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Mane et al.

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[54] **COOLANT COMPOSITIONS**

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4,157,384	6/1979	Watson et al.	424/45
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"A Molecular Approach to Flavor Synthesis. I. Menthol Esters of Varying Size and Polarity", by Jabloner et al. Hercules Incorporated Research Center, Wilimgton, Delaware, 1989.

Primary Examiner—James M. Spear
Attorney, Agent, or Firm—Larson and Taylor

[57] **ABSTRACT**

Coolant compositions, flavorant compositions and ingestible and topical compositions containing at least one coolant compound selected from monomenthyl succinate, alkali metal salts of monomenthyl succinate, alkaline earth metal salts of monomenthyl succinate and mixtures thereof. These compositions are found to provide a pleasant, long-lasting cooling effect without bitterness and the cooling effect manifests itself differently than the cooling effect of other known coolants. As a result, a complementary or synergistic effect can by obtained by combination with other coolants. Further, the succinate-based coolant compounds of the invention are found to enhance the sensation of alcohol in alcoholic beverages.

23 Claims, No Drawings

COOLANT COMPOSITIONS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to coolant compositions having a unique cooling perception that provides the user with a pleasing cooling effect without bitterness. The invention also relates to products containing one or more coolant compounds.

2. Description of the Prior Art

A variety of compounds are known which provide a cooling sensation when ingested or contacted with the body. Perhaps the best known of these compounds is menthol. It is believed that menthol acts on the cold receptors at the nerve endings in order to provide this cooling effect.

Since menthol has a strong minty odor and high relative volatility, several other coolant compounds have been developed and reported in the technical literature as potential flavorants or odorants in a variety of topical and ingestible compositions. For example, U.S. Pat. No. 5,009,893 proposes the use of menthol in combination with N-substituted-p-menthane carboxamide compounds as coolant compositions in edible products.

International Patent application publication No. WO93/23005 proposes coolant compositions for edible or topical products which comprise a ketal and a secondary coolant which may be selected from menthol, carboxamides and mixtures thereof. In addition, this patent application mentions several other references which disclose compounds which have a flavor resembling menthol including menthyl carbinol, saccharide esters of menthol and a variety of amides. Also mentioned is that 2,3-p-menthane diol has been reported as having a sharp cooling taste.

German Patent application 2 339 661 discloses aromatic compositions which include menthol or menthol esters of heterocyclic carboxylic acids. The preferred ester is menthyl-2-pyrrolidone-5-carboxylic acid ester.

German Patent application 26 08 226 discloses a composition which exhibits a physiological cooling effect. The cooling compounds disclosed include menthol esters of naturally occurring hydroxycarboxylic acids having 2–6 carbon atoms which are esterified with a C_1–C_4 alkyl group. Menthyl acetate and menthyl lactate are the most preferred cooling compounds of this disclosure. Finally, another commercially available coolant compound is 3-menthoxypropane-1,2 diol.

Thus, a variety of compounds are known which provide cooling properties and are useful in a wide variety of products. However, there is still a need to provide coolant compositions having an improved cooling effect and/or taste perception.

Accordingly, it is an object of the present invention to provide improved coolant compositions.

It is a further object of the present invention to provide coolant compositions having a unique cooling sensation and taste perception.

It is a still further object of the present invention to provide coolant compositions including two or more cooling agents which provide a complementary cooling sensation and taste perception.

It is a still further object of the present invention to provide a novel coolant composition which employs a non-toxic coolant having a unique cooling sensation and taste perception.

These and other objects of the present invention will be apparent from the description which follows.

SUMMARY OF THE INVENTION

The present invention relates to a composition selected from topical products, oral care products, nasal care products, toilet articles, ingestible products and chewing gum, which comprises a product base and an effective amount of a cooling compound selected from monomenthyl succinate, alkali metal salts of monomenthyl succinate and alkaline earth metal salts of monomenthyl succinate.

In a second aspect, the present invention relates to a composition including a coolant selected from monomenthyl succinate, alkali metal salts of monomenthyl succinate and alkaline earth metal salts of monomenthyl succinate formulated with a diluent selected from the group of flavors, flavoring oils and herbal oils.

The present invention also relates to coolant compositions which include a primary coolant selected from monomenthyl succinate, alkali metal salts of monomenthyl succinate and alkaline earth metal salts of monomenthyl succinate, and at least one secondary coolant component.

