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(54) **GRANULATED SUGAR PRODUCT**

GRANULIERTES ZUCKERPRODUCT

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Description

[0001] The present invention relates to a granulated sugar product and a process for making such a product and, in particular, to a product intended to be used as a substitute for granulated sugar.

[0002] Many and varied attempts have been made over a number of years to produce a granulated sugar product with similar appearance to sugar, the same sweetness and half the bulk density. The product should, when dispensed by a variety of measures eg. spoons, deliver less, preferably, only half or less, of the weight for the same sweetness when compared with granulated sugar. The product should also exhibit the "crunch" and reflective appearance of granulated sugar.

[0003] EP 0,335,852 discloses a powder product containing at least 50% saccharose, with a density of between 50-70% of the density of commercial powder sugar, with added high intensity sweeteners.

[0004] The present invention has been made from a consideration of this problem and in order to provide a granulated sugar product having one or more of the above-mentioned characteristics.

[0005] According to one aspect of the invention there is provided a granulated sugar product comprising a core material of a granulated first sugar and a surface material, wherein the surface material is less dense than the first sugar material and wherein the surface material comprises a second sugar, dextrans, sorbitol, mannitol, starch, cellulose, inulin, glycogen, xylitol, levoglucoson or maltol (and ethyl derivative).

[0006] The surface material may cover only some or all of the surface of the first sugar granule. The product may also incorporate a sweetener, preferably a high intensity sweetener.

[0007] In this manner, a granulated sugar product can be provided with an overall bulk density less than the bulk density of the granulated first sugar and, therefore, act as a lighter alternative to the first sugar product whilst maintaining the granulated form and "crunch". Furthermore, by the use of appropriate quantities of sweeteners, a lighter product with the same sweetness as the first sugar may be obtained.

[0008] Preferably, the first sugar is sucrose but any granulated sugar product may be used. By granulated is meant such products as would include, for instance, commercial table sugar and caster sugar but not icing sugar. Thus, typically granulated may imply having crystals of at least 0.1 mm or between about 0.1 mm and 1.0 mm, more preferably 0.2 mm and 0.8 mm and including specifically castor sugar having crystals in the range 0.27 to 0.34 mm and conventional granulated or table sugar having crystals in the range 0.60 to 0.67 mm. Preferably, the crystal sizes are in the range 0.27 to 0.67 mm.

[0009] The second sugar may be selected from any sugar product. Preferably, it may be selected from sucrose, glucose (dextrose, anhydrous & mono), fructose,

lactose (anhydrous and hydrated), maltose, Ribose, galactose, dried glucose syrups, grape sugar, arabinose, raffinose, mannose, rhamnose, iso-maltose, gentobiose, trehalose, cellobiose, neohesperidose, maltotriose, parose, neokestose, stachyose.

[0010] The sweetener may be any sweetener. Preferably, the sweetener is selected from sorbitol (E420), mannitol (E421), isomalt (E953), maltitol (E965), lactitol (E966), xylitol (E967), acesulfame K (E950), aspartame (E951), cyclamic acid and sodium and calcium salts (E952), saccharin and its sodium, potassium and calcium salts (E954), thaumatin (E957), neohesperidine DC (E959).

[0011] More preferably, the sweetener is aspartame and/or acesulfame K and/or other high intensity sweeteners. The high intensity of the sweetener is defined in terms of its sweetness compared with sugar on a weight basis. Preferably, the high intensity sweetener is at least 30 times, typically 200/300 times or at least 100 times, as sweet as sugar on a weight basis. Preferably, the product comprises two sweeteners, typically both aspartame and acesulfame K. In general aspartame tastes good but tends not to be heat stable whereas acesulfame K is heat stable but does not taste as good. The product may include a liquid component such as water. The amount of added liquid typically determines the consistency of the mixture. Preferably, the surface material is in a powder form. More preferably, the surface material comprises a foam dried material. Preferably, a surface material having a lower calorific density compared with sucrose is used. The lower calorific density may be due to the chemical or physical form of the surface material or both. Preferably, a low density maltodextrin is used. Preferably, the maltodextrin is in powder form and most preferably the maltodextrin comprises foam dried maltodextrin. Foam drying is a known process comprising pumping gas under pressure into the feed to the spray drier prior to the sugar being spray dried. Foam dried sugar has a honeycomb effect which gives it a significantly reduced bulk density. Thus, preferably a sugar that is fluffy and light is used.

