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(54) Title: SWEETS WITH FILLING AND COATING OF DIFFERENT FLAVOURS AND COLOURS

(57) Abstract: Disclosed are sweets comprising an inner core (a) (filling) surrounded by a transparent or translucent outer layer (b), (a) and (b) being differently flavoured and coloured from one another, characterised in that (a) contains an opacifying agent and core (a) and/or layer (b) contain at least one flavour enhancer.

SWEETS WITH FILLING AND COATING OF DIFFERENT FLAVOURS AND COLOURS

This invention relates to sweets comprising an inner core (a) (filling) surrounded by a transparent or translucent outer shell (b), (a) and (b) being differently flavoured and coloured from one another, characterised in that (a) contains an opacifying agent and core (a) and/or shell (b) contains at least one flavour enhancer.

PRIOR ART

Sweets comprising a filling and an outer shell or crust with a different colour and flavour from one another are known and available on the market. The filling is usually liquid, whereas the crust is solid and glazed. More recently, sweets have been marketed wherein both the crust and the filling are hard and glazed, and the filling has a different flavour and colour from the crust.

When consumers suck the sweet, they first perceive the flavour present in the crust, then gradually perceive the flavour of the filling as the outer crust dissolves.

Typically, the filling constitutes 10-30% in weight of the sweet, and the organoleptic sensation caused when the outer layer dissolves in the oral cavity is therefore predominant. The change of flavour from that of the crust to that of the filling is therefore perceived in a confused, indistinct way by consumers, who may not perceive the flavour of the filling after being "saturated" by the flavour of the outer layer.

In the known sweets of this type, the filling is often visible inside the substantially transparent or translucent crust, but without a clear border or demarcation between the filling, which normally has a darker colour, and the outer shell or crust of the sweet. Conversely, the change from one zone to the

other is vague and gradual, with no clear borders, and there are intermediate zones of varying sizes with an intermediate colour between that of the filling and that of the crust. Consumers may therefore already perceive the absence of a clear demarcation between the flavours at visual level.

This is particularly critical in the confectionery industry and the food industry in general, where products which present small defects in shape or appearance are usually rejected by quality control systems, even if they are faultless in terms of flavour, safety and hygiene, because consumers inevitably associate defects in appearance with low product quality in general.

DESCRIPTION OF THE INVENTION

This invention is designed to overcome the drawbacks described above by providing sweets in which the aesthetic and organoleptic demarcation between outer layer and filling is clear-cut.

This result is obtained by adding an opacifier, preferably titanium dioxide, to the filling, and at least one flavour enhancer to the filling, the outer layer or both at different levels, depending on the type of flavouring and organoleptic sensation to be imparted to the product.

The sweets according to the invention are typically made by depositing, and can be based on sugar or, preferably, isomalt, sorbitol, maltitol, xylitol, polydextrose and the like. Isomalt is preferred, possibly in association with other polyalcohols such as sorbitol and/or polydextrose. The percentage of isomalt in sweet manufacturing practice can be up to 95% of the mass of the sweet, but could be even more.

Titanium dioxide is preferably used as opacifying agent in the amount of between 10 and 10,000 ppm of the colour of filling (a), preferably 500 to 8000 ppm, and more preferably 700 to 1500 ppm. The presence of these quantities of opacifier makes the perception of the shape of the filling inside the outer crust very clear, giving the sweet a pleasant, attractive appearance, especially if suitable

colour combinations are used, which will normally be pale for the translucent or transparent outer layer and a darker colour for the filling, which pleasantly contrasts with the colour of the outer layer.

All artificial or natural colourings suitable for food use can be employed, provided that the legislation governing the industry is complied with.

Artificial colourings will preferably be used for the outer layer.

The quantity of colouring can vary within wide limits, which must comply with current legislation: for example, the artificial colouring in the outer layer could range between 0 and 100 ppm, preferably between 2 and 50 ppm, whereas natural colourings could be present in slightly higher amounts, such as 0 to 400 ppm, and preferably 20 to 200 ppm. These concentrations relate to the part concerned, not to the whole sweet.

