cocoa beans and milk and under conditions which, according to appellant 3's submissions, should inevitably result in the formation of methanethiol. It is also worth noting that, as shown in D36, methanethiol was found in meat samples heated for a short time but was not detected in

meat subjected to heating for a substantially longer time.

- 3.16 For these reasons, the board is not convinced by the appellants' assertion, based *inter alia* on paragraph [0012] of the patent, that all crumb and crumb chocolates, including those of D4, comprise all the flavor compounds detected in the experiments described in the patent, including methanethiol.
- 3.17 Furthermore, the experiments in the patent identified several flavor compounds, including lactones, caramelic compounds and aldehydes, which provide the aroma and creaminess of crumb chocolate. The patent does not teach that all these compounds, let alone those now claimed, must be present to provide the aroma and creaminess of crumb. On the contrary, claim 1 as granted foresaw alternative highly volatile compounds in place of methanethiol, for example. This confirms that, even according to the teaching of the patent, not all chocolate products having the aroma and creaminess of crumb necessarily have to comprise all the specific compounds being claimed.
- 3.18 In view of the aforementioned considerations and taking into account that:
- the origin and type of the cocoa beans and milk used to prepare the chocolate used to carry out the experiments described in the patent are not known
 - the origin and type of the cocoa beans and milk used to prepare the chocolate disclosed in D4 are not known either

- the conditions used to prepare those chocolates were not necessarily the same (as noted by the respondent during the oral proceedings, paragraph [0010] of the patent states that crumb is typically prepared starting from milk, yet the crumb of D4 was prepared from milk powder mixed with water, which did not necessarily result in the same starting material; furthermore, the crumb of D4 was obtained in a process involving aspiration, i.e. a process removing volatile compounds)

the board is not convinced that the crumb and crumb chocolates disclosed in D4 contained methanethiol and the other flavor compounds specified in claims 1, 10 and 15.

- 3.19 Accordingly, D4 does not directly and unambiguously disclose the compositions defined in these claims. Consequently, the claimed subject-matter is novel over the teaching of D4 (Article 54(2) EPC).

Novelty over D10, D12, D25 and D26

- 3.20 D10, D12, D25 and D26 describe studies aimed at identifying the flavor compounds present in certain chocolates. It was undisputed that these documents disclose chocolate compositions comprising the claimed flavor compounds, with the exception of methanethiol.
- 3.21 The three compounds of the caramelic component and at least one of the claimed lactones were detected during the studies and are explicitly mentioned among the numerous flavor compounds detected in the tested chocolates. However, methanethiol was not detected and is not mentioned in any of D10, D12, D25 and D26.

- 3.22 According to appellant 3, despite the fact that methanethiol was not mentioned, it was inevitably formed during the manufacture of any chocolate. Methanethiol was also formed during the heating steps for sterilising the milk used to produce chocolate. As shown in D42, these steps reached temperatures of 100°C. Thus, in its opinion, methanethiol was inevitably present in all chocolates disclosed in D10, D12, D25 and D26. The declarations D32 and D34 showed that Mr Baines, a consultant food technologist, was confident that those chocolates contained methanethiol.
- 3.23 For these reasons, appellant 3 was of the view that the subject-matter of claims 1 and 10 was not novel over the teaching of the aforementioned documents.
- 3.24 These arguments are not persuasive. First and foremost, none of D10, D12, D25 and D26, which describe experiments aimed specifically at identifying the volatile flavor compounds imparting aroma on chocolate, mentions methanethiol among the considerable number of compounds which were actually identified.
- 3.25 Appellant 3 submitted that methanethiol had not been noted in those experiments because it was difficult to detect; at the time the experiments were performed, it had eluded detection.
- 3.26 This argument is not persuasive either because the analytical technique used to carry out the tests described in D10, D12, D25 and D26, namely a combination of gas chromatography, olfactometry and mass spectrometry, is the same as that used to carry out the tests described in the opposed patent. In particular, the tests described in D26 were conducted in 2014, i.e. shortly before the priority date. In

addition, D36, a book from 1975, shows that methanethiol was a well-known flavor which was detected in other food products long before the relevant date.

