



(86) Date de dépôt PCT/PCT Filing Date: 2006/02/13
(87) Date publication PCT/PCT Publication Date: 2006/08/31
(45) Date de délivrance/Issue Date: 2010/12/07
(85) Entrée phase nationale/National Entry: 2007/07/31
(86) N° demande PCT/PCT Application No.: US 2006/004941
(87) N° publication PCT/PCT Publication No.: 2006/091409
(30) Priorité/Priority: 2005/02/18 (EP05003512.0)

(51) Cl.Int./Int.Cl. *A61K 9/68* (2006.01)
(72) Inventeurs/Inventors:
LORENZI, MARC PAUL, GB;
CAHEN, CHRISTINE MARIE, GB;
FEE, JENNY ELIZABETH, GB
(73) Propriétaire/Owner:
THE PROCTER & GAMBLE COMPANY, US
(74) Agent: LEDGLEY LAW

(54) Titre : PRODUITS DE CONFISERIE CONTENANT DE LA CAFEINE
(54) Title: CONFECTIONERY PRODUCTS CONTAINING CAFFEINE

(57) **Abrégé/Abstract:**

Confectionery compositions comprising a xanthine derivative, a cooling composition and a warming composition are provided. The cooling and warming compositions are located in distinct and discrete regions within the confectionery composition and are adapted to provide sequential release profiles. The compositions herein provide xanthine derivatives as stimulants without negative aspects of xanthine derivative flavour perception.



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

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 August 2006 (31.08.2006)

PCT

(10) International Publication Number
WO 2006/091409 A1

(51) International Patent Classification:
A61K 9/68 (2006.01)

(21) International Application Number:

PCT/US2006/004941

(22) International Filing Date:

13 February 2006 (13.02.2006)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

05003512.0 18 February 2005 (18.02.2005) EP

(71) Applicant (for all designated States except US): **THE PROCTER & GAMBLE COMPANY** [US/US]; One Procter & Gamble Plaza, Cincinnati, Ohio 45202 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LORENZI, Marc, Paul** [GB/GB]; 18 South Avenue, Egham Surrey TW20 8HG (GB). **CAHEN, Christine, Marie** [FR/GB]; 25 Trotsworth Avenue, Virginia Water Surrey GU25 4AN (GB). **FEE, Jenny, Elizabeth** [GB/GB]; 6 Wendover Court, 124 Wendover Road, Staines Middlesex TW18 3DP (GB).

(74) Common Representative: **THE PROCTER & GAMBLE COMPANY**; c/o Eileen L. Hughett, The Procter & Gamble Company, Winton Hill Business Center, 6110 Center Hill Road, Cincinnati, Ohio 45224 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.

(54) Title: CONFECTIONERY PRODUCTS CONTAINING CAFFEINE

(57) Abstract: Confectionery compositions comprising a xanthine derivative, a cooling composition and a warming composition are provided. The cooling and warming compositions are located in distinct and discrete regions within the confectionery composition and are adapted to provide sequential release profiles. The compositions herein provide xanthine derivatives as stimulants without negative aspects of xanthine derivative flavour perception.

WO 2006/091409 A1

CONFECTIONERY PRODUCTS CONTAINING CAFFEINE

FIELD OF THE INVENTION

The present invention relates to confectionery compositions comprising a xanthine
5 derivative and flavouring sensate systems for reducing the perception of the xanthine
derivative. The compositions herein comprise both a cooling composition and a warming
composition in distinct and discrete regions of the composition, preferably in the shell and
filling respectively of a centre-filled drop, so that sequential release of the compositions is
obtained when the drop is sucked that effectively reduces the consumers perception of the
10 xanthine derivative during use.

BACKGROUND OF THE INVENTION

Xanthine derivatives, such as xanthine itself and caffeine are known as stimulants.
Several products comprising caffeine exist for consumption to increase wakefulness and
15 alertness. Caffeine is also the major stimulant found in a number of beverages including
coffee and tea, and the increasingly popular stimulant drinks such as Red Bull™.
Confectionery-like products comprising caffeine are also available. EP0716853 describes
sustained release caffeine formulations comprising a biodegradable matrix of at least one
water-soluble material such as polyvinyl pyrrolidone. DE2336106 discloses sugar-based
20 confectionery comprising caffeine. WO00/06127 discloses centre-fill confectionery
compositions comprising caffeine from Guarana extract in the shell.

However, whilst these documents disclose compositions comprising caffeine, a
notable barrier to consumer acceptance of confectionery-like caffeine compositions is the
bitter taste associated with caffeine that is further increased when presented in a form that
25 is meant to be consumed by prolonged exposure to the oral cavity i.e. by sucking. The
problem is further exacerbated by the fact that mucous membranes are believed to be
highly permeable to caffeine. As the buccal mucosa is believed to be highly permeable to
caffeine, this may exacerbate the problem. Whilst this is a reason for wanting to deliver
caffeine in a form that is trans-mucosally absorbed in the oral cavity, thereby delivering
30 the caffeine to the blood stream directly and avoiding first pass metabolism, it results in

the caffeine taste being highly perceived by the user, and the flavour residence time is increased. The strength of the caffeine flavour is such that the compositions cannot contain significant levels sufficient to deliver a noticeable stimulatory effect similar to that of a cup of coffee or a tablet ingested directly and designed for gut absorption. A need exists for suitably masking the taste associated with caffeine administered in a confectionery format and exposed to the oral cavity for a prolonged time.

SUMMARY OF THE INVENTION

The present invention provides confectionery compositions that effectively mask the flavour associated with a xanthine derivative comprised therein. The compositions herein can incorporate a xanthine derivative at levels required to induce a stimulant effect that is released over a prolonged time as the confectionery is consumed by sucking in the user's mouth. A confectionery composition is provided comprising:

