



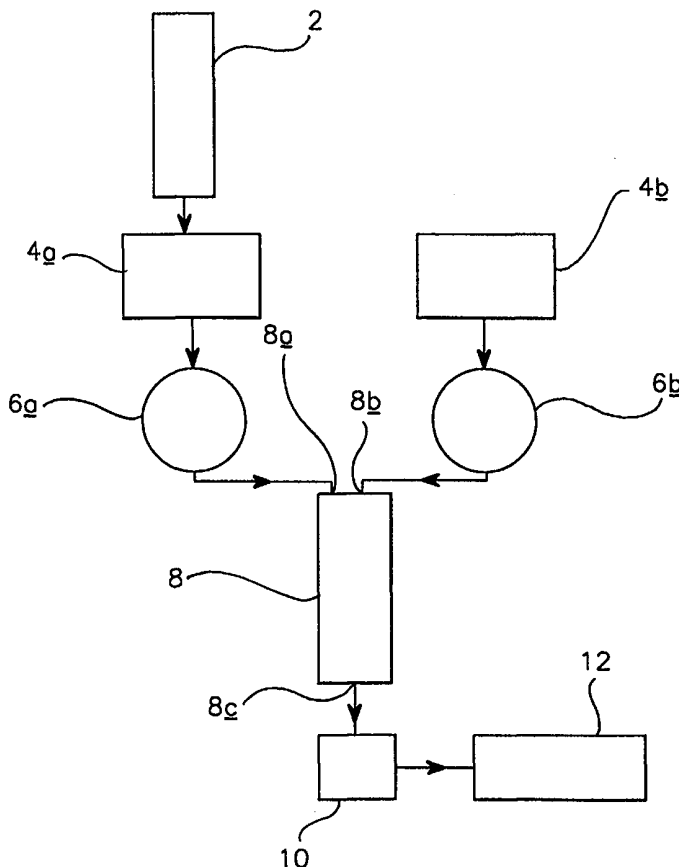
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : A23G 1/00, 3/00, 1/04, 1/10, 1/20</p>	<p>A1</p>	<p>(11) International Publication Number: WO 00/32057 (43) International Publication Date: 8 June 2000 (08.06.00)</p>
<p>(21) International Application Number: PCT/GB99/03860 (22) International Filing Date: 22 November 1999 (22.11.99) (30) Priority Data: 9825892.4 27 November 1998 (27.11.98) GB (71) Applicant (for all designated States except US): CADBURY SCHWEPES PLC [GB/GB]; 25 Berkeley Square, London W1X 6HT (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): SANDERS, Nigel, Hugh [GB/CA]; 317 Runnymede Road, Toronto, Ontario M6S 2Y5 (CA). (74) Agents: PEARCE, Anthony, Richmond et al.; Marks & Clerk, Alpha Tower, Suffolk Street Queensway, Birmingham B1 1TT (GB).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, 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, ARIPO patent (GH, GM, KE, LS, MW, 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), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>

(54) Title: IMPROVEMENTS IN CONFECTIONERY MANUFACTURE

(57) Abstract

A continuous process for the manufacture of a fat-based heat-meltable confectionery product comprises the steps of introducing a fat-based heat-meltable confectionery mixture and water into a low-shear extruded mixer (8). The fat-based heat-meltable confectionery mixture and water are mixed as they pass through the mixer (8) to form a fat-based heat-meltable confectionery composition. The fat-based heat-meltable confectionery composition is formed into the fat-based heat-meltable confectionery product.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

IMPROVEMENTS IN CONFECTIONERY MANUFACTURE

The present invention relates to processes for producing fat-based heat-meltable confectionery products, particularly chocolate-type compositions.

Examples of suitable fat-based heat-meltable confectionery products include chocolate-type compositions and fat-based cremes (e.g. biscuit cremes, wafer cremes and pralines).

For the avoidance of doubt, "chocolate-type compositions" includes conventional milk, plain and white chocolate compositions, such compositions in which at least some of the cocoa butter has been removed (i.e. low fat chocolate) and/or replaced by other fats/oils, and/or having at least some of the sugar removed and/or replaced by bulking agents (i.e. low calorie chocolate), including such compositions which by national or international agreement may not be sold as "chocolate". For clarity, such compositions will hereinafter be referred to as chocolate compositions, and any references to "chocolate mixture", "chocolate composition" or "chocolate product" should be construed accordingly.

