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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SBUX1.380A
		Application Number	
Title of Invention	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS		
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Title of the Invention	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS		
Attorney Docket Number	SBUX1.380A	Small Entity Status Claimed ☐	
Application Type	Nonprovisional		
Subject Matter	Utility		
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Title of Invention	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS		

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For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SBUX1.380A
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Title of Invention	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS		

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		Application Number	
Title of Invention	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS		
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SBUX1.380A
		Application Number	
Title of Invention	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS		

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SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS**FIELD**

[0001] The present disclosure relates to a soluble beverage component and a sealed cartridge containing a single serving of a soluble beverage component for producing a beverage when fluid is introduced into the cartridge. The cartridge can be configured for use with single-serve beverage machines.

BACKGROUND

[0002] Many beverages have a distinct taste and aroma that is difficult to duplicate in a more convenient form. One example of such a beverage is coffee. With regular coffee, water is boiled in a coffee pot in advance, and ground roasted coffee beans are put directly in contact with boiling water (the standard amount is 10 g of ground roasted coffee beans per 100 ml of boiling water) and are boiled in boiling water to effect extraction or are similarly extracted by using a percolator or the like. The obtained extract contains caffeine, tannic acid, saccharides, fats, proteins and various aromatic components and it has a fragrance inherent to coffee and a peculiar complicated flavor inclusive of a bitter taste, an astringent taste and an acid taste.

[0003] Attempts have been made to place soluble beverages such as soluble coffee in cartridges for use in single-serve beverage machines. However, dry soluble coffee creates dust when transported from one container to another. When soluble coffee is introduced into a single-serve cartridge, so much dusting occurs that often the cartridges cannot be sealed correctly. Further, dry soluble coffee material is generally too free flowing to allow efficient commercial processing and packing into self-serve cartridges. Soluble coffee in self-serve cartridges can also dissolve very quickly in water, which can clog the cartridge or self-serve machine and prevent the production of a uniform beverage product.

[0004] Many aromas and flavors associated with coffee are very delicate and complex. With conventional soluble coffee, the delicate coffee flavors and aromas are often degraded or lost during processing and manufacturing methods. Coffee aroma is known to be very unstable. As coffee aroma degrades, it generates unpleasant and non-coffee-like notes that are undesirable. This degradation substantially reduces the perceived quality of

the product. For this reason, special attention must be paid to the preparation and storage of flavoring components such as coffee aroma so that desirable aroma components are enhanced or undesirable components are reduced or eliminated.

SUMMARY OF THE DISCLOSURE

[0005] Some embodiments relate to a method of making a sweetened soluble beverage component, the method comprising combining a soluble beverage, a sweetener and coffee beans in a vessel to form a mixture; agitating the mixture for a predetermined amount of time; and removing the coffee beans from the mixture, wherein the sweetened soluble beverage component comprises the soluble beverage and the sweetener.

[0006] In some embodiments, the sweetener is sugar.

[0007] In some embodiments, the sweetener is granular sugar.

[0008] In some embodiments, the soluble beverage is soluble coffee.

[0009] In some embodiments, the soluble coffee contains pulverized coffee beans.

[0010] In some embodiments, the coffee beans are roasted whole coffee beans.

[0011] In some embodiments, the roasted whole coffee beans are roasted whole espresso beans.

[0012] In some embodiments, agitating the mixture comprises at least one of mixing, blending, tumbling and panning.

[0013] In some embodiments, removing the coffee beans from the mixture comprises filtering the mixture.

[0014] Some embodiments relate to adding to the mixture at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

[0015] Some embodiments relate to placing the sweetened soluble beverage component into a self-serve cartridge.

[0016] Some embodiments relate to a cartridge for producing a single serving of a beverage, the cartridge comprising: a cup comprising a lid, a bottom wall and a sidewall extending between the lid and the bottom wall; and a single serving of a sweetened soluble beverage component disposed in the cartridge, wherein the sweetened soluble beverage component comprises a soluble beverage, a sweetener and oil from coffee beans, wherein

the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing them with the coffee beans which were removed after mixing.

[0017] In some embodiments, the sweetener is sugar.

[0018] In some embodiments, the coffee beans were removed from the sweetened soluble beverage component by filtering.

[0019] Some embodiments relate to a sweetened soluble beverage component comprising a soluble beverage, a sweetener and oil from coffee beans, wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing them with the coffee beans which were removed after mixing.

[0020] In some embodiments, the sweetener is sugar.

[0021] In some embodiments, the soluble beverage is soluble coffee.

[0022] In some embodiments, the coffee beans are roasted whole coffee beans.

BRIEF DESCRIPTION OF THE FIGURES

[0023] The foregoing aspects and many of the attendant advantages will become more readily appreciated as the same become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

[0024] FIG. 1 is a process flow diagram illustrating an overview of one embodiment of a method of making a sweetened soluble beverage component;

[0025] FIG. 2 is a process flow diagram illustrating an overview of one embodiment of a method of making a sweetened soluble coffee component;

[0026] FIG. 3 is a process flow diagram illustrating an overview of one embodiment of a method of making a sweetened soluble coffee component; and

[0027] FIG. 4 is a schematic representation of a beverage cartridge according to certain embodiments of the present disclosure.

DETAILED DESCRIPTION

[0028] The following discussion is presented to enable a person skilled in the art to make and use one or more of the present embodiments. The general principles described herein may be applied to embodiments and applications other than those detailed below without departing from the spirit and scope of the disclosure. Indeed, the present embodiments are not intended to be limited to the particular embodiments shown, but are to

be accorded the widest scope consistent with the principles and features disclosed or suggested herein.

[0029] Language of degree used herein, such as the terms “approximately,” “about,” “generally,” and “substantially” as used herein represent a value, amount or characteristic close to the stated value, amount or characteristic that still performs a desired function or achieves a desired result. For example, the terms “approximately,” “about,” “generally,” and “substantially” may refer to an amount that is within less than 10% of, within less than 5% of, within less than 1% of, within less than 0.1% of, and within less than 0.01% of the stated amount. As another example, in certain embodiments, the terms “generally parallel” and “substantially parallel” refer to a value, amount, or characteristic that departs from exactly parallel by less than or equal to 15°, 10°, 5°, 3°, 1°, 0.1°, or otherwise. Similarly, in certain embodiments, the terms “generally perpendicular” and “substantially perpendicular” refer to a value, amount, or characteristic that departs from exactly perpendicular by less than or equal to 15°, 10°, 5°, 3°, 1°, 0.1°, or otherwise.

[0030] Some embodiments of the present disclosure are directed to soluble beverage components and methods of making soluble beverage components with improved features such as, taste and aroma. Soluble or “instant” beverages, especially in single-serve cartridges allow for an efficient and simple way for a consumer to prepare a beverage at home or other setting. Maintaining the flavors and aromas of the original beverage in the soluble form of the beverage presents unique challenges. For example, the introduction of dry soluble coffee into a self-serve cartridge may cause an unacceptable amount of dusting, which prevents the cartridge from being effectively sealed. Further, such soluble coffee inside a cartridge may dissolve quickly and unevenly when water is introduced by a self-serve machine. This can result in clogging of the cartridge or the machine and the production of an uneven beverage product.

[0031] In some embodiments of the present disclosure, soluble beverage powder is mixed with sweetener and roasted whole coffee beans. The resulting sweetened soluble beverage component has enhanced flavors and aromas, significantly lower amounts of dusting and can be efficiently placed in a self-serve cartridge which can then be properly sealed. While not wishing to be bound by any particular theory, it is postulated that the sweetener, when mixed with the whole coffee beans, removes oil from the coffee beans, a

portion of which is then transferred to the soluble coffee. The resulting mixture is easier to handle and can be transferred and packaged efficiently. Also, the oil from the whole coffee beans may impart higher caffeine content and additional flavor notes and aromas to the soluble beverage, giving it a flavor and aroma more like that of fresh brewed coffee. The oil from the whole coffee beans may also reduce the solubility of the soluble beverage, thereby allowing it to dissolve in a more controlled and uniform manner when mixed with liquid. Therefore, the sweetened soluble beverage component can be used in self-serve beverage cartridges and machines.

[0032] FIGS. 1-4 discussed below illustrate example embodiments in which particular combinations and variables are used. However, the following are in no way meant to limit the scope of the present embodiments which cover modifications and equivalent arrangements included within the spirit and scope of the appended claims. It should be understood that the particulars disclosed below are for illustrative purposes and may vary without departing from the scope of the present disclosure. Each example embodiment will be addressed in turn below with reference to the accompanying figures.

[0033] One example embodiment of the process for preparing such a sweetened soluble beverage component is shown in FIG. 1. Referring to FIG. 1, in accordance with an example embodiment, a soluble beverage 101 is combined with a sweetener 103 and coffee beans 105. The resulting mixture is then agitated for an amount of time in a vessel 107. The mixture is then subjected to a filter 109 to remove the coffee beans 111. The resulting sweetened soluble beverage component 113 is retained.

[0034] FIG. 2 shows another example embodiment of the present disclosure. Referring to FIG. 2, pulverized coffee 204 is added to soluble coffee 201, which is combined with flavoring 202, sugar 203 and whole coffee beans 205 in a mixer 207 to form a mixture. The mixture is agitated for an amount of time, after which, a paper filter 209 is used to remove the coffee beans 211. The sweetened soluble coffee component 213 is retained and then placed in a self-serve cartridge 215.

[0035] Another example embodiment is shown in FIG. 3. Referring to FIG. 3, soluble coffee 301 is combined with vanilla flavoring 302, crystalline fructose 303 and roasted whole espresso beans 305 in a ribbon mixer 307 to form a mixture. The mixture is agitated for an amount of time, after which, a mesh filter 309 is used to remove the

coffee beans 311. The sweetened soluble coffee component 313 is retained and pulverized coffee 314 is added. The combination of sweetened soluble coffee component 313 and pulverized coffee 304 is then placed in a self-serve cartridge 315. The self-serve cartridge can then be placed in a self-serve beverage machine 317 in order to prepare a beverage.

[0036] The sweetener used in the methods described herein is not particularly limited and may include, for example, cane sugar, fructose, corn syrup, crystalline fructose, dextrose, malto-dextrose, maltodextrin, glycerine, threitol, erythritol, rebaudioside A, stevia, xylitol, arabitol, ribitol, sorbitol, mannitol, maltitol, maltotriitol, maltotetraitol, lactitol, hydrogenated isomaltulose, hydrogenated starch, shellac, ethyl cellulose, hydroxy propyl methylcellulose, starches, modified starches, carboxyl cellulose, carrageenan, cellulose acetate phthalate, cellulose acetate trimellitate, chitosan, corn syrup solids, dextrans, fatty alcohols, hydroxy cellulose, hydroxy ethyl cellulose, hydroxy methyl cellulose, hydroxy propyl cellulose, hydroxy propyl ethyl cellulose, hydroxy propyl methyl cellulose, hydroxy propyl methyl cellulose phthalate, polyethylene glycol or a combination thereof. In addition, the sweetener may have various levels of granularity. For example, granulated sugar, baker's sugar, sanding sugar, etc. may be used. In some embodiments a more highly granulated sweetener is used.

[0037] In some embodiments, about half of the sweetener to be used is first introduced to the vessel, followed by the amount of soluble beverage to be used, followed by the other half of the sweetener to be used; however the present embodiments are not so limited. In some embodiments, the soluble beverage and sweetener can be combined first and mixed for an amount of time. Then the whole coffee beans can be added and the resulting mixture mixed for a second amount of time. The ratio of sweetener to soluble beverage is not particularly limited and includes ratios of, for example, 1:100, 1:50, 1:10, 1:5, 1:1, 2:1, 3:1, 4:1, 5:1, 5.5:1, 6:1, 6.5:1, 7:1, 7.5:1, 8:1, 9:1, 10:1, 15:1, 20:1, 50:1 and 100:1. In some embodiments the ratio of sweetener to soluble beverage is about 5:1 to about 10:1. In certain embodiments the ratio of sweetener to soluble beverage is about 17:3.

[0038] Any type of agitation of the mixture of soluble beverage, sweetener and whole coffee beans can be used. Some examples include mixing, blending, tumbling, panning, hand mixing, ribbon blending, etc. In some embodiments, either or both mixing

processes described above can be performed for 10 seconds, 30 seconds, 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 6 minutes, 7 minutes, 8 minutes, 9 minutes, 10 minutes, 11 minutes, 12 minutes, 13 minutes, 14 minutes, 15 minutes, 16 minutes, 17 minutes, 18 minutes, 19 minutes, 20 minutes, 25 minutes, 30 minutes, 40 minutes, 50 minutes, 60 minutes, 2 hours, 3 hours, 4 hours, 12 hours or more. In certain embodiments either or both mixing processes are performed for 1-15 minutes.

[0039] Some embodiments relate to soluble beverage components including pulverized coffee that has not been extracted. Such pulverized coffee can be added to the mixture, for example, before or after (or both before and after) the other ingredients are mixed with the whole coffee beans. In some embodiments, the pulverized coffee has a mean particle size, in diameter, of less than about 2000 microns, less than about 1500 microns, less than about 1000 microns, less than about 900 microns, less than about 800 microns, less than about 700 microns, less than about 600 microns, less than about 500 microns, less than about 450 microns, less than about 400 microns, less than about 350 microns, less than about 300 microns, less than about 250 microns in diameter, less than about 200 microns, less than about 150 microns, less than about 100 microns, or less than about 50 microns.

[0040] In some embodiments, the pulverized coffee has a median particle size, in diameter, of less than about 2000 microns, less than about 1500 microns, less than about 1000 microns, less than about 900 microns, less than about 800 microns, less than about 700 microns, less than about 600 microns, less than about 500 microns, less than about 450 microns, less than about 400 microns, less than about 350 microns, less than about 300 microns in diameter, less than about 250 microns, less than about 200 microns, less than about 150 microns, less than about 100 microns, or less than about 50 microns.

[0041] In some embodiments, the dry addition of pulverized coffee to dry coffee extract adds aroma, flavor complexity and body to the finished bulk product. The addition of pulverized coffee can be accomplished by one or more of many different methods, e.g., centrifugal equipment, lightning mixer, ribbon blender, PK blender, sonic methods, etc. In some embodiments, other compounds may be added during the process, including non-coffee oils, non-coffee aromas, coffee aromas, etc. In some embodiments, pulverized coffee can be encapsulated with carbohydrates, soy products, dairy ingredients or other agents. One advantage of the encapsulation is to protect against degradation from environmental factors.

