

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2001 (27.12.2001)

PCT

(10) International Publication Number
WO 01/97626 A2

- (51) International Patent Classification⁷: **A23G**
- (21) International Application Number: PCT/EP01/05089
- (22) International Filing Date: 4 May 2001 (04.05.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/212,378 19 June 2000 (19.06.2000) US
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- (81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*



WO 01/97626 A2

(54) Title: EFFERVESCENT CANDY BAR

(57) Abstract: An effervescent candy bar of a syrup-based malleable and chewable component comprising at least two masses at least one of which contains acid and at least one contains alkali and a method for its preparation.

EFFERVESCENT CANDY BAR

FIELD OF THE INVENTION

5 The present invention relates to an effervescent candy bar and more particularly to an effervescent chewable candy bar.

BACKGROUND OF THE INVENTION

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There are a number of effervescent products on the market and reported in the literature, e.g. chewing gum, spoonable food, cakes, fat-based products such as chocolate, frozen products such as ice cream,
15 effervescent powder trapped inside a high-boiled candy, effervescent powder plus lollipop format, or pressed tablets which effervesce when eaten such as "Trebor Refreshers" sold by Cadbury in the United Kingdom. The effervescence is usually caused by the use of an acid
20 and alkali which react in the mouth when the product is consumed.

However, no syrup based effervescent candy bars are known because there is a problem of the premature
25 reaction of the acid and alkali due to the presence of moisture.

We have found that an effervescent effect may be achieved in a malleable, chewy type of syrup-based
30 product although it would normally be expected that if the acid and alkali was mixed into the warm mass during processing then the acid and alkaline components would prematurely react during the mixing and layering process. Surprisingly, we have found that by utilizing
35 a two separate mass type technique these components do not prematurely react to any significant effect. In

addition, at lower moisture contents there is usually no need for an insulating layer between the acidic and the alkaline masses.

5 SUMMARY OF THE INVENTION

According to the present invention there is provided an effervescent candy bar of a syrup-based malleable and chewable component comprising at least two masses at
10 least one of which contains acid and at least one contains alkali.

DETAILED DESCRIPTION OF THE INVENTION

15 The syrup-based malleable and chewable component may be, for instance, marshmallow, fudge, nougat, marzipan, fruit chew, fruit paste, caramel, chewy gelled / gummy masses, etc. This component may, if desired, be mixed with edible solid pieces such as cereal pieces, e.g.
20 wheat crispies, puffed wheat, crisped rice ; candy pieces; fruit pieces; legume pieces, e.g. chickpea; or chopped nuts, etc.

In one example of a candy bar, one of the masses
25 containing either the acid or alkali may be the syrup-based malleable and chewable component while the other mass is in the form of one or more pellets or compressed powder within the candy bar. In another example of a candy bar, the syrup-based malleable and
30 chewable component may be substantially neutral while the masses comprise two or more pellets or compressed powders distributed within the syrup-based malleable and chewable component.

35 Preferably, the masses are formed by layers of the syrup-based malleable and chewable component, at least

Preferably, the masses are formed by layers of the syrup-based malleable and chewable component, at least one layer containing acid and at least one layer containing alkali.

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To achieve an optimum effervescent effect the amount of acid and alkali used must exactly neutralize each other. It should be understood that the ratio between acid and alkali used to achieve this is not necessarily equal amounts. For example a weak acid may require two parts to neutralize one part of sodium bicarbonate. However, it has been found that a slight excess of acid, i.e. more acid than needed to just neutralize the alkali, achieves a more pleasant end flavor appropriate to a fruity flavor, namely a slightly acidic one. The amount of acid and alkali used should be sufficient to realize a recognisable degree of effervescence consistent with an acceptable taste. For example, by using citric acid and sodium bicarbonate in equal amounts by weight of each we end up with a slight excess of acid and a slightly acidic flavor.

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Differing layer thicknesses are also possible as long as the desired ratio of acid to alkali is maintained. This could be achieved by having a thicker, lower acid concentration acidic layer combined with a thinner layer with a higher than normal percentage of alkali. This could also be achieved by having a thinner, higher acid level layer combined with a thicker alkali layer which has a lower than normal level of alkali.

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In one preferred example, the adjacent layers are made of a mixture of the syrup-based malleable and chewable component and edible solid pieces, advantageously in which the edible solid pieces are substantially evenly

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coated with the syrup-based malleable and chewable component.

5 The acidic layer may be up to 50 times more acidic than normal and the alkaline layer may be up to 50 times more alkaline than normal. Preferably, the acidic layer is from 10 to 30 times more acidic than normal and the alkaline layer is from 10 to 30 times more alkaline than normal. The acid and alkali should be edible and
10 food-acceptable. The acid may comprise one or more of citric, malic, lactic, tartaric, phosphoric acid. The alkali may be conveniently be sodium bicarbonate or potassium bicarbonate.

15 The amount of acid used in the acid portion may be from 3 to 20% and preferably from 10 - 15% by weight based on the weight of the acid portion. The amount of alkali used in the alkali portion may be from 3 to 20% and preferably from 10 - 15% by weight based on the weight
20 of the alkali portion.