The pleasurable organoleptic properties of conventional chocolate are to a significant extent due to the fact that the fat (primarily cocoa butter) which forms the continuous phase in chocolate melts quickly and smoothly in the mouth giving a characteristic mouthfeel. This is because cocoa butter softens at approximately 28°C and is generally completely melted at 32 to 35°C. However, such melting presents problems for storage and

- 2 -

distribution in regions where ambient temperatures are high (e.g. 30 to 40°C).

As a result, much research effort has been directed towards the production of so-called "high-temperature tolerant" chocolate products. As used herein, "high-temperature tolerant" in relation to chocolate products, refers to those products which retain their shape at higher temperatures than conventional chocolate. One approach is to replace the cocoa butter partially or completely with higher melting fats. Although such an approach does yield products which maintain their shape at relatively high temperatures, the higher melting fats melt less readily when eaten and leave an undesirable waxy mouthfeel.

A second approach is to develop a structure of non-fat ingredients in the chocolate product which remains rigid when the fat starts to melt, such as a lattice of predominantly sugar particles. A lattice of sugar and/or other hydrophilic materials may be developed by the addition of water to a chocolate mixture. To have a satisfactory mouthfeel and texture, the lattice should dissolve evenly when the chocolate is eaten, and there should be no large aggregates of non-fat ingredients to impart a gritty texture. For success, the prior art focuses on the problem of how to present water to the chocolate mixture. The solutions offered are to form very small water droplets and/or oil/water emulsions. For example, US 5125160 discloses the use of an aqueous foam and WO93/12664 discloses the use of water-in-oil microemulsions, the water being in the form of droplets of size 10 to 1000Å.

- 3 -

Thus, it is an object of a first aspect of the present invention to provide a process for the manufacture of a fat-based heat-meltable confectionery product which exhibits improved properties.

According to the first aspect of the present invention, there is provided a continuous process for the manufacture of a fat-based heat-meltable confectionery product comprising the steps of:-

- (i) introducing a fat-based heat-meltable confectionery mixture into a low-shear extruder mixer,
- (ii) introducing water into the low-shear extruder mixer,
- (iii) mixing the fat-based heat-meltable confectionery mixture and water as they pass through the mixer to form a fat-based heat-meltable confectionery composition, and
- (iv) forming the fat-based heat-meltable confectionery composition into the fat-based heat-meltable confectionery product.

The above process enables the confectionery product formed by the process to retain its shape at a higher temperature than a corresponding confectionery product formed from the fat-based heat-meltable confectionery mixture not having undergone the process.

It will be understood that the basis of the first aspect of the present invention resides in the surprising discovery that, contrary to accepted wisdom, the nature of the mixing of the water with the fat-based heat-meltable confectionery mixture is more significant than the form in which water is added. None of the prior art makes any specific recommendation as to the type of mixer to be used. As used herein "low-shear" means a shear of not more than $1000s^{-1}$.

- 4 -

Preferably, said low-shear extruder mixer is a cavity-transfer type mixer, for example that disclosed in EP 0048590.

The water may be introduced into the mixer by itself, or alternatively as an oil-in-water emulsion, but preferably as a water-in-oil emulsion. If the water is to be added as an emulsion, an emulsifier such as polyglycerol polyricinoleate (PGPR) is preferably included.

Preferably, sufficient water is added such that the fat-based heat-meltable confectionery product has a water content in the range of 1.8 to 3.0% by weight, more preferably in the range of 1.8 to 2.5% by weight.

Preferably, steps (i) and (ii) are effected simultaneously.

Preferably, the fat-based heat-meltable confectionery mixture is a chocolate mixture.

The chocolate mixture may be tempered or untempered. Surprisingly, the process of said first aspect of the present invention does not cause detempering of tempered chocolate mixtures.

Preferably, the water is added to the mixer at 30 to 45°C, and more preferably 40°C.