In some embodiments, encapsulation can also alter the rate of solubility of the coffee components so that coffee aroma components and coffee flavor components are released from the pulverized or ground coffee at different times compared to other ingredients in the coffee product.

[0042] Coffee aromas are volatile components of coffee that produce the characteristic fragrance of coffee. In some embodiments, the coffee aroma can be provided to the final beverage component in the form of a highly aromatized coffee concentrate. The aromatized coffee concentrate is prepared by adding coffee aroma to a coffee concentrate. Methods of preparing coffee concentrates are well known to one of skill in the art.

[0043] In some embodiments, coffee aroma is added to the sweetened soluble beverage component. Such coffee aroma can be in the form of natural coffee aroma components that are collected during the preparation of soluble coffee powder. In some embodiments, the natural coffee aroma includes highly volatile aroma components. Highly volatile aroma components are those which condense at a temperature below about 0°C. To recover highly volatile aroma components, volatile aroma components may be flushed from the coffee during processing using an inert carrier gas such as nitrogen, carbon dioxide gas or carbon dioxide pellets, for example. The aroma-laden carrier gas is then chilled to temperatures lower than about -40°C, and sometimes as low as about -195°C, to cause the aroma components to condense. The condensed aroma components are then collected. Suitable procedures for capturing coffee aroma are known to one of skill in the art.

[0044] In some embodiments, the encapsulation of beverage components can be used to optimize product functionality, particle size and/or create a new product form. Encapsulation can be done with one or more products including, for example, coffee, coffee extracts, coffee concentrates, dry pulverized coffee, coffee oils or other oils, aromas, functional ingredients, etc. In addition, encapsulation can also be done with one or more of carbohydrates, soy products, dairy products, corn syrup, hydrocolloids, polymers, waxes, fats, vegetable oils, gum arabic, lecithin, sucrose-esters, mono-diglycerides, pectin, K-carbonate, K-bicarbonate, Na-carbonate, Na₃PO₄, K₃PO₄, maltodextrin, glycerine, threitol, erythritol, xylitol, arabitol, ribitol, sorbitol, mannitol, maltitol, maltotriitol, maltotetraitol, lactitol, hydrogenated isomaltulose, hydrogenated starch, liposomes, liposomes in sol-gels, shellac, hydrolyzed fats, ethyl cellulose, hydroxy propyl methylcellulose, starches, modified

starches, alginate and alginic acid (e.g., sodium alginate), calcium caseinate, calcium polypectate, carboxyl cellulose, carrageenan, cellulose acetate phthalate, cellulose acetate trimellitate, chitosan, corn syrup solids, dextrans, fatty acids, fatty alcohols, gelatin, gellan gums, hydroxy cellulose, hydroxy ethyl cellulose, hydroxy methyl cellulose, hydroxy propyl cellulose, hydroxy propyl ethyl cellulose, hydroxy propyl methyl cellulose, hydroxy propyl methyl cellulose phthalate, lipids, liposomes, low density polyethylene, mono-, di- and triglycerides, pectins, phospholipids, polyethylene glycol, polylactic polymers, polylactic co-glycolic polymers, polyvinyl pyrrolidone, stearic acid and derivatives, xanthum and proteins, zein, gluten or other agents to protect against environmental elements.

[0045] Also, additional flavoring can be added to the soluble beverage, sweetener or sweetened soluble beverage component at any time during processing. Non-limiting examples of flavoring include vanilla, chocolate, hazelnut, caramel, cinnamon, mint, eggnog, apple, apricot, aromatic bitters, banana, berry, blackberry, blueberry, celery, cherry, cranberry, strawberry, raspberry, juniper berry, brandy, cachaca, carrot, citrus, lemon, lime, orange, grapefruit, tangerine, coconut, cola, menthol, gin, ginger, licorice, hot, milk, nut, almond, macadamia nut, peanut, pecan, pistachio, walnut, peach, pear, pepper, pineapple, plum, quinine, rum, white rum, dark rum, sangria, shellfish, clam, tea, black tea, green tea, tequila, tomato, top note, tropical, vermouth, dry vermouth, sweet vermouth, whiskey, bourbon whiskey, Irish whiskey, rye whiskey, Scotch whisky, Canadian whiskey, red pepper, black pepper, horseradish, wasabi, jalapeno pepper, chipotle pepper essential oils, concretes, absolutes, resins, resinoids, balms, tinctures, soybean oil, coconut oil, palm oil, kern oil, sunflower oil, peanut oil, almond oil, cocoa butter, amyris oil, angelica seed oil, angelica root oil, aniseed oil, valerian oil, basil oil, tarragon oil, eucalyptus citriodora oil, eucalyptus oil, fennel oil, fir needle oil, galbanum oil, galbanum resin, geranium oil, grapefruit oil, guaiac wood oil, guaiac balsam, guaiac balsam oil, helichrysum absolute, helichrysum oil, ginger oil, iris root absolute, iris root oil, jasmin absolute, calmus oil, chamomile oil bleu, chamomile oil roman, carrot seed oil, cascarilla oil, mint oil, carvi oil, labdanum oil, labdanum absolute, labdanum resin, lavandin absolute, lavandin oil, lavender absolute, lavender oil, lemongrass oil, *Bursera penicillata* (linaloe) oil, litsea-cubeba oil, bay laurel leaf oil, macis oil, marjoram oil, mandarin oil, massoirinde oil, mimosa absolute, ambrette seed oil, ambrette tincture, muskatelle salbei oil, nutmeg oil, orange blossom absolute, orange oil,

oregano oil, palmarosa oil, patchouli oil, perilla oil, parsley leaf oil, parsley seed oil, clove seed oil, peppermint oil, pepper oil, pimento oil, pine oil, poley oil, rose absolute, rose wood oil, rose oil, rosemary oil, sage oil, lavandin, sage oil Spanish, sandalwood oil, celery seed oil, lavender spike oil, star anis oil, styrax oil, tagetes oil, pine needle oil, tea-tree oil, turpentine oil, thyme oil, tolu balm, tonka absolute, tuberose absolute, vanilla extract, violet leaf absolute, verbena oil, vetiver oil, juniper berry oil, wine yeast oil, wormwood oil, wintergreen oil, ylang ylang oil, hyssop oil, civet absolute, cinnamon leaf oil, cinnamon bark oil etc. any other type of food flavoring or edible substance or a combination thereof.

[0046] In some embodiments, the sweetened soluble beverage component is placed in a single-serve beverage cartridge. A single-serve beverage cartridge can be configured for use in a single-serve beverage machine, such as an automatic single-serve coffee brewer. The term “cartridge” as used herein shall be given its ordinary and customary meaning, and shall include, without limitation, cartridges, capsules, cups, sachets, pucks, pods and the like.

[0047] Referring to FIG. 4, a cartridge 10 can include a cup 12, a lid 15 and a filter 18. In some embodiments, the cartridge has no filter. The cup 12 has a generally hollow structure having a bottom wall 13, a shoulder 16 and a sidewall 14. The cartridge 10 can have a gradually tapered, generally cylindrical shape; however, other shapes can be used without departing from the spirit and/or scope of the disclosure.

[0048] The cup can include an outwardly extending rim. The lid 15 can be secured, adhered, or otherwise connected with the outwardly extending rim or adjacent thereto, thereby forming a sealed cartridge. The seal can be an airtight seal to reduce entry of ambient air into the cartridge and thus promote freshness of the beverage component. The lid 15 can be secured or adhered to the cartridge using any suitable adhesive or sealing techniques and materials, such as heat-sealing, crimping, gluing, UV-curing, applying ultrasonic or microwave energy (e.g., sonic welding), and otherwise.

[0049] In some embodiments, the cartridge can be vacuum sealed or pressurized. In some embodiments, the oxygen or ambient air in the cartridge is replaced with nitrogen (or another generally non-reactive gas). In certain other embodiments, the oxygen or ambient air in the cartridge is replaced with a combination of nitrogen and carbon-dioxide. Replacement of the oxygen or ambient air in the cartridge can, for example, enhance the

shelf-life of the cartridge and reduce the chance of spoilage or degradation of the contents of the cartridge. In some embodiments, one or more portions of the cartridge (e.g., the cup and/or the lid) are configured to limit or otherwise control the transmission of water vapor and/or oxygen between the beverage component and an external environment (e.g., ambient air) in order to provide an acceptable shelf life. For example, in some cases, the lid 15 has a water vapor transmission rate of less than or equal to about 0.050 g/m²/day (measured as per ASTM F-1249). In certain embodiments, the lid 15 has an oxygen transmission rate of less than or equal to about 0.500 cc/m²/day (measured as per ASTM D3985). Those skilled in the art will recognize that such transmission rates are illustrative and thus, should not be construed as limiting. In some instances, an acceptable shelf life is between about 6 months and about 12 months after assembly of the cartridge. However, depending on the contents of the cartridge, a shelf life that is shorter (e.g., about 3 months) or longer (e.g., about 18 months) may be applicable and is contemplated by this disclosure.

[0050] The cartridge can include a single serving, or single-serve portion, of the beverage component, such as instant coffee, tea, fruit juice, soft drink, or any other beverage that can be produced by mixing one or more substantially soluble beverage components with a fluid. The term soluble as used herein shall be given its ordinary and customary meaning, and shall include, without limitation, products that readily dissolve or disperse in a liquid, such as water or milk.

[0051] In some embodiments, the beverage component includes microground or pulverized coffee, such as that described in U.S. Patent Application Publication No. 2010/0009039, filed July 9, 2008, and titled "METHOD OF MAKING BEVERAGES WITH ENHANCED FLAVORS AND AROMAS," the entirety of which is incorporated herein by reference. For example, in some cases, the instant beverage component includes coffee having a median or mean particle size of about 350 microns or less. In some embodiments, the beverage component includes a combination of dry coffee extract and microground coffee. In certain embodiments, the beverage component includes freeze-dried coffee. In some embodiments, the beverage component includes a combination of freeze-dried coffee and microground coffee. In certain instances, the instant beverage component includes particulate matter, such as particulates of microground coffee.

[0052] The type and amount of beverage component can be selected to provide a beverage having certain desired characteristics. For example, the amount of soluble beverage component 17 can be selected to deliver a predetermined strength of beverage. In some embodiments, the beverage component can include dairy, soy, sugar, artificial sweeteners, nutrients, flavorings, or other components, in addition to, for example, coffee or tea.

[0053] The beverage component can be provided in the cup in many forms. For example, in some embodiments, the beverage component is generally loose and non-compressed. In another embodiment, the beverage component is generally compressed and/or compacted.

[0054] The cup 12 and the lid 15 can be constructed of a liquid-impermeable material that is capable of being pierced or perforated by a piercing member of a single-serve beverage machine to allow the introduction of liquid (e.g., hot water or cold water) into the cartridge. For example, the cup 12 and the lid 15 can be made of one or more metallic (e.g., aluminum), paper-based, polymeric (e.g., plastic, polyethylene, polyurethane, nylon), and/or biodegradable materials. In some embodiments, the cup 12 and/or the lid 15 is constructed of a flexible material. In certain instances, the lid 15 of the cartridge can be pierced or perforated by a piercing member. In such cases, liquid can be injected or otherwise delivered through a piercing member and/or the opening created therefrom into the cup 12, thereby forming a beverage within the cup 12. In other instances, the lid 15 may be constructed of a gas and/or water permeable material that allows a liquid, such as water, to pass through without requirement piercing of the lid.

[0055] In some embodiments, the introduction of liquid into the cartridge encourages mixing of the liquid and the beverage component. For example, the liquid can be introduced as a pressurized (e.g., between about 0.5 bars and about 20 bars) stream, which can impinge the beverage component and/or the cup 12 (e.g., the bottom wall 13) and facilitating mixing. In some embodiments, the liquid is injected in a manner such that liquid and instant beverage component are effectively churned or swirled within the cup 12, thereby allowing the beverage particles to be dispersed and/or dissolved more readily. For example, in some such cases the liquid is injected in a cyclonic fashion.

[0056] Generally, the liquid introduced into the cartridge is water, but most any type of liquid can be used. For example, in some embodiments, the liquid is milk, such as for the preparation of hot cocoa. In other embodiments, the liquid is a juice. In some embodiments, the liquid is carbonated, such as for the preparation of a soft drink. In certain embodiments, the liquid is alcoholic, such as for the preparation of a shot or a cocktail. In some instances, a hot liquid is introduced, e.g., for hot beverages. In other instances, a cold liquid is introduced, e.g., for iced beverages. The amount of liquid introduced can be predetermined or adjusted based on a desired strength of the beverage.

[0057] In some embodiments, after the cartridge has been pierced by a first piercing member, the liquid has been introduced into the cartridge, and the beverage components have been at least partly mixed with and/or dissolved into the liquid, the beverage is ready to exit the cartridge. Accordingly, in some instances, the cup 12 can be configured to provide a location for the liquid to exit the cartridge. For example, the bottom wall 13 can be configured to be pierced or perforated by a piercing member to allow the prepared beverage to exit the cartridge. The piercing member can be a hollow needle or cannula-like element, such that the prepared beverage can flow through the second piercing member for delivery to a cup or other beverage receptacle for consumption (e.g., via a discharge spout). In some embodiments, the prepared beverage does not flow through a piercing member, rather the prepared beverage exits via a hole or opening formed by a piercing member. In certain embodiments, a piercing member pierces approximately the center (e.g., radial center) of the bottom wall 13. In yet other embodiments the cartridge may be fabricated with one or more holes or openings in the bottom wall 13. In such embodiments, the hole(s) may be sealed by a removable tab or other covering that may be stripped from the bottom wall 13 prior to use. In yet other embodiments, the bottom wall 13 is constructed of a gas and/or impermeable material that allows the formed beverage to pass through without requiring piercing or removal of any tab or covering.

[0058] In certain arrangements, components of the cartridge are constructed of a flexible material. For example, in some embodiments, the cup 12 is sufficiently flexible to be able to collapse and expand. Such a configuration can, for example, reduce the storage space occupied by the cartridge and reduce the likelihood of air or other gasses spoiling or otherwise degrading the instant beverage component. In some cases, the cup 12 is collapsed

around the instant beverage component. In some cases, air or other gases are substantially evacuated from the cartridge. In some embodiments, the cup 12 is configured to expand when the liquid is introduced into the cartridge. In certain such cases, the cup 12 expands to about its size and shape prior to collapse.