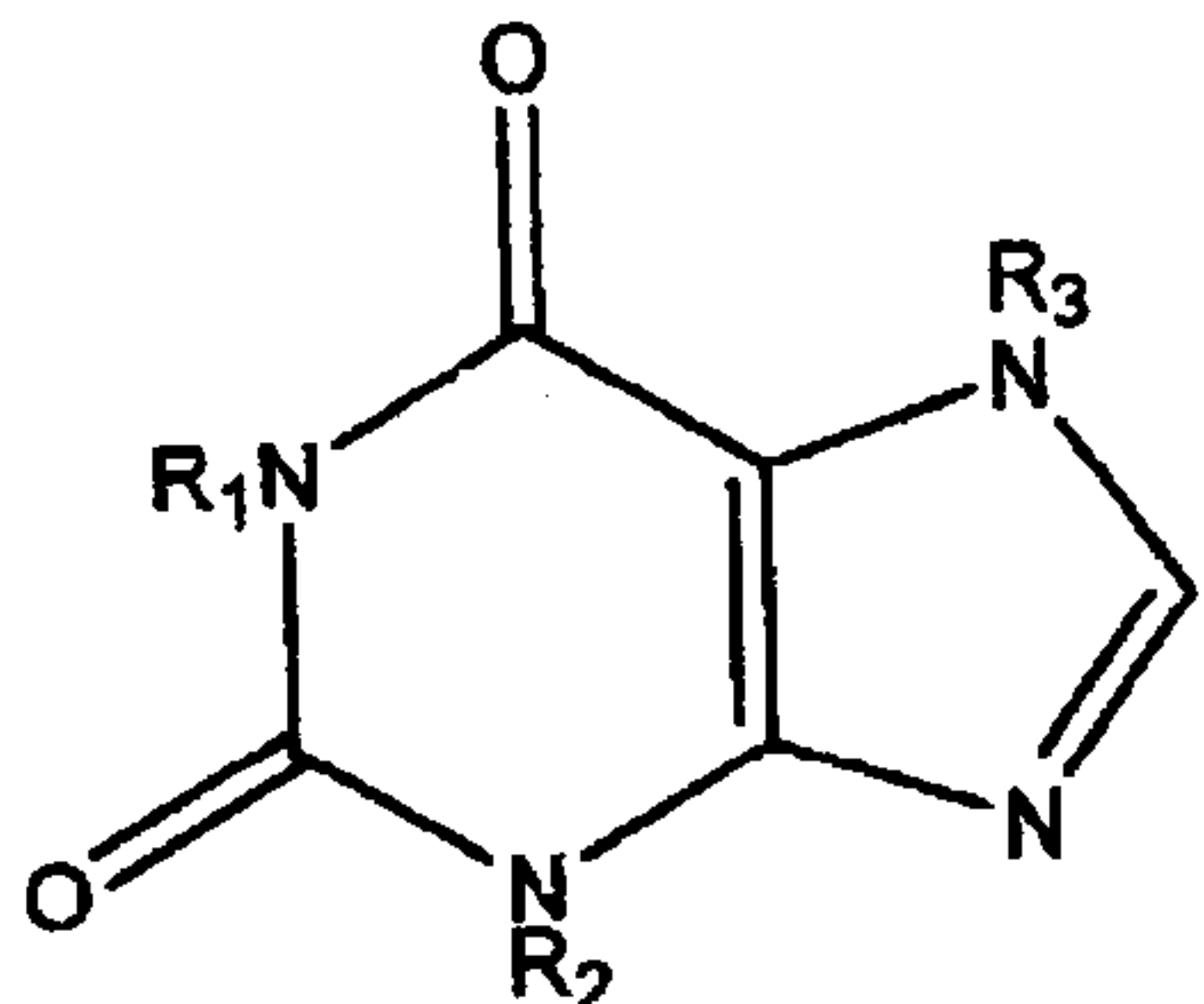
- a. a xanthine derivative;
- b. a cooling composition comprising a physiological cooling agent which has an average threshold for a reported cooling effect of 100 μg or less amongst a test panel selected to have an average threshold for a reported cooling effect of 1-menthol of 0.25 μg ; and
- c. a warming composition comprising a physiological warming agent which has an average threshold for a reported warming effect of 100 μg or less amongst a test panel selected to have an average threshold for a reported warming effect of benzyl alcohol of 0.25 μg ,

wherein said cooling composition and said warming composition are located in distinct and discrete regions within said throat drop and said cooling and warming compositions being adapted to provide sequential release profiles.

2a

In accordance with an aspect of the present invention, there is provided a confectionery composition comprising:

- a. a xanthine derivative according to Formula I:



Formula I

- wherein R_1 , R_2 and R_3 are independently selected from H or methyl, salts thereof and mixtures thereof;
- b. a cooling composition comprising a physiological cooling agent which has an average threshold for a reported cooling effect of 100 μg or less amongst a test panel selected to have an average threshold for a reported cooling effect of 1-menthol of 0.25 μg ; and
- c. a warming composition comprising a physiological warming agent which has an average threshold for a reported warming effect of 100 μg or less amongst a test panel selected to have an average threshold for a reported warming effect of benzyl alcohol of 0.25 μg ,

wherein said cooling composition and said warming composition are located in distinct and discrete regions within said confectionery composition and said cooling and warming compositions being adapted to provide sequential release profiles.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the xanthine derivative comprises xanthine, caffeine, theobromine, theophylline, their salts or mixtures thereof.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the xanthine derivative is caffeine.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.01% to 5% xanthine derivative by weight of the confectionery composition.

2b

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.05% to 2.5% xanthine derivative by weight of the confectionery composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.1% to 1% xanthine derivative by weight of the confectionery composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the cooling agent comprises menthol, monomenthyl glutarate, peppermint oil, 3-lmenthoxy propan-1,2-diol, N-ethyl-p-menthane-3-carboxamide, trimethyl isopropyl butanamide, or mixtures thereof.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.001% to 10% cooling agent, by weight of the composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the warming agent comprises vanillyl alcohol n-butyl ether, vanillyl alcohol n-propyl ether, vanillyl alcohol isopropyl ether, vanillyl alcohol isobutyl ether, vanillyl alcohol n-amino ether, vanillyl alcohol isoamyl ether, vanillyl alcohol n-hexyl ether, vanillyl alcohol methyl ether, vanillyl alcohol ethyl ether, gingerol, shogaol, paradol, zingerone, capsaicin, dihydrocapsaicin, nordihydrocapsaicin, homocapsaicin, homodihydrocapsaicin, ethanol, iso-propyl alcohol, iso-amylalcohol, benzyl alcohol, chloroform, eugenol, cinnamon oil, cinnamic aldehyde, or mixtures thereof.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.001% to 10% warming agent by weight of the composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.005% to 5% warming agent by weight of the composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition comprises from 0.005% to 1% warming agent by weight of the composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the composition is in the form

of a centre-fill throat drop comprising from 60% to 95% candy shell and from 5% to 40% filling, by weight of the drop, the candy shell comprising the cooling composition and the filling comprising the warming composition.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the filling comprises less than 7% water by weight of the filling.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the filling comprises less than 6% water by weight of the filling.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein the filling is shear thinning.

In accordance with another aspect of the present invention, there is provided a confectionery composition according to the present invention wherein said xanthine derivative salts are citrate, lactate and succinate salts.