When the fat-based heat-meltable confectionery mixture is chocolate, it is preferably added to the mixer at 27 to 45°C and, in this case, the mixer is preferably maintained at a temperature of 27 to 45°C. However, in the

- 5 -

case where tempered chocolate is employed, it is preferably added to the mixer at less than 30°C in order to preserve the temper and the mixer is preferably maintained at less than 30°C.

Also according to said first aspect of the present invention, there is provided a fat-based heat-meltable confectionery product prepared in accordance with the process of said first aspect of the present invention.

A related problem is that refrigeration (which may be required even in temperate climates during summer months) hardens conventional chocolate such that it must be held in the mouth for an unacceptably long time in order for it to melt, or it must be chewed. In either event at least some of the pleasure derived from eating chocolate is lost.

European Patent Application No. 0717931 also discloses a chocolate composition suitable for consumption at low temperatures. The fat content of the composition includes at least 40% by weight of fats rich in 2-unsaturated-1,3-disaturated glycerides. Specific fats include fractions of palm, palm kernel and coconut oils having overall melting points from 21 to 30°C. Despite such relatively high melting points, loss of shape at ambient temperatures requires the chocolate to be held in a mould.

Thus, it is an object of a second aspect of the present invention to provide a fat-based heat-meltable confectionery product which, when consumed directly from a refrigerator or freezer, has superior eating characteristics to conventional chocolate consumed in the same way, but which retains its shape at eating temperatures above that of its storage, for example 8 to 50°C.

- 6 -

According to the second aspect of the present invention, there is provided a process for the manufacture of a fat-based heat-meltable confectionery product comprising the steps of:-

- (i) mixing a fat-based heat-meltable confectionery mixture whose fat component remains substantially liquid from its melting temperature to a temperature not exceeding 30°C and water in a mixer to produce a fat-based heat-meltable confectionery composition, and
- (ii) forming the fat-based heat-meltable confectionery composition into the fat-based heat-meltable confectionery product.

The confectionery mixture will normally contain, in addition to the fat component, at least one added sweetener (e.g. sugar) and may also contain one or more added flavouring ingredients.

The above process enables the product so produced to melt more rapidly when consumed directly from storage at sub-ambient temperature than a corresponding confectionery product formed from the fat-based heat-meltable confectionery mixture not having undergone the process consumed in the same way, and to retain its shape at ambient temperatures.

Preferably said fat component referred to in step (i) is liquid at less than 20°C.

Preferably step (i) is effected by a low-shear extruder mixer, and more preferably, a cavity transfer mixer, for example that disclosed in EP 0048590.

- 7 -

Preferably, said fat component comprises one or more vegetable oils which are more preferably selected from the group consisting of sunflower, maize, groundnut, palm, palm kernel and coconut oils.

Preferably, said fat component oil(s) account(s) for at least 5% by weight of the fat-based heat-meltable confectionery mixture, and more preferably account(s) for between 5% and 55% by weight, and most preferably 15 to 40% by weight.

Also according to the second aspect of the present invention, there is provided a fat-based heat-meltable confectionery product prepared in accordance with the process of said second aspect of the present invention.

Surprisingly, it has been found that such a fat-based heat-meltable confectionery product is capable of retaining its shape at ambient temperatures (e.g. 8 to 50°C) even when the entire fat component consists of a low temperature melting fat such as sunflower oil (melting point -16°C).

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawing which is a schematic representation of an apparatus for performing a process in accordance with the first aspect of the present invention.

Referring to the drawing, an apparatus for performing the process of the present invention comprises a Silverson high-shear mixer 2, first and

- 8 -

second thermostatically controlled holding tanks 4a,4b, a pair of flow-control pumps 6a,6b, a cavity transfer mixer 8 (sold under the tradename CTM under license from the Rubber and Plastics Research Association), a forming station 10 and a cooling tunnel 12. The cavity transfer mixer 8 has first and second inlets 8a,8b and a single outlet 8c.