[0059] In various embodiments, the cartridges described herein are made of biodegradable or otherwise “environmental friendly” materials. The cartridges described herein can be configured for single use. The cartridges described herein can be compatible with one or more existing single-serve beverage machines or technologies.

EXAMPLES

[0060] The following examples are provided for illustrative purposes only, and are in no way intended to limit the scope of the present embodiments.

EXAMPLE 1

Preparation of a Sweetened Soluble Coffee Component

[0061] Into a ribbon mixer, 600 pounds of soluble coffee were combined with 4200 pounds of sugar to form a mixture. First, 2100 pounds of sugar were placed in the ribbon mixer, and then the 600 pounds of soluble coffee were added to the mixer. Then 2100 additional pounds of sugar were added to the mixture. The mixture was then mixed for about four minutes. Roasted whole espresso beans were then added to the mixture, which was then mixed again for about three minutes. The mixture was then passed through a mesh to remove the coffee beans and placed into a self-serve cartridge which was sealed.

EXAMPLE 2

Preparation of a Vanilla-Flavored Sweetened Soluble Coffee Component

[0062] Into a ribbon mixer, 600 pounds of soluble coffee were combined with 4200 pounds of sugar and vanilla flavor powder to form a mixture. First, 2100 pounds of sugar were placed in the ribbon mixer, followed by vanilla flavor powder and then the 600 pounds of soluble coffee were added to the mixer. Then 2100 pounds of sugar were added to the mixture. The mixture was then mixed for about four minutes. Roasted whole espresso beans were then added to the mixture, which was then mixed again for about three minutes. The mixture was then passed through a #8 mesh to remove the coffee beans and placed into a self-serve cartridge which was sealed.

EXAMPLE 3

Preparation of a Cocoa-Flavored Sweetened Soluble Coffee Component

[0063] Into a ribbon mixer, 600 pounds of soluble coffee are combined with 4200 pounds of sugar and cocoa flavor powder to form a mixture. First, 2100 pounds of sugar are placed in the ribbon mixer, followed by cocoa flavor powder and then the 600 pounds of soluble coffee were added to the mixer. Then 2100 additional pounds of sugar are added to the mixture. The mixture is then mixed for about four minutes. Roasted whole espresso beans are then added to the mixture, which is then mixed again for about three minutes. The mixture is then passed through a #8 mesh to remove the coffee beans and placed into a self-serve cartridge which is then sealed.

EXAMPLE 4

Preparation of a Sweetened Soluble Cocoa Component

[0064] Into a ribbon mixer, 600 pounds of cocoa powder are combined with 4200 pounds of sugar to form a mixture. First, 2100 pounds of sugar are placed in the ribbon mixer, followed by 600 pounds of cocoa flavor powder. Then 2100 additional pounds of sugar are added to the mixture. The mixture is then mixed for about four minutes. Roasted whole espresso beans are then added to the mixture, which is then mixed again for about three minutes. The mixture is then passed through a #8 mesh to remove the coffee beans and placed into a self-serve cartridge which is then sealed.

[0065] Although certain embodiments have been described herein with respect to coffee, the methods and compositions described herein can include particulate materials or components for producing many other types of beverages, such as a chocolate based product (e.g., hot cocoa), tea, juice, and other beverages. Further, although some embodiments have been disclosed in which liquid is introduced into a cartridge, the introduction of other phases is contemplated. For example, in some embodiments, steam or a combination of steam and liquid water is introduced into a cartridge. Additionally, although certain embodiments have been disclosed that include a beverage component, the term “beverage component” is not limited to only a single component. Rather, the beverage component can comprise one component or a plurality of components.

[0066] Conditional language, for example, among others, “can,” “could,” “might,” or “may,” unless specifically stated otherwise, or otherwise understood within the context as used, is generally intended to convey that certain embodiments include, while

other embodiments do not include, certain features, elements and/or steps. Thus, such conditional language is not generally intended to imply that features, elements, and/or steps are in any way required for one or more embodiments or that one or more embodiments necessarily include logic for deciding, with or without user input or prompting, whether these features, elements, and/or steps are included or are to be performed in any particular embodiment.

[0067] Although certain embodiments and examples have been described herein, it will be understood by those skilled in the art that many aspects of the methods and devices shown and described in the present disclosure may be differently combined and/or modified to form still further embodiments or acceptable examples. All such modifications and variations are intended to be included herein within the scope of this disclosure. A wide variety of designs and approaches are possible. No feature, structure or step disclosed herein is essential or indispensable.

[0068] Some embodiments have been described in connection with the accompanying drawings. However, it should be understood that the figures are not drawn to scale. Distances, angles, etc. are merely illustrative and do not necessarily bear an exact relationship to actual dimensions and layout of the devices illustrated. Components can be added, removed and/or rearranged. Further, the disclosure herein of any particular feature, aspect, method, property, characteristic, quality, attribute, element, or the like in connection with various embodiments can be used in all other embodiments set forth herein. Additionally, it will be recognized that any methods described herein may be practiced using any device suitable for performing the recited steps.

[0069] For purposes of this disclosure, certain aspects, advantages and novel features are described herein. It is to be understood that not necessarily all such advantages may be achieved in accordance with any particular embodiment. Thus, for example, those skilled in the art will recognize that the disclosure may be embodied or carried out in a manner that achieves one advantage or group of advantages as taught herein without necessarily achieving other advantages as may be taught or suggested herein.

WHAT IS CLAIMED IS:

1. A method of making a sweetened soluble beverage component, the method comprising:

combining a soluble beverage, a sweetener and coffee beans in a vessel to form a mixture;

agitating the mixture for a predetermined amount of time; and

removing the coffee beans from the mixture,

wherein the sweetened soluble beverage component comprises the soluble beverage and the sweetener.

2. The method of Claim 1, wherein the sweetener comprises sugar.

3. The method of Claim 1, wherein the sweetener comprises granular sugar.

4. The method of Claim 1, wherein the soluble beverage comprises soluble coffee.

5. The method of Claim 4, wherein the soluble coffee contains pulverized coffee beans.

6. The method of Claim 1, wherein the coffee beans comprise roasted whole coffee beans.

7. The method of Claim 6, wherein the roasted whole coffee beans comprise roasted whole espresso beans.

8. The method of Claim 1, wherein agitating the mixture comprises at least one of mixing, blending, tumbling and panning.

9. The method of Claim 1, wherein removing the coffee beans from the mixture comprises filtering the mixture.

10. The method of Claim 1, wherein the sweetened soluble beverage component comprises oil from the coffee beans imparted to the soluble beverage and sweetener prior to removing the coffee beans from the mixture.

11. The method of Claim 1, further comprising adding to the mixture at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

12. The method of Claim 1, further comprising placing the sweetened soluble beverage component into a self-serve cartridge.

13. A cartridge for producing a single serving of a beverage, the cartridge comprising:

a cup comprising a lid, a bottom wall and a sidewall extending between the lid and the bottom wall; and

a single serving of a sweetened soluble beverage component disposed in the cartridge,

wherein the sweetened soluble beverage component comprises a soluble beverage, a sweetener and oil from coffee beans,

wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing the soluble beverage and sweetener with the coffee beans, and

wherein the coffee beans were removed after mixing.

14. The cartridge of Claim 13, wherein the sweetener comprises sugar.

15. The cartridge of Claim 13, wherein the sweetener comprises granular sugar.

16. The cartridge of Claim 13, wherein the soluble beverage comprises soluble coffee.

17. The cartridge of Claim 16, wherein the soluble coffee contains pulverized coffee beans.

18. The cartridge of Claim 13, wherein the coffee beans comprise roasted whole coffee beans.

19. The cartridge of Claim 18, wherein the roasted whole coffee beans comprise roasted whole espresso beans.

20. The cartridge of Claim 13, wherein the coffee beans were removed from the sweetened soluble beverage component by filtering.

21. The cartridge of Claim 13, wherein the sweetened soluble beverage component further comprises at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

22. A sweetened soluble beverage component comprising:

a soluble beverage, a sweetener and oil from coffee beans,

wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing the soluble beverage and sweetener with the coffee beans, and

wherein the coffee beans were removed after mixing.

23. The sweetened soluble beverage component of Claim 22, wherein the sweetener comprises sugar.

24. The sweetened soluble beverage component of Claim 22, wherein the sweetener comprises granular sugar.

25. The sweetened soluble beverage component of Claim 22, wherein the soluble beverage comprises soluble coffee.

26. The sweetened soluble beverage component of Claim 25, wherein the soluble coffee contains pulverized coffee beans.

27. The sweetened soluble beverage component of Claim 22, wherein the coffee beans comprise roasted whole coffee beans.

28. The sweetened soluble beverage component of Claim 27, wherein the roasted whole coffee beans comprise roasted whole espresso beans.

29. The sweetened soluble beverage component of Claim 22, wherein the coffee beans were removed from the sweetened soluble beverage component by filtering.

30. The sweetened soluble beverage component of Claim 22, further comprising at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS

ABSTRACT

Present embodiments generally relate to a sweetened soluble beverage component and a single-serve beverage cartridge for use with a single-serve coffee brewer. In some embodiments, the cartridge includes a cup, a lid and a single serving of sweetened soluble beverage component.