3.27 In addition, appellant 3's arguments fail to convince in view of the reasons given above in the context of assessing novelty over D4. In particular, due to the possible variations in the cocoa beans and milk used to produce chocolate, and due to the complexity of the reactions occurring during chocolate manufacture, it cannot be assumed that methanethiol was formed and then still present in the chocolates disclosed in D10, D12, D25 and D26.

3.28 For these reasons, the claimed subject-matter is novel over the teaching of D10, D12, D25 and D26 (Article 54(2) EPC).

Non-admittance of D43

3.29 With its statement setting out the grounds of appeal, appellant 2 filed D43, an experimental report aimed at supporting its novelty objection over D4. According to appellant 2, D43 showed that methanethiol was present in the crumb chocolate described in example 3 of D4 despite not being mentioned in this document.

3.30 Under Article 12(6), second sentence, RPBA the board *inter alia* does not admit evidence which should have been submitted in the proceedings leading to the decision under appeal, unless the circumstances of the appeal case justify its admittance.

3.31 As noted by the respondent, although D4 had already been filed by opponent 1 with its notice of opposition, opponent 2 (appellant 2) had raised the novelty

objection based on this document for the first time at a late stage of the opposition proceedings, namely with its reply to the opposition division's communication issued under Rule 116 EPC.

3.32 Appellant 2 argued that D43 had been filed to address the opposition division's unexpected finding during the oral proceedings that the crumbs and chocolates of D4 did not contain methanethiol. It also argued that before the oral proceedings held before the opposition division, the proprietor had not contested the presence of methanethiol in the crumbs and chocolates of D4. Up to that point, it had defended novelty by relying on the expressions "extraneous flavor composition" and "flavor composition". Hence, in appellant 2's opinion, the experimental report D43 had been filed in due time. Moreover, D43 was *prima facie* relevant, easy to understand and did not raise new issues. Consequently, it should be admitted into the appeal proceedings.

3.33 The board does not agree. As noted by the respondent during the oral proceedings, it is immediately evident that the claims as granted and as amended during the opposition proceedings characterise the claimed compositions by specifying that they comprise methanethiol and other specific compounds. It is also immediately evident that D4 does not even mention methanethiol and the other relevant compounds.

3.34 The principle that a party must contribute to the conduct of the proceedings by substantiating its own requests and objections in a minimum way is a general procedural principle underlying the EPC and not limited to appeal proceedings (for claim requests, see T 1776/18, Reasons 4.5.7, second sentence). Hence, when raising its new novelty objection based on D4 at a late

stage of the opposition proceedings, appellant 2 should have fully substantiated its attack, setting out why the entirety of the claimed subject-matter was allegedly directly and unambiguously disclosed in D4 and providing already at that time any additional evidence that may be required for that purpose. In particular, appellant 2 should have addressed the fact that D4 does not mention the compounds characterising the claims by providing an explanation for this and filing any additional evidence to support its view that these compounds were nevertheless (at least implicitly) disclosed in D4. In any case, it cannot be considered objectively surprising that it emerged during the oral proceedings before the opposition division that D4 did not mention the claimed compound methanethiol, regardless of the fact that, until then, the respondent had addressed the novelty attacks by relying on a different argument.

- 3.35 Furthermore, the experimental report D43 raises new complex technical issues and, regarding *prima facie* relevance, does not provide conclusive evidence that methanethiol was present in the compositions of D4. As already explained above in the context of assessing novelty over D4, methanethiol and the other claimed flavor compounds can be formed in reactions occurring between compounds that are possibly present within a complex mixture obtained by combining and processing the ingredients used to produce crumb. The composition of the ingredients and of the resulting mixture can vary depending on e.g. the genotype, geographic origin and fermentation conditions of the cocoa beans and on the conditions applied in each manufacturing step. None of these is specified in D4 or D43.