According to one aspect of the invention, either the outer layer or the filling, or both, is fruit flavoured.

According to another aspect of the invention, either outer layer (b) or filling (a), or both, is mint flavoured.

For example, the sweets according to the invention could be flavoured with two different fruit flavourings in (a) and (b), or one of the two could be mint flavoured and the other fruit flavoured, or (a) and (b) could have two different mint flavourings.

The mint flavouring will preferably be present in filling (a), while outer layer (b) will be fruit flavoured.

Examples of fruit flavouring include strawberry, melon, green apple, banana, lemon, orange, grapefruit, mandarin, raspberry, cherry, pineapple, apricot, peach, bilberry and kiwi flavourings.

Examples of mint flavourings include flavourings obtained from essential oils of peppermint, spearmint or wild mint (mentha arvensis), used alone, mixed with one another, or sometimes mixed with other essential oils,

such as sage or eucalyptus, or nature identical or artificial flavourings where allowed.

"Flavour enhancer" means a compound or mixture of compounds designed to increase the sensitivity of consumers towards a given flavouring.

These enhancers have long been known and studied: in the case of fruit flavourings, for example, organic acids compatible with food use are effective as fruit flavouring enhancers. Examples of these acids include citric, ascorbic, lactic, malic and tartaric acid.

If it is intended to enhance the fruit flavour of the filling and differentiate it from a different flavour present in the outer layer, between 1 and 10% in weight of said acids, preferably between 2 and 5%, and more preferably between 2.5 and 3.5%, could advantageously be added to the filling.

In the outer shell, the acid can be wholly absent or present in lower quantities in the case of fruit flavouring, for example between 0 and 3%, preferably between 0.5 and 2%, and more preferably between 1 and 1.5%.

In the case of a mint flavoured filling, the filling could be substantially non-acid, containing no acids or a small amount of acids, for example between 0 and 2%, preferably between 0.5 and 1%, and more preferably between 0 and 0.3%. In this case, the acid in the fruit-flavoured crust could be present in quantities ranging between 0.3% and 7%, preferably between 1 and 3%, and more preferably between 1.5 and 2.5%.

"Twist" flavourings, namely flavourings which confer a different property from the main part of the flavouring, such as a fruit (lemon) flavouring, a spicy or herbal flavouring, or a flavouring with sensation properties (hot, cold, hot and spicy, tingling or other effect), could also be opportunely used as flavour enhancers, either alone or in combination with other flavour enhancers.

The sweets according to the invention could also contain functional ingredients in the outer layer, the filling or both.

"Functional ingredient" means a substance which performs a function beneficial to the body, not necessarily a pharmacological function properly so called, but, for example, a nutritional function, by providing an intake or supplement of vitamins, mineral salts, trace elements, or plant extracts with medicinal or health properties, such as extracts of Echinacea, soya, St. John's Wort, camomile, valerian, ginkgo, ginseng and other plants commonly used in the herbal, diet supplement and nutraceutical fields.

A sweet particularly preferred according to the invention contains Echinacea extract, vitamin C and zinc salts, which said constituents are known for their beneficial and preventive action against influenza and cold syndromes. These constituents can be contained in the filling, especially when the flavouring of the filling can effectively correct and conceal the organoleptic properties of some functional ingredients, which may be unpleasant (bitter) or too strong. For example, Echinacea extract has a similar flavour to liquorice, and is opportunely masked by a mint flavouring,which blends nicely with it. It is therefore preferably introduced into the filling when the filling is mint flavoured, but the crust is fruit flavoured.

The sweets according to the invention can be prepared by conventional depositing methods, and can have a variety of shapes and colour combinations.

Said sweets could also contain other constituents, especially antioxidants, fruit juices and sweeteners.

Sweeteners will preferably be used to ensure a difference in sweetness between the crust and the filling, and/or the absence of bitterness in the part of the sweet with the greatest concentration of bitter elements (flavouring, acids and functional ingredients), by using suitable amounts of "intensive" sweeteners.