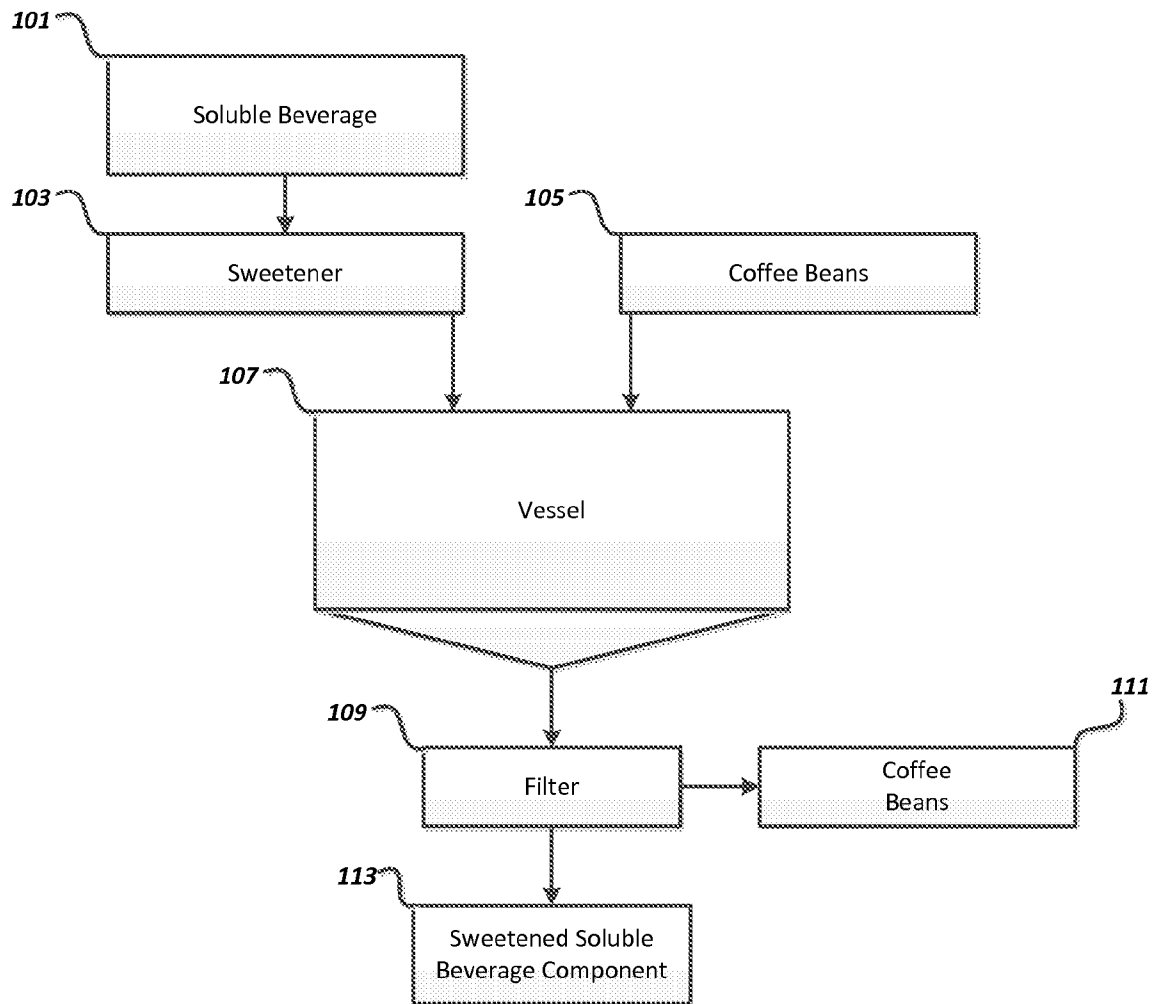


FIG. 1

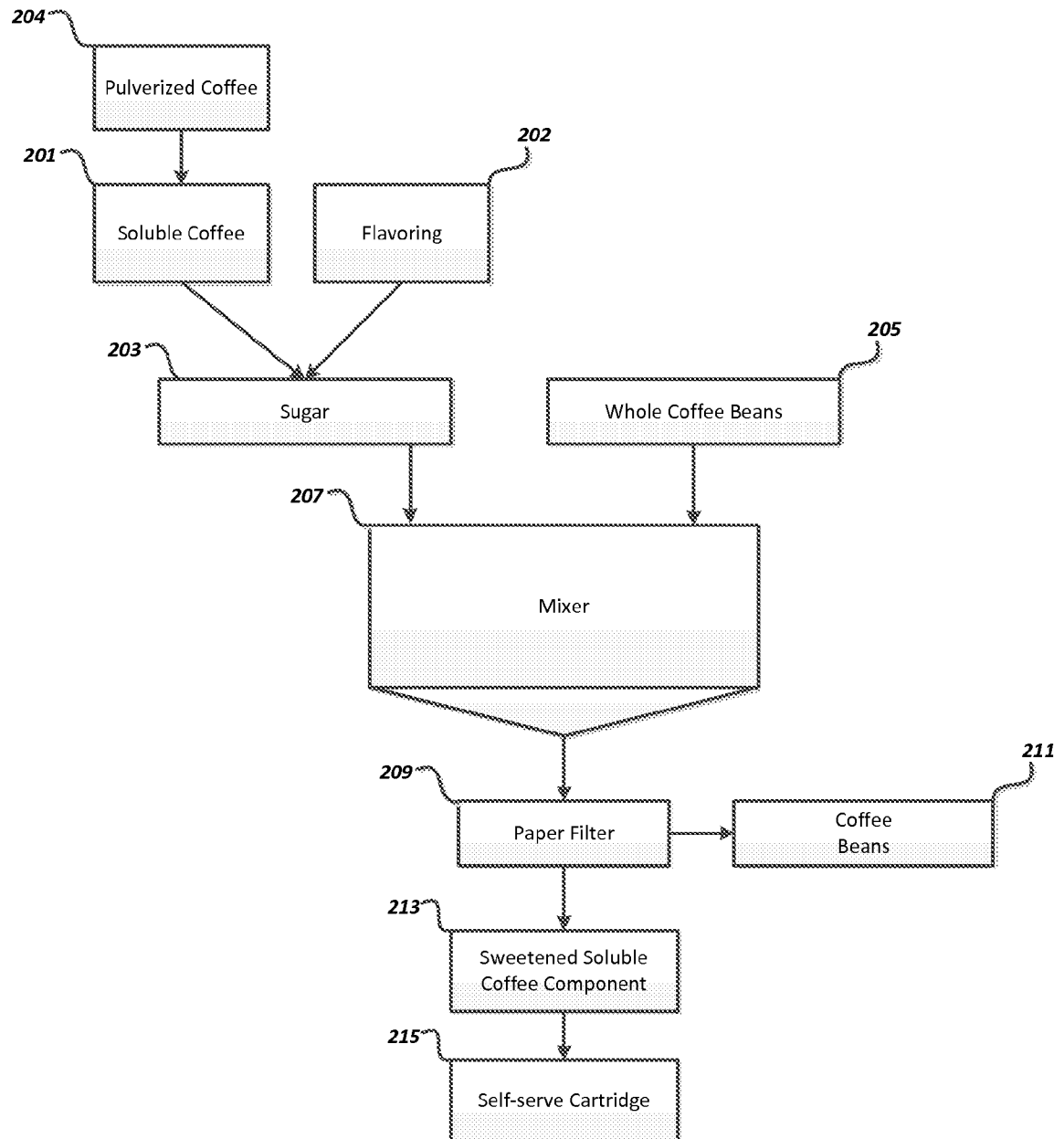


FIG. 2

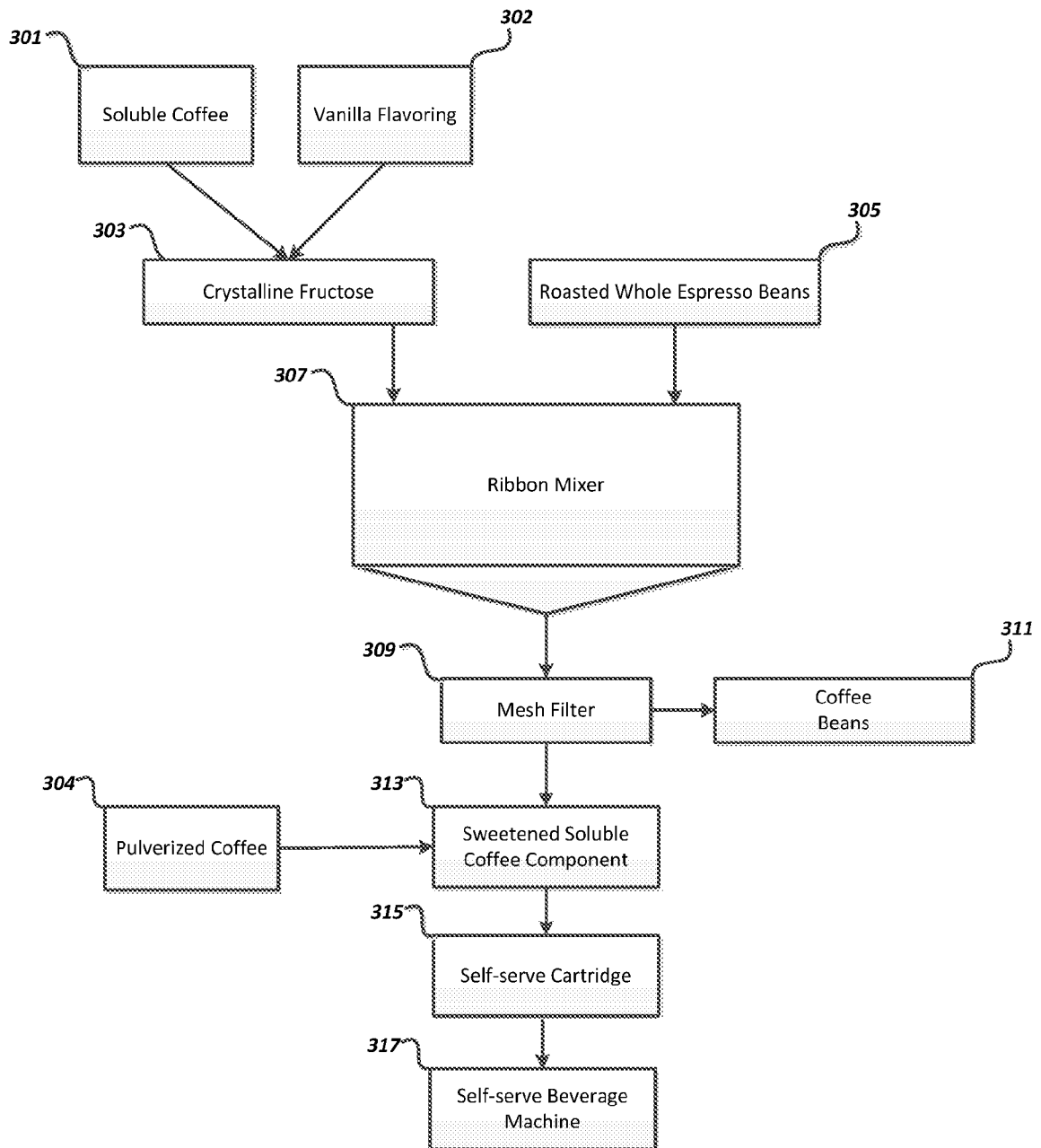


FIG. 3

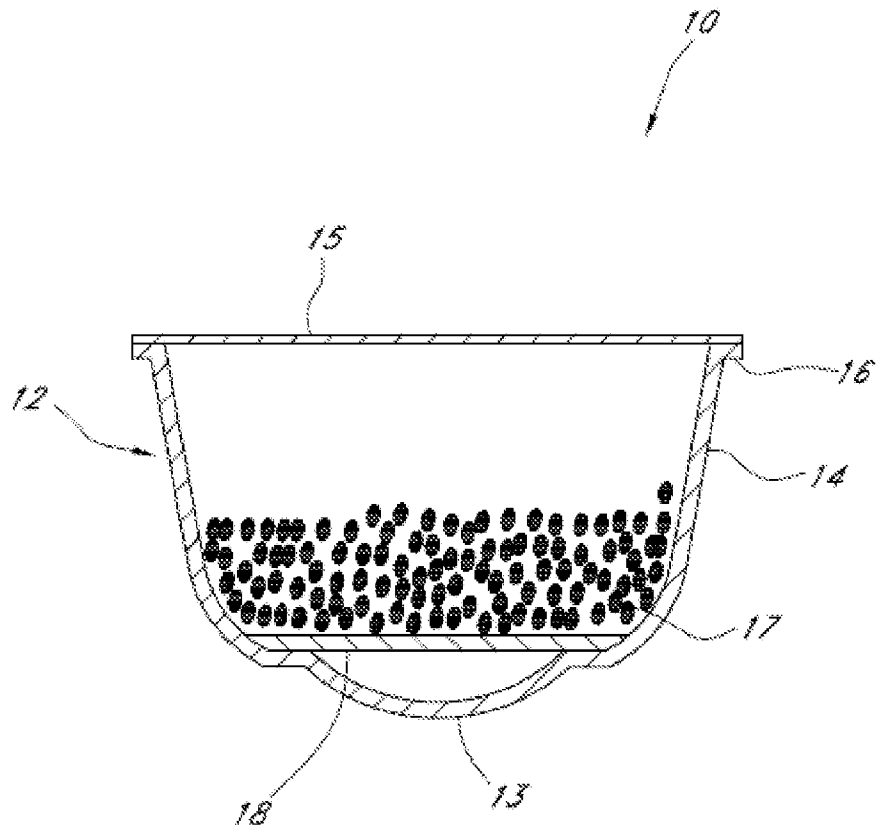


FIG. 4

Electronic Acknowledgement Receipt

EFS ID:	21175942
Application Number:	14594041
International Application Number:	
Confirmation Number:	1342
Title of Invention:	SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS
First Named Inventor/Applicant Name:	Christopher Charles
Customer Number:	20995
Filer:	Christopher Thomas Sweeney/Anthony Bonilla
Filer Authorized By:	Christopher Thomas Sweeney
Attorney Docket Number:	SBUX1.380A
Receipt Date:	09-JAN-2015
Filing Date:	
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Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 2540
RAM confirmation Number	6130
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	2015-01-09_ADS_SBUX1380A.pdf	1560934	no	7
			ae589f00d909ac208b8a28b4a2cb206c18fa3709		
Warnings:					
Information:					
2		2015-01-09_Specification_SBU X1380A.pdf	312356	yes	24
			34519135df3aef3e576b6cdf66d9c15610344127		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	16	
	Claims		17	19	
	Abstract		20	20	
	Drawings-only black and white line drawings		21	24	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	38479	no	2
			b62b433efdd7b5f3449483e7ce44bbfb177e065c		
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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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SCORE Placeholder Sheet for IFW Content

Application Number: 14594041

Document Date: 01/09/2015

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(54) Title: SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS

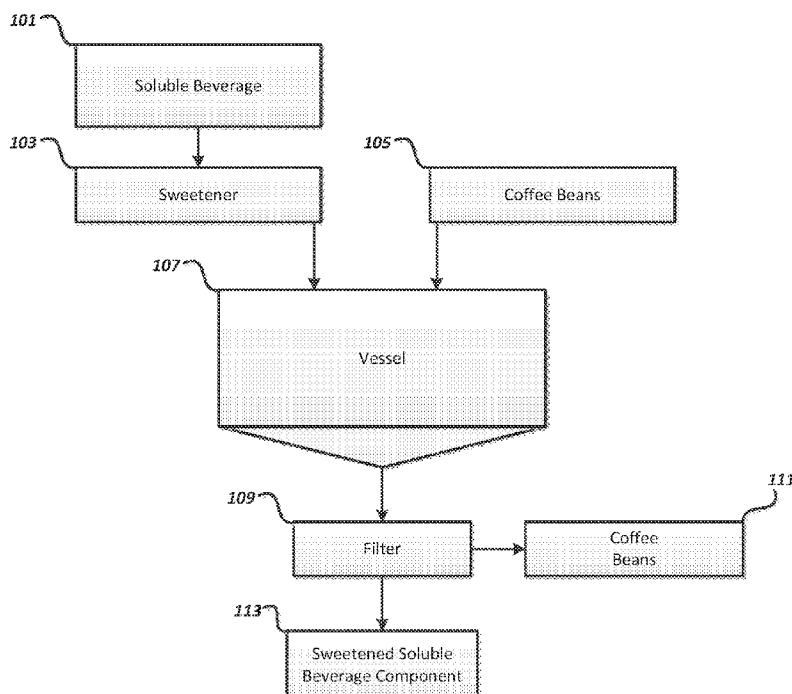


FIG. 1

(57) Abstract: Present embodiments generally relate to a sweetened soluble beverage component and a single-serve beverage cartridge for use with a single-serve coffee brewer. In some embodiments, the cartridge includes a cup, a lid and a single serving of sweetened soluble beverage component.

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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SOLUBLE BEVERAGES WITH ENHANCED FLAVORS AND AROMAS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims benefit of U.S. Application No. 14/594,041, filed January 9, 2015, which is incorporated herein by reference in its entirety.

FIELD

[0001] The present disclosure relates to a soluble beverage component and a sealed cartridge containing a single serving of a soluble beverage component for producing a beverage when fluid is introduced into the cartridge. The cartridge can be configured for use with single-serve beverage machines.

BACKGROUND

[0002] Many beverages have a distinct taste and aroma that is difficult to duplicate in a more convenient form. One example of such a beverage is coffee. With regular coffee, water is boiled in a coffee pot in advance, and ground roasted coffee beans are put directly in contact with boiling water (the standard amount is 10 g of ground roasted coffee beans per 100 ml of boiling water) and are boiled in boiling water to effect extraction or are similarly extracted by using a percolator or the like. The obtained extract contains caffeine, tannic acid, saccharides, fats, proteins and various aromatic components and it has a fragrance inherent to coffee and a peculiar complicated flavor inclusive of a bitter taste, an astringent taste and an acid taste.

[0003] Attempts have been made to place soluble beverages such as soluble coffee in cartridges for use in single-serve beverage machines. However, dry soluble coffee creates dust when transported from one container to another. When soluble coffee is introduced into a single-serve cartridge, so much dusting occurs that often the cartridges cannot be sealed correctly. Further, dry soluble coffee material is generally too free flowing to allow efficient commercial processing and packing into self-serve cartridges. Soluble coffee in self-serve cartridges can also dissolve very quickly in water, which can clog the cartridge or self-serve machine and prevent the production of a uniform beverage product.

[0004] Many aromas and flavors associated with coffee are very delicate and complex. With conventional soluble coffee, the delicate coffee flavors and aromas are often degraded or lost during processing and manufacturing methods. Coffee aroma is known to be very unstable. As coffee aroma degrades, it generates unpleasant and non-coffee-like notes that are undesirable. This degradation substantially reduces the perceived quality of the product. For this reason, special attention must be paid to the preparation and storage of flavoring components such as coffee aroma so that desirable aroma components are enhanced or undesirable components are reduced or eliminated.

SUMMARY OF THE DISCLOSURE

[0005] Some embodiments relate to a method of making a sweetened soluble beverage component, the method comprising combining a soluble beverage, a sweetener and coffee beans in a vessel to form a mixture; agitating the mixture for a predetermined amount of time; and removing the coffee beans from the mixture, wherein the sweetened soluble beverage component comprises the soluble beverage and the sweetener.

[0006] In some embodiments, the sweetener is sugar.

[0007] In some embodiments, the sweetener is granular sugar.