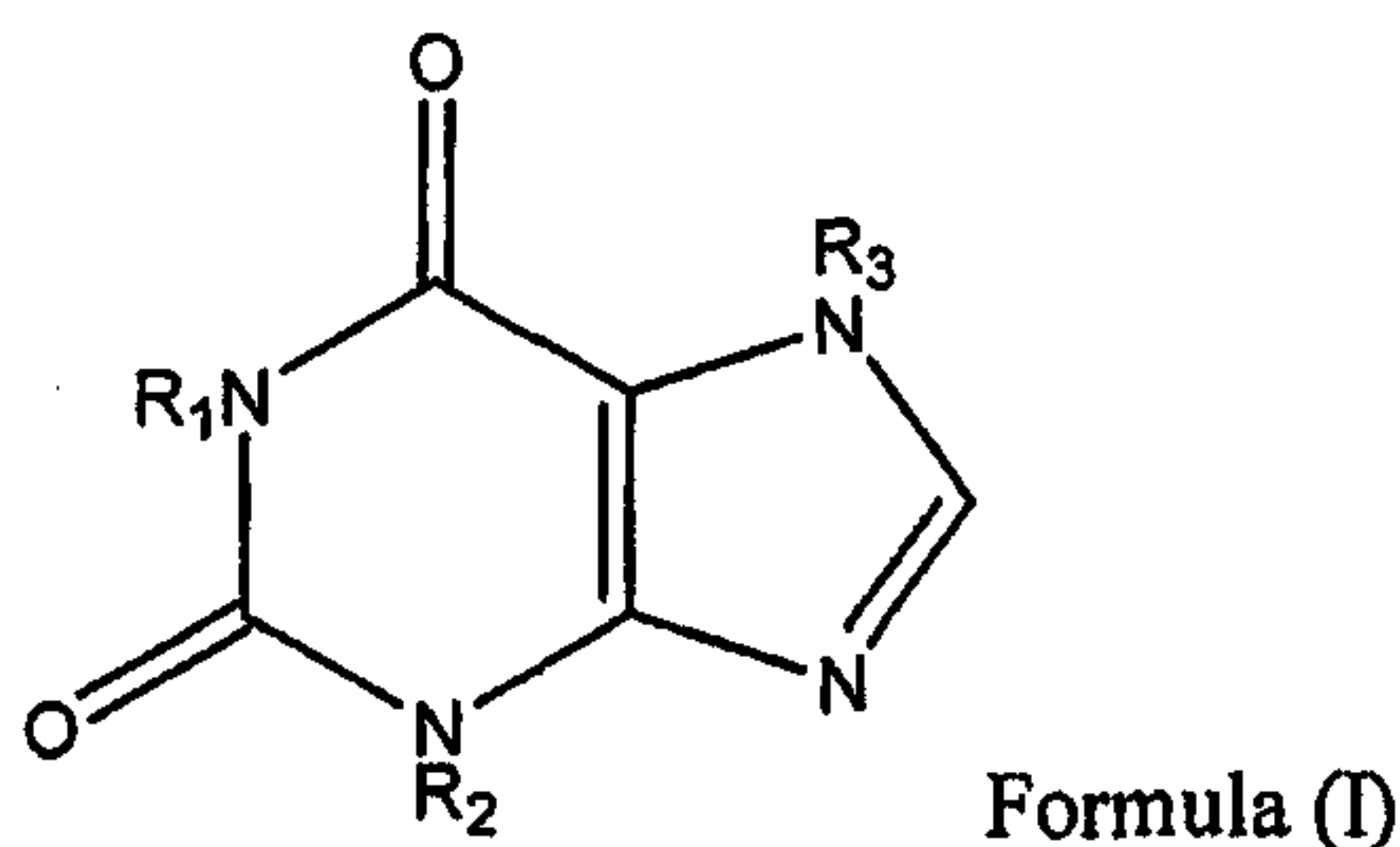
DETAILED DESCRIPTION OF THE INVENTION

Unless otherwise stated herein, all percentages are weight percentages.

Unless otherwise stated herein, all measurements are taken at 25⁰C.

The present invention provides confectionery compositions comprising a xanthine derivative, a cooling composition and a warming composition. The compositions are in distinct and discrete regions of the composition, preferably in the shell and filling respectively of a centre-filled drop, so that sequential release of the compositions is obtained when the drop is sucked that effectively reduces the consumers perception of the xanthine derivative during use. Examples of suitable product constructions providing differential release profiles are described in WO97/06695. Preferred for use herein, however, are centre-filled drops comprising a shell and a filling contained within the shell. The shell comprises a cooling or warming composition, and the filling comprises a warming composition if the shell comprises a cooling composition or a cooling composition if the shell comprises a warming composition.

The confectionery compositions of the present invention comprise a xanthine derivative. Xanthine derivatives are useful as stimulants. Xanthine derivatives useful in the present invention include those that conform generally to formula (I):



where R_1 , R_2 and R_3 are independently selected from H or methyl, salts thereof and mixtures thereof. Non-limiting examples of xanthine derivative salts suitable for use herein include citrate, lactate and succinate salts. Preferred xanthine derivatives include:

- Xanthine; where R_1 , R_2 and R_3 in formula (I) above are all H;
- Caffeine; where R_1 , R_2 and R_3 in formula (I) above are all methyl;
- Theobromine; where R_1 is H and R_2 and R_3 are both methyl; and
- Theophylline; where R_1 and R_2 are both methyl and R_3 is H, salts of the aforementioned, and mixtures thereof. More preferably the xanthine derivative comprises caffeine, or salts thereof.

The confectionery compositions of the present invention may preferably comprise from about 0.01% to about 5% xanthine derivative by weight of the composition. Preferably the compositions herein comprise from about 0.05% to about 2.5% xanthine derivative, more preferably from about 0.1% to about 1% xanthine derivative. Preferably
5 the confectionery composition comprises enough xanthine derivative to contain from about 1 mg to about 150 mg of xanthine derivative per individual confectionery unit, more preferably from about 5 mg to about 100mg, more preferably still from about 10 mg to about 50 mg xanthine derivative per individual confectionery unit.

The confectionery compositions of the present invention comprise a cooling
10 composition and a warming composition that are located in distinct and discrete regions within the confectionery composition. The cooling and warming compositions are adapted to provide sequential release profiles. As used herein, 'adapted to provide sequential release profiles' means that the compositions are chemically and/or physically modified relative to a homogeneous mix of the compositions, in order that the person
15 ingesting the confectionery product can perceive the peak effect of the cooling agent at a different point in time to the peak sensation of warming. It will be understood that many such compositions will release the warming or cooling agent over the period of ingestion of the product and that there may be some simultaneous perception of warming agent and cooling agent.

20 By separating the peak effects of the cooling composition and the heating composition, the perception of caffeine bitterness is reduced effectively. Without wishing to be bound by theory, it is believed that the physiological cooling and warming agents act to reduce the perception of caffeine bitterness by not only masking the bitterness, but further by reducing the consumers ability to actually detect the caffeine. Singly, the
25 cooling or warming compositions herein are able to mask the caffeine bitterness for a brief period of time of first exposure to the consumer. However, it is believed that the caffeine bitterness has a greater residence time resulting in its perception being continued as the initial sensate impact begins to recede. Therefore, used singly, the cooling or warming compositions are not effective to mask the caffeine bitterness for the extended
30 period of time required to make the composition consumer acceptable.

By physically separating the peak effects of cooling agent and warming agent, however, the overall organoleptic effect of the product is substantially improved. Without wishing to be bound by theory it is believed that by using contrasting cooling and warming compositions in a sequential release format the consumer's perception of caffeine is reduced to a greater extent, and for a longer period due to the contrast between the cooling and warming compositions. Such sequential release can conveniently be achieved within a centre-filled confection.

The confectionery compositions of the present invention comprise a cooling composition. An essential component of the cooling composition is a physiological cooling agent. Suitable levels of the cooling agent are from about 0.001 to about 10%, preferably from about 0.01 to about 5%, more preferably from about 0.01 to about 2%, more preferably still from about 0.01 to about 0.5% by weight of the throat drop composition. A test for physiological cooling agents is described in GB-A-1,452,291, published Oct. 13, 1976, is reproduced herein below for convenience.

The following test procedure can be used as a means to identify compounds having a physiological cooling activity. This test is intended purely as a means for identifying compounds having a physiological cooling agent activity and useful in the present invention and for giving an indication of the different relative activities of the compounds, as between themselves and as compared with l-menthol, when applied in particular manner to a particular part of the body. The results are not necessarily indicative of the activity of these compounds in other formulations and other parts of the body where other factors come into play. For example, a controlling factor in the onset of cooling effect, its intensity and longevity will be the rate of penetration of the compounds through the epidermis and this will vary in different locations on the human body. The formulation of actual products according to this invention will therefore be done largely on an empirical basis although the test results and other figures given herein will be useful as a guide, particularly in the formulation of products for oral administration, since the test procedure to be described involves oral application of the compound. A similar test may, of course, be devised for the purposes of measuring the relative activities of the compounds of another area of the body, for example, the face or forearm, and this will be

a useful guide in the choice of compounds to be used in preparations for external topical usage. It will also be noted that the described test procedure is done on a statistical basis. This is necessary since sensitivity to these compounds will vary not only from compound to compound and from one part of the body to another, but also from one individual to another. Tests of this nature are commonly used in the testing of the organoleptic properties e.g. taste and smell of organic and inorganic compounds, see Kirk-Othmer: Encyclopedia of Chemical Technology, 2nd Ed. (1967) Vol. 14, pages 336-344.