In a candy product of this invention, the masses may have different colours. In a layered product, the adjacent layers of the candy bar may be made of the
25 same or different materials. The adjacent layers of the candy bar may advantageously be of different colours. There may be more than two layers, e.g. from 3 to 6 layers or more, the number of layers of layers only being limited by practical considerations.

30 The moisture content of the candy bar may vary from 7% to 30%, preferably from 10% to 25%, and more preferably from 12.5 % to 22.5% by weight based on the weight of the bar. In a layered product, when the moisture
35 content of the candy bar is such that an interaction between the layers with respect to premature

effervescence is created, an insulating layer of fat-based material between adjacent layers of the candy bar is used to prevent any reaction prior to consumption of the product.

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As the moisture level increases the candy becomes less hard and chewy. Chewiness depends mostly on the % residual moisture and also on the presence of thickeners such as gums and or gelling agents.

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The exact moisture content where no insulative barrier between the layers is needed will vary depending on the formula type involved, the components of the layer, (e.g. when crispies are included the moisture level required to cause a "cold" reaction is higher than when the layer/formula does not contain crispies), as well as how much of the moisture is bound up. Normally, when the center moisture content is around 15% to 17%, interaction between the layers with respect to premature effervescence is not experienced.

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Advantageously, the candy bar may be coated on one or more sides with a fat-based material.

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The fat-based material used for the insulating layer or for coating the product may be any fat based layer known within the industry as a compound coating type of material. This means any formula which is comprised of fine (under 500 microns as measured by an engineering micrometer) particles suspended in a edible lipid material such as fat. This material can be any color. chocolate or compound coating material. The chocolate may be milk, dark or white chocolate. The compound coating material may include chocolate substitutes containing direct cocoa butter replacements, stearines, coconut oil, palm oil, butter or any mixture thereof

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including confectioner's coatings also known as compound or couvertures, used for covering ice cream or cakes usually comprising chocolate analogues with cocoa butter replaced by a cheaper vegetable fat.

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The present invention also provides a method for the production of an effervescent candy bar of a syrup-based malleable and chewable component comprising at least two masses at least one of which contains acid and at least one contains alkali which comprises
10 preparing a syrup-based malleable and chewable base adding acid to at least one of the masses and alkali to at least one of the other masses.

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When the candy bar comprises at least two layers of syrup-based malleable and chewable components wherein at least one layer is acidic and an adjacent layer is alkaline the method of production comprises preparing a syrup-based malleable and chewable base, forming into
20 layers of the desired thickness, width and length, adding acid and alkali respectively to adjacent layers and sequentially forming the layers one on top of the other.

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When the syrup-based malleable and chewable base is combined with edible solid pieces, the syrup-based malleable and chewable base may be combined with the edible solid pieces in a ribbon blender, or similar continuous mixer. These components can also be added,
30 and mixed in in batch type mixers such as mixing kettles, Hobart planetary mixers and the like. Each layer may prepared simultaneously but in separate streams and first one complete layer mass is sheeted to the required thickness by any available suitable means
35 such as but not limited to a Hutt extruder and typically at 38° to 66°C (100 to 150°F) on to a moving

endless belt. This mass is typically, although not always necessary, cooled until of a firm texture and the second layer is likewise sheeted on top of the first layer. The two layers are cooled to such a
5 temperature that the firmness is adequate for the mass to typically but not exclusively be slit by rotary knives into strips. These strips are then cross cut by a guillotine blade to the required length.

10 The bars can be wrapped in this format but are more typically partly or fully enrobed in a fat based coating such a chocolate or what is known in the trade as compound coating. Bars may be then typically wrapped and packed at 20-60 in a box for distribution.

15 When the syrup-based malleable and chewable base is marshmallow, there may be added minor ingredients such as vegetable fat, typically in an amount of 8-16% by weight (of the complete layer) and preferably 11 - 13%
20 by weight to reduce stickiness at cutting and when eaten, emulsifiers in an amount of 0.01 - 2% by weight (of the complete layer) and typically 0.1 - 0.5% by weight, glycerine to retain moisture in an amount of 0.2 - 7% by weight and typically at 1 - 3% by weight,
25 and suitable flavoring materials such as vanilla.

When the product is eaten, approximately equal quantities of acidic and alkali layers are bitten off
30 and masticated with saliva in the mouth. The higher moisture level caused by the admixing of saliva with the product causes sufficient moisture to be present to activate a reaction between the acidic layer and the alkaline layer such that CO₂ gas is given off together
35 with a slightly overall acidic taste plus a prickly, tingling mouthfeel associated with effervescence.

EXAMPLES

The following Examples further illustrate the present
5 invention.

Example 1

A marshmallow base is prepared by a standard method
10 from heated, dissolved gelatin and water, mixed with a
cooked syrup of sugar, glucose syrup, fructose and
sorbitol. This has air whipped into it to an initial
density of around 0.4, to form a base marshmallow.