[0008] In some embodiments, the soluble beverage is soluble coffee.

[0009] In some embodiments, the soluble coffee contains pulverized coffee beans.

[0010] In some embodiments, the coffee beans are roasted whole coffee beans.

[0011] In some embodiments, the roasted whole coffee beans are roasted whole espresso beans.

[0012] In some embodiments, agitating the mixture comprises at least one of mixing, blending, tumbling and panning.

[0013] In some embodiments, removing the coffee beans from the mixture comprises filtering the mixture.

[0014] Some embodiments relate to adding to the mixture at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

[0015] Some embodiments relate to placing the sweetened soluble beverage component into a self-serve cartridge.

[0016] Some embodiments relate to a cartridge for producing a single serving of a beverage, the cartridge comprising: a cup comprising a lid, a bottom wall and a sidewall extending between the lid and the bottom wall; and a single serving of a sweetened soluble beverage component disposed in the cartridge, wherein the sweetened soluble beverage component comprises a soluble beverage, a sweetener and oil from coffee beans, wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing them with the coffee beans which were removed after mixing.

[0017] In some embodiments, the sweetener is sugar.

[0018] In some embodiments, the coffee beans were removed from the sweetened soluble beverage component by filtering.

[0019] Some embodiments relate to a sweetened soluble beverage component comprising a soluble beverage, a sweetener and oil from coffee beans, wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing them with the coffee beans which were removed after mixing.

[0020] In some embodiments, the sweetener is sugar.

[0021] In some embodiments, the soluble beverage is soluble coffee.

[0022] In some embodiments, the coffee beans are roasted whole coffee beans.

BRIEF DESCRIPTION OF THE FIGURES

[0023] The foregoing aspects and many of the attendant advantages will become more readily appreciated as the same become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

[0024] FIG. 1 is a process flow diagram illustrating an overview of one embodiment of a method of making a sweetened soluble beverage component;

[0025] FIG. 2 is a process flow diagram illustrating an overview of one embodiment of a method of making a sweetened soluble coffee component;

[0026] FIG. 3 is a process flow diagram illustrating an overview of one embodiment of a method of making a sweetened soluble coffee component; and

[0027] FIG. 4 is a schematic representation of a beverage cartridge according to certain embodiments of the present disclosure.

DETAILED DESCRIPTION

[0028] The following discussion is presented to enable a person skilled in the art to make and use one or more of the present embodiments. The general principles described herein may be applied to embodiments and applications other than those detailed below without departing from the spirit and scope of the disclosure. Indeed, the present embodiments are not intended to be limited to the particular embodiments shown, but are to be accorded the widest scope consistent with the principles and features disclosed or suggested herein.

[0029] Language of degree used herein, such as the terms “approximately,” “about,” “generally,” and “substantially” as used herein represent a value, amount or characteristic close to the stated value, amount or characteristic that still performs a desired function or achieves a desired result. For example, the terms “approximately,” “about,” “generally,” and “substantially” may refer to an amount that is within less than 10% of, within less than 5% of, within less than 1% of, within less than 0.1% of, and within less than 0.01% of the stated amount. As another example, in certain embodiments, the terms “generally parallel” and “substantially parallel” refer to a value, amount, or characteristic that departs from exactly parallel by less than or equal to 15°, 10°, 5°, 3°, 1°, 0.1°, or otherwise. Similarly, in certain embodiments, the terms “generally perpendicular” and “substantially perpendicular” refer to a value, amount, or characteristic that departs from exactly perpendicular by less than or equal to 15°, 10°, 5°, 3°, 1°, 0.1°, or otherwise.

[0030] Some embodiments of the present disclosure are directed to soluble beverage components and methods of making soluble beverage components with improved features such as, taste and aroma. Soluble or “instant” beverages, especially in single-serve cartridges allow for an efficient and simple way for a consumer to prepare a beverage at home or other setting. Maintaining the flavors and aromas of the original beverage in the soluble form of the beverage presents unique challenges. For example, the introduction of dry soluble coffee into a self-serve cartridge may cause an unacceptable amount of dusting, which prevents the cartridge from being effectively sealed. Further, such soluble coffee inside a cartridge may dissolve quickly and unevenly when water is introduced by a self-serve

machine. This can result in clogging of the cartridge or the machine and the production of an uneven beverage product.

[0031] In some embodiments of the present disclosure, soluble beverage powder is mixed with sweetener and roasted whole coffee beans. The resulting sweetened soluble beverage component has enhanced flavors and aromas, significantly lower amounts of dusting and can be efficiently placed in a self-serve cartridge which can then be properly sealed. While not wishing to be bound by any particular theory, it is postulated that the sweetener, when mixed with the whole coffee beans, removes oil from the coffee beans, a portion of which is then transferred to the soluble coffee. The resulting mixture is easier to handle and can be transferred and packaged efficiently. Also, the oil from the whole coffee beans may impart higher caffeine content and additional flavor notes and aromas to the soluble beverage, giving it a flavor and aroma more like that of fresh brewed coffee. The oil from the whole coffee beans may also reduce the solubility of the soluble beverage, thereby allowing it to dissolve in a more controlled and uniform manner when mixed with liquid. Therefore, the sweetened soluble beverage component can be used in self-serve beverage cartridges and machines.

[0032] FIGS. 1-4 discussed below illustrate example embodiments in which particular combinations and variables are used. However, the following are in no way meant to limit the scope of the present embodiments which cover modifications and equivalent arrangements included within the spirit and scope of the appended claims. It should be understood that the particulars disclosed below are for illustrative purposes and may vary without departing from the scope of the present disclosure. Each example embodiment will be addressed in turn below with reference to the accompanying figures.

[0033] One example embodiment of the process for preparing such a sweetened soluble beverage component is shown in FIG. 1. Referring to FIG. 1, in accordance with an example embodiment, a soluble beverage 101 is combined with a sweetener 103 and coffee beans 105. The resulting mixture is then agitated for an amount of time in a vessel 107. The mixture is then subjected to a filter 109 to remove the coffee beans 111. The resulting sweetened soluble beverage component 113 is retained.

[0034] FIG. 2 shows another example embodiment of the present disclosure. Referring to FIG. 2, pulverized coffee 204 is added to soluble coffee 201, which is combined with flavoring 202, sugar 203 and whole coffee beans 205 in a mixer 207 to form a mixture. The mixture is agitated for an amount of time, after which, a paper filter 209 is used to remove the coffee beans 211. The sweetened soluble coffee component 213 is retained and then placed in a self-serve cartridge 215.

[0035] Another example embodiment is shown in FIG. 3. Referring to FIG. 3, soluble coffee 301 is combined with vanilla flavoring 302, crystalline fructose 303 and roasted whole espresso beans 305 in a ribbon mixer 307 to form a mixture. The mixture is agitated for an amount of time, after which, a mesh filter 309 is used to remove the coffee beans 311. The sweetened soluble coffee component 313 is retained and pulverized coffee 314 is added. The combination of sweetened soluble coffee component 313 and pulverized coffee 314 is then placed in a self-serve cartridge 315. The self-serve cartridge can then be placed in a self-serve beverage machine 317 in order to prepare a beverage.

[0036] The sweetener used in the methods described herein is not particularly limited and may include, for example, cane sugar, fructose, corn syrup, crystalline fructose, dextrose, malto-dextrose, maltodextrin, glycerine, threitol, erythritol, rebaudioside A, stevia, xylitol, arabitol, ribitol, sorbitol, mannitol, maltitol, maltotriitol, maltotetraitol, lactitol, hydrogenated isomaltulose, hydrogented starch, shellac, ethyl cellulose, hydroxy propyl methylcellulose, starches, modified starches, carboxyl cellulose, carrageenan, cellulose acetate phthalate, cellulose acetate trimellitate, chitosan, corn syrup solids, dextrans, fatty alcohols, hydroxy cellulose, hydroxy ethyl cellulose, hydroxy methyl cellulose, hydroxy propyl cellulose, hydroxy propyl ethyl cellulose, hydroxy propyl methyl cellulose, hydroxy propyl methyl cellulose phthalate, polyethylene glycol or a combination thereof. In addition, the sweetener may have various levels of granularity. For example, granulated sugar, baker's sugar, sanding sugar, etc. may be used. In some embodiments a more highly granulated sweetener is used.

[0037] In some embodiments, about half of the sweetener to be used is first introduced to the vessel, followed by the amount of soluble beverage to be used, followed by

the other half of the sweetener to be used; however the present embodiments are not so limited. In some embodiments, the soluble beverage and sweetener can be combined first and mixed for an amount of time. Then the whole coffee beans can be added and the resulting mixture mixed for a second amount of time. The ratio of sweetener to soluble beverage is not particularly limited and includes ratios of, for example, 1:100, 1:50, 1:10, 1:5, 1:1, 2:1, 3:1, 4:1, 5:1, 5.5:1, 6:1, 6.5:1, 7:1, 7.5:1, 8:1, 9:1, 10:1, 15:1, 20:1, 50:1 and 100:1. In some embodiments the ratio of sweetener to soluble beverage is about 5:1 to about 10:1. In certain embodiments the ratio of sweetener to soluble beverage is about 17:3.

[0038] Any type of agitation of the mixture of soluble beverage, sweetener and whole coffee beans can be used. Some examples include mixing, blending, tumbling, panning, hand mixing, ribbon blending, etc. In some embodiments, either or both mixing processes described above can be performed for 10 seconds, 30 seconds, 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 6 minutes, 7 minutes, 8 minutes, 9 minutes, 10 minutes, 11 minutes, 12 minutes, 13 minutes, 14 minutes, 15 minutes, 16 minutes, 17 minutes, 18 minutes, 19 minutes, 20 minutes, 25 minutes, 30 minutes, 40 minutes, 50 minutes, 60 minutes, 2 hours, 3 hours, 4 hours, 12 hours or more. In certain embodiments either or both mixing processes are performed for 1-15 minutes.

[0039] Some embodiments relate to soluble beverage components including pulverized coffee that has not been extracted. Such pulverized coffee can be added to the mixture, for example, before or after (or both before and after) the other ingredients are mixed with the whole coffee beans. In some embodiments, the pulverized coffee has a mean particle size, in diameter, of less than about 2000 microns, less than about 1500 microns, less than about 1000 microns, less than about 900 microns, less than about 800 microns, less than about 700 microns, less than about 600 microns, less than about 500 microns, less than about 450 microns, less than about 400 microns, less than about 350 microns, less than about 300 microns, less than about 250 microns in diameter, less than about 200 microns, less than about 150 microns, less than about 100 microns, or less than about 50 microns.

[0040] In some embodiments, the pulverized coffee has a median particle size, in diameter, of less than about 2000 microns, less than about 1500 microns, less than about 1000 microns, less than about 900 microns, less than about 800 microns, less than

about 700 microns, less than about 600 microns, less than about 500 microns, less than about 450 microns, less than about 400 microns, less than about 350 microns, less than about 300 microns in diameter, less than about 250 microns, less than about 200 microns, less than about 150 microns, less than about 100 microns, or less than about 50 microns.

[0041] In some embodiments, the dry addition of pulverized coffee to dry coffee extract adds aroma, flavor complexity and body to the finished bulk product. The addition of pulverized coffee can be accomplished by one or more of many different methods, e.g., centrifugal equipment, lightning mixer, ribbon blender, PK blender, sonic methods, etc. In some embodiments, other compounds may be added during the process, including non-coffee oils, non-coffee aromas, coffee aromas, etc. In some embodiments, pulverized coffee can be encapsulated with carbohydrates, soy products, dairy ingredients or other agents. One advantage of the encapsulation is to protect against degradation from environmental factors. In some embodiments, encapsulation can also alter the rate of solubility of the coffee components so that coffee aroma components and coffee flavor components are released from the pulverized or ground coffee at different times compared to other ingredients in the coffee product.

[0042] Coffee aromas are volatile components of coffee that produce the characteristic fragrance of coffee. In some embodiments, the coffee aroma can be provided to the final beverage component in the form of a highly aromatized coffee concentrate. The aromatized coffee concentrate is prepared by adding coffee aroma to a coffee concentrate. Methods of preparing coffee concentrates are well known to one of skill in the art.

[0043] In some embodiments, coffee aroma is added to the sweetened soluble beverage component. Such coffee aroma can be in the form of natural coffee aroma components that are collected during the preparation of soluble coffee powder. In some embodiments, the natural coffee aroma includes highly volatile aroma components. Highly volatile aroma components are those which condense at a temperature below about 0°C. To recover highly volatile aroma components, volatile aroma components may be flushed from the coffee during processing using an inert carrier gas such as nitrogen, carbon dioxide gas or carbon dioxide pellets, for example. The aroma-laden carrier gas is then chilled to temperatures lower than about -40°C, and sometimes as low as about -195°C, to cause the

aroma components to condense. The condensed aroma components are then collected. Suitable procedures for capturing coffee aroma are known to one of skill in the art.

[0044] In some embodiments, the encapsulation of beverage components can be used to optimize product functionality, particle size and/or create a new product form. Encapsulation can be done with one or more products including, for example, coffee, coffee extracts, coffee concentrates, dry pulverized coffee, coffee oils or other oils, aromas, functional ingredients, etc. In addition, encapsulation can also be done with one or more of carbohydrates, soy products, dairy products, corn syrup, hydrocolloids, polymers, waxes, fats, vegetable oils, gum arabic, lecithin, sucrose-esters, mono-diglycerides, pectin, K-carbonate, K-bicarbonate, Na-carbonate, Na_3PO_4 , K_3PO_4 , maltodextrin, glycerine, threitol, erythritol, xylitol, arabitol, ribitol, sorbitol, mannitol, maltitol, maltotriitol, maltotetraitol, lactitol, hydrogenated isomaltulose, hydrogenated starch, liposomes, liposomes in sol-gels, shellac, hydrolyzed fats, ethyl cellulose, hydroxy propyl methylcellulose, starches, modified starches, alginate and alginic acid (e.g., sodium alginate), calcium caseinate, calcium polypectate, carboxyl cellulose, carrageenan, cellulose acetate phthalate, cellulose acetate trimellitate, chitosan, corn syrup solids, dextrans, fatty acids, fatty alcohols, gelatin, gellan gums, hydroxy cellulose, hydroxy ethyl cellulose, hydroxy methyl cellulose, hydroxy propyl cellulose, hydroxy propyl ethyl cellulose, hydroxy propyl methyl cellulose, hydroxy propyl methyl cellulose phthalate, lipids, liposomes, low density polyethylene, mono-, di- and tri-glycerides, pectins, phospholipids, polyethylene glycol, polylactic polymers, polylactic co-glycolic polymers, polyvinyl pyrrolidone, stearic acid and derivatives, xanthan and proteins, zein, gluten or other agents to protect against environmental elements.