3.36 Furthermore, as noted by the respondent during the oral proceedings, the tests described in D43 are not carried out under the same conditions used to produce the crumbs of D4. The mixture used to produce the crumbs exemplified in D4 was processed in a mixing system provided with ploughs and an aspiration facility for rapidly removing moisture. By contrast, the crumbs of D43 were produced by spreading the blend on baking paper and heating it in an oven, without aspiration. Moreover, the amount of methanethiol detected in the experiments in D43 is extremely low, at the limit of detectability; the peak at 6.9 minutes in the chromatogram is barely visible. For these reasons, D43 does not support the conclusion that methanethiol was present in the crumbs and chocolates described in D4, certainly not in view of the standard to be met for denying novelty, i.e. direct and unambiguous disclosure.

3.37 In conclusion, the experimental report D43 should have been filed during the opposition proceedings. Moreover, there are no circumstances in the appeal which could justify the admittance of D43 given that it raises new complex technical issues and does not provide conclusive evidence that methanethiol was present in the compositions exemplified in D4. Hence, D43 is not admitted into the appeal proceedings under Article 12(6), second sentence, RPBA.

Non-admittance of D45 to D47

3.38 With its letter of 13 September 2024, appellant 3 filed:

- D45: a witness statement by Mr Ende describing experiments aimed at demonstrating that prior art chocolate compositions contained methanethiol
- D46: an experimental report allegedly showing that there is no sensory difference between a chocolate composition to which a flavor composition according to the claims was added, and one which contained that flavor composition without it having to be added
- D47: a witness statement by Mr Brown, who approved and oversaw the experiments described in D46

3.39 D45 to D47 were filed to support the novelty attacks based on D10, D12, D25 and D26 and were aimed at showing that the different varieties of chocolates disclosed in these documents all comprised methanethiol. They were also intended to demonstrate that no sensory differences were produced irrespectively of whether the claimed flavor composition was added to a chocolate composition as an extraneous agent or was inevitably formed during the manufacture of chocolate.

3.40 Under Article 13(2) RPBA any amendment to a party's appeal case made after the expiry of a period specified by the board in a communication under Article 15(1) RPBA is, in principle, not to be taken into account, unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

3.41 Appellant 3 conceded that D45 to D47 were not filed until after the notification of the communication issued by the board in preparation for the oral

proceedings. However, it argued that these documents provided experimental evidence supporting arguments which had already been presented during the proceedings before the opposition division. The experiments described in these documents had only recently been concluded and could not have been filed earlier. Moreover, they were *prima facie* very relevant.

3.42 The board does not consider these arguments convincing. The novelty objections based on D10, D12, D25 and D26 had already been raised during the opposition proceedings. Analogously to what has been explained above in the section about the admittance of D43, it is immediately evident that the claims require the claimed composition to comprise methanethiol. Furthermore, it is clear that none of D10, D12, D25 and D26 mentions methanethiol. Therefore, D45, the experimental report allegedly showing that methanethiol was inevitably comprised in prior art chocolates, should have already been presented during the opposition proceedings, not at this very late stage of the appeal proceedings. It is also noted that appellant 3 never informed the other parties and the board during the appeal proceedings that allegedly very relevant experiments were ongoing. As to the alleged *prima facie* relevance, for essentially the same reasons as given in point 3.35 above for D43, D45 also fails to provide conclusive evidence that methanethiol was present in the compositions exemplified in D4.

3.43 The experiments in D46 and D47 are aimed at demonstrating that there is no difference between a chocolate composition that inherently comprises the relevant flavor compounds and one to which these are added as an "extraneous flavor composition". However, as already mentioned above when discussing the

admittance of D44, the board's finding renders this issue irrelevant for assessing novelty. Therefore, these documents are not relevant for the appeal proceedings.

3.44 For these reasons, D45 to D47 are not admitted into appeal proceedings (Article 13(2) RPBA).

4. *Inventive step*

The claimed invention and the closest prior art

4.1 The claimed invention relates to a flavor composition and to a chocolate composition comprising that flavor composition. As explained in the patent, the idea on which the patent is based is to prepare a chocolate composition having the characteristics, in particular the flavor and creaminess, of a chocolate prepared using chocolate crumb, without using any crumb. This avoids the cost-consuming drying steps required to prepare the crumb. The invention foresees including selected flavor compounds that impart the characteristics of chocolate crumb on a chocolate (paragraphs [0001], [0009] to [0014] and the claims).

4.2 The opposition division decided that any of D3, D7 or D13 could be considered the closest prior art for assessing inventive step.