[0012] Preferably, the product comprises the first sugar in the range of 60-90% by weight, more preferably, 75-85 % by weight. Preferably, the surface material is 10-40% by weight, more preferably, 15-25% by weight. Preferably, the sweetener, typically aspartame and/or acesulfame K, is 0.1 - 1.0 % by weight, more preferably, 0.1 to 0.5 % by weight. Preferably, about 0.4 % sweetener or about 0.2% each of aspartame and acesulfame K is used. Preferably about 0.18 to 0.22 % each of aspartame and acesulfame K is used.

[0013] According to a second aspect of the invention there is provided a method of producing a granulated sugar product comprising mixing a core material of a granulated first sugar and a surface material in such a manner as to result in agglomeration of the mixture, wherein the surface material is less dense than the first sugar material and wherein the surface material com-

prises a second sugar, dextrans, sorbitol, mannitol, starch, cellulose, inulin, glycogen, xylitol, levoglucoson or maltol (and ethyl derivative).

[0014] Preferably, the components of the mixture are as described above with respect to the first aspect of the invention. Preferably, the mixing is by means of a low shear mixer or slow speed blender. Alternatively, a batch or continuous agglomerator may be used. Preferably, liquid, typically water, is added to the mixture during mixing. The liquid may be added by spraying atomised liquid onto the mixture. Advantageously, the liquid turns the mixture into a slurry, but, preferably, does not dissolve the majority of the granulated first sugar or, preferably, the majority of the surface material although the liquid will, inevitably, dissolve some of the sugars. Advantageously dissolving a small amount of the sugars, the liquid, once dried, has the effect of encouraging the first sugar and the surface material to agglomerate thus producing larger granules with lower bulk density than the first sugar. Preferably, the liquid is water but any liquid able to solubilise sugars may be used. Preferably, the liquid is nontoxic and is easily evaporated. Preferably, 0.05-5% of liquid by weight, typically, water, is used, more preferably, 1.0-2.0% by weight is used.

[0015] Preferably, the mixture is mixed in a low shear mixer and a small amount of liquid, typically water, is added. As a specific example, 50 ml to 3.0 litres water may be added to an approximately 60 kg mixture. This results in the even and permanent agglomeration of the mixture with all of or some of the aforementioned characteristics. The low shear mixer may be of any suitable type such as drum types, tote blenders or slow speed blenders.

[0016] Alternatively, the mixture may be added to a batch or continuous agglomerator such as a fluidised bed agglomerator. Such an agglomerator may comprise a vessel having an air distribution grate at a lower end thereof. One or more filters may be positioned at an upper end of the vessel to filter out entrained solids. Nozzles for spraying atomised liquids, typically water, may be positioned in, on or adjacent to the vessel, for example in the sides or top of the vessel. Preferably, a small amount of sugar is added to the liquid or water in either embodiment before it enters the mixer or agglomerator as it has been found that this gives better results.

[0017] Preferably, the method comprises mixing using a mixing machine as described in GB 2026881. Thus, preferably the method comprises mixing by means of a mixing machine in which the components of the mixture are mixed by means of two counterrotating shafts with blades, where some of the blades have different angles of incidence and different blade areas in order to obtain a good mixing of the components.

[0018] Preferably, the mixing machine comprises a mixing chamber in which two shafts are arranged in the same horizontal plane, the shafts being provided with blades or paddles disposed at an angle to and parallel with the shafts, the shafts rotating in opposite directions.

Although the machine may be operated as described in GB 2026881 with reference to Figure 4 thereof, it is preferred that the machine is operated such that downward movements are on the side where the shafts turn toward one another.

[0019] Preferably, the mixing machine is operated such that the blades have a peripheral rotational velocity of at least 1.2 m/sec or between 1.2 and 1.8 m/sec.

[0020] Preferably, a plurality of opposing pairs of blades of certain area are mounted on each shaft, positioned 90° transverse of the centerline for the shafts and with the blade wings disposed at a 45° angle in relation to the shaft centreline.

[0021] The supports for the blade wings of some opposing pairs of blades may be displaced 90° in relation to the supports for other pairs as specifically described in GB 2026881. Other specific features of the machine, such as the disposition and form of the blades at the ends of the shafts, may be as described in GB 2026881.