A flow path exists between the Silverson high shear mixer 2, the first holding tank 4a and the first inlet 8a of the cavity transfer mixer 8. A flow path also exists between the second holding tank 4b and the second inlet 8b of the cavity transfer mixer 8. The outlet 8c of the cavity transfer mixer 8 is connected to a forming station 10 linked by conveyor to the cooling tunnel 12.

In use, an oil/water emulsion (either water-in-oil or oil-in water) is prepared in the Silverson high shear mixer 2 and passed into the first holding tank 4a. A pre-prepared fat-based heat-meltable confectionery mixture is transferred to the second holding tank 4b, with both holding tanks 4a,4b being maintained at the respective desired temperature. The pumps 6a,6b are activated, causing the oil/water emulsion and the fat-based heat-meltable confectionery mixture to be passed via the respective inlets 8a,8b into the cavity transfer mixer 8. The relative flow rates of the pumps 6a,6b are adjusted so that a fat-based heat-meltable confectionery composition having a desired water content will be formed. The oil/water emulsion is mixed into the fat-based heat-meltable confectionery mixture as it passes through the cavity transfer mixer 8 until a substantially homogeneous fat-based heat-meltable confectionery composition emerges from the outlet 8c of the cavity transfer mixer 8. The composition is formed into bars of a desired size and shape. The bars are passed by

- 9 -

conveyor to the cooling tunnel 12 where they are cooled. If the pre-prepared fat-based heat-meltable confectionery mixture is chocolate, it may be tempered before passing into the cavity transfer mixer 8. Alternatively, the chocolate composition formed in the cavity transfer mixer 8 may be tempered after having passed therethrough.

It will be understood that if water rather than an emulsion is to be supplied to the first inlet 8a of the cavity transfer mixer 8, then the Silverson high shear mixer 2 is not required.

In the following Examples, all percentages are weight percentages unless specified otherwise.

Example 1

Water (1%) was added at 40°C to the first inlet 8c of the cavity transfer mixer 8 and a tempered milk chocolate mixture (milk solids 24.1%, sugar (sucrose) 47.4%, cocoa mass 11.6%, cocoa butter 11.3%, vegetable fat 4.9%, emulsifier 0.6% and flavouring 0.1%, with moisture content 1.0%) at 28°C to the second inlet 8b. The chocolate composition which emerged from the outlet 8c of the cavity transfer mixer was slightly more viscous than the chocolate mixture, but was substantially homogeneous and not detempered (as determined by visual inspection).

Comparative Examples 1A and 1B

A tempered chocolate mixture of the same composition as used in Example 1 was stirred at 28°C in a Hobart planetary mixer (Example 1A) and a Winkworth Z-blade mixer (Example 1B). The direct addition of

- 10 -

water (1%) caused in each case the formation of a viscous, detempered, gritty mass, unsuitable for product formation.

The above Examples demonstrate the importance of the choice of mixer for the water to be successfully incorporated into the chocolate mixture, and the fact that, if the cavity transfer mixer is used, even the addition of water itself does not cause detempering of tempered chocolate.

Example 2

An oil-in-water emulsion (47.5% water; 47.5% cocoa butter; 5% soya lecithin) was prepared in the Silverson high-shear mixer 2 and added to the tempered milk chocolate mixture of Example 1 in the manner described in Example 1 to give a final added water content of 1.2%. The chocolate composition emerging from the cavity transfer mixer 8 was formed into bars and cooled.

Example 3

Example 2 was repeated using a water-in-oil emulsion (47.5% water; 47.5% cocoa butter; 5% PGPR) to give a chocolate product with a final added water content of 1.2%. The hardness of the bars, measured as the average force in grams required to compress the chocolate conditioned and held at 35°C by 4mm, is given in Table 1.

Comparative Examples 3A and 3B

Comparative examples 1A and 1B were repeated using the water-in-oil emulsion of Example 3 (a total water content of 2.2%) in place of the

water. The chocolate composition was formed into bars. The hardness values are given in Table 1.

Table 1: Effect of mixer on hardness of chocolate product at 35°C

	Example 3	Example 3A	Example 3B
Hardness (grams force)	1760	305	520

Example 4

Example 3 was repeated using untempered milk chocolate of the same composition as in Example 3 maintained at 40°C.