4.3 Appellant 3 argued that none of D3, D7 and D13 was a suitable starting point for assessing inventive step. In its opinion, the skilled person would not have consulted these documents and would instead have turned to a source of information describing the components which are present in crumb chocolate and impart its flavor. However, appellant 3 has not identified any

document providing that information which could be considered the closest prior art, as an alternative to D3, D7 and D13.

- 4.4 Appellant 2 referred to D3 or alternatively to D7 as the closest prior art. The respondent has not disputed the choice of these documents as starting points to assess inventive step. The board does not see any reason to diverge from this choice either.
- 4.5 D3 and D7 relate to the preparation of a chocolate composition and to a method for manipulating the flavor of that chocolate using certain "flavour attributes". The flavor attributes can be, among others, a "crumb" or a "crumb flavour"; see D3, page 4, line 8 and D7, page 5, line 19. In practice, D3 and D7 propose using reaction products obtained in reactions between flavor precursors comprising certain amino acids, like proline or ornithine, and some saccharides, like rhamnose, fructose and sucrose; see claim 5 of D3 and claim 7 of D7.
- 4.6 Appellant 3's argument that a "source of information" providing "the details of the components in crumb chocolate" should be considered the closest prior art is not convincing. Appellant 3 did not specify any such "source of information". The board considers that a fictitious, non-identified source of information, cannot be considered the closest prior art. The closest prior art should disclose a specific set of relevant features intended for the same or a similar purpose and which allows the parties and the board to determine the features distinguishing the prior art from the claimed invention. This is not possible from appellant 3's generic reference to a "source of information" or to a "crumb chocolate itself". In sum, appellant 3 has not

identified any closest prior art as an alternative to D3, D7 and D13 or provided a fully substantiated inventive step objection starting from a specific disclosure. For this reason alone, its inventive step objection fails.

Distinguishing features

- 4.7 The opposition division and the parties did not dispute that the chocolate composition of claim 1 and the flavor composition of claim 10 differ from the disclosure of D3 and D7 at least in that they comprise methanethiol.

Technical effect

- 4.8 The board concurs with the respondent that the tests in the patent unequivocally demonstrate that methanethiol recreates in a chocolate the creaminess typical of crumb chocolate.
- 4.9 The appellants disputed this view, arguing that there was no evidence that this effect could be obtained across the entire scope claimed. In particular, appellant 3 argued that the patent did not provide "any evidence whatsoever" that the alleged technical effect could be achieved by a flavor composition differing from that used to carry out the tests described in the patent and containing anything other than:

- methanethiol
- the three compounds of the caramellic composition present in the chocolate used for the tests and

- the five lactones δ -octalactone, γ -nonalactone, δ -decalactone, γ -undecalactone and δ -dodecalactone present in the chocolate used for those tests

4.10 It also noted that claims 1 and 10 encompassed compositions comprising only one or two of the relevant lactones and that these could differ from those used in the tests. Thus, it was not credible that the effect could be achieved over the entire scope claimed.

4.11 These arguments are not persuasive. As argued by the respondent, the tests in Table 15 of the patent clearly indicate that methanethiol has a significant influence on the aroma and creaminess of chocolate. Those in Table 18 confirm this result. Even if it were accepted that the effect of methanethiol was associated with the simultaneous presence of specific caramelic and lactone compounds, this would not mean that the effect cannot be obtained across the entire scope claimed. Claims 1 and 10 do not foresee the use of methanethiol alone; they foresee its use in combination with a caramelic composition and at least one lactone compound. Thus, they foresee compositions comprising at least one compound for each of the claimed compound classes. Appellant 3 has not provided any evidence that the relevant effect cannot be achieved using methanethiol in combination with one or more of the claimed lactones and the caramelic ingredients specified in claim 1.

4.12 Appellant 3 also argued that essential features necessary for obtaining the relevant effect were missing in the claims. In particular, the claims did not require the presence of dimethyl trisulfite which, as shown by the OAV values in Table 14 of the patent, was an important flavor in chocolate. In appellant 3's opinion, this compound was necessary to "truly recreate

the flavor of crumb chocolate" but had not been included in the claims.

