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(54) Title: AROMATIZING AGENT

(57) Abstract: An aromatizing agent comprising granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.



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Aromatizing agent

The present invention relates to an aromatizing agent and to a process for manufacturing it.

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WO0044238 (SOCIETE DES PRODUITS NESTLE S.A.) discloses an aromatized, soluble creamer powder, which comprises particles formed of a matrix of proteins, fats, carbohydrates and a coffee aroma system, and which may be

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A first object of the present invention is to provide a water soluble aromatizing agent in powder form which is able to quickly release aroma on the surface of a liquid.

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A second object of the present invention is to provide a water soluble aromatizing agent in powder form which is able to release aroma both within a liquid and on the surface of the liquid.

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A third object of the present invention is to provide a process for manufacturing a water soluble aromatizing agent in powder form which is able to quickly release aroma within a liquid and/or on the surface of a liquid.

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To this end the aromatizing agent according to the present invention comprises granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.

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The process according to the present invention comprises agglomerating together particles of a foaming agent and particles and/or droplets of an aroma compound with an agglomerating agent.

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The aromatizing agent according to the present invention indeed has proved surprisingly to be able to quickly release aroma within a liquid and even more surprisingly to be able to release aroma on the surface of a liquid upon reconstitution wherefrom the aroma can be perceived by the consumer's nose.

Generally speaking, when reconstituting a dehydrated powdery food product in a liquid, the aroma compound has to diffuse to the surface of the product in order to be perceived by the consumer's nose.

Thus, the gas bubbles released by the foaming agent comprised in the present aromatized agent improve the release of volatile aroma compound. The gas bubbles act as a "fast" carrier of the compounds to the surface of the liquid.

The advantage is that the aroma dosage can be reduced and that as long as gas bubbles rise to the surface, there will be an additional convective transport of the volatile aromas to the surface. This, which may be said to be a lingering effect, will also greatly improve the aroma perception, especially the fresh or traditionally cooked aroma perception of the product.

Another advantage of the present aromatizing agent is that its solubility is improved as compared with that of a traditional dense aroma entrapment powder, and the perception of the aroma/flavour can occur even at cold solvent temperatures.

The aromatizing agent according to the present invention thus comprises granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.

The particles of a foaming agent may comprise a matrix containing carbohydrates and protein and entrapped gas.

- 5 The carbohydrates in the matrix may be any suitable sugar or starch product such as lactose, dextrose, fructose, sucrose, starch, maltodextrin or corn syrup, for example.

- 10 The protein in the matrix may be any suitable protein of animal or vegetable origin such as milk proteins, soy proteins or wheat proteins, for example.

- 15 The matrix may also contain fat as an ingredient. The fat may be milk fat, vegetable fat or animal fat, for example.

- 20 The carbohydrates, protein and fat may respectively provide 40 to 98%, 2 to 50% and up to 30% by weight of the matrix, for example.

- 25 The particles of the foaming agent may provide 1 to 80%, preferably 10 to 80%, more preferably 15 to 50% and even 15 to 25%, and even more preferably 20 to 60% by weight of the aromatizing agent, for example.

- 30 The gas entrapped in the matrix may be any suitable food grade gas such as nitrogen, carbon dioxide, air or mixtures of them, for example.

- 35 The gas may be entrapped in the matrix in an amount to release 1 to 25 ml of gas at room temperature per g of soluble foaming agent, for example.

- 40 The particles of an aroma compound may comprise a natural or synthetic aroma concentrate entrapped in a matrix of a suitable aroma support such as starch, for example.

The droplets of an aroma compound may comprise a natural or synthetic aroma concentrate dissolved in a suitable liquid solvent such as oil, for example.

- 5 The aroma itself may be any suitable, attractive food grade aroma such as a coffee, chocolate, herb, fruit or spice aroma, for example.

10 The particles and/or droplets of an aroma compound may be present in the aromatizing agent in an amount such that a reasonable amount of aromatizing agent has to be added to a liquid for adequately aromatizing it.

15 In other words, if a reasonable amount of aromatizing agent to be added may be considered to be 0.1 to 10%, preferably 0.25 to 2.5%, and more preferably 0.2 to 1.0% by weight of the liquid to be aromatized and if the amount of aroma compound able to adequately aromatize the liquid is supposed to be 0.005 to 1%, preferably 0.005 to 0.1%, more
20 preferably 0.01 to 1%, and even more preferably 0.05 to 0.5% by weight of the liquid, the particles and/or droplets of an aroma compound may be present in the aromatizing agent in an amount of about 0.2 to 70%, preferably 0.5 to 40% and more preferably 1 to 10% by weight, for example.

25 The agglomerating agent may be any suitable food grade agglomerating agent such as fat, especially palm fat, gum or sugar, for example.

30 The use of fat as agglomerating agent may provide a definite advantage in that it may push the aromatizing agent to the surface of the liquid into which it was dispersed so that a substantial part of volatile aroma is released and directly brought to the consumer's nose under
35 the foaming effect of the foaming agent at the surface of the liquid. The fat namely may substantially protect the

foaming agent and delay its dissolution within the liquid during its transport to the surface so that a substantial part of it only exerts its foaming effect when it has reached the surface of the liquid.

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The agglomerating agent may provide about 1 to 80%, preferably 1 to 50%, more preferably 20 to 60% and even more preferably 15 to 40% by weight of the aromatizing agent, for example.

10

The present aromatizing agent may in addition also comprise a filler such as starch, sodium chloride or maltodextrin, for example.