As previously mentioned it is preferred that the machine is operated conversely to the operation described in GB 2026881 in that the shafts are rotated in contra-rotation with downward movement of the shafts being on the side where the shafts turn towards each other. This allows the mixing to take place towards the lower region of the chamber, that is below the level of the shafts. It has been found that such operation gives surprisingly better results.

[0022] According to a third aspect of the invention there is provided a method of producing a granulated sugar product comprising the steps of:-

- (i) adding a core material of a granulated first sugar, and a surface material to a low shear mixer or slow speed blender having at least two driving shafts, the shafts being provided with blades arranged at an angle to and parallel with the shafts, wherein the surface material is less dense than the first sugar material and wherein the surface material comprises a second sugar, dextrans, sorbitol, mannitol, starch, cellulose, inulin, glycogen, xylitol, levoglucoson or maltol (and ethyl derivative); and
- (ii) operating the mixer or blender such that the shafts rotate in opposite directions.

[0023] Preferably, the shafts of the mixer or blender are disposed in substantially the same horizontal plane and preferably the mixer or blender is operated such that downward movement of the shafts is on the side where the shafts turn toward one another.

[0024] Preferably, the mixer or blender is as described in GB 2026881 with reference to Figures 1 to 3 thereof and/or as described above. The method may include adding sweetener, liquid or other method steps described herein. The surface material sugars and sweeteners may be as aforescribed herein. The invention further includes a method of producing a granulated sugar product of the invention and a product produced

by means of a method of the invention.

[0025] According to a further aspect of the present invention there is provided a granulated sugar product comprising a mixture of granulated sugar, maltodextrin and high intensity sweetener. Preferably the product is crystalline. Preferably, the sweetener is as described above. Preferably, the product comprises two sweeteners, typically both aspartame and acesulfame K. The product may include a liquid component such as water. The amount of added liquid typically determines the consistency of the mixture. Preferably, a low density maltodextrin is used. Preferably, the maltodextrin is in powder form and most preferably, the maltodextrin comprises foam dried maltodextrin. Foam dried maltodextrin has a honeycomb effect which gives it a significantly reduced bulk density. Thus, preferably a maltodextrin that is fluffy and light is used.

[0026] Preferably, the product comprises granulated sugar in the range of 60-90 % by weight, more preferably 75-85% by weight, maltodextrin 10-40% by weight more preferably 15-25 % by weight and sweetener, typically aspartame and/or acesulfame K, 0.1 to 1.0% by weight more preferably 0.1 to 0.5% by weight. Preferably, about 0.4% sweetener or about 0.2% each of aspartame and acesulfame K is used. Preferably about 0.18 to 0.22 % each of aspartame and acesulfame K is used.

[0027] According to a still further aspect of the present invention there is provided a method of producing a granulated sugar product comprising mixing granulated sugar, maltodextrin and high intensity sweetener in such a manner as to result in agglomeration of the mixture. Preferably, the components of the mixture are as described above. Preferably, the mixing is by means of a low shear mixer or slow speed blender. Alternatively, a batch or continuous agglomerator may be used. Preferably, liquid, typically water, is added to the mixture during mixing. The liquid may be added by spraying atomised liquid onto the mixture.

[0028] Preferably, the mixture is mixed in a low shear mixer and a small amount of liquid, typically water, is added. As a specific example, 50 ml to 3.0 litres water may be added to an approximately 60 kg mixture. This results in the even and permanent agglomeration of the mixture with all of or some of the aforementioned characteristics. The low shear mixer may be of any suitable type such as drum types, tote blenders or slow speed blenders.

[0029] Alternatively, the mixture may be added to a batch or continuous agglomerator such as a fluidised bed agglomerator. Such an agglomerator may comprise a vessel having an air distribution grate at a lower end thereof. One or more filters may be positioned at an upper end of the vessel to filter out entrained solids. Nozzles for spraying atomised liquids, typically water, may be positioned in, on or adjacent to the vessel, for example in the sides or top of the vessel.

[0030] Preferably, a small amount of sugar is added to the liquid or water in either embodiment before it en-

ters the mixer or agglomerator as it has been found that this gives better results.

[0031] Preferably, the mixer or blender is as described above and is operated as described above.

[0032] According to another aspect of the invention there is provided a method of producing a granulated sugar product comprising the steps of:-

(i) adding granulated sugar, starch or maltodextrin, and high intensity sweetener to a low shear mixer or slow speed blender having at least two driving shafts, the shafts being provided with blades arranged at an angle to and parallel with the shafts; and

(ii) operating the mixer or blender such that the shafts rotate in opposite directions.