- 4.13 This argument is not convincing either. As stated by the respondent, although the OAV analysis data are relevant, the omission experiments described in example 5 demonstrate that methanethiol is effective in providing the relevant effect. These are ultimately human sensory experiments providing the most reliable results. They provide an answer as to how the human brain perceives the combined overall aroma of crumb chocolate. The appellant has not provided evidence of its own to the contrary.
- 4.14 Appellant 3 also argued that the tests in the patent were performed using a single amount of methanethiol. It was not credible that the effect observed using this amount could be achieved using infinitesimal amounts of this compound, which would have been ineffective, or using very high amounts, which would have induced an unpleasant taste. In this regard it filed documents D41 and D41a, showing that some of the claimed flavor compounds only provided their flavor properties above a specific threshold concentration.
- 4.15 The board does not concur with these arguments. The skilled person is aware that infinitesimal amounts of a flavor will not provide any flavoring effect and that an extremely high amount will likely induce an unpleasant taste. However, for the very same reason, since the claims relate to the preparation of a chocolate, the skilled person would not consider using amounts of methanethiol inducing an unpleasant taste. Furthermore, since the claims require the use of a flavor composition, the skilled person would not consider using a flavor composition in amounts that are

so low that the flavor is not even detectable. For these reasons, appellant 3's arguments are considered to be an attempt to tear down the invention by focusing deliberately on embodiments devoid of technical sense. As such, they are not convincing.

4.16 Referring to declaration D34, appellant 3 presented "further comments" alleging "inconsistencies" in the results presented in the opposed patent. It argued that it was surprising that furaneol, which according to Table 14 had an OAV value above 1, did not have noticeable effects in the omission tests in Table 15. However, as already mentioned above, it is credible that the human sensory experiments in Table 15 provide a more persuasive answer as to how the human brain perceives the aroma in a specific food. Thus, appellant 3's "further comments" do not discredit the results shown in the patent.

4.17 Appellant 3 also submitted that there were inconsistencies between the results in the omission experiments shown in the patent and those presented in Table 12 on page 58 of D33, namely that furaneol did not have a significant effect according to Table 15 of the patent but was effective according to D33. The lactones had a significant effect according to Table 15 of the patent but were not effective according to D33. These arguments do not discredit the relevant results in the patent either. As argued by the respondent, the data in D33, which had been gathered 10 years earlier, did not focus on the creaminess of crumb chocolate, unlike the patent. Furthermore, D33 does not even mention methanethiol and its effect.

4.18 Appellant 3 further submitted that the patent did not provide any evidence that there was a synergy between

the tested caramellic ingredients and a "working inter-relationship" between the tested lactones. It also argued that from the OAV values, it was to be expected that all tested lactones and other ingredients having a high FD factor mentioned in Table 10 and a high OAV value mentioned in Table 14 were relevant for providing the relevant effect.

- 4.19 The board does not agree. Since the discussion is focused on how methanethiol influences the aroma and creaminess of crumb chocolate, the issue of whether other ingredients act synergistically or have an inter-relationship is irrelevant.
- 4.20 Appellant 3 also tried to discredit the credibility of the results in Tables 15 and 17 by raising concerns on how the tests were conducted and taking into account e.g. the OAV values of the individual ingredients. However, as already mentioned above, the sensory tests described in the patent are considered to provide a persuasive answer as to how the human brain perceives the combined overall aroma and creaminess of methanethiol in a crumb chocolate.
- 4.21 Lastly, appellant 3 referred to T 939/92, "Agrevo". However, the situation in that decision was different from the one in hand because there was clear evidence that specific compounds falling within the claimed scope did not induce the claimed effect. No such evidence has been provided in this case.
- 4.22 For these reasons, it is concluded that the patent makes it credible that methanethiol recreates in a chocolate the creaminess of a crumb chocolate, without using any crumb.