The following test procedure is aimed at determining the minimum quantity of the test compound required to produce a noticeable cooling effect in a person of average sensitivity, this minimum quantity being termed the threshold for that particular compound. The tests are carried out on a selected panel of 6 people of median sensitivity to l-menthol.

To select a test panel of average sensitivity the following procedure is used. Known quantities of l-menthol in solution in petroleum ether (bp. 40-60 °C.) are placed on 5 mm squares of filter paper, whereafter the solvent is allowed to evaporate. A panel of observers is enrolled and asked to place one impregnated square at a time on the tongue and to report on the presence or absence of a cooling effect. The quantity of l-menthol on each impregnated square is gradually reduced from a value substantially above 0.25 µg. per square to substantially below 0.25 µg, the precise range being immaterial. Conveniently, one starts with squares containing 2.0 µg being half that of the preceding square, i.e. the second test square will contain 1.0 µg, the third 0.5 µg, and so on. Each quantity is tested on the tongue at least 10 times. In this way, the thresholds to cold receptor stimulus by l-menthol are determined for each individual of the panel, the threshold for each individual being that amount of l-menthol for which, in a series of not less than 10 test applications, a cooling effect is reported 50% of the time. Six panel members are now selected whose threshold to l-menthol is in the range 0.1 µg to 10 µg and whose average threshold is approximately 0.25 µg, this select panel being regarded as the test panel of average sensitivity.

To test the activity of cooling agents, the above procedure is repeated using only the 6 selected panel members of average sensitivity to l-menthol. The individual

thresholds for each test compound on each of the 6 selected panel members are determined and averaged. Those compounds whose average threshold on the select test panel is 100 μg or less, preferably 50 μg or less are regarded as having cooling activity in accordance with this invention.

5 Suitable physiological cooling agents are described in W097/06695. Preferred for use herein are physiological cooling agents selected from the group consisting of menthol, peppermint oil, N-substituted-p-menthane-3-carboxamides, acyclic tertiary and secondary carboxamides, 3-1-menthoxy propan-1,2-diol, monomenthyl glutarate and mixtures thereof. The carboxamides found most useful are those described in U.S. Pat. No. 10 4,136,163, Jan. 23, 1979 to Watson et al., and U.S. Pat. No. 4,230, 688, Oct. 28, 1980 to Rowsell et al. The carboxamides in U.S. Pat. No. 4,136,163 are N-substituted-p-menthane-3-carboxamides, such as N-ethyl-p-menthane-3-carboxamide, commercially available as WS-3 from Wilkinson Sword. The carboxamides of U.S. Pat. No. 4,230,688 are certain acyclic tertiary and secondary carboxamides, such as trimethyl isopropyl 15 butanamide, commercially available as WS-23 from Wilkinson Sword. More preferred for use herein are monomenthyl glutarate, N-ethyl-p-menthane-3-carboxamide, trimethyl isopropyl butanamide and mixtures thereof, more preferably still monomenthyl glutarate, commercially available as Cooler-2 from IFF (Netherlands).

 The balance of the cooling composition may be made up of a suitable appropriate 20 carrier, such as water, propylene glycol or a bulk sweetener, described in more detail below. The cooling composition can further comprise a warming agent as described herein provided that the predominant effect is one of cooling.

 The confectionery compositions of the present invention further comprise a warming composition. An essential component of the warming composition is a 25 physiological warming agent. Suitable levels of the warming agent are from about 0.001 to about 10%, preferably from about 0.005 to about 5%, more preferably from about 0.01 to about 1%, more preferably still from about 0.01% to about 0.5% by weight of the throat drop.

 Physiological warming agents can be tested for using a modification of the test for 30 cooling agents described above, the test being modified to use benzyl alcohol rather than

menthol as the reference sample tongue and asking the panellists to report on the presence or absence of a warming effect rather than a cooling effect. Preferred physiological warming agents are those selected from the group consisting of vanillyl alcohol n-butyl ether, vanillyl alcohol n-propyl ether, vanillyl alcohol isopropyl ether, vanillyl alcohol isobutyl ether, vanillyl alcohol n-amino ether, vanillyl alcohol isoamyl ether, vanillyl alcohol n-hexyl ether, vanillyl alcohol methyl ether, vanillyl alcohol ethyl ether, gingerol, shogaol, paradol, zingerone, capsaicin, dihydrocapsaicin, nordihydrocapsaicin, homocapsaicin, homodihydrocapsaicin, ethanol, iso-propyl alcohol, iso-amylalcohol, benzyl alcohol, chloroform, eugenol, cinnamon oil, cinnamic aldehyde, phosphate derivatives thereof, and mixtures thereof. The phosphate derivatives mentioned are those described in WO 97/02273. A commercial example of a suitable warming agent for use herein is Optaheat (Symrise, Germany). The balance of the warming composition may be made up of a suitable appropriate carrier, such as water, propylene glycol or a bulk sweetener, described in more detail below. The warming composition can further comprise a cooling agent as described herein provided that the predominant effect is one of warming.

The confectionery compositions of the present invention may be in any confectionery form, including hard boiled sweets, soft boiled sweets, chewing gums, gummy-based sweets, chocolate, centre-fill confectionery, or lollies. The confectionery compositions of the present invention preferably take the form of a centre-filled confectionery comprising from about 60 to about 95%, preferably from about 75 to about 85%, of an edible shell and from about 5 to about 40%, preferably from about 15 to about 25%, of an edible filling, by weight of the drop.

Where the confectionery composition is a centre-fill confectionery, the filling can be a solid, particularly a powder, or a liquid, including forms of intermediate consistency such as a paste, gel or chewing gum material. Preferably the filling is a non-aqueous filling comprising water at a level of less than 10%, preferably less than 8% more preferably still 6% or less water by weight of the filling.

The filling may preferably comprise a polar edible liquid. As used herein "polar edible liquid" includes materials that are liquid at room temperature (25°C), that are polar

in nature at the molecular level (i.e. have "positive" and "negative" poles dependent upon the electrostatic nature of the atoms that constitute the molecule) and that are edible (i.e. that have no known toxicological side-effects and are sanctioned for use in human foods and medicine). Suitable examples of polar edible liquids useful herein include water, low
5 molecular weight alcohols, polyhydric alcohols and mixtures thereof, preferably polyhydric alcohols. Non-limiting examples of polyhydric alcohols suitable for use herein include glycerin, low molecular weight (i.e. less than 1000MW) polyethylene glycols, propylene glycol and mixtures thereof, preferably glycerine. The filling of the present invention preferably comprises from about 30% to about 95% polar edible liquid or
10 mixtures thereof by weight of the filling, more preferably from about 40% to about 90% and more preferably still from about 50% to about 85%, even more preferably still from about 40% to about 60% by weight of the filling.

Preferably the filling is a low water content or non-aqueous filling comprising water at a level of less than about 10%, preferably less than about 8% more preferably still
15 about 6% or less water by weight of the filling. Without wishing to be bound by theory, it is believed that high levels of water may adversely affect the stability of the filling when comprised within the hard candy shell due to the solubilisation and subsequent recrystallisation of sugars or sugar alcohols within the candy shell. This results in the filling becoming hard and crystalline, as well as the shell becoming opaque and
20 susceptible to breakage.