Monomenthyl succinate is a known compound having Chemical Abstracts no. 77341-67-4. It has been used, for example, in smoking tobacco products as is disclosed in U.S. Pat. No. 3,111,127. In particular, this patent discloses spraying monomenthyl succinate onto tobacco products which were then fabricated into cigarettes. These tobacco products were evaluated and observed to burn slower at smolder than a comparable control product, to have increased firmness, and to require more puffs under a controlled smoking regime. Further, when tested organoleptically, these products were found to deliver smoke having the pleasing and cooling taste and aroma characteristic of menthol.

The article, "A Molecular Approach to Flavor Synthesis. I. Menthol Esters of Varying Size and Polarity," Jabloner, H. and Dunbar, B. I., *J. of polymer Science*, Vol. 18, pages 2933–40 (1980) discloses a method for the synthesis of monomenthyl succinate as well as monomenthyl sodium succinate and other menthol esters derived from monomenthyl succinate. Solutions of 5% by weight of several of these menthol esters in mineral oil or water were tasted by a nine person taste panel. 5% of dimenthyl succinate in mineral oil was found to be odorless and tasteless. 5% sodium monomenthyl succinate in water was found to be vile and bitter and monomenthyl succinate itself was not tasted.

The present inventors have surprisingly found that monomenthyl succinate, alkali metal salts of monomenthyl succinate and alkaline earth metal salts of monomenthyl succinate used in a variety of ingestible and topical products at low concentrations of up to 1% by weight, give a pleasing, long-lasting cooling effect rather than the vile and bitter taste observed by the taste panel in the Jabloner article.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention relates to an end use composition selected from topical products, oral care products, nasal care products, toilet articles, ingestible products and chewing gum, which comprises a product base and an effective amount of a cooling compound selected from monomenthyl succinate, alkali metal salts of monomenthyl succinate and alkaline earth metal salts of monomenthyl succinate (hereinafter collectively referred to as "succinate-based coolant compounds"). More preferably, the coolant

employed in the compositions of the present invention is selected from monomenthyl succinate, monomenthyl sodium succinate, monomenthyl potassium succinate, monomenthyl lithium succinate, monomenthyl calcium succinate, monomenthyl magnesium succinate and monomenthyl barium succinate, as well as mixtures thereof.

It has been surprisingly found that these succinate-based coolant compounds, when used in low concentrations of up to 1% by weight based on the total weight of the end use composition into which they are incorporated, provide a pleasing cooling, or long-lasting cooling effect without the bitterness which would be expected from the prior art. Further, at concentrations of up to 1% by weight, the succinate-based coolant compounds do not develop a strong minty taste in the mouth or throat as do other coolants such as menthol.

The present inventors have also found that the succinate-based coolant compounds of the present invention provide a cooling effect in a different area of the mouth and throat when ingested than, for example, menthol or carboxamide-based coolant compounds. As a result, the succinate-based coolants of the present invention provide a complementary or synergistic cooling effect when combined with at least one secondary coolant compound.

The present inventors have also found that the succinate-based coolant compounds of the present invention enhance the taste sensation of alcohol in alcoholic beverages. As a result, alcoholic beverages comprising the succinate-based coolant compounds of the present invention taste like they have a higher alcohol content than equally strong alcoholic beverages without the succinate-based coolant compound.

The choice of the succinate-based coolant compound for use in the coolant composition will depend, to some extent, on the solubility characteristics which are desired of the compound. For example, monomenthyl succinate is sparingly soluble in water and more soluble in oil. Thus, monomenthyl succinate is particularly suitable for environments where oil solubility is advantageous, although monomenthyl succinate can be used in aqueous environments if a concentration below the water solubility limit is employed. The alkali metal and alkaline earth metal salts of monomenthyl succinate are substantially more soluble in water and, as a result, are most useful in products where water solubility is advantageous.

The end use compositions in which the succinate-based coolant compounds may be employed include a wide variety of ingestible compositions and topical compositions for application to the human or animal body. Ingestible compositions include foodstuffs for human or animal consumption, beverages and other orally ingested compositions for humans or animals such as medicaments, antacids, laxatives, as well as chewing gum compositions. Topical compositions include a wide variety of compositions for application to humans or animals such as toiletries, oral care products, nasal care products, lotions, oils and ointments which are applied to the human body.

In formulating the compositions of the present invention, the coolant compound can be employed in the form of a coolant composition, a flavoring composition and/or the coolant compound, composition or flavoring composition may be incorporated into a carrier material which may be inert or contain other active ingredients of the end use composition. A wide variety of carrier materials can be employed including, for example, polar solvents, oils, fats, finely divided solids, maltodextrins, cyclodextrins, gums, natural or synthetic resins and any other known carrier materials for coolant or flavoring compositions.