Underlying technical problem

- 4.23 There is no evidence that the claimed chocolate has a higher creaminess than the compositions of the closest prior art D3 or D7, or that the claimed flavor composition induces such creaminess. However, taking into account the aforementioned effects, the underlying problem can be formulated as providing an alternative chocolate composition having crumb characteristics and a flavor composition conferring such characteristics, in particular the creaminess of a chocolate prepared using chocolate crumb, without using any crumb.
- 4.24 Appellant 2 disputed the aforementioned formulation of the problem on the ground that, in its opinion, the alleged effect was not associated with a distinguishing technical feature. This argument is not persuasive because, as already explained above, that effect is induced by methanethiol and can be achieved across the entire scope claimed.

Non-obviousness of the claimed solution

- 4.25 Documents D3 and D7, which represent the closest prior art, teach how to manipulate the flavor of a chocolate and, among other things, how to impart a crumb flavor using the products formed by reacting amino acids such as proline and ornithine with rhamnose, fructose or fucose. Nevertheless, methanethiol is not mentioned.
- 4.26 According to the appellants, the claimed solution did not involve an inventive step because using methanethiol to increase the creaminess of foods was already known before the relevant date, as shown in D37 and in D38.

- 4.27 This is not convincing. As noted by the respondent, D37 mentions methanethiol and its formation in a pasteurised cream. D37 also suggests, in passing, that this flavor compound may contribute to the perception of creaminess in that cream. Yet, the conclusion in D37 is that, among the numerous compounds tested, only δ -tetradecalactone provides a clear increase in the perception of creaminess in cream. Concerning methanethiol, D37 merely states that this compound "may play a role in creaminess perception". Furthermore, D37 states that further tests are still in progress to confirm the contribution of other lactones and methanethiol. This means that, according to the authors, the results are not conclusive. Furthermore, D37 relates to the perception of creaminess of a full-fat cream, not of a chocolate. Thus, the skilled person confronted with the underlying problem would not have found in D37 an incentive to include methanethiol in a chocolate composition to solve the problem. At most, the skilled person would have considered using δ -tetradecalactone for this purpose.
- 4.28 D38 is a declaration from a technical expert, who states that *"methanethiol is a well-known ingredient in flavor compositions when dairy flavors are developed. I herewith declare in particular that methanethiol will impart creaminess to [sic] a flavor composition and is frequently used for this purpose"*.
- 4.29 However, this assertion is not supported by any further evidence. In particular, there is no evidence that using methanethiol for increasing the creaminess of chocolate compositions was part of the common general knowledge at the filing date. Appellant 3 filed an extract from the "Wayback Machine" (D40), relating to an entry concerning methanethiol in a food additives

database. The entry mentions, among other things, a creamy savoury nuance. However, the reference is succinct and generic, and no mention is made of any effect in a chocolate composition. The teaching of this document thus does not go beyond that of D37.

- 4.30 This means that none of the documents on file discloses using methanethiol to impart crumb characteristics on a chocolate not prepared using a crumb, let alone the creaminess of crumb chocolate.
- 4.31 Appellant 3 also argued that the invention was merely the result of a routine analysis. In its opinion, the skilled person wishing to replicate the crumb chocolate flavor would have analysed and identified compounds imparting the flavor of crumb using standard analytical techniques. This argument is not convincing either since it is clearly tainted by hindsight, i.e. by previous knowledge of the claimed invention. This is true in particular considering that, as already mentioned above, none of the documents cited by the appellants, including those specifically focused on identifying compounds that impart the flavor on chocolate compositions (D10, D12, D25, D26 and D33), mentions methanethiol. On top of that, D36 appears to suggest that before the relevant date methanethiol was considered to impart a meat flavor. This would in fact have taught the skilled person away from adding methanethiol to a chocolate.
- 4.32 For these reasons, when confronted with the underlying problem, the skilled person would not have considered including methanethiol in the compositions described in the closest prior art D3 or D7.

- 4.33 Consequently, the subject-matter claimed in the main request involves an inventive step (Article 56 EPC).
- 4.34 For completeness, the board notes that the patent proprietor requested that D40 to D42 not be admitted into the appeal proceedings. These documents were filed with appellant 3's statement setting out the grounds of appeal, to support arguments presented in the context of its novelty and inventive step attacks. As set out above, the board considered appellant 3's arguments not convincing, even when taking D40 to D42 into account. Hence, there is no need to address the admittance of these documents.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:



K. Götz-Wein

N. Obrovski

Decision electronically authenticated