The filling may further comprise a bulk sweetener, such as a sugar, to improve the palatability of the filling. Fillings may comprise from about 5 to 80%, preferably from about 30 to about 75% on a dry solids basis by weight of the bulk sweetener. A preferred source of the sweetener is high fructose corn syrup which, being commercially available
25 as an 80% solids of which the balance is essentially water, can also provide some, or even all, of the water required by aqueous fillings, when employed. Sugar free compositions comprising a sugar alcohol such as sorbitol or xylitol can also be used in combination with artificial or natural high intensity sweeteners; non-limiting examples of high intensity sweeteners are sodium saccharin, potassium acesulfame, aspartame and
30 sucralose.

The confectionery compositions may optionally comprise a filling that is shear thinning. Preferably the filling exhibits a $\log [(\eta @ 0.01s^{-1}) / (\eta @ 250s^{-1})]$ greater than about 0.5 at 37°C, measured according to the method set out below. Preferably the $\log [(\eta @ 0.01s^{-1}) / (\eta @ 250s^{-1})]$ ratio is greater than about 1, more preferably greater than about 5. The optimal centre fill should display a very high viscosity at low or zero shear but show a dramatic drop in viscosity when subjected to high shear rates. Without wishing to be bound by theory, it is believed that the shear thinning centre fills used herein provide multiple benefits for the confectionery fill. Firstly, it is believed that the shear thinning properties of the centre fill allow it to become semi-solid or solid following manufacture, cooling and storage. This slows the transfer of chemicals from the center fill to the shell, and thus improves the stability of the composition, avoiding problems such as liquid leakage through the candy shell and solubilisation of the candy shell that can cause the shell to recrystallise or become soft due to the permeation of the polar edible liquid from the fill.

However, solid centre fills are not as consumer acceptable as liquid ones. Therefore, it is required that the centre fill display shear thinning properties to allow it to reduce its viscosity substantially upon consumption as the consumer sucks the confectionery, and moves it around their mouth with their tongue, applying increased shear stress. This shear stress thins the centre fill upon release resulting in an impression of liquidity. However, it has been discovered that truly liquid centre fills (i.e. those not incorporating a thickener according to the present invention) do not deliver consumer acceptable consumption aesthetics. Specifically, truly liquid centre fills are quickly diluted in saliva, ingested and removed from the oral cavity rapidly. As a result, any flavours, sensates or active ingredients comprised within the centre fill are rapidly removed from the oral cavity, leading to reduced perception of activity or flavour. Without wishing to be bound by theory it is also believed that the shear-thinning centre fills herein act as muco-adherents, coating the centre fill over the oral mucosa, improving the residence time of the fill within the oral cavity. This has manifold advantages, including improving the imparted feeling on the oral cavity by coating it with thickened liquid, and ensuring that there is center fill remaining with the candy shell pieces after the

center fill has been breached. Furthermore, perception of flavours and active ingredients is increased as the major mucosal surfaces (e.g. tongue, throat and buccal surfaces) are exposed to these ingredients for a prolonged time.

In order to achieve such shear thinning properties, the confectionery filling may optionally further comprise a thickener. To achieve the above attributes, the thickener should impart a high degree of pseudoplasticity to the filling, causing it to significantly decrease in viscosity as the shear rate is increased and also display muco-adherent properties. Polymeric thickeners which induce pseudoplasticity in the said formulations are preferred. Polymeric thickeners are generally high molecular weight materials which are straight chained or branched, they may also form cross-linked networks when hydrated. Shear thinning or pseudoplastic polymers impart a high viscosity when dissolved or dispersed in a polar liquid, and show a significant drop in viscosity under increased shear strain or shear rate.

Thickeners for use herein must be suitable for human consumption. Non-limiting examples of suitable thickeners include xanthan gum, carrageenan and derivatives, gellan gum, hydroxypropyl methyl cellulose, sclerotium gum and derivatives, pullulan, rhamosan gum, welan gum, konjac, curdlan, carbomer, algin, alginic acid, alginates and derivatives, hydroxyethyl cellulose and derivatives, hydroxypropyl cellulose and derivatives, starch phosphate derivatives, guar gum and derivatives, starch and derivatives, co-polymers of maleic acid anhydride with alkenes and derivatives, ethylene glycol/propylene glycol co-polymers, long chain alcohols such as behenyl alcohol, poloxamers and derivatives, polyacrylates and derivatives, methyl cellulose and derivatives, ethyl cellulose and derivatives, agar and derivatives, gum arabic and derivatives, pectin and derivatives, chitosan and derivatives, high molecular weight polyethylene glycols such as polyethylene Glycols (molecular weight 10,000 and above), karaya gum, locust bean gum, natto gum, co-polymers of vinyl pyrrolidone with alkenes, tragacanth gum, polyacrylamides, chitin derivatives, gelatin, betaglucan, dextrin, dextran, cyclodextrin, methacrylates, microcrystalline cellulose, polyquaterniums, furcellaren gum, ghatti gum, psyllium gum, quince gum, tamarind gum, larch gum, tara gum, talc, kaolin clay, bentonite clay, cellulose, fumed silica and mixtures thereof. Preferred are xanthan gum, carrageenan and

derivatives, gellan gum, hydroxypropyl methyl cellulose, sclerotium gum and derivatives, pullulan, rhamsan gum, welan gum, konjac, curdlan, carbomer, algin, alginic acid, alginates and derivatives, hydroxyethyl cellulose and derivatives, hydroxypropyl cellulose and derivatives, starch phosphate derivatives, guar gum and derivatives, starch and derivatives, co-polymers of maleic acid anhydride with alkenes and derivatives, cellulose gum and derivatives, poloxamers and derivatives, gelatin and mixtures thereof. More preferred are xanthan gum, carrageenan and derivatives, gellan gum, hydroxypropyl methyl cellulose, gelatin and mixtures thereof, more preferably still xanthan gum.

The filling compositions of the present invention preferably comprise from about 0.001% to about 10% thickener by weight of the fill. More preferably, the fill comprises the thickener at levels of from about 0.01% to about 5%, more preferably still from about 0.01% to about 2.5%, and even more preferably still from about 0.01% to about 1%.

The log viscosity ratio value at a fixed temperature, i.e., $\log [(\eta @ 0.01s^{-1}) / (\eta @ 250s^{-1})]$, used herein is determined as follows. The individual viscosities, η , are determined at the respective shear rates using a viscometer (e.g., commercially available from TA Instruments, model number AR2000). The measurements can be made with a parallel plate arrangement. First, the center fill composition is loaded onto the rheometer at the temperature at which it would be filled at the candy production facility, the preferred temperature being 85°C, and the parallel plate is applied to the sample. An example of a suitable plate would be a 40mm acrylic plate with a gap of 500 micrometers (μm), where possible it is preferred that a solvent trap is used to avoid loss of water or other solvents from the formula during measurement. The plate is cooled to mucosal membrane temperature (37°C) and the center fill is allowed to equilibrate for 1 hour. The viscosity is measured using rotational shear forces at an exponentially increasing shear rate from about 0.01 s^{-1} to about $250s^{-1}$ over 180 seconds. It is believed that a relatively large gap between cone and bottom plates of the rheometer should be used for this method to avoid misleading viscosity data due to presence of large particles in the formulae (e.g. polymer lumps) or crystals which form during cooling such as recrystallised sucrose. As it is known to one skilled in the art, the gap should be at least 10 times the size of the largest known particles in the product.

When an aqueous centre-filling (i.e. greater than 10% water) is used, the centre-filled throat drops of the present invention may optionally also comprise from about 0.001 to about 10% by weight of the filling of a vesicle-forming agent which acts to form vesicles which are dispersed within the filling and encapsulate the warming or cooling agent as described in US6432441. By 'vesicle' is meant an essentially spherical structure comprising a lipid bilayer encapsulating a central core. The vesicles herein can be uni- or multi-lamellar and have a number average particle size of from about 1 to about 100 μm , more preferably from about 5 to about 50 μm . The particle size can be measured using an optical microscope, such as a Nikon Optiphot 2, linked to an electronic image analysis system such as the Linkam MS100. Measurement can also be made using a graduated graticule in the field of view. EP-A-534,823, which describes anhydrous make-up compositions which can form vesicles on exposure to water gives a comprehensive list of amphiphilic liquids which can be used to form vesicles. For the throat drops herein it is of course preferable that food-grade materials are used and the preferred vesicle forming agents are natural phospholipids such as egg or soy lecithin. The preferred phospholipids of the present invention are plant-derived lecithins and, especially, soybean lecithin. Soybean lecithin can act to form vesicles at very low levels. Preferably the vesicle forming agent is present at a level of from about 0.001 to about 1%, more preferably from about 0.005 to about 0.1% and especially from about 0.01 to about 0.05% by weight of the filling. With adequate mixing, in the presence of water and a warming or cooling agent as described herein, the lecithin forms vesicles which encapsulate the warming or cooling agent.

The palatability of the filling is substantially improved if the composition further comprises a bulk sweetener, non-limiting examples of which include sucrose or glucose, suitably at a level of from about 5 to about 80%, preferably from about 30 to about 75% on a dry solids basis by weight of the filling. A preferred source of the sweetener is high fructose corn syrup which, being commercially available as an 85% active material of which the balance is essentially water, can also provide some, or even all, of the water required by aqueous fillings, when employed.

Sugar free compositions comprising a sugar alcohol such as sorbitol, xylitol, isomalt or maltitol can also be used. Preferably however, sugar alcohols are employed in admixture with glycerine, since it has been found that sugar alcohols on their own can suppress vesicle formation.

5 The fillings herein can also include a flavouring agent. As used herein, the term 'flavouring agent' means those flavour essences and equivalent synthetic ingredients which are added to the flavour composition for the principal purpose of providing flavour to the confectionery product. It excludes warming and cooling agents as described above. Flavouring agents well known in the confectionery art can be added to the flavour
10 compositions of the invention. These flavouring agents can be chosen from synthetic flavouring liquid and/or oils derived from plants leaves, flowers, fruits and so forth, and combinations thereof. Representative flavouring liquids include: artificial, natural or synthetic fruit flavours such as lemon, orange, banana, grape, lime, apricot and grapefruit oils and fruit essences including apple, strawberry, cherry, orange, pineapple and so forth;
15 bean and nut derived flavours such as coffee, cocoa, cola, peanut, almond and so forth; and root derive flavours such as licorice or ginger. The amount of flavouring agent employed is normally a matter of preference subject to such factors as flavour type, base type and strength desired. In general, amounts up to about 4% by weight are usable with amounts of from about 0.1% to about 1% being preferred.

20 The edible shell can be a chewing gum or a hard or soft candy, preferably it is a hard candy. Centre-filled chewing gums are described, for example, in U.S. Pat. No. 3,894,154. Centre-filled hard candies are described in U.S. Pat. No. 4,372,942 and U.S. Pat. No. 4,466,983. A suitable sugar base for a hard candy shell comprises from about 30% to about 85% glucose syrup and from about 15% to about 70% sucrose.
25 Alternatively, a sugar-free base can be used for the shell. Suitable sugar-free bases include bulk sweeteners such as isomalt, maltitol and sorbitol. Isomalt and maltitol are preferred. The inner surface of the shell can also have a separate edible lining to prevent or reduce interaction of the filling with the shell. The edible shell can also further comprise flavours as described above. In preferred throat drops according to the invention the edible shell is

a cooling composition comprising a cooling agent and the centre-fill is a warming composition comprising a warming agent.

Aqueous fillings can be made by straightforward mixing techniques. The general techniques for manufacturing centre-filled confectionery products can be found in the "Silesia Confiserie Manual No. 3", published by Silesia-Essenzenfabrik Gerhard Hanke K. G., Abt. Fachbucherei.

Centre-filled throat drops according to the invention can be manufactured by deposit, rope-forming and extrusion processes as known in the art. Extrusion and rope-forming processes are preferred. An example of an extrusion process is described in U.S. Pat. No. 5,458,894. An example of an extrusion process is described in U.S. Pat. No. 5,002,791.

The following examples are given to illustrate the compositions and uses according to the invention. However, the invention is not limited thereto.

Example 1 (a) and (b)

Pseudoplastic Center fill composition using Xanthan gum and sucrose with Heating agent.

Material Description	a	b
	% w/w	% w/w
GLYCERIN	55.9750	55.9750
GLUCOSE SYRUP (80% solids)	30.0000	30.0000
SUCROSE	10.0000	10.0000
CITRIC ACID ANHYDROUS	3.0000	3.0000
XANTHAN GUM	0.2500	0.2500
ANTHOCANINS (COLOURANTS)	0.1500	0.1500
HEATING AGENT: OPTAHEAT	0.1500	-
COOLING AGENT: COOLER-2	-	0.1500
GUARANA EXTRACT	0.1250	0.1250
TAURINE	0.1000	0.1000
FLAVOURS	0.2500	0.2500
	100.0000	100.0000

Manufacturing instructions:

Step 1 Weigh the Glycerine at room temperature into a suitable vessel

Step 2 Add the Anthocyanins, Taurine + Guarana powders, mix until dispersed

Step 3 Add the Xanthan gum, mix until dispersed

Step 4 Add the Glucose syrup preheated to 40°C, heat the batch whilst mixing to 80°C

Step 5 Stop heating, add the Sucrose + Citric acid, mix until dissolved

Step 6 Add the Flavours + Heating or Cooling agent, mix for 10 minutes

Example 2

Pseudoplastic Center fill composition using Xanthan gum and a Cooling agent

Material Description	% w/w
GLYCERIN	55.9750
HIGH FRUCTOSE GLUCOSE SYRUP (80% solids)	40.0000
CITRIC ACID ANHYDROUS	3.0000
XANTHAN GUM	0.2500
ANTHOCANINS (COLOURANTS)	0.1500
COOLING AGENT: COOLER-2 (IFF)	0.1500
GUARANA EXTRACT	0.1250
TAURINE	0.1000
FLAVOURS	0.2500
	100.0000

5 Manufacturing instructions:

Step 1 Weigh the Glycerine at room temperature into a suitable vessel

Step 2 Add the Anthocyanins, Taurine + Guarana powders, mix until dispersed

Step 3 Add the Xanthan gum, mix until dispersed

10 **Step 4** Add the High fructose Glucose syrup preheated to 40°C, heat the batch whilst mixing to 80°C

Step 5 Stop heating, add the Citric acid, mix until dissolved

Step 6 Add the Flavours + Cooling Agent, mix for 10 minutes

Example 3

Substantially anhydrous pseudoplastic Center fill composition using Xanthan gum.

Material Description	% w/w
GLYCERIN	76.08
SUCROSE	20.00
CITRIC ACID ANHYDROUS	3.0000
XANTHAN GUM	0.1500
ANTHOCANINS (COLOURANTS)	0.1500
HEATING AGENT: OPTAHEAT	0.1500
GUARANA EXTRACT	0.1250
TAURINE	0.1000

17

FLAVOURS	0.2500
	100.0000

Manufacturing instructions:

Step 1 Weigh the Glycerine at room temperature into a suitable vessel

Step 2 Add the Anthocyanins, Taurine + Guarana powders, mix until dispersed

Step 3 Add the Xanthan gum, mix until dispersed

5 **Step 4** Heat the batch whilst mixing to 80°C, mix until Xanthan gum is fully dissolved.

Step 5 Stop heating, add the Sucrose + Citric acid, mix until dissolved

Step 6 Add the Flavours + Heating agent, mix for 10 minutes

Example 4

A substantially sugar free Pseudoplastic Center fill composition using Xanthan gum.

Material Description	% w/w
GLYCERIN	90.91
CITRIC ACID ANHYDROUS	3.00
WATER DRINKING	5.00
XANTHAN GUM	0.2500
ASPARTAME	0.0500
SUCRALOSE	0.0200
ANTHOCANINS (COLOURANTS)	0.1500
HEATING AGENT: OPTAHEAT	0.1500
GUARANA EXTRACT	0.1250
TAURINE	0.1000
FLAVOURS	0.2500
	100.0000

10 Manufacturing instructions:

Step 1 Weigh the Glycerine at room temperature into a suitable vessel

Step 2 Add the Anthocyanins, Taurine + Guarana powders, mix until dispersed

Step 3 Add the Xanthan gum, mix until dispersed

Step 4 Add the Water, heat the batch whilst mixing to 80°C

15 **Step 5** Stop heating, add the Sucrose + Citric acid, mix until dissolved

Step 6 Add the Flavours + Heating agent, mix for 10 minutes

Suitable vessels for making the center fill compositions should be made of stainless steel or other food grade acceptable material which can easily be heated and cooled. Ideally the mixing vessels should have scraped wall mixers as well as a medium /

high shear mixer. Suitable high shear mixers include static in-line mixers, jet mixers such as those manufactured by Ika GmbH, or rotor stator mixers such as those manufactured by Silverson Inc. Care must be taken when using high shear mixers that the pseudoplastic polymers are not broken into lower molecular weight components.

5 Example 5 and 6.

Hard boiled confectionary shell as used in the manufacture of center filled sugar based candy. Example 5 is used in conjunction with examples 1(a) and 2 to 4. Example 6 is used in conjunction with example 1(b).

Material Description	5		6	
	Before cooking % w/w	After cooking % w/w	Before cooking % w/w	After cooking % w/w
SUCROSE	48.4900	48.4900	48.4900	48.4900
GLUCOSE SYRUP	58.1653	46.5322	58.1653	46.5322
WATER DRINKING	16.0766	2.5000	16.0766	2.5000
CITRIC ACID ANHYDROUS	1.2000	1.2000	1.2000	1.2000
ANHYDROUS CAFFEINE	0.7781	0.7781	0.7781	0.7781
COOLING AGENT: COOLER-2	0.3000	0.3000	-	-
HEATING AGENT: OPTAHEAT	-	-	0.300	0.300-
FLAVOUR PREMIX	0.2000	0.2000	0.2000	0.2000
	125.2100		125.210	
	Total	100.000	Total	100.000
Processing/Moisture/Volatiles Loss	25.2100	-	25.2100	-
Total	100.0000	100.0000	100.0000	100.0000

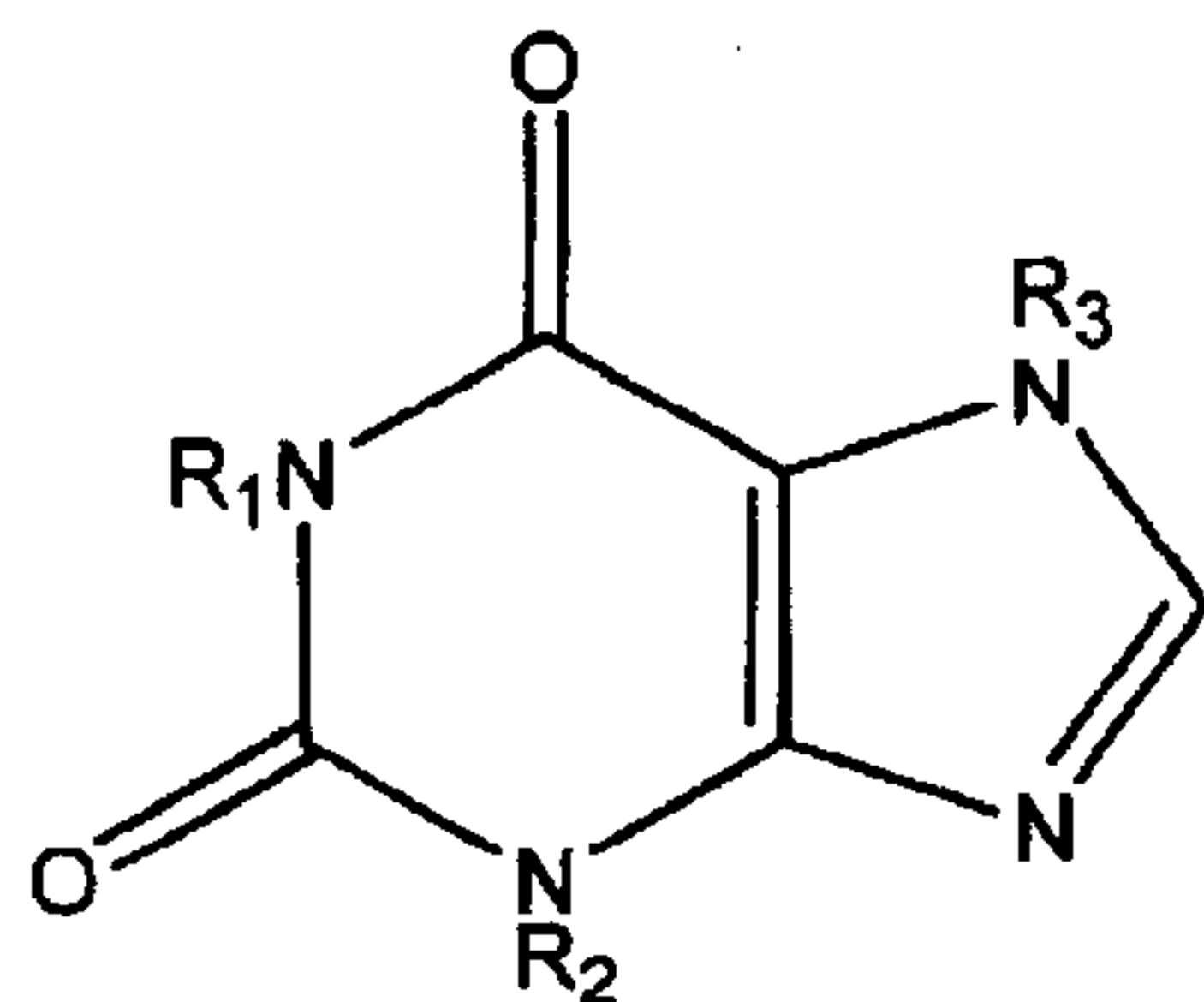
10 A preferred method of manufacture of the above confectionary formula is by continuous extrusion process as described in US 5,548,893 and in US 5,002,791. Any of the center fills of examples 1-4 may be suitable for use in this shell formula. Although the continuous extrusion process allows a high degree of flexibility in the center fill content for the above formula, a preferred target is an average 20% content.

What is claimed is:

1. A confectionery composition comprising:
 - a. a xanthine derivative;
 - b. a cooling composition comprising a physiological cooling agent which has an average threshold for a reported cooling effect of 100 μg or less amongst a test panel selected to have an average threshold for a reported cooling effect of 1-menthol of 0.25 μg ; and
 - c. a warming composition comprising a physiological warming agent which has an average threshold for a reported warming effect of 100 μg or less amongst a test panel selected to have an average threshold for a reported warming effect of benzyl alcohol of 0.25 μg ,wherein said cooling composition and said warming composition are located in distinct and discrete regions within said confectionery composition and said cooling and warming compositions being adapted to provide sequential release profiles.
2. The confectionery composition according to claim 1 wherein the xanthine derivative comprises xanthine, caffeine, theobromine, theophylline, their salts or mixtures thereof.
3. The confectionery composition according to claim 2 wherein the xanthine derivative is caffeine.
4. The confectionery composition according to any one of claims 1 to 3 wherein the composition comprises from 0.01% to 5% xanthine derivative by weight of the confectionery composition.
5. The confectionery composition according to claim 4 wherein the composition comprises from 0.05% to 2.5% xanthine derivative by weight of the confectionery composition.
6. The confectionery composition according to claim 5 wherein the composition comprises from 0.1% to 1% xanthine derivative by weight of the confectionery composition.
7. The confectionery composition according to any one of claims 1 to 6 wherein the cooling agent comprises menthol, monomenthyl glutarate, peppermint oil, 3-lmenthoxy propan-1,2-diol, N-ethyl-p-menthane-3 -carboxamide, trimethyl isopropyl butanamide, or mixtures thereof.
8. The confectionery composition according to any one of claims 1 to 7 comprising from 0.001% to 10% cooling agent, by weight of the composition.
9. The confectionery composition according to any one of claims 1 to 8 wherein the warming agent comprises vanillyl alcohol n-butyl ether, vanillyl alcohol n-propyl ether, vanillyl

alcohol isopropyl ether, vanillyl alcohol isobutyl ether, vanillyl alcohol n-amino ether, vanillyl alcohol isoamyl ether, vanillyl alcohol n-hexyl ether, vanillyl alcohol methyl ether, vanillyl alcohol ethyl ether, gingerol, shogaol, paradol, zingerone, capsaicin, dihydrocapsaicin, nordihydrocapsaicin, homocapsaicin, homodihydrocapsaicin, ethanol, isopropyl alcohol, iso-amylalcohol, benzyl alcohol, chloroform, eugenol, cinnamon oil, cinnamic aldehyde, or mixtures thereof.

10. The confectionery composition according to any one of claims 1 to 9 comprising from 0.001% to 10% warming agent by weight of the composition.
11. The confectionery composition according to claim 10 comprising from 0.005% to 5% warming agent by weight of the composition.
12. The confectionery composition according to claim 11 comprising from 0.005% to 1% warming agent by weight of the composition.
13. The confectionery composition according to any one of claims 1 to 12 wherein the composition is in the form of a centre-fill throat drop comprising from 60% to 95% candy shell and from 5% to 40% filling, by weight of the drop, the candy shell comprising the cooling composition and the filling comprising the warming composition.
14. The confectionery composition according to claim 13 wherein the filling comprises less than 7% water by weight of the filling.
15. The confectionery composition according to claim 14 wherein the filling comprises less than 6% water by weight of the filling.
16. The confectionery composition according to any one of claims 13 to 15 wherein the filling is shear thinning.
17. A confectionery composition comprising:
 - a. a xanthine derivative according to Formula I:



Formula I

wherein R₁, R₂ and R₃ are independently selected from H or methyl, salts thereof and mixtures thereof;

- b. a cooling composition comprising a physiological cooling agent which has an average threshold for a reported cooling effect of 100 µg or less amongst a test panel selected to have an average threshold for a reported cooling effect of 1-menthol of 0.25 µg; and
- c. a warming composition comprising a physiological warming agent which has an average threshold for a reported warming effect of 100 µg or less amongst a test panel selected to have an average threshold for a reported warming effect of benzyl alcohol of 0.25 µg,

wherein said cooling composition and said warming composition are located in distinct and discrete regions within said confectionery composition and said cooling and warming compositions being adapted to provide sequential release profiles.

- 18. The confectionery composition according to claim 17 wherein the xanthine derivative comprises xanthine, caffeine, theobromine, theophylline, their salts or mixtures thereof.
- 19. The confectionery composition according to claim 18 wherein the xanthine derivative is caffeine.
- 20. The confectionery composition according to any one of claims 17 to 19 wherein the composition comprises from 0.01% to 5% xanthine derivative by weight of the confectionery composition.
- 21. The confectionery composition according to claim 20 wherein the composition comprises from 0.05% to 2.5% xanthine derivative by weight of the confectionery composition.
- 22. The confectionery composition according to claim 21 wherein the composition comprises from 0.1% to 1% xanthine derivative by weight of the confectionery composition.
- 23. The confectionery composition according to any one of claims 17 to 22 wherein the cooling agent comprises menthol, monomenthyl glutarate, peppermint oil, 3-lmenthoxy propan-1,2-diol, N-ethyl-p-menthane-3-carboxamide, trimethyl isopropyl butanamide, or mixtures thereof.
- 24. The confectionery composition according to any one of claims 17 to 23 comprising from 0.001% to 10% cooling agent, by weight of the composition.
- 25. The confectionery composition according to any one of claims 17 to 24 wherein the warming agent comprises vanillyl alcohol n-butyl ether, vanillyl alcohol n-propyl ether, vanillyl alcohol isopropyl ether, vanillyl alcohol isobutyl ether, vanillyl alcohol n-amino ether, vanillyl alcohol isoamyl ether, vanillyl alcohol n-hexyl ether, vanillyl alcohol methyl ether, vanillyl alcohol ethyl ether, gingerol, shogaol, paradol, zingerone, capsaicin,

- dihydrocapsaicin, nordihydrocapsaicin, homocapsaicin, homodihydrocapsaicin, ethanol, isopropyl alcohol, iso-amylalcohol, benzyl alcohol, chloroform, eugenol, cinnamon oil, cinnamic aldehyde, or mixtures thereof.
26. The confectionery composition according to any one of claims 17 to 25 comprising from 0.001% to 10% warming agent by weight of the composition.
 27. The confectionery composition according to claim 26 comprising from 0.005% to 5% warming agent by weight of the composition.
 28. The confectionery composition according to claim 27 comprising from 0.005% to 1% warming agent by weight of the composition.
 29. The confectionery composition according to any one of claims 17 to 28 wherein the composition is in the form of a centre-fill throat drop comprising from 60% to 95% candy shell and from 5% to 40% filling, by weight of the drop, the candy shell comprising the cooling composition and the filling comprising the warming composition.
 30. The confectionery composition according to claim 29 wherein the filling comprises less than 7% water by weight of the filling.
 31. The confectionery composition according to claim 30 wherein the filling comprises less than 6% water by weight of the filling.
 32. The confectionery composition according to any one of claims 29 to 31 wherein the filling is shear thinning.
 33. The confectionery composition according to claim 17 wherein the xanthine derivative salts are citrate, lactate and succinate salts.