Thus, it will be clear that the process of the present invention offers distinct advantages in terms of the hardness of the chocolate product. The hardness values reflect the relative abilities of the products to retain their shape at a given temperature. By comparison, the same milk chocolate having no water or water emulsion added has a hardness of <60g. In addition, the texture and mouthfeel of the chocolate of Example 3 was superior to that of Comparative Examples 3A and 3B.

The following Examples are illustrative of the second aspect of the present invention:-

Example 5

Sugar (50 kg), skimmed milk powder (22.6 kg) and low fat cocoa powder (6.1 kg) were premixed and milled at ambient temperature using an

- 12 -

Alpine classifier (mill speed 7000 rpm, classifier speed 3000 rpm) such that 90% of the resultant particles were less than 30 microns in diameter. The above milled powder (4 kg) was conched with butterfat (460 g), sunflower oil (1 kg) and lecithin (54 g) for 4 hours at speed 1 in a Hobart mixer jacketed at 40°C. The resultant mixture was transferred to a Z-blade mixer and a water-in-oil emulsion at 3% of the mix was slowly added at 30°C. The emulsion contained water (47.5%), cocoa butter (47.5%) and PGPR (5.0%). Mixing was continued until the emulsion was dispersed. The chocolate mixture was put into moulds, stored in a refrigerator and demoulded after cooling. Demoulded product had structural integrity at ambient temperature. Chocolate from the refrigerator or the deep freeze melted readily in the mouth to deliver a typical chocolate flavour.

Example 6

2.5 kg milk chocolate crumb (16% fat) was blended with 0.236 kg butterfat and passed through a refiner. 2.68 kg of the refined material was blended in a Hobart mixer with 0.149 kg sunflower oil and 0.016 kg soya lecithin dispersed in cocoa butter for about 2 hours at 40°C until a smooth homogeneous mix was obtained. A water-in-oil emulsion as in Example 1 at 3% of the stirred mix was added and blended. The chocolate was put into moulds and stored in a refrigerator before demoulding. The product was similar in structural integrity at ambient temperature to the product of Example 5.

Example 7

Powder mix as in Example 5 (1.6 kg) was blended in a Hobart mixer at 40°C with butterfat (184 g) and soy lecithin (22 g) followed by blending with groundnut oil (400 g). This blend was fed to the cavity transfer mixer

- 13 -

8 at 40°C while water-in-oil emulsion was pumped to the inlet 8a of the mixer at a rate to give a final moisture content of 2.2% in the chocolate. The chocolate emerging from the mixer was formed into bars and cooled. The product had improved structural integrity at ambient temperature compared with chocolate of Examples 5 and 6, while being at least equal in sensory qualities.

Surprisingly, the chocolates of Examples 5 to 7 retained their structural integrity at ambient temperature, despite the fat component being substantially liquid.

CLAIMS

1. A continuous process for the manufacture of a fat-based heat-meltable confectionery product comprising the steps of:-
 - (i) introducing a fat-based heat-meltable confectionery mixture into a low-shear extruder mixer (8),
 - (ii) introducing water into the low-shear extruder mixer (8),
 - (iii) mixing the fat-based heat-meltable confectionery mixture and water as they pass through the mixer (8) to form a fat-based heat-meltable confectionery composition, and
 - (iv) forming the fat-based heat-meltable confectionery composition into the fat-based heat-meltable confectionery product.
2. A method as claimed in claim 1, wherein said low-shear extruder mixer (8) is a cavity-transfer type mixer.
3. A method as claimed in claim 1 or 2, wherein the water is introduced into the mixer (8) in the form of an emulsion with oil.
4. A method as claimed in claim 3, wherein the emulsion is a water-in-oil emulsion.
5. A method as claimed in claim 3 or 4, wherein an emulsifier is included.
6. A method as claimed in any preceding claim, wherein sufficient water is added such that the fat-based heat-meltable confectionery product formed in step (iv) has a water content in the range of 1.8 to 3.0% by

weight.

7. A method as claimed in claim 6, wherein the fat-based heat-meltable confectionery product formed in step (iv) has a water content in the range of 1.8 to 2.5% by weight.