Ingestible compositions in accordance with the present invention include, but are not limited to, alcoholic and non-alcoholic beverages, confectionery compositions including confectionery tablets, hard-boiled candies, chewing gums, pectin-based candies, chewy candies, cream-centered candies and fondants; carbonated beverages, powdered beverage mixes, distilled beverages, mineral waters, baked goods, dairy products, fruit ices, jams, jellies, gelatins, puddings and animal feeds.

The topical compositions of the present invention include, but are not limited to, toiletries such as face creams, talcum powders, hair oils, shampoos, bath oils and salts, toilet soaps, cologne, antiperspirants, toilet water, perfume, shaving lotions and creams, soaps, creams, dentifrices, mouthwashes, hair tonics and other similar products.

The succinate-based coolant of the present invention may also be incorporated into ingestible or topical medicaments such as cough drops, antacids, lozenges, anti-irritants, ointments, lotions, oral analgesics and other similar products. Further, other compositions such as adhesives for a variety of uses where taste perception is a concern can incorporate the cooling and flavorant compositions of the present invention.

The most preferred compositions which will incorporate the succinate-based coolant of the present invention are pressed confectionery tablets, hard-boiled candies, chewing gums, chewy candies, pectin candies, cream-centered candies, fondant, toothpastes, mouthwashes, breath fresheners, alcoholic and non-alcoholic beverages, carbonated beverages and dry beverage mixes.

The amount of coolant composition incorporated in each of these end use compositions will vary depending upon the particular compound, the degree of cooling effect desired and the strength of other flavorants in the composition. Typically, the succinate-based coolant compound will make up from 0.001–1.0% by weight of the end use composition. More preferably, the succinate-based coolant compound makes up 0.005–0.5% by weight, based on the total weight of the end use composition.

In a second aspect, the present invention relates to a flavoring composition including a succinate-based coolant and a diluent selected from flavorants. This composition is particularly useful as a flavoring composition in a variety of ingestible compositions and/or compositions destined for contact with the human or animal body.

The flavorants may be selected from fruit flavors such as strawberry flavor, herbal oils such as eucalyptus oil, peppermint oil, spearmint oil, as well as other known flavors or flavoring oils which are conventionally employed in ingestible compositions and compositions designed for contact with human or animal bodies including flavors such as flavoring syrups such as sorbitol syrup or other sweetening or flavoring syrups.

These flavoring compositions can be optionally diluted with a polar solvent such as, for example, ethyl alcohol, ethyl acetate, propylene glycol, isopropyl alcohol and glycerin. The solvent functions as a carrier material which aids in incorporating the flavoring composition into a product. The diluent may optionally comprise one or more additional conventional components selected from the group consisting of colorants, lubricants, thickeners, emulsifiers, plasticizers and encapsulating agents such as gums, starches, dextrins and cyclodextrins.

Typically the flavoring composition will include 1–80% by weight of the succinate-based coolant compound and from 20–99% by weight of the flavorant diluent and optional

EXAMPLE 2—PRESSED TABLETS

Royal T™ Dextrose (tabletting sugar) was pressed into two tablets, one containing only dextrose (control) and one containing 0.1% by weight of monomenthyl succinate. The taste panel noticed a pleasant cooling effect from the tablet containing the monomenthyl succinate and no cooling effect was obtained from the dextrose control tablet.

EXAMPLE 3—MOUTHWASH

Four samples of a mouthwash formulation having the following composition were tasted,

cetyl pyridinium chloride	0.757 grams
sodium: saccharin	1.75 grams
Tween ™ 80	0.5 fluid os.
D & C Green #5 (0.1% soln. in propylene glycol)	0.8 fluid ozs.
D & C Yellow #10 (0.1 soln. in propylene glycol)	0.2 fluid ozs.
Flavor N & A Mint Blend (0.2% soln.)	0.25 fluid ozs.
Specially denatured alcohol	31.0 fluid ozs.

These ingredients were blended together until dissolved and then 96 fluid ozs. of water were added to provide a mouthwash formulation. The coolant compounds were then added to the mouthwash formulation in the amounts specified below.

The four mouthwash formulations tested were as follows: one containing no additives (control), one containing 0.004% by weight of monomenthyl succinate, one containing 0.004% by weight of WS3™ and one containing 0.002% by weight of monomenthyl succinate and 0.002% by weight of WS3™.