15 To the marshmallow base is added, based on the weight
of a complete layer, 4 - 20% by weight of vegetable
fat, 0.01 - 1% by weight of lecithin, 0,1 - 10% by
weight of glycerine, and 0.1% by weight of vanilla
flavour.

20 This is mixed at slow speed until evenly distributed
throughout the mass. This has the purpose of ensuring
that the chewy mass does not overly stick on the teeth
when chewed.

25 To this combined mixture is added 5% by weight of
crisped wheat in the form of small 2-3mm. spheres in a
ribbon blender with mixing applied until all the
crispies are evenly coated with the marshmallow.

30 Two layers are prepared simultaneously but in separate
streams and first one complete layer mass is sheeted to
the required thickness using a Hutt extruder at 50°C
(122°F) on to a moving endless belt into a sheet 20-
35 25mm thick. This mass is cooled to 20°C (68°F) until
of a firm texture and the second layer is likewise

sheeted on top of the first layer. The two layers are cooled to such a temperature that the firmness is adequate for the mass to be slit by rotary knives into strips. These strips are then cross cut by a guillotine blade into 25 mm wide strips before being cross cut (guillotined) to the desired length. The moisture content is 12% by weight based on the weight of the layers.

The product uses two equally thick layers of the same base material comprised of different colors. One layer has mixed through it 10% by weight of fine citric acid powder. The other layer has mixed through it 10% of fine sodium bicarbonate powder. These layers are placed one on top of the other and are formed sequentially first one and then the other directly on top of each other. The base of this combined layer is then covered by a colored compound coating (or colored white chocolate) material to a depth of about 5mm.

It was found that no insulating layer of chocolate-like material was needed and the two layers did not react with each other on storage.

When the product is eaten, the consumer perceives a slightly overall acidic taste plus a prickly, tingling mouthfeel associated with effervescence.

Example 2.

A similar procedure to that described in Example 1 was followed except that the moisture content of the mixture of marshmallow and crisped wheat is 20%.

In this case, a layer of compound coating 2.5mm thick is placed between between the two layers to stop a premature reaction between the two layers

- 5 When the product is eaten, the consumer perceives a slightly overall acidic taste plus a prickly, tingling mouthfeel associated with effervescence.

CLAIMS

1. An effervescent candy bar of a syrup-based malleable and chewable component comprising at least two masses at least one of which contains acid and at least one contains alkali.
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2. An effervescent candy bar according to claim 1 comprising at least two layers of syrup-based malleable and chewable components wherein one layer is acidic and the adjacent layer is alkaline.
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3. A candy bar according to claim 1 wherein the syrup-based malleable and chewable component is marshmallow, fudge, nougat, marzipan, fruit chews, fruit pastes, caramel, chewy or gelled gummy masses.
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4. An effervescent candy bar according to claim 1 wherein the syrup-based malleable and chewable component contains cereal pieces, candy pieces, dried fruit, dried legumes or chopped nuts.
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5. An effervescent candy bar according to claim 2 wherein the adjacent layers are made of a mixture of the syrup-based malleable and chewable component and edible solid pieces, in which the edible solid pieces are substantially evenly coated with the syrup-based malleable and chewable component.
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6. A candy bar according to claim 1 wherein the acidic layer is up to 50 times more acidic than normal and the alkaline layer is up to 50 times more alkaline than normal.
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7. A candy bar according to claim 1 wherein the amount of acid used in the acid mass is from 3 to 20% by
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weight based on the weight of the acid mass and the amount of alkali used in the alkali mass is from 3 to 20% by weight based on the weight of the alkali mass.

5 8. A candy bar according to claim 1 wherein the moisture content of the candy bar is from 7 to 30% by weight based on the weight of the bar.

10 9. A candy bar according to claim 2 wherein when the moisture content of the candy bar is such that an interaction between the layers with respect to premature effervescence is created, an insulating layer of fat-based material is positioned between adjacent layers of the candy bar.

15 10. A candy bar according to claim 9 wherein the moisture content of the candy bar is greater than 15% by weight based on the weight of the bar.

20 11. A candy bar according to claim 9 wherein the fat-based material is chocolate or compound coating material.

25 12. A candy bar according to claim 2 wherein the adjacent layers are of different colours.

13. A candy bar according to claim 2 wherein the adjacent layers are made of the same or different materials.

30 14. A method for the production of an effervescent candy bar of a syrup-based malleable and chewable component comprising at least two masses at least one of which contains acid and at least one contains alkali
35 which comprises preparing a syrup-based malleable and chewable base and adding acid to at least one of the

masses and adding alkali to at least one of the other masses.

15. A method according to claim 14 wherein the candy
5 bar comprises at least two layers of syrup-based
malleable and chewable components at least one layer
being acidic and an adjacent layer being alkaline,
which comprises preparing a syrup-based malleable and
chewable base, forming into layers of the desired
10 thickness, width and length, adding acid and alkali
respectively to adjacent layers and sequentially
forming the layers one on top of the other.