8. A method as claimed in any preceding claim, wherein steps (i) and (ii) are effected simultaneously.

9. A method as claimed in any preceding claim, wherein the fat-based heat-meltable confectionery mixture is a chocolate mixture.

10. A method as claimed in claim 9, wherein the chocolate mixture is tempered.

11. A method as claimed in claim 9 or 10, wherein the fat-based heat-meltable confectionery mixture is added to the mixer (8) at 27 to 45°C.

12. A method as claimed in claim 11, wherein the mixer (8) is maintained at a temperature of 27 to 45°C.

13. A method as claimed in claim 10, wherein the tempered chocolate mixture is added to the mixer (8) at less than 30°C

14. A method as claimed in claim 13, wherein the mixer (8) is maintained at less than 30°C.

- 16 -

15. A method as claimed in any preceding claim, wherein in step (ii), the water is added to the mixer (8) at 30 to 45°C.
16. A method as claimed in claim 15, wherein in step (ii), the water is added to the mixer (8) at 40°C.
17. A fat-based heat-meltable confectionery product prepared in accordance with the method of any one of claims 1 to 16.
18. A process for the manufacture of a fat-based heat-meltable confectionery product comprising the steps of:-
 - (i) mixing a fat-based heat-meltable confectionery mixture whose fat component remains substantially liquid from its melting temperature to a temperature not exceeding 30°C and water in a mixer (8) to produce a fat-based heat-meltable confectionery composition, and
 - (ii) forming the fat-based heat-meltable confectionery composition into the fat-based heat-meltable confectionery product.
19. A method as claimed in claim 18, wherein said fat component referred to in step (i) is liquid at less than 20°C.
20. A method as claimed in claim 18 or 19, wherein the mixer (8) in step (i) is a low-shear extruder mixer.
21. A method as claimed in claim 20, wherein said mixer (8) is a cavity transfer mixer.

- 17 -

22. A method as claimed in any one of claims 18 to 21, wherein said fat component comprises one or more vegetable oils.

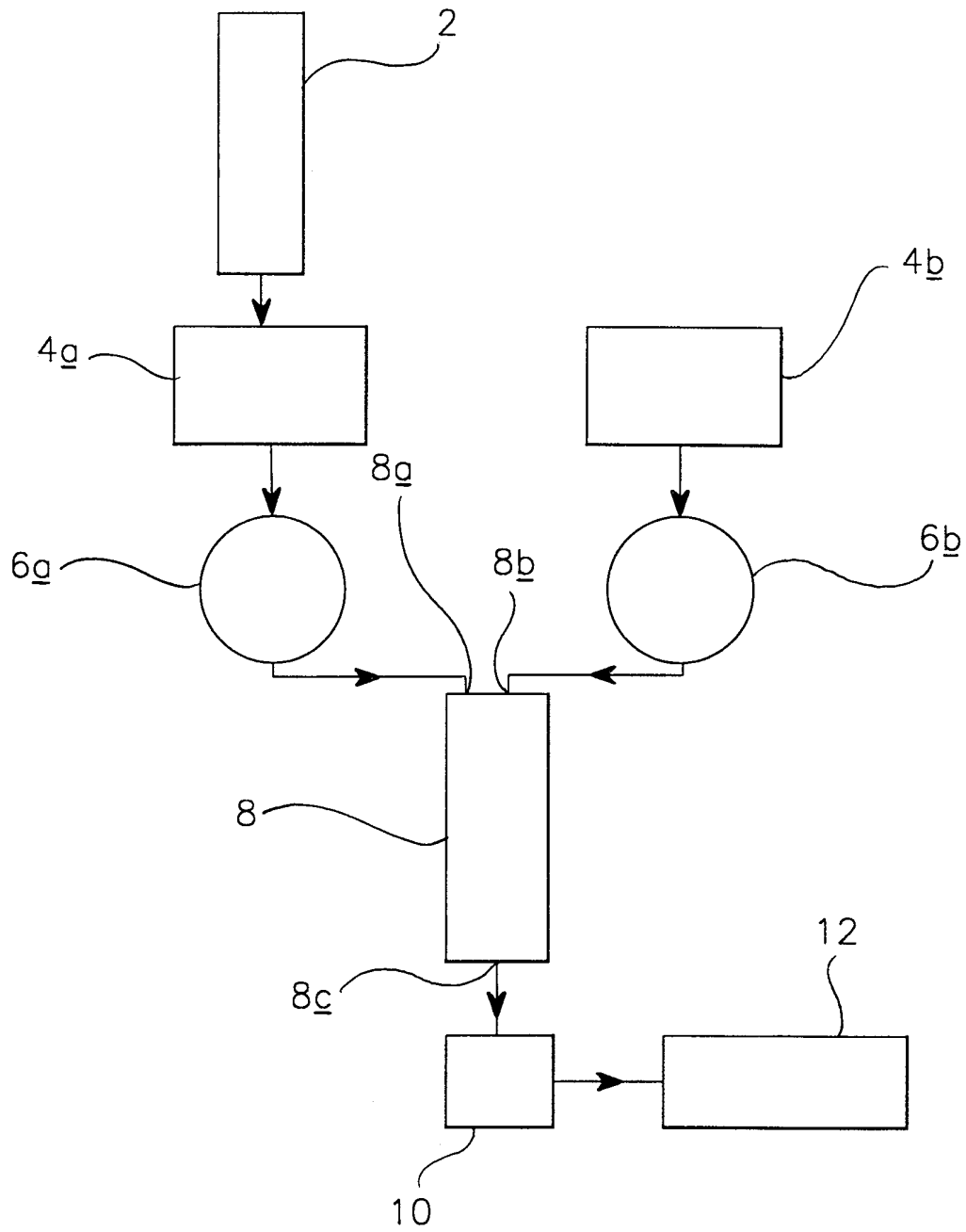
23. A method as claimed in claim 22, wherein said one or more vegetable oils are selected from the group consisting of sunflower, maize, groundnut, palm, palm kernel and coconut oils.