15

The purpose of an optional filler is to adequately modulate the speed at which the aroma is dissolved in the liquid and/or brought to the surface of the liquid under a booster effect of the foaming agent possibly coupled with an upwards pushing effect of a relatively light compound of the agglomerating agent such as fat, for example.

20

The possible filler may provide up to 50%, preferably up to 40% of the aromatizing agent, for example.

25

The present aromatizing agent may further comprise a colouring agent.

The present aromatizing agent may advantageously comprises free flowing granules 0.1-4.0, more preferably 0.3-2.5 mm in diameter.

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The present aromatizing agent may be used as such, in order to prepare aromatized drinks such as fruit flavoured water, or coffee, cocoa or vanilla flavoured milk, for example.

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The present aromatizing agent may also be used in addition to a dehydrated food product to be reconstituted in water, such as soups and sauces, especially powdered soups and sauces or instant noodles, or in milk, such as nutritious, especially powdered cocoa beverages, for example.

The present process comprises agglomerating together particles of a foaming agent and particles and/or droplets of an aroma compound with an agglomerating agent.

For carrying out this process, particles of a foaming agent may be obtained in known ways such as spray drying or freeze drying, for example.

To this end a base liquor of the matrix compounds may be prepared which has a solid concentration of about 20 to 40% by weight. The base liquor may be either gassed and then spray dried into a drying tower along with a drying gas such as hot air, or frozen, comminuted and freeze dried under vacuum.

Alternatively, particles of a foaming agent may be obtained in new ways such as convection drying a foamed concentrated solution, or gas impregnation under pressure, for example.

The first of these new ways may consist of preparing a concentrated solution of the matrix compounds having a solid concentration above about 50% by weight, foaming the concentrated solution to an overrun of at least about 200%, and drying the foamed solution in a conventional batch or continuously working convection dryer.

The second of these new ways may consist of impregnating a molten mixture of the matrix compounds with gas in an extruder under a pressure of 100 kPa to 20 MPa, for example. Alternatively it may consist of preparing a dried,

particulated porous matrix by spray drying or freeze drying as disclosed above and then subjecting the particles to gas impregnation under a pressure of 100 kPa to 20 MPa at a temperature above the glass temperature transition and then rapidly quenching to ensure entrapment of the gas.

Suitable powdered and/or liquid aroma concentrates are freely available on the market.

Agglomerating together particles of a foaming agent and particles and/or droplets of an aroma compound with an agglomerating agent may be carried out by spraying the agglomerating agent onto a mixture of the powdered ingredients agitated in a rotating bowl or in a fluidised bed, for example.

In case the aroma compound is in liquid form it may be sprayed onto the powdery mixture after having been dispersed into the agglomerating agent, for example.

The Examples hereafter are given by way of illustration of various embodiments of the present aromatizing agent and of its manufacturing process.

In these Examples:

- the percentages and parts are given by weight,
- the equipment used for carrying out the agglomeration comprised a bowl coater made by the company Erweka in Germany and a M21G type Kremlin (France) spray gun,
- the bowl of the bowl coater rotated at about 80 rpm,
- the foaming agent had been prepared by gas impregnation under pressure as disclosed hereafter,
- the agglomerating agent was palm fat which was spread at 55°C onto a dry mix of the powdered compounds rotating within the bowl,

- the aromas were purchased from the company FIS, Switzerland,
- the powdered aromas were added to the dry mix,
- the liquid aromas were injected into the liquid fat before spraying,
- 500-800 g batches were prepared,
- free flowing aromatizing agents were obtained which comprised granules about 0.1-4.0 mm in diameter and were soluble in liquids at about 40-50°C.

Preparation of the foaming agent

A mixture of 70-90 parts maltodextrin, 30-10 parts caseinate and water was prepared which had a solids content of about 55% by weight. Nitrogen gas was injected into the mixture and the mixture was spray dried to a powder. The resulting powder was then subjected to an atmosphere of nitrogen gas at a pressure of about 2 MPa and at a temperature of about 70°C for about 20 minutes. The powder was then rapidly quenched by rapid release of the pressure. Nitrogen gas was thus entrapped in the foamed matrix in an amount to release 12-14 ml of gas at room temperature per g of soluble foaming agent. A white powder was obtained which had an appearance similar to that of a soluble creamer powder.

Example 1

An aromatizing agent was manufactured which had the following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		110	
Agglomerating agent		221	
Aroma	Butter, powder	10	2
Filler	Maltodextrin	164	
	TOTAL	505	

1% of this aromatizing agent (corresponding to 0.02% of
 5 aroma compound) were dispersed into water together with
 0.1% sodium chloride. A nicely butter smelling savoury
 beverage was obtained of which a fresh butter flavour was
 immediately perceivable by the consumer's nose.

Example 2

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An aromatizing agent was manufactured which had the
 following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		110	
Agglomerating agent		221	
Aroma	Butter, liquid	5	1
Filler	Maltodextrin	164	
	TOTAL	500	

15 2% of this aromatizing agent (corresponding to 0.02% of
 aroma compound) were dispersed into water together with
 0.1% sodium chloride. A nicely butter smelling savoury
 beverage was obtained of which a butter fresh flavour was
 immediately perceivable by the consumer's nose.

Example 3

5 An aromatizing agent was manufactured which had the following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		110	
Agglomerating agent		191	
Aroma	Milk chocolate, liquid	35	7
Filler	Maltodextrin	164	
TOTAL		500	

10 1.43% of this aromatizing agent (corresponding to 0.1% of aroma compound) were dispersed into milk together with 10% sugar. A nicely chocolate smelling milk beverage was obtained