The intensive sweeteners most commonly used to manufacture sugar-free sweets (Neohesperidine, Acesulfame K, Aspartame and Sucralose) could be added in variable concentrations and combinations to the outer layer and the filling, obviously provided that they comply with current legislation. The filling will preferably have a higher concentration of sweeteners.

The invention is illustrated in greater detail in the following examples.

Example 1 - Fruit-Mint (Functional positioning)

a - A "basic syrup" is prepared with the following ingredients and percentages

Basic syrup	%
ISOMALT	81.739
Water	18.213
ACESULFAME K	0.040
NEOHESPERIDINE D.C.	0.008
Total	100.000

b - The "basic syrup" is cooked under vacuum until it reaches approx. 1% residual moisture; it can be cooked with any cooking device, but continuous cooking on microfilm is preferred.

c - The cooked syrup is divided into two parts.

c1 - Mixtures and flavourings for the outer shell are added to one part, as follows

Shell mixture 1	**%**
SODIUM ASCORBATE	22.21
LACTIC ACID	68.42
WATER	9.34
E 104 QUINOLINE YELLOW	0.03
Total	100.00

Dose 4% of crust

Shell mixture 2	%
ASPARTAME	10.00
70% liquid sorbitol (buffered)	90.00
Total	100.00

Dose 0.7% of crust

Flavouring of crust	%
Fruit flavouring	100

Dose 0.5% of crust

c2 - Mixtures and flavourings for the filling are added to one part, as follows

Filling mixture 1	%
E 171 TITANIUM DIOXIDE	5.00
GLYCERIN	3.75
E 133 BRILLIANT BLUE	0.25
Echinacea extract	20.60
Water	27.75
ASPARTAME	6.00
BUFFERED MALTITOL SYRUP	36.65
TOTAL	100

Dose 2% of filling

Flavouring of filling	%
Mint flavouring	95
Cooling agents	5
Total	100

Dose 1% of filling

d - The shell and filling parts are poured into the dedicated hoppers of a depositing machine, and filled deposited sweets are produced. The filling accounts for 13% of the total weight of the sweet.

In the above example, the crust and filling differ as follows:

Colour	
Crust	Pale transparent yellow
Filling	Matt blue

Flavouring	
Crust	Fruit at normal concentration
Filling	Mint at higher than normal concentration

Acidity	
Crust	Strong (2% lactic acid)
Filling	None

Sweeteners	
Crust	Aspartame 700 ppm
Filling	Aspartame 1200 ppm

Functional ingredients	
Crust	none
Filling	Echinacea extract

Example 2 - Fruit-Fruit (taste and pleasure positioning)

a - A "basic syrup" is prepared with the following ingredients and percentages

Basic syrup	**%**
ISOMALT	81.74
WATER	18.22
ACESULFAME K	0.04
Total	100

b - The "basic syrup" is cooked under vacuum until it reaches approx. 1% residual moisture; it can be cooked with any cooking device, but

continuous cooking on microfilm is preferred.

c - The cooked syrup is divided into two parts.

c1 - Mixtures and flavourings for the crust are added to one part, as follows

Acid for crust	**%**
88% lactic acid	100

dose 1.4%

Mix 1 for crust	**%**
Water	84
E102 tartrazine yellow	4
Total	100

dose 0.1%

Flavouring for crust	**%**
Melon Flavouring	100

dose 0.5%

c2 - Mixtures and flavourings for the filling are added to one part, as follows

Flavouring for filling	**%**
Concentrated strawberry flavouring	100

dose 0.5%

Mix 1 for filling	**%**
E 171 titanium dioxide	2.25
E129 allura red	2.25
Water	17
Lactic acid	78.5
Total	100

dose 4%

d - The crust and filling parts are poured into the dedicated hoppers of a casting machine, and filled cast sweets are produced. The filling accounts for 20% of the total weight of the sweet.

In the above example, the crust and filling differ as follows:

Colour	
Crust	pale transparent yellow
Filling	matt red

Flavouring	
Crust	melon flavouring
Filling	strawberry

The absolute concentration of flavouring is not a significant factor in the case of fruit flavours. In fact, fruit flavourings contain solvents to maintain in solution molecules or essential oils which have an olfactory or flavouring effect. Moreover, some flavours are perceived very differently from others. The organoleptic impact of the filling, therefore, needs to be adjusted as more intense than that of the crust according to different cases.