24. A method as claimed in claim 22 or 23, wherein said fat component oil(s) account(s) for at least 5% by weight of the fat-based heat-meltable confectionery mixture.

25. A method as claimed in claim 24, wherein said fat component oil(s) account(s) for between 5% and 55% by weight.

26. A method as claimed in claim 25, wherein said fat component oil(s) account(s) for between 15 to 40% by weight.

27. A fat-based heat-meltable confectionery product prepared in accordance with the method of any one of claims 18 to 26.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03860

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23G1/00 A23G3/00 A23G1/04 A23G1/10 A23G1/20

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)

IPC 7 A23G B01F B29C

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	EP 0 958 747 A (DOVEUROPE) 24 November 1999 (1999-11-24) page 3, line 28 - line 30 page 3, line 40 - line 44 page 4, line 9 - line 12 claims 1,6-11	18, 19, 22, 24-27
X	EP 0 800 770 A (SOCIETE DES PRODUITS NESTLÉ) 15 October 1997 (1997-10-15) page 2, line 53 - page 3, line 2; claims 1-10; examples 1,5 page 2, line 19 - line 20	1,6, 8-10, 17-20, 22,27
	-/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

8 February 2000

Date of mailing of the international search report

23/02/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lepretre, F

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03860

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 311 481 A (SOCIÉTÉ DES PRODUITS NESTLÉ) 1 October 1997 (1997-10-01)	1,6-9, 17-20, 22,23,27
A	page 3, paragraph 2; claims 1,5,7,14,15,17-20	3-5
X	EP 0 393 327 A (LOTTE CO., LTD.) 24 October 1990 (1990-10-24)	18,19, 22,24-27
A	claims; examples	1-17,20, 23
X	EP 0 033 718 A (BATELLE MEMORIAL) 12 August 1981 (1981-08-12)	18,19, 22,24-27
A	claims 1-4,7,12,13; examples	1-17,20, 23
X	US 2 760 867 A (KEMPF ET AL.) 28 August 1956 (1956-08-28)	18,19, 22,27
A	column 5, line 15 -column 6, line 14 claims 1-3,8,9	1-17,20
X	WO 93 12664 A (KARLSHAMNS OILS & FATS AB) 8 July 1993 (1993-07-08)	18,19, 22,24-27
A	cited in the application page 4, line 24 - line 28 page 5, line 4 - line 9 claims 1,3,5; examples 2,6	1-17,20
X	WO 91 19424 A (MARS G.B. LIMITED) 26 December 1991 (1991-12-26)	18,19, 22-27
	page 8, line 24 -page 10, line 18; examples	
X	EP 0 354 600 A (UNILEVER N.V.) 14 February 1990 (1990-02-14)	18,19, 22-27