[0045] Also, additional flavoring can be added to the soluble beverage, sweetener or sweetened soluble beverage component at any time during processing. Non-limiting examples of flavoring include vanilla, chocolate, hazelnut, caramel, cinnamon, mint, eggnog, apple, apricot, aromatic bitters, banana, berry, blackberry, blueberry, celery, cherry, cranberry, strawberry, raspberry, juniper berry, brandy, cachaca, carrot, citrus, lemon, lime, orange, grapefruit, tangerine, coconut, cola, menthol, gin, ginger, licorice, hot, milk, nut, almond, macadamia nut, peanut, pecan, pistachio, walnut, peach, pear, pepper, pineapple, plum, quinine, rum, white rum, dark rum, sangria, shellfish, clam, tea, black tea, green tea,

tequila, tomato, top note, tropical, vermouth, dry vermouth, sweet vermouth, whiskey, bourbon whiskey, Irish whiskey, rye whiskey, Scotch whisky, Canadian whiskey, red pepper, black pepper, horseradish, wasabi, jalapeno pepper, chipotle pepper essential oils, concretes, absolutes, resins, resinoids, balms, tinctures, soybean oil, coconut oil, palm oil, kern oil, sunflower oil, peanut oil, almond oil, cocoa butter, amyris oil, angelica seed oil, angelica root oil, aniseed oil, valerian oil, basil oil, tarragon oil, eucalyptus citriodora oil, eucalyptus oil, fennel oil, fir needle oil, galbanum oil, galbanum resin, geranium oil, grapefruit oil, guaiac wood oil, guaiac balsam, guaiac balsam oil, helichrysum absolute, helichrysum oil, ginger oil, iris root absolute, iris root oil, jasmin absolute, calmus oil, chamomile oil bleu, chamomile oil roman, carrot seed oil, cascarilla oil, mint oil, carvi oil, labdanum oil, labdanum absolute, labdanum resin, lavandin absolute, lavandin oil, lavender absolute, lavender oil, lemongrass oil, Bursera penicillata (linaloe) oil, litsea-cubeba oil, bay laurel leaf oil, macis oil, marjoram oil, mandarin oil, massoirinde oil, mimosa absolute, ambrette seed oil, ambrette tincture, muskatelle salbei oil, nutmeg oil, orange blossom absolute, orange oil, oregano oil, palmarosa oil, patchouli oil, perilla oil, parsley leaf oil, parsley seed oil, clove seed oil, peppermint oil, pepper oil, pimento oil, pine oil, poley oil, rose absolute, rose wood oil, rose oil, rosemary oil, sage oil, lavandin, sage oil Spanish, sandalwood oil, celery seed oil, lavender spike oil, star anis oil, styrax oil, tagetes oil, pine needle oil, tea-tree oil, turpentine oil, thyme oil, tolu balm, tonka absolute, tuberose absolute, vanilla extract, violet leaf absolute, verbena oil, vetiver oil, juniper berry oil, wine yeast oil, wormwood oil, wintergreen oil, ylang ylang oil, hyssop oil, civet absolute, cinnamon leaf oil, cinnamon bark oil etc. any other type of food flavoring or edible substance or a combination thereof.

[0046] In some embodiments, the sweetened soluble beverage component is placed in a single-serve beverage cartridge. A single-serve beverage cartridge can be configured for use in a single-serve beverage machine, such as an automatic single-serve coffee brewer. The term “cartridge” as used herein shall be given its ordinary and customary meaning, and shall include, without limitation, cartridges, capsules, cups, sachets, pucks, pods and the like.

[0047] Referring to FIG. 4, a cartridge 10 can include a cup 12, a lid 15 and a filter 18. In some embodiments, the cartridge has no filter. The cup 12 has a generally

hollow structure having a bottom wall 13, a shoulder 16 and a sidewall 14. The cartridge 10 can have a gradually tapered, generally cylindrical shape; however, other shapes can be used without departing from the spirit and/or scope of the disclosure.

[0048] The cup can include an outwardly extending rim. The lid 15 can be secured, adhered, or otherwise connected with the outwardly extending rim or adjacent thereto, thereby forming a sealed cartridge. The seal can be an airtight seal to reduce entry of ambient air into the cartridge and thus promote freshness of the beverage component. The lid 15 can be secured or adhered to the cartridge using any suitable adhesive or sealing techniques and materials, such as heat-sealing, crimping, gluing, UV-curing, applying ultrasonic or microwave energy (e.g., sonic welding), and otherwise.

[0049] In some embodiments, the cartridge can be vacuum sealed or pressurized. In some embodiments, the oxygen or ambient air in the cartridge is replaced with nitrogen (or another generally non-reactive gas). In certain other embodiments, the oxygen or ambient air in the cartridge is replaced with a combination of nitrogen and carbon-dioxide. Replacement of the oxygen or ambient air in the cartridge can, for example, enhance the shelf-life of the cartridge and reduce the chance of spoilage or degradation of the contents of the cartridge. In some embodiments, one or more portions of the cartridge (e.g., the cup and/or the lid) are configured to limit or otherwise control the transmission of water vapor and/or oxygen between the beverage component and an external environment (e.g., ambient air) in order to provide an acceptable shelf life. For example, in some cases, the lid 15 has a water vapor transmission rate of less than or equal to about $0.050 \text{ g/m}^2/\text{day}$ (measured as per ASTM F-1249). In certain embodiments, the lid 15 has an oxygen transmission rate of less than or equal to about $0.500 \text{ cc/m}^2/\text{day}$ (measured as per ASTM D3985). Those skilled in the art will recognize that such transmission rates are illustrative and thus, should not be construed as limiting. In some instances, an acceptable shelf life is between about 6 months and about 12 months after assembly of the cartridge. However, depending on the contents of the cartridge, a shelf life that is shorter (e.g., about 3 months) or longer (e.g., about 18 months) may be applicable and is contemplated by this disclosure.

[0050] The cartridge can include a single serving, or single-serve portion, of the beverage component, such as instant coffee, tea, fruit juice, soft drink, or any other beverage

that can be produce by mixing one or more substantially soluble beverage components with a fluid. The term soluble as used herein shall be given its ordinary and customary meaning, and shall include, without limitation, products that readily dissolve or disperse in a liquid, such as water or milk.

[0051] In some embodiments, the beverage component includes microground or pulverized coffee, such as that described in U.S. Patent Application Publication No. 2010/0009039, filed July 9, 2008, and titled “METHOD OF MAKING BEVERAGES WITH ENHANCED FLAVORS AND AROMAS,” the entirety of which is incorporated herein by reference. For example, in some cases, the instant beverage component includes coffee having a median or mean particle size of about 350 microns or less. In some embodiments, the beverage component includes a combination of dry coffee extract and microground coffee. In certain embodiments, the beverage component includes freeze-dried coffee. In some embodiments, the beverage component includes a combination of freeze-dried coffee and microground coffee. In certain instances, the instant beverage component includes particulate matter, such as particulates of microground coffee.

[0052] The type and amount of beverage component can be selected to provide a beverage having certain desired characteristics. For example, the amount of soluble beverage component 17 can be selected to deliver a predetermined strength of beverage. In some embodiments, the beverage component can include dairy, soy, sugar, artificial sweeteners, nutrients, flavorings, or other components, in addition to, for example, coffee or tea.

[0053] The beverage component can be provided in the cup in many forms. For example, in some embodiments, the beverage component is generally loose and non-compressed. In another embodiment, the beverage component is generally compressed and/or compacted.

[0054] The cup 12 and the lid 15 can be constructed of a liquid-impermeable material that is capable of being pierced or perforated by a piercing member of a single-serve beverage machine to allow the introduction of liquid (e.g., hot water or cold water) into the cartridge. For example, the cup 12 and the lid 15 can be made of one or more metallic (e.g., aluminum), paper-based, polymeric (e.g., plastic, polyethylene, polyurethane, nylon), and/or biodegradable materials. In some embodiments, the cup 12 and/or the lid 15 is

constructed of a flexible material. In certain instances, the lid 15 of the cartridge can be pierced or perforated by a piercing member. In such cases, liquid can be injected or otherwise delivered through a piercing member and/or the opening created therefrom into the cup 12, thereby forming a beverage within the cup 12. In other instances, the lid 15 may be constructed of a gas and/or water permeable material that allows a liquid, such as water, to pass through without requirement piercing of the lid.

[0055] In some embodiments, the introduction of liquid into the cartridge encourages mixing of the liquid and the beverage component. For example, the liquid can be introduced as a pressurized (e.g., between about 0.5 bars and about 20 bars) stream, which can impinge the beverage component and/or the cup 12 (e.g., the bottom wall 13) and facilitating mixing. In some embodiments, the liquid is injected in a manner such that liquid and instant beverage component are effectively churned or swirled within the cup 12, thereby allowing the beverage particles to be dispersed and/or dissolved more readily. For example, in some such cases the liquid is injected in a cyclonic fashion.

[0056] Generally, the liquid introduced into the cartridge is water, but most any type of liquid can be used. For example, in some embodiments, the liquid is milk, such as for the preparation of hot cocoa. In other embodiments, the liquid is a juice. In some embodiments, the liquid is carbonated, such as for the preparation of a soft drink. In certain embodiments, the liquid is alcoholic, such as for the preparation of a shot or a cocktail. In some instances, a hot liquid is introduced, e.g., for hot beverages. In other instances, a cold liquid is introduced, e.g., for iced beverages. The amount of liquid introduced can be predetermined or adjusted based on a desired strength of the beverage.

[0057] In some embodiments, after the cartridge has been pierced by a first piercing member, the liquid has been introduced into the cartridge, and the beverage components have been at least partly mixed with and/or dissolved into the liquid, the beverage is ready to exit the cartridge. Accordingly, in some instances, the cup 12 can be configured to provide a location for the liquid to exit the cartridge. For example, the bottom wall 13 can be configured to be pierced or perforated by a piercing member to allow the prepared beverage to exit the cartridge. The piercing member can be a hollow needle or cannula-like element, such that the prepared beverage can flow through the second piercing

member for delivery to a cup or other beverage receptacle for consumption (e.g., via a discharge spout). In some embodiments, the prepared beverage does not flow through a piercing member, rather the prepared beverage exits via a hole or opening formed by a piercing member. In certain embodiments, a piercing member pierces approximately the center (e.g., radial center) of the bottom wall 13. In yet other embodiments the cartridge may be fabricated with one or more holes or openings in the bottom wall 13. In such embodiments, the hole(s) may be sealed by a removable tab or other covering that may be stripped from the bottom wall 13 prior to use. In yet other embodiments, the bottom wall 13 is constructed of a gas and/or impermeable material that allows the formed beverage to pass through without requiring piercing or removal of any tab or covering.

[0058] In certain arrangements, components of the cartridge are constructed of a flexible material. For example, in some embodiments, the cup 12 is sufficiently flexible to be able to collapse and expand. Such a configuration can, for example, reduce the storage space occupied by the cartridge and reduce the likelihood of air or other gasses spoiling or otherwise degrading the instant beverage component. In some cases, the cup 12 is collapsed around the instant beverage component. In some cases, air or other gases are substantially evacuated from the cartridge. In some embodiments, the cup 12 is configured to expand when the liquid is introduced into the cartridge. In certain such cases, the cup 12 expands to about its size and shape prior to collapse.

[0059] In various embodiments, the cartridges described herein are made of biodegradable or otherwise “environmental friendly” materials. The cartridges described herein can be configured for single use. The cartridges described herein can be compatible with one or more existing single-serve beverage machines or technologies.

EXAMPLES

[0060] The following examples are provided for illustrative purposes only, and are in no way intended to limit the scope of the present embodiments.

EXAMPLE 1

Preparation of a Sweetened Soluble Coffee Component

[0061] Into a ribbon mixer, 600 pounds of soluble coffee were combined with 4200 pounds of sugar to form a mixture. First, 2100 pounds of sugar were placed in the

ribbon mixer, and then the 600 pounds of soluble coffee were added to the mixer. Then 2100 additional pounds of sugar were added to the mixture. The mixture was then mixed for about four minutes. Roasted whole espresso beans were then added to the mixture, which was then mixed again for about three minutes. The mixture was then passed through a mesh to remove the coffee beans and placed into a self-serve cartridge which was sealed.

EXAMPLE 2

Preparation of a Vanilla-Flavored Sweetened Soluble Coffee Component

[0062] Into a ribbon mixer, 600 pounds of soluble coffee were combined with 4200 pounds of sugar and vanilla flavor powder to form a mixture. First, 2100 pounds of sugar were placed in the ribbon mixer, followed by vanilla flavor powder and then the 600 pounds of soluble coffee were added to the mixer. Then 2100 pounds of sugar were added to the mixture. The mixture was then mixed for about four minutes. Roasted whole espresso beans were then added to the mixture, which was then mixed again for about three minutes. The mixture was then passed through a #8 mesh to remove the coffee beans and placed into a self-serve cartridge which was sealed.

EXAMPLE 3

Preparation of a Cocoa-Flavored Sweetened Soluble Coffee Component

[0063] Into a ribbon mixer, 600 pounds of soluble coffee are combined with 4200 pounds of sugar and cocoa flavor powder to form a mixture. First, 2100 pounds of sugar are placed in the ribbon mixer, followed by cocoa flavor powder and then the 600 pounds of soluble coffee were added to the mixer. Then 2100 additional pounds of sugar are added to the mixture. The mixture is then mixed for about four minutes. Roasted whole espresso beans are then added to the mixture, which is then mixed again for about three minutes. The mixture is then passed through a #8 mesh to remove the coffee beans and placed into a self-serve cartridge which is then sealed.

EXAMPLE 4

Preparation of a Sweetened Soluble Cocoa Component

[0064] Into a ribbon mixer, 600 pounds of cocoa powder are combined with 4200 pounds of sugar to form a mixture. First, 2100 pounds of sugar are placed in the ribbon mixer, followed by 600 pounds of cocoa flavor powder. Then 2100 additional pounds of

sugar are added to the mixture. The mixture is then mixed for about four minutes. Roasted whole espresso beans are then added to the mixture, which is then mixed again for about three minutes. The mixture is then passed through a #8 mesh to remove the coffee beans and placed into a self-serve cartridge which is then sealed.