[0033] Preferably, the mixer or blender is as described above and is operated as described above.

[0034] Preferably, the starch or maltodextrin is a low bulk density material. Preferably, maltodextrin is used. The method may include adding liquid or other method steps described herein. The sugar, maltodextrin and sweetener may be as described herein.

[0035] The invention further includes a method of producing a granulated sugar product of the invention and a product produced by means of a method of the invention.

[0036] The invention will now be described further by way of example only, and with reference to the accompanying drawings and examples in which:-

Fig. 1 is a schematic view showing use of a low shear mixer in the method of the invention; and

Fig. 2 is a schematic view showing use of a fluidised bed agglomerator in the method of the invention.

[0037] Referring to Fig. 1 granulated sugar, maltodextrin and aspartame/acesulfame K, are added as shown schematically by arrow A, in powder form to a low shear mixer or slow speed blender 1 comprising an open topped vessel 2 having mixing blades or paddles 4 located therein. The blades are mounted on a driving shaft 6 which is rotated by motor means 8 so that the blades move slowly. It is preferable that on certain mixers the rotation is reversed to that of conventional operation. In normal operation on certain mixers such as that described in GB 2026881 the two shafts turn towards each other with upward movement on the side where the shafts turn toward each other so that the paddles take the product and mix them at the top of the vessel where these two sets of paddles meet. It is preferable for the invention that the two shafts turn toward each other with downward movement on the side where the shafts turn toward each other and that the mixing takes place at the bottom of the machine where the paddles meet. It will be appreciated that any suitable low shear mixer or slow

speed blender may be used and for example, a ribbon or screw mixing means may be used instead of blades 4 and shaft 6. Although ribbon mixing means are normally run at high speed such means could be run slowly for the purpose of the present invention.

[0038] While or after the powders are added, liquid such as water is added typically while the blades are moving. This is illustrated by arrow B. As the mixture is mixed, the mixture agglomerates and the resultant product is output via a suitable outlet 10 on the vessel 2, as shown by arrow C.

[0039] Referring to Fig. 2, the mixture 12 is added to a fluidised bed agglomerator comprising an open topped vessel 14. Liquid is sprayed into the vessel via one or more nozzles 16 located in or on the vessel. Typically the nozzles 16 are designed to atomise the liquid. The base of the vessel 14 comprises a mesh plate 18 and the vessel is connected to an air supply or fan 20 so that, in use, air passes up through the mesh plates, through the mixture and out through the filters 22 located at the top of the vessel 14.

[0040] It has been found that a product of the invention or produced using a method of the invention has one or more of the aforementioned desired characteristics and is cost effective to produce.

Method of Preparation

[0041] Load a mixing machine as described in GB 2026881 with reference to Figures 1 to 3 thereof with 28.30 kg (sucrose) sugar or ground oversize plus 0.079g each of Aspartame and Acesulfame K. Start the machine at full speed. Add a wet mix of sucrose sugar (2.70 kg) and water (0.75 kg) and mix for 45 seconds. Stop the machine. Add 5.0 kg sugar followed by 7.67 kg maltodextrin (foam dried). Mix for 10 seconds on full speed and discharge into bin. Transfer to Calmic container and gently mix. Sieve through 2 mm screen, keeping the load on the screen low. If the bulk density starts to increase, the amount of water in the wet mix may be increased by 50 ml at a time until the required bulk density is obtained. It is preferred that the mixing machine is operated such that the shafts rotate in opposite directions with downward movements on the side where the shafts turn toward one another so that the mixing zone lies below the level of the shafts in contrast to the mixing method described with reference to Figure 4 of GB 2026881.

[0042] The above procedure produces a maximum bulk density of 0.38 g/cc.

[0043] It will be appreciated that the present invention is not intended to be restricted to the details of the above embodiments which are described by way of example only.

Claims

1. A granulated sugar product comprising a core material of a granulated first sugar and a surface material wherein the surface material is less dense than the first sugar material and wherein the surface material comprises a second sugar, dextrins, sorbitol, mannitol, starch, cellulose, inulin, glycogen, xylitol, levoglucosan or maltol (and ethyl derivative).
2. A granulated sugar product according to claim 1, wherein the surface material covers only some or all of the surface of the first sugar granule.
3. A granulated sugar product according to any preceding claim, wherein the product incorporates a sweetener.
4. A granulated sugar product according to any preceding claim, wherein the product comprises a high intensity sweetener.
5. A granulated sugar product according to any preceding claim, wherein the first sugar is sucrose.
6. A granulated sugar product according to any preceding claim, wherein the second sugar is selected from sucrose, glucose (dextrose, anhydrous & mono), fructose, lactose (anhydrous and hydrated), maltose, Ribose, galactose, dried glucose, syrups, grape sugar, arabinose, raffinose, mannose, rhamnose, iso-maltose, gentoiose, trehalose, cellobiose, neohesperidose, maltotriose, parose, neokesotose, stachyose.
7. A granulated sugar product according to any preceding claim, wherein the sweetener is selected from sorbitol (E420), mannitol (E421), isomalt (E953), maltitol (E965), lactitol (E966), xylitol (E967), acesulfame K (E950), aspartame (E951), cyclamic acid and sodium and calcium salts (E952), saccharin and its sodium, potassium and calcium salts (E954), thaumatin (E957), neohesperidine DC (E959).
8. A granulated sugar product according to any preceding claim, wherein the surface material comprises a foam dried material.
9. A granulated sugar product according to any preceding claim, wherein the surface material comprises a low density maltodextrin.
10. A granulated sugar product according to any preceding claim, wherein the product comprises the first sugar in the range of 60-90% by weight.
11. A granulated sugar product according to any pre-

ceding claim, wherein the surface material is 10-40% by weight.

12. A granulated sugar product according to any preceding claim, wherein the sweetener is 0.1 to 1.0% by weight. 5
13. A method of producing a granulated sugar product comprising mixing a core material of a granulated first sugar and a surface material in such a manner as to result in agglomeration of the mixture, wherein the surface material is less dense than the first sugar material and wherein the surface material comprises a second sugar, dextrins, sorbitol, mannitol, starch, cellulose, inulin, glycogen, xylitol, levoglucosan or maltol (and ethyl derivative). 10
14. A method of producing a granulated sugar product according to claim 13, wherein mixing is by means of a mixing machine comprising a mixing chamber in which two shafts are arranged in the same horizontal plane, the shafts being provided with blades or paddles disposed at an angle to and parallel with the shafts, the shafts rotating in opposite directions. 15
15. A method of producing a granulated sugar product according to claim 14, wherein the machine is operated such that downward movements are on the side where the shafts turn towards one another. 20
16. A method of producing a granulated sugar product according to claim 14 or claim 15 wherein a plurality of opposing pairs of blades of certain areas are mounted on each shaft, positioned 90° transverse of the centreline for the shafts and with the blade wings disposed at a 45° angle in relation to the shaft centreline. 25
17. A method of producing a granulated sugar product comprising the steps of:- 30
- (i) adding a core material of a granulated first sugar, and a surface material to a low shear mixer or slow speed blender having at least two driving shafts, the shafts being provided with blades arranged at an angle to and parallel with the shafts wherein the surface material is less dense than the first sugar material and wherein the surface material comprises a second sugar, dextrins, sorbitol, mannitol, starch, cellulose, inulin, glycogen, xylitol, levoglucosan or maltol (and ethyl derivative); and 35
- (ii) operating the mixer or blender such that the shafts rotate in opposite directions. 40
18. A method according to claim 17, wherein the shafts of the mixer or blender are disposed in the same 45

horizontal plane and the mixer or blender is operated such that downward movement of the shafts is on the side where the shafts turn toward one another. 5

19. A product obtainable by means of a method as claimed in any of claims 13 to 18. 10

Patentansprüche

1. Granuliertes Zuckerprodukt, das ein Kernmaterial aus einem granulierten ersten Zucker und ein Oberflächenmaterial umfasst, wobei das Oberflächenmaterial weniger dicht ist als das erste Zuckermaterial und das Oberflächenmaterial einen zweiten Zucker, Dextrine, Sorbit, Mannit, Stärke, Cellulose, Inulin, Glycogen, Xylit, Lävoglucosan oder Maltol (und ein Ethyl-Derivat davon) umfasst. 15
2. Granuliertes Zuckerprodukt nach Anspruch 1, worin das Oberflächenmaterial nur einen Teil oder die gesamte Oberfläche der ersten Zuckerkörnchen bedeckt. 20
3. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, das ein Süßungsmittel enthält. 25
4. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, das ein Süßungsmittel mit hoher Süßkraft enthält. 30
5. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin der erste Zucker Saccharose ist. 35
6. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin der zweite Zucker ausgewählt ist aus der Gruppe Saccharose, Glucose (Dextrose, wasserfrei und mono), Fructose, Lactose (wasserfrei und hydratisiert), Maltose, Ribose, Galactose, getrocknete Glucose, Sirupe, Traubenzucker, Arabinose, Raffinose, Mannose, Rhamnose, Isomaltose, Gentobiose, Trehalose, Cellobiose, Neohesperidose, Maltotriose, Parose, Neokestose und Stachyose. 40
7. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin das Süßungsmittel ausgewählt ist aus der Gruppe Sorbit (E420), Mannit (E421), Isomalt (E953), Maltit (E965), Lactit (E966), Xylit (E967), Acesulfam K (E950), Aspartam (E951), Cyclaminsäure und ihren Natrium- und Calciumsalzen (E952), Saccharin und seinen Natrium-, Kalium- und Calciumsalzen (E954), Thaumatin (E957) und Neohesperidin DC (E959). 45

8. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin das Oberflächenmaterial ein getrocknetes Schaummaterial umfasst.
9. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin das Oberflächenmaterial ein Maltodextrin mit niedriger Dichte umfasst. 5
10. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, das den ersten Zucker in einer Menge in dem Bereich von 60 bis 90 Gew.-% enthält. 10
11. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin das Oberflächenmaterial 10 bis 40 Gew.-% ausmacht. 15
12. Granuliertes Zuckerprodukt nach irgendeinem vorhergehenden Anspruch, worin das Süßungsmittel 0,1 bis 1,0 Gew.-% ausmacht. 20
13. Verfahren zur Herstellung eines granulierten Zuckerprodukts, das umfasst das Mischen eines Kernmaterials aus einem granulierten ersten Zucker mit einem Oberflächenmaterial in der Weise, dass eine Agglomeration der Mischung erhalten wird, wobei das Oberflächenmaterial weniger dicht ist als das erste Zuckermaterial und das Oberflächenmaterial einen zweiten Zucker, Dextrine, Sorbit, Mannit, Stärke, Cellulose, Inulin, Glycogen, Xylit, Lävoglucason oder Maltol (und ein Ethyl-Derivat davon) umfasst. 25 30
14. Verfahren zur Herstellung eines granulierten Zuckerprodukts nach Anspruch 13, worin das Mischen unter Verwendung einer Mischvorrichtung durchgeführt wird, die eine Mischkammer aufweist, in der zwei Wellen in der gleichen horizontalen Ebene angeordnet sind, wobei die Wellen mit Schaufeln oder Paddeln ausgestattet sind, die unter einem Winkel zu den Wellen und parallel zu den Wellen, die sich in zueinander entgegengesetzten Richtungen drehen, angeordnet sind. 35 40
15. Verfahren zur Herstellung eines granulierten Zuckerprodukts nach Anspruch 14, worin die Vorrichtung so betrieben wird, dass die Abwärtsbewegungen auf der Seite erfolgen, auf der die Wellen sich aufeinander zu drehen. 45 50
16. Verfahren zur Herstellung eines granulierten Zuckerprodukts nach Anspruch 14 oder 15, worin eine Vielzahl von einander gegenüberliegenden Paaren von Rührschaufeln bestimmter Flächen auf jeder Welle befestigt sind, die unter einem Winkel von 90 ° transversal zur Zentrallinie für die Wellen angeordnet sind, und worin die Schaufelflügel unter einem Winkel von 45 ° zu der Wellen-Zentrallinie angeordnet sind. 55
17. Verfahren zur Herstellung eines granulierten Zuckerprodukts, das die Stufen umfasst:
- (i) Einführung eines Kernmaterials aus einem granulierten ersten Zucker und eines Oberflächenmaterials in einen Mischer mit niedriger Scherkraft oder in einen langsam laufenden Mixer, der mindestens zwei Antriebswellen aufweist, wobei die Wellen mit Rührschaufeln ausgestattet sind, die unter einem Winkel zu den Wellen und parallel zu den Wellen angeordnet sind, wobei das Oberflächenmaterial weniger dicht ist als das erste Zuckermaterial und das Oberflächenmaterial einen zweiten Zucker, Dextrine, Sorbit, Mannit, Stärke, Cellulose, Inulin, Glycogen, Xylit, Lävoglucason oder Maltol (und ein Ethyl-Derivat davon) umfasst; und
- (ii) Betreiben des Mixers oder Mixers in der Weise, dass die Wellen sich in zueinander entgegengesetzten Richtungen drehen.
18. Verfahren nach Anspruch 17, worin die Wellen des Mixers oder Mixers in der gleichen horizontalen Ebene angeordnet sind und der Mischer oder Mixer so betrieben wird, dass die Abwärtsbewegung der Wellen auf der Seite erfolgt, auf der die Wellen sich aufeinander zu drehen.
19. Produkt, das erhältlich ist nach einem Verfahren nach einem der Ansprüche 13 bis 18.

Revendications

- Produit de sucre granulé comprenant un matériau de coeur d'un premier sucre granulé et un matériau de surface, dans lequel le matériau de surface est moins dense que le matériau du premier sucre et dans lequel le matériau de surface comprend un second sucre, des dextrines, du sorbitol, du mannitol, de l'amidon, de la cellulose, de l'inuline, du glycogène, du xylitol, du lévoglucosane ou du maltol (et un dérivé éthyle).
- Produit de sucre granulé selon la revendication 1, dans lequel le matériau granulé couvre seulement une partie ou la totalité de la surface de la granule du premier sucre.
- Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le produit incorpore un édulcorant.
- Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le produit comprend un édulcorant haute intensité.

5. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le premier sucre est du sucrose.
6. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le second sucre est choisi parmi sucrose, glucose (dextrose, anhydre et mono), fructose, lactose (anhydre et hydraté), maltose, ribose, galactose, glucose séché, sirops, dextrose, arabinose, raffinose, mannose, rhamnose, iso-maltose, gentobiose, tréhalose, cellobiose, néo-hespéridose, maltotriose, parose, néokestose, stachyose.
7. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel l'édulcorant est choisi parmi sorbitol (E420), mannitol (E421), isomalt (E953), maltitol (E965), lactitol (E966), xylitol (E967), acésulfame K (E950), aspartame (E951), acide cyclamique et sels de sodium et de calcium (E952), saccharine et ses sels de sodium, potassium et de calcium (E954), thaumatine (E957), néo-hespéridine DC (E959).
8. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le matériau de surface comprend un matériau mousse séché.
9. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le matériau de surface comprend une maltodextrine faible densité.
10. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le produit comprend le premier sucre dans la plage de 60-90 % en poids.
11. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel le matériau de surface est 10-40 % en poids.
12. Produit de sucre granulé selon l'une quelconque des revendications précédentes, dans lequel l'édulcorant est 0,1 à 1,0 % en poids.
13. Procédé de production d'un produit de sucre granulé comprenant le mélange d'un matériau de coeur d'un premier sucre granulé et d'un matériau de surface, de façon à donner une agglomération du mélange, dans lequel le matériau de surface est moins dense que le matériau du premier sucre et dans lequel le matériau de surface comprend un second sucre, des dextrines, du sorbitol, du mannitol, de l'amidon, de la cellulose, de l'inuline, du glycogène, du xylitol, du lévoglucosane ou maltol (et dérivé éthyle).
14. Procédé de production d'un produit de sucre granulé selon la revendication 13, dans lequel le mélange s'effectue au moyen d'une machine de mélange comprenant une chambre de mélange dans laquelle les deux arbres sont disposés dans le même plan horizontal, les arbres étant munis de pales ou de palettes disposées selon un angle et parallèles aux arbres, les arbres tournant dans des directions opposées.
15. Procédé de production d'un produit de sucre granulé selon la revendication 14, dans lequel la machine est actionnée de telle sorte que des mouvements vers le bas s'effectuent sur le côté où les arbres tournent l'un vers l'autre.
16. Procédé de production d'un produit de sucre granulé selon la revendication 14 ou la revendication 15, dans lequel une pluralité de paires opposées de pales de certaines zones sont montées sur chaque arbre, positionnées à 90° transversalement par rapport à la ligne médiane pour les arbres et avec les ailettes de pales disposées selon un angle de 45° par rapport à la ligne médiane de l'arbre.
17. Procédé de production d'un produit de sucre granulé comprenant les étapes de :
- (i) addition d'un matériau de coeur d'un premier sucre granulé et d'un matériau de surface à un mélangeur à faible cisaillement ou à un malaxeur à faible vitesse ayant au moins deux arbres de commande, les arbres étant munis de pales disposées selon un angle et parallèles aux arbres, dans lequel le matériau de surface est moins dense que le matériau du premier sucre et dans lequel le matériau de surface comprend un second sucre, des dextrines, du sorbitol, du mannitol, de l'amidon, de la cellulose, de l'inuline, du glycogène, du xylitol, du lévoglucosane ou maltol (et dérivé éthyle) ; et
- (ii) actionnement du mélangeur ou malaxeur de telle sorte que les arbres tournent dans des directions opposées.
18. Procédé selon la revendication 17, dans lequel les arbres du mélangeur ou malaxeur sont disposés dans le même plan horizontal, et qu'un mélangeur ou malaxeur est actionné de telle sorte que le mouvement vers le bas des arbres se situe sur le côté où les arbres tournent l'un vers l'autre.
19. Produit susceptible d'être obtenu au moyen d'un procédé selon l'une quelconque des revendications 13 à 18.

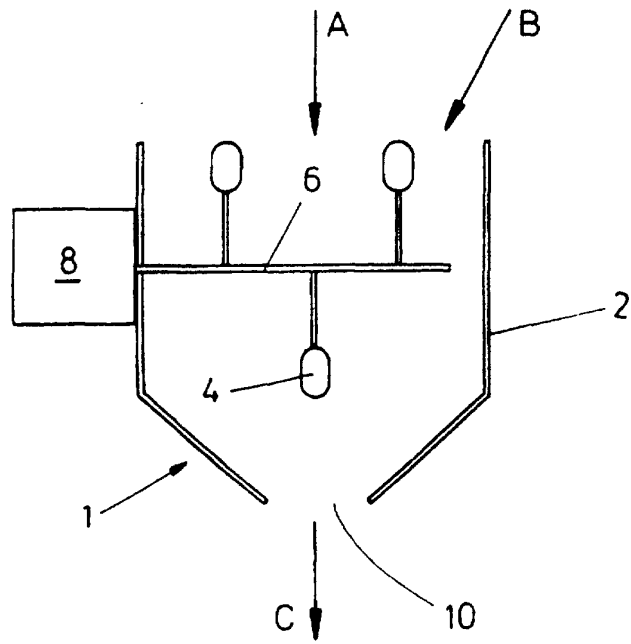


FIG. 1

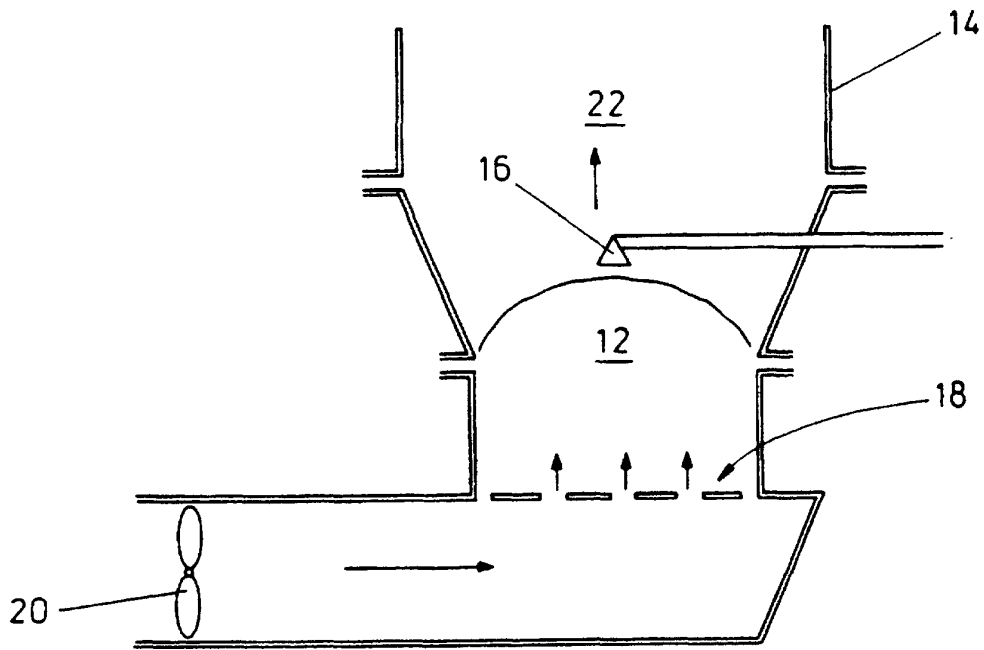


FIG. 2