A	page 2, line 52 -page 3, line 4 page 3, line 17 - line 21 page 3, line 43 - line 47 page 4, line 57 -page 5, line 14 page 5, line 49 - line 54; claims 8,9; examples	1-17
X	FINCKE, H. ET AL.: "Handbuch der Kakaoerzeugnisse" 1965, SPRINGER, BERLIN XP002129392 page 252 -page 254	18,19,27
A	GB 1 520 490 A (WACKER CHEMIE) 9 August 1978 (1978-08-09)	1,2,9, 18,20,21
	page 3, line 99 - line 116; examples 5,6	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/03860

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
EP 958747	A	24-11-1999	NONE	
EP 800770	A	15-10-1997	AU 711208 B AU 1783997 A CA 2200887 A JP 10028530 A NZ 314553 A US 5965179 A	07-10-1999 16-10-1997 12-10-1997 03-02-1998 29-04-1999 12-10-1999
GB 2311481	A	01-10-1997	AU 1648997 A BG 101281 A BR 9701456 A CA 2198759 A CZ 9700912 A EP 0797922 A GB 2311483 A HU 9700643 A JP 10004884 A NO 971193 A NZ 314293 A PL 319133 A SK 37297 A ZA 9702448 A	02-10-1997 30-01-1998 18-08-1998 27-09-1997 15-10-1997 01-10-1997 01-10-1997 29-12-1997 13-01-1998 29-09-1997 28-07-1998 29-09-1997 08-10-1997 21-09-1998
EP 393327	A	24-10-1990	JP 2276537 A JP 2514711 B AU 626650 B AU 5219690 A DE 69008609 D DE 69008609 T KR 9705236 B US 5160760 A	13-11-1990 10-07-1996 06-08-1992 18-10-1990 09-06-1994 01-09-1994 14-04-1997 03-11-1992
EP 33718	A	12-08-1981	AR 222743 A AT 5226 T AU 542304 B AU 6664581 A CA 1162783 A ES 498924 A GR 73126 A JP 57115140 A KR 8600888 B MX 6322 E OA 6731 A US 4446166 A ZA 8100592 A	15-06-1981 15-11-1983 14-02-1985 06-08-1981 28-02-1984 01-05-1982 07-02-1984 17-07-1982 16-07-1986 01-04-1985 30-06-1982 01-05-1984 24-02-1982
US 2760867	A	28-08-1956	NONE	
WO 9312664	A	08-07-1993	SE 507450 C AU 3270493 A EP 0661925 A SE 9103783 A US 5486376 A	08-06-1998 28-07-1993 12-07-1995 21-06-1993 23-01-1996
WO 9119424	A	26-12-1991	AU 8001191 A CA 2085613 A DE 69117059 D	07-01-1992 20-12-1991 21-03-1996

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/GB 99/03860

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9119424 A		DE 69117059 T	27-06-1996
		EP 0533815 A	31-03-1993
		ES 2084171 T	01-05-1996
<hr/>			
EP 354600 A	14-02-1990	AT 94025 T	15-09-1993
		AU 3007489 A	15-02-1990
		DE 68908984 D	14-10-1993
		DE 68908984 T	27-01-1994
		JP 2200145 A	08-08-1990
		US 5248509 A	28-09-1993
<hr/>			
GB 1520490 A	09-08-1978	DE 2458862 A	16-06-1976
		BE 836479 A	10-06-1976
		CH 610218 A	12-04-1979
		FR 2293970 A	09-07-1976
		IT 1052784 B	20-07-1981
		JP 5108552 A	27-07-1976
		NL 7513473 A	15-06-1976
<hr/>			