[0065] Although certain embodiments have been described herein with respect to coffee, the methods and compositions described herein can include particulate materials or components for producing many other types of beverages, such as a chocolate based product (e.g., hot cocoa), tea, juice, and other beverages. Further, although some embodiments have been disclosed in which liquid is introduced into a cartridge, the introduction of other phases is contemplated. For example, in some embodiments, steam or a combination of steam and liquid water is introduced into a cartridge. Additionally, although certain embodiments have been disclosed that include a beverage component, the term “beverage component” is not limited to only a single component. Rather, the beverage component can comprise one component or a plurality of components.

[0066] Conditional language, for example, among others, “can,” “could,” “might,” or “may,” unless specifically stated otherwise, or otherwise understood within the context as used, is generally intended to convey that certain embodiments include, while other embodiments do not include, certain features, elements and/or steps. Thus, such conditional language is not generally intended to imply that features, elements, and/or steps are in any way required for one or more embodiments or that one or more embodiments necessarily include logic for deciding, with or without user input or prompting, whether these features, elements, and/or steps are included or are to be performed in any particular embodiment.

[0067] Although certain embodiments and examples have been described herein, it will be understood by those skilled in the art that many aspects of the methods and devices shown and described in the present disclosure may be differently combined and/or modified to form still further embodiments or acceptable examples. All such modifications and variations are intended to be included herein within the scope of this disclosure. A wide variety of designs and approaches are possible. No feature, structure or step disclosed herein is essential or indispensable.

[0068] Some embodiments have been described in connection with the accompanying drawings. However, it should be understood that the figures are not drawn to scale. Distances, angles, etc. are merely illustrative and do not necessarily bear an exact relationship to actual dimensions and layout of the devices illustrated. Components can be added, removed and/or rearranged. Further, the disclosure herein of any particular feature, aspect, method, property, characteristic, quality, attribute, element, or the like in connection with various embodiments can be used in all other embodiments set forth herein. Additionally, it will be recognized that any methods described herein may be practiced using any device suitable for performing the recited steps.

[0069] For purposes of this disclosure, certain aspects, advantages and novel features are described herein. It is to be understood that not necessarily all such advantages may be achieved in accordance with any particular embodiment. Thus, for example, those skilled in the art will recognize that the disclosure may be embodied or carried out in a manner that achieves one advantage or group of advantages as taught herein without necessarily achieving other advantages as may be taught or suggested herein.

WHAT IS CLAIMED IS:

1. A method of making a sweetened soluble beverage component, the method comprising:

combining a soluble beverage, a sweetener and coffee beans in a vessel to form a mixture;

agitating the mixture for a predetermined amount of time; and

removing the coffee beans from the mixture,

wherein the sweetened soluble beverage component comprises the soluble beverage and the sweetener.

2. The method of Claim 1, wherein the sweetener comprises sugar.

3. The method of Claim 1, wherein the sweetener comprises granular sugar.

4. The method of Claim 1, wherein the soluble beverage comprises soluble coffee.

5. The method of Claim 4, wherein the soluble coffee contains pulverized coffee beans.

6. The method of Claim 1, wherein the coffee beans comprise roasted whole coffee beans.

7. The method of Claim 6, wherein the roasted whole coffee beans comprise roasted whole espresso beans.

8. The method of Claim 1, wherein agitating the mixture comprises at least one of mixing, blending, tumbling and panning.

9. The method of Claim 1, wherein removing the coffee beans from the mixture comprises filtering the mixture.

10. The method of Claim 1, wherein the sweetened soluble beverage component comprises oil from the coffee beans imparted to the soluble beverage and sweetener prior to removing the coffee beans from the mixture.

11. The method of Claim 1, further comprising adding to the mixture at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

12. The method of Claim 1, further comprising placing the sweetened soluble beverage component into a self-serve cartridge.

13. A cartridge for producing a single serving of a beverage, the cartridge comprising:
a cup comprising a lid, a bottom wall and a sidewall extending between the lid and the bottom wall; and
a single serving of a sweetened soluble beverage component disposed in the cartridge,
wherein the sweetened soluble beverage component comprises a soluble beverage, a sweetener and oil from coffee beans,
wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing the soluble beverage and sweetener with the coffee beans, and
wherein the coffee beans were removed after mixing.
14. The cartridge of Claim 13, wherein the sweetener comprises sugar.
15. The cartridge of Claim 13, wherein the sweetener comprises granular sugar.
16. The cartridge of Claim 13, wherein the soluble beverage comprises soluble coffee.
17. The cartridge of Claim 16, wherein the soluble coffee contains pulverized coffee beans.
18. The cartridge of Claim 13, wherein the coffee beans comprise roasted whole coffee beans.
19. The cartridge of Claim 18, wherein the roasted whole coffee beans comprise roasted whole espresso beans.
20. The cartridge of Claim 13, wherein the coffee beans were removed from the sweetened soluble beverage component by filtering.
21. The cartridge of Claim 13, wherein the sweetened soluble beverage component further comprises at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.
22. A sweetened soluble beverage component comprising:
a soluble beverage, a sweetener and oil from coffee beans,
wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing the soluble beverage and sweetener with the coffee beans, and
wherein the coffee beans were removed after mixing.

23. The sweetened soluble beverage component of Claim 22, wherein the sweetener comprises sugar.

24. The sweetened soluble beverage component of Claim 22, wherein the sweetener comprises granular sugar.

25. The sweetened soluble beverage component of Claim 22, wherein the soluble beverage comprises soluble coffee.

26. The sweetened soluble beverage component of Claim 25, wherein the soluble coffee contains pulverized coffee beans.

27. The sweetened soluble beverage component of Claim 22, wherein the coffee beans comprise roasted whole coffee beans.

28. The sweetened soluble beverage component of Claim 27, wherein the roasted whole coffee beans comprise roasted whole espresso beans.

29. The sweetened soluble beverage component of Claim 22, wherein the coffee beans were removed from the sweetened soluble beverage component by filtering.

30. The sweetened soluble beverage component of Claim 22, further comprising at least one of a dairy component, a spice, a cocoa, a fruit powder and a flavoring component.

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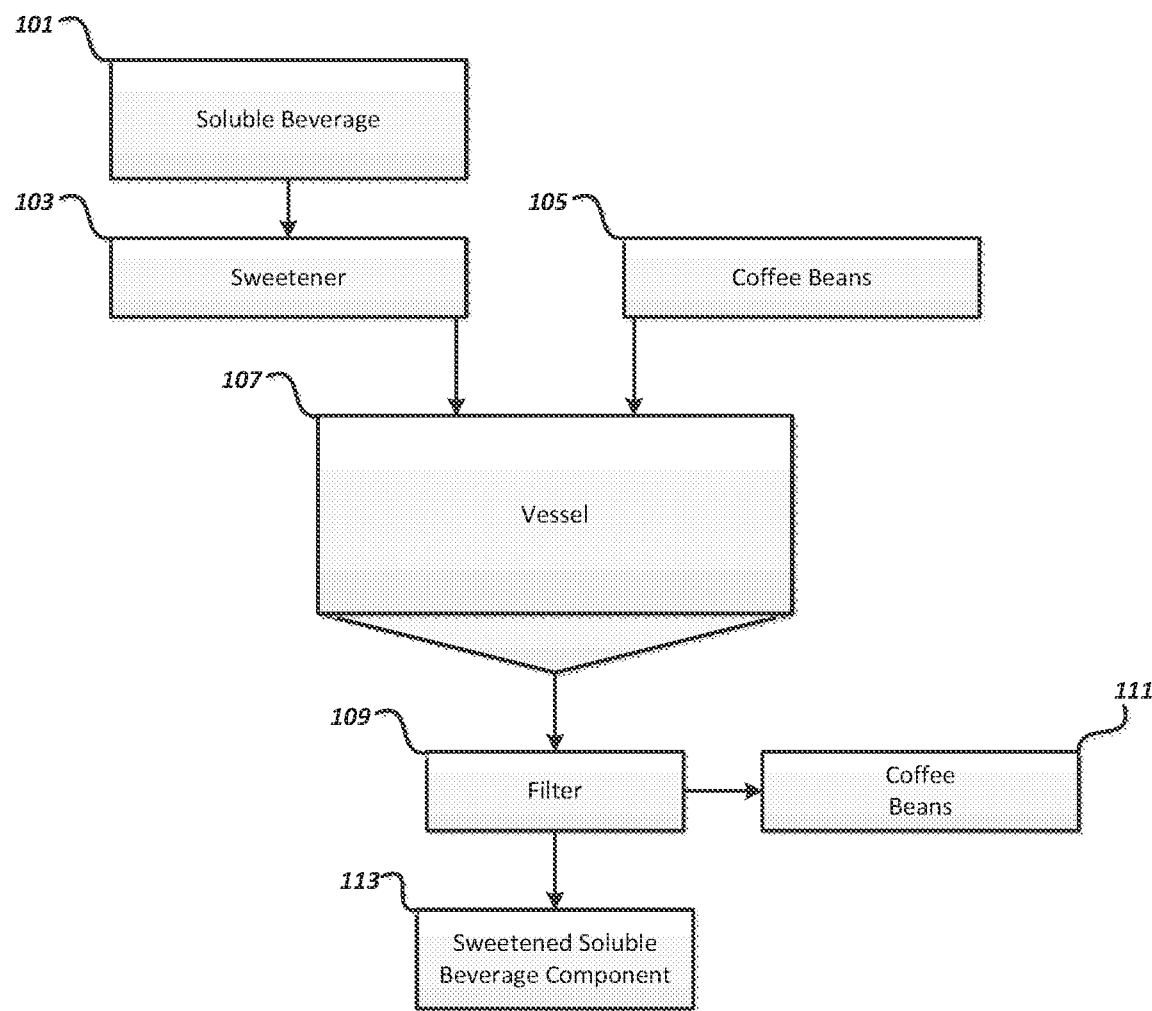


FIG. 1

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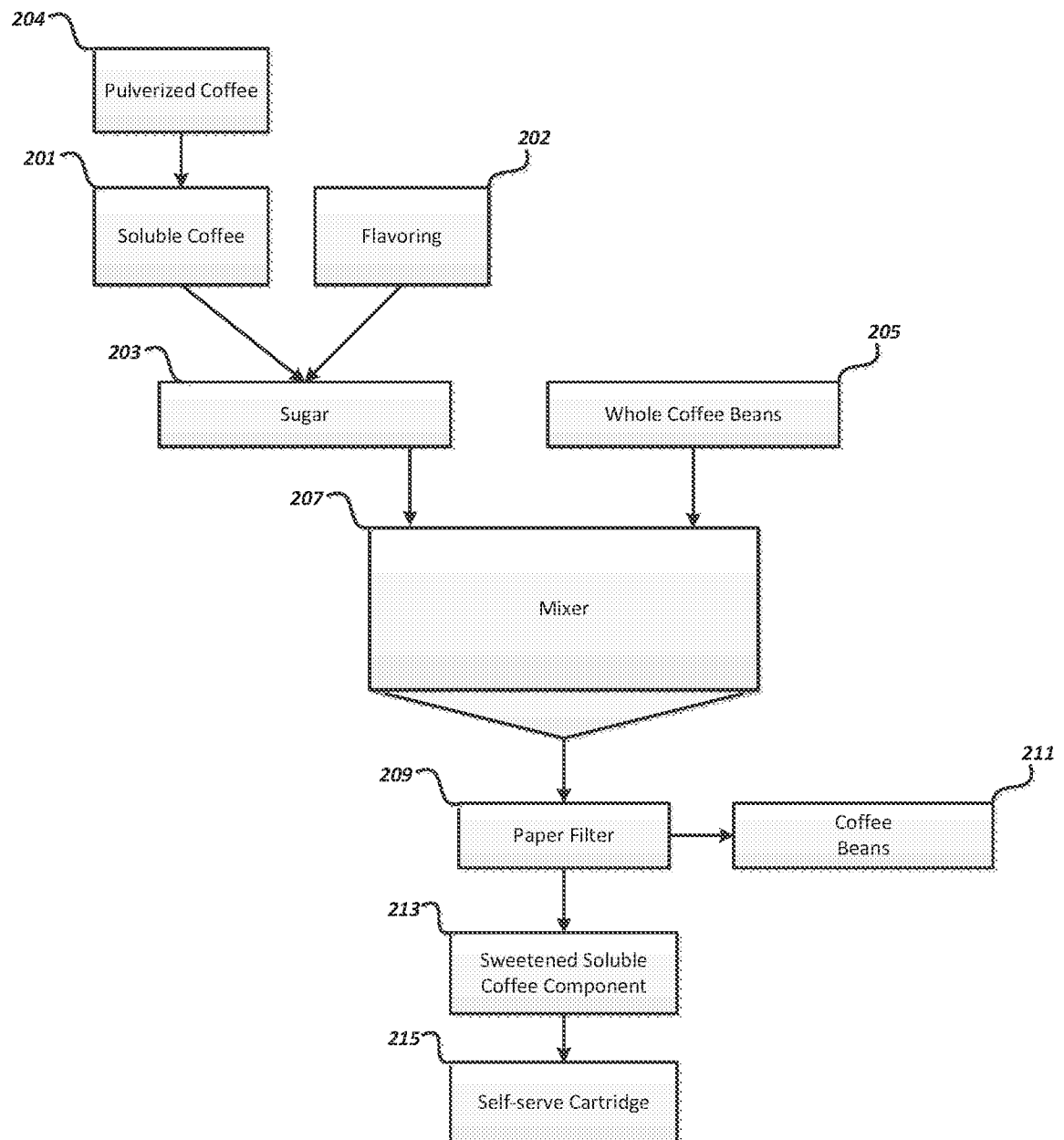