Acidity	
Crust	slight (1.2% lactic acid)
Filling	very strong (3.1% lactic acid)

CLAIMS

1. Sweets comprising an inner core (a) (filling) surrounded by a transparent or translucent layer outer (b), (a) and (b) being differently flavoured and coloured from one another, characterised in that (a) contains an opacifying agent and core (a) and/or layer (b) contain at least one flavour enhancer.

2. Sweets as claimed in claim 1, wherein at least one of (a) or (b) is fruit flavoured.

3. Sweets as claimed in claim 1 or 2, wherein at least one of (a) or (b) is mint flavoured.

4. Sweets as claimed in claim 2, wherein both (a) and (b) are fruit flavoured and the flavour enhancer is present in (a) but absent in (b) or is present in a smaller amount in (b) than in (a).

5. Sweets as claimed in claim 1, 2 or 3, wherein outer layer (b) is fruit flavoured and core (a) is mint flavoured.

6. Sweets as claimed in one of claims 1 to 5, also containing functional ingredients in (a) or (b) or both.

7. Sweets as claimed in claim 6, wherein the functional ingredients include vitamins, mineral salts and medicinal plant extracts.

8. Sweets as claimed in claim 7, wherein core (a) contains Echinacea extract, vitamin C and zinc salts.

9. Sweets as claimed in any of claims 1 to 8, wherein the opacifying agent is titanium dioxide.

10. Sweets as claimed in any of claims 1 to 9, wherein the flavour enhancer is an acid chosen from among citric, ascorbic, lactic, malic and tartaric acids.

11. Sweets as claimed in any of claims 1 to 10, containing no added sugar.

12. Sweets as claimed in claim 10, wherein both core (a) and layer (b) are

constituted mainly by isomalt, possibly mixed with polydextrose, maltitol, sorbitol and xylitol.

13. Sweets as claimed in any of claims 1 to 12, characterised in that they are made by depositing..

14. Sweets as claimed in any of the preceding claims, wherein the flavourings are chosen from among strawberry, melon, green apple, banana, lemon, orange, grapefruit, mandarin, raspberry, cherry, pineapple, apricot, peach, bilberry, kiwi, peppermint and spearmint flavourings.

15. Sweets as claimed in any of claims 1 to 12, also including antioxidants, sweeteners and fruit juices.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/000074

A. CLASSIFICATION OF SUBJECT MATTER
INV. A23G3/54 A23G3/48

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A23G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, FSTA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/018829 A1 (NIELSEN HANS ERIK ET AL) 14 February 2002 (2002-02-14) paragraphs [0005] - [0032], [0042] - [0050]; claims 1-5,15; examples 1,2; tables 1,2	1-4,10, 11,13-15
X	US 2001/048965 A1 (CHERUKURI SUBRAMAN RAO) 6 December 2001 (2001-12-06) paragraphs [0039], [0042], [0043], [0046], [0055], [5657], [0058], [0059], [0084], [0085]; claims 1-18,28; examples 21,22	1-8,10, 11,13-15
X	WO 02/19834 A (GUM TECH INTERNATIONAL INC; DAY, TREVOR, NEIL; GREENWOOD, MARK; STRAND) 14 March 2002 (2002-03-14) page 2, line 23 - page 3, line 5; claim 8 page 14, line 8 - line 20	1,6,9,13

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 April 2006	03/05/2006

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 447 733 A (ENRIQUE BERNAT F., S.A) 25 September 1991 (1991-09-25) the whole document	1-15
Y	GB 2 396 543 A (* SWIZZELS MATLOW LIMITED) 30 June 2004 (2004-06-30) page 5, line 3 - page 6, line 11; claims 1,3,5 page 1, line 10 - page 2, line 4	1-15

INTERNATIONAL SEARCH REPORT

nformation on patent family members

Int[redacted]ional application No
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