The taste panel noted a cooling effect in all three compositions although the taste panel concluded that each of the four mouthwash samples had a different taste and that the cooling effect of the monomenthyl succinate manifested itself in a different area of the mouth and throat than the cooling effect of WS3™ and the mouthwash. The cooling effects of the monomenthyl succinate, mouthwash mint flavor and WS3™ were found to be complementary in the fourth sample which contained all three coolants.

EXAMPLE 4—MOUTHWASH CONTAINING SODIUM MONOMENTHYL SUCCINATE

The same four mouthwash formulations as were made in Example 3 were taste tested except that sodium monomenthyl succinate was substituted for the monomenthyl succinate in the same amounts. The tasting panel found a pleasant, long-lasting cooling sensation without bitterness for the sodium monomenthyl succinate-containing mouthwashes. The tasting panel also noted that the cooling sensation of sodium monomenthyl succinate was perceived at a point slightly forward of the point in the mouth and throat where the cooling sensation of monomenthyl succinate was perceived in the taste tests of Example 3. The sodium monomenthyl succinate was also found to have a complementary cooling effect when combined with WS3™.

EXAMPLE 5—CARBONATED BEVERAGES

Four samples each of lemon-lime carbonated beverage were prepared, one without additives (control), one with 0.004% by weight of monomenthyl succinate, one with 0.004% by weight of WS3™ and one with 0.002% by weight of monomenthyl succinate and 0.002% by weight of WS3™. The carbonated beverage formulation was as follows, with all parts being parts by weight:

High fructose corn syrup	96.00 parts
Water	28.90 parts
Sodium benoate (25% solution w/w in water)	0.50 parts
Citric acid (50% solution w/w in water)	2.30 parts
Flavor N&A lemon-lime	0.30 parts

The carbonated beverage was formulated by combining the first three ingredients and mixing thoroughly, adding the citric acid solution and mixing again followed by adding the flavor to provide a beverage syrup. One part of the beverage syrup was then combined with 5 parts of carbonated water to provide the carbonated beverage. The coolant compounds were then mixed into the carbonated beverages on the amounts specified above.

The taste panel concluded that the samples containing monomenthyl succinate and WS3™ provided a cooling effect and that the cooling effect of monomenthyl succinate manifested itself in a different area of the mouth and throat than the cooling effect of WS3™. In addition, the cooling effect of monomenthyl succinate was found to be pleasing, not minty and long-lasting. Further, the combination of monomenthyl succinate with WS3™ was found to provide a complementary cooling effect since different areas of the mouth and throat were affected by the respective coolants.

EXAMPLES 6–8—ALCOHOLIC BEVERAGES

Three different alcoholic beverages were made by using 17.00 grams of high fructose corn syrup, 140.89 grams of water and 21.05, 42.11 and 84.22 grams of 190 proof alcohol in order to obtain alcoholic drinks of 20, 40 and 80 proof, respectively. To samples of each of the three alcoholic beverages was added 0.07% by weight of monomenthyl succinate. A cooling effect was noted in the 20 and 40 proof alcoholic beverages containing the monomenthyl succinate but not in the 80 proof beverage.

As a result, a new sample of 80 proof alcoholic beverage was prepared using a higher concentration of monomenthyl succinate and, at this higher concentration level a pleasant, long-lasting cooling effect was noticed by the tasting panel. In addition, the tasting panel concluded that the monomenthyl succinate enhanced the taste sensation of the alcohol in all of the alcoholic beverages and, as a result, the 20, 40 and 80 proof alcoholic beverages including monomenthyl succinate each tasted as if there were a higher alcohol content than the corresponding control beverage having the same alcohol content no coolant compound.

EXAMPLE 9—CHEWING GUM

A conventional chewing gum base was employed for this example. To the chewing gum base was added 1.0% by weight of mixed berry flavoring. Then, to one of the chewing gum samples 0.30% by weight of monomenthyl succinate was added. A pleasant, long-lasting cooling effect in the back of the mouth and throat was noted by the tasting panel in the chewing gum containing monomenthyl succinate. In addition, no minty taste was apparent.

These examples have been given for the purpose of illustration and description only and are not to be construed as limiting the scope of the invention in any way. The scope of the invention is to be determined from the claims appended hereto.

What is claimed is:

1. A composition selected from topical products for humans and animals, oral care products, nasal care products and toilet articles which comprises a product base selected

from the group consisting of a topically effective product base for humans and animals, an oral care product base, a nasal care product base and a toilet article product base and an effective amount of from 0.001–1.0% by weight, based on the total weight of the composition, of a coolant selected from the group consisting of monomenthyl succinate, alkali metal salts of monomenthyl succinate, alkaline earth metal salts of monomenthyl succinate and mixtures thereof.

2. An ingestible product for humans and animals which is selected from the group consisting of baked goods, dairy products, fruit ices, confectionery products, jams, jellies, gelatins, puddings, animal feeds, lozenges, cough mixtures, decongestants, anti-irritants, antacids, anti-indigestion preparations, oral analgesics, pressed confectionery tablets, hard boiled candies, chewing gums, pectin-based candies, chewy candies, cream-centered candies, fondants, toothpastes, mouthwashes, breath fresheners, carbonated beverages, mineral waters, powdered beverage mixes, non-alcoholic beverages, alcoholic beverages and distilled beverages, which comprises a product base and an effective amount of a coolant selected from the group consisting of monomenthyl succinate, alkali metal salts of monomenthyl succinate, alkaline earth metal salts of monomenthyl succinate and mixtures thereof, with the proviso that when said ingestible product is selected from the group consisting of mouthwashes and alcoholic beverages and distilled beverages the amount of the coolant is from 0.001–1.0% by weight, based on the total weight of the ingestible product.

3. A product as claimed in claim **2** wherein the ingestible product is a foodstuff selected from the group consisting of baked goods, dairy products, fruit ices, confectionery products, jams, jellies, gelatins, puddings and animal feeds.

4. A product as claimed in claim **2** wherein the ingestible product is selected from the group consisting of lozenges, cough mixtures, decongestants, anti-irritants, antacids, anti-indigestion preparations and oral analgesics.

5. A product as claimed in claim **2** wherein the ingestible product is selected from the group consisting of pressed confectionery tablets, hard boiled candies, chewing gums, pectin-based candies, chewy candies, creme-centered candies, fondants, toothpastes, mouthwashes, breath fresheners, carbonated beverages, mineral waters, powdered beverage mixes and non-alcoholic beverages.

6. A flavoring composition which comprises from 1–80% by weight of a coolant selected from the group consisting of monomenthyl succinate, alkali metal salts of monomenthyl succinate, alkaline earth metal salts of monomenthyl succinate and mixtures thereof and 20–99% by weight of a flavorant diluent which comprises at least one flavorant selected from the group consisting of fruit flavors, herbal oils, sweetening syrups, flavoring syrups, and flavoring oils.

7. A flavoring composition as claimed in claim **6** wherein the flavorant is selected from the group consisting of fruit flavors, eucalyptus oil, peppermint oil and spearmint oil.

8. A flavoring composition as claimed in claim **6** which comprises from 5–50% by weight of the coolant and from 50–95% of the flavorant diluent.

9. A flavoring composition as claimed in claim **6** wherein the flavorant diluent further comprises a polar solvent.

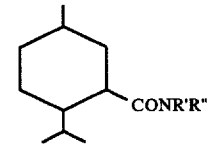
10. A flavoring composition as claimed in claim **9** wherein the polar solvent is selected from the group consisting of ethanol, ethyl acetate, propylene glycol, isopropyl alcohol and glycerin.

11. A flavoring composition as claimed in claim **10** wherein the flavorant diluent further comprises one or more components selected from the group consisting of colorants, lubricants, thickeners, emulsifiers and plasticizers.

12. A product as claimed in claim **2** which comprises from 0.001–1.0% by weight based on the total weight of the composition, of said coolant.

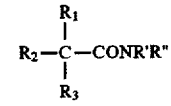
13. A coolant composition which comprises an effective amount of at least one primary coolant selected from the group consisting of monomenthyl succinate, alkali metal salts of monomenthyl succinate, alkaline earth metal salts of monomenthyl succinate and mixtures thereof, and at least one secondary coolant component selected from the group consisting of carboxamides, ketals, menthyl acetate, menthyl lactate, 3-menthoxypropane-1,2 diol and mixtures thereof.

14. A coolant composition as claimed in claim **13** wherein the carboxamide coolant component is selected from the group consisting of:



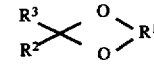
where R', when taken separately, is hydrogen or an aliphatic radical containing up to 25 carbon atoms; R" when taken separately is hydroxy, or an aliphatic radical containing up to 25 carbon atoms, with the proviso that when R' is hydrogen R" may also be an aryl radical of up to 10 carbon atoms and selected from the group consisting of phenyl, phenalkyl, naphthyl, and pyridyl; and R' and R", when taken together with the nitrogen atom to which they are attached, represent a cyclic or heterocylic group of up to 25 carbon atoms;

acyclic tertiary and secondary carboxamides of the formula:



where R' and R", when taken separately, are each hydrogen, C_1–C_5 alkyl or C_1–C_8 hydroxyalkyl and provide a total of no more than 8 carbon atoms, with the proviso that when R' is hydrogen R" may also be alkylcarboxyalkyl of up to 6 carbon atoms; R' and R", when taken together, represent an alkylene group of up to 6 carbon atoms, the opposite ends of which group are attached to the amide nitrogen atom thereby to form a nitrogen heterocycle, the carbon chain of which may optionally be interrupted by oxygen; R_1 is hydrogen or C_1–C_5 alkyl; and R_2 and R_3 are each C_1–C_5 alkyl; with the provisos that (i) R_1, R_2, and R_3 together provide a total of at least 5 carbon atoms; and (ii) when R_1 is hydrogen, R_2 is C_2–C_5 alkyl and R_3 is C_2–C_5 alkyl and at least one of R_2 and R_3 is branched and mixtures thereof.

15. A coolant composition as claimed in claim **13** wherein the ketal coolant component is selected from the group consisting of:



in which R^1 represents a C_2–C_6-alkylene radical having at least 1, but not more than 3, hydroxyl group(s), and either R^2 and R^3 independently of one another represent C_1–C_{10}-alkyl which is optionally substituted by 1 to 3 radicals selected from the group consisting of hydroxyl, amino, halogen, C_5–C_7-cycloalkyl, C_6–C_{12}-aryl, with the proviso that the

total of the C atoms of R^2 and R^3 is not less than 3, or R^2 and R^3 together represent an alkylene radical which, together with the carbon atom which carries the radicals R^2 and R^3, forms a 5–7 membered ring, optionally substituted by C_1–C_6-alkyl groups.

16. A coolant composition as claimed in claim **13** wherein the primary coolant is selected from the group consisting of monomenthyl succinate and monomenthyl sodium succinate.

17. A product as claimed in claim **2** further comprising at least one secondary coolant component selected from the group consisting of menthol, carboxamides, ketals, menthyl acetate, menthyl lactate, 3-menthoxypropane-1,2 diol and mixtures thereof.

18. A product as claimed in claim **17**, wherein the ingestible product is a foodstuff selected from the group consisting of baked goods, dairy products, fruit ices, confectionery products, jams, jellies, gelatins, puddings and animal feeds.

19. A product as claimed in claim **17** which comprises from 0.001–1.0% by weight, based on the total weight of the product, of said primary coolant.

20. A product as claimed in claim **19** wherein the primary coolant is selected from monomenthyl succinate and monomenthyl sodium succinate.

21. A product as claimed in claim **1** further comprising at least one secondary coolant component selected from the group consisting of menthol, carboxamides, ketals, menthyl acetate, menthyl lactate, 3-menthoxypropane-1,2 diol and mixtures thereof.

22. A product as claimed in claim **17** wherein the ingestible product is selected from the group consisting of lozenges, cough mixtures, decongestants, anti-irritants, antacids, anti-indigestion preparations and oral analgesics.

23. A product as claimed in claim **17** wherein the ingestible product is selected from the group consisting of pressed confectionery tablets, hard boiled candies, chewing gums, pectin-based candies, chewy candies, creamed-centered candies, fondants, toothpastes, mouthwashes, breath fresheners, carbonated beverages, mineral waters, powdered beverage mixes and non-alcoholic beverages.

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(54) **COOLANT COMPOSITIONS**

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(58) **Field of Classification Search** ..... None
See application file for complete search history.

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(57) **ABSTRACT**

Coolant compositions, flavorant compositions and ingestible and topical compositions containing at least one coolant compound selected from monomenthyl succinate, alkali metal salts of monomenthyl succinate, alkaline earth metal salts of monomenthyl succinate and mixtures thereof. These compositions are found to provide a pleasant, long-lasting cooling effect without bitterness and the cooling effect manifests itself differently than the cooling effect of other known coolants. As a result, a complementary or synergistic effect can by obtained by combination with other coolants. Further, the succinate-based coolant compounds of the invention are found to enhance the sensation of alcohol in alcoholic beverages.

EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

NO AMENDMENTS HAVE BEEN MADE TO THE PATENT

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1-23** is confirmed.

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