FIG. 2

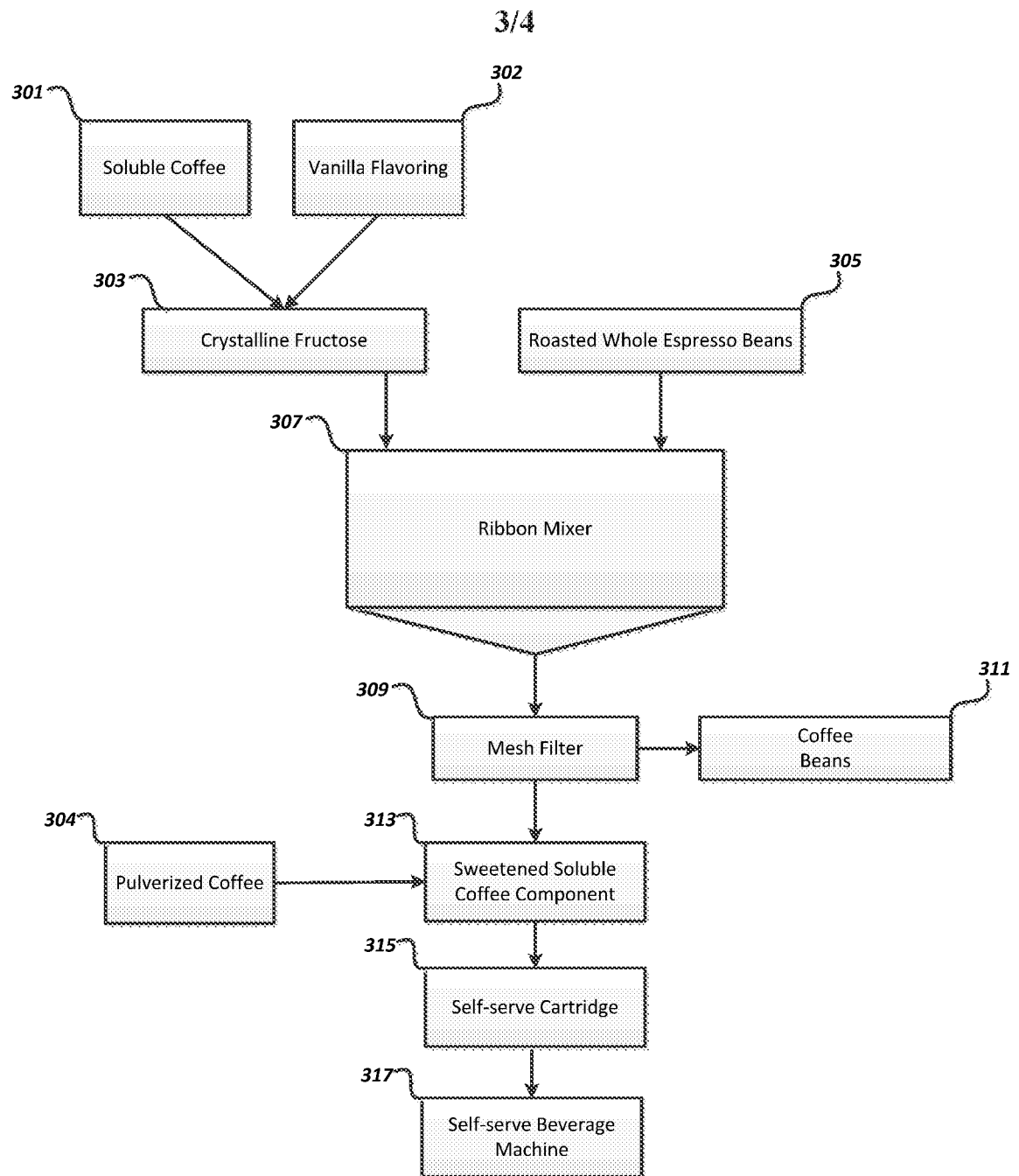


FIG. 3

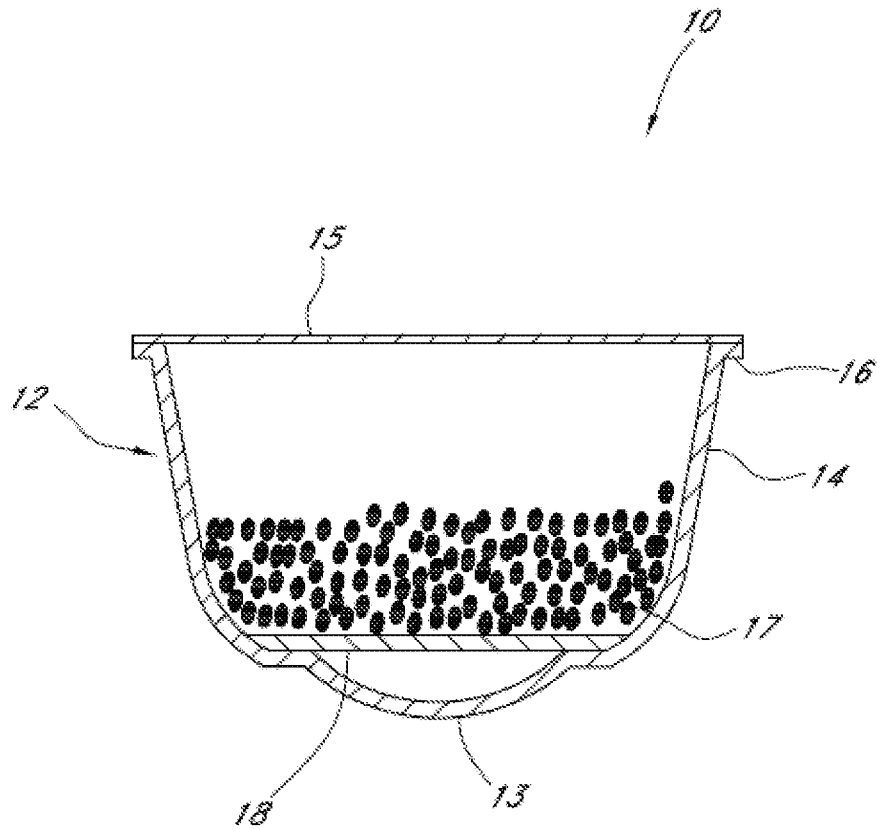


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 16/12159

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - A23F 5/00 (2016.01) CPC - A23F 5/262; A23F 5/26; A23F 5/267; A23F5/36; B65D85/8046 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(8): A23F 5/00 (2016.01) CPC: A23F 5/262; A23F 5/26; A23F 5/267; A23F5/36; A23F5/36; B65D85/8046 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 99/295; 426/432, 426/590 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Google Scholar, Google Patents, PatBase Keywords used: Instant, soluble, coffee, sweetener, sugar, mix, incorporate, agitate, add, remove, filter, bean, coffee oil, enhance, improve, enrich, espresso		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/0261002 A1 (Fountain et al.) 18 September 2014 (18.09.2014); para [0001], para [0011], para [0037], para [0041], para [0042], para [0045], para [0049], para [0063]- para [0069], para [0083], para [0090]- para [0092], fig. 10, fig. 11	1-12; 22-30
A	EP 1,631,151 B1 (Krueger GmbH & Co. KG) 08 March 2006 (08.03.2006); entire document	1-12; 22-30
A	US 2011/0183048 A1 (Noble et al.) 28 July 2011 (28.07.2011); entire document	1-12; 22-30
☐ Further documents are listed in the continuation of Box C. ☐		
* 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 application or patent 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 26 February 2016 (26.02.2016)		Date of mailing of the international search report 13 MAY 2016
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/12159

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows.
—see extra sheet—

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-12; 22-30

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 16/12159

Lack of Unity Invention:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-12 and 22-30, directed to sweetened soluble beverage component and a method of making said sweetened soluble beverage component.

Group II: Claims 13-21, directed to a cartridge for producing a single swerving of a beverage.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Special Technical Features

The invention of Group I includes the special technical feature of combining a soluble beverage, a sweetener and coffee beans in a vessel to form a mixture and agitating the mixture for a predetermined amount of time, not required by Group II.

The invention of Group II includes the special technical feature of a cartridge, the cartridge comprising: a cup comprising a lid, a bottom wall and a sidewall extending between the lid and the bottom wall and a single serving of a sweetened soluble beverage component disposed in the cartridge.

Common Technical Features

Groups I and II share the technical feature of a sweetened soluble beverage comprising a soluble beverage, a sweetener, and oil from coffee beans, wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing the soluble beverage and sweetener with the coffee beans. However, this shared technical feature does not represent a contribution over prior art as being obvious over US 2014/0261002 A1 to Fountain et al. (hereinafter Fountain) who discloses of a sweetened soluble beverage comprising a soluble beverage, a sweetener, and oil from coffee beans, wherein the oil from coffee beans was imparted to the soluble beverage and sweetener by mixing the soluble beverage and sweetener with the coffee beans (para [0001]: "...coffee products and processes for forming coffee products. In particular, it relates to soluble coffee products...") comprising: a soluble beverage, a sweetener and oil from coffee beans, wherein the soluble beverage comprises soluble coffee (para [0063]: "...a coffee beverage formed using the soluble coffee product..."; para [0069]: "...release of coffee oil from the roasted coffee precursor..."; para [0090]: "...container containing... the soluble coffee product described above..."; para [0092]: "...container may further contain... natural or artificial sweeteners..."), wherein the oil from coffee beans was imparted to the soluble beverage by mixing the soluble beverage with the coffee beans (para [0065]: "introducing particles of a roasted coffee precursor into a milling chamber"; para [0066]: "introducing particles of soluble coffee into the milling chamber"; para [0067]: "jetting a gas into the milling chamber to mobilise the particles of the roasted coffee precursor and soluble coffee"; para [0068]: "thereby producing a milled and blended coffee product..."; para [0069]: "...release of coffee oil from the roasted coffee precursor... the incorporation of the particles of soluble coffee into the milling chamber results in the soluble coffee absorbing... all the coffee oil released during comminution") and further discloses of a prior art that teaches of a sweetened soluble beverage component comprising oil from the coffee beans imparted to the sweetener (para [0011]: "...in EP1631151... an additional component such as cocoa mass or sugar to absorb any coffee oil released by the roasted and ground coffee"). Fountain does not disclose of the sweetened soluble beverage component, wherein the oil from coffee beans was imparted by mixing the soluble beverage and sweetener with the coffee beans and further removing the coffee beans after mixing. However, it would have been obvious to an ordinary person skilled in the art through routine experimentation to incorporate coffee beans into the mixture and further comprising removing said beans after the oil has been absorbed in order to obtain the aroma and flavor of the coffee oil, but have reduced caffeine compared to the same product without the removal of said coffee beans. It would have been further obvious to mix the soluble beverage and sweetener with the coffee beans in order to maximize the amount of coffee oil to be absorbed, since Fountain discloses it is absorbed by the soluble beverage (para [0069]: "...the incorporation of the particles of soluble coffee into the milling chamber results in the soluble coffee absorbing... all the coffee oil released during comminution") and discloses of a prior art which notes that it is absorbed by the sweetener (para [0011]: "...in EP1631151... an additional component such as cocoa mass or sugar to absorb any coffee oil released by the roasted and ground coffee"), in order to produce an improved sweetened soluble beverage component with enhanced flavor and aroma from the mixing of the coffee beans, but has a reduced caffeine content compared to a sweetened soluble beverage that additionally contains the coffee beans.

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

From the INTERNATIONAL BUREAU

PCTNOTIFICATION CONCERNING SUBMISSION,
OBTENTION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

CHRISTENSEN, Michael, R.
Knobbe Martens Olson & Bear, LLP
2040 Main Street, 14th Floor
Irvine, CA 92614
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 12 February 2016 (12.02.2016)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference SBUX1-380WO	
International application No. PCT/US2016/012159	
International publication date (day/month/year) Not yet published	
Applicant STARBUCKS CORPORATION D/B/A STARBUCKS COFFEE COMPANY	International filing date (day/month/year) 05 January 2016 (05.01.2016) Priority date (day/month/year) 09 January 2015 (09.01.2015)

The applicant is hereby notified of the date of receipt (or of obtaining by the International Bureau) of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to the date of receipt, **the priority document concerned was submitted or transmitted to or obtained by the International Bureau in compliance with Rule 17.1(a), (b) or (b-bis)**. This Form replaces any previously issued notification concerning submission, transmittal or obtaining of priority documents.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
09 January 2015 (09.01.2015)	14/594,041	US	30 January 2016 (30.01.2016)

The letters "NR" denote a priority document which, on the date of mailing of this Form, had not yet been received or obtained by the International Bureau in compliance with Rule 17.1(a), (b) or (b-bis). Where the applicant has failed to either submit, request to prepare and transmit, or to request the International Bureau to obtain the priority document within the applicable time limit under that Rule, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

An asterisk "*" next to a date of receipt, denotes a priority document submitted or transmitted to or obtained by the International Bureau but not in compliance with Rule 17.1(a), (b) or (b-bis) (the priority document was received after the time limit prescribed in Rule 17.1(a); the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b) or the request to the International Bureau to obtain the priority document was made after the applicable time limit under Rule 17.1(b-bis)). Even though the priority document was not furnished in compliance with Rule 17.1(a), (b) or (b-bis), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 70 10	Authorized officer Mineko Mohri e-mail pt08.pct@wipo.int Telephone No. +41 22 338 74 08
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PCT

(PCT Rule 92*bis*.1 and
Administrative Instructions, Section 422)

To:

CHRISTENSEN, Michael, R.
Knobbe Martens Olson & Bear, LLP
2040 Main Street, 14th Floor
Irvine, CA 92614
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 26 September 2016 (26.09.2016)	
Applicant's or agent's file reference SBUX1-380WO	IMPORTANT NOTIFICATION
International application No. PCT/US2016/012159	International filing date (day/month/year) 05 January 2016 (05.01.2016)

1. The following indications appeared on record concerning:		
☒ the applicant	☐ the inventor	☐ the common representative
Name and Address STARBUCKS CORPORATION D/B/A STARBUCKS COFFEE COMPANY 2401 Utah Avenue South Seattle, WA 98134-1435 United States of America	State of Nationality US	State of Residence US
	Telephone No.	
	Facsimile No.	
	E-mail address	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
☐ the person	☒ the name	☐ the address
☐ the nationality	☐ the residence	
Name and Address STARBUCKS CORPORATION 2401 Utah Avenue South Seattle, WA 98134-1435 United States of America	State of Nationality	State of Residence
	US	US
	Telephone No.	
	Facsimile No.	
E-mail address ☐ Notifications by e-mail authorized		

3. Further observations, if necessary:
--

4. A copy of this notification has been sent to:		☐	the International Preliminary Examining Authority
☒	the receiving Office	☒	the designated Offices concerned
☐	the International Searching Authority	☐	the elected Offices concerned
☐	the Authority(ies) specified for supplementary search	☐	other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Nissen Diana e-mail diana.nissen@wipo.int Telephone No. +4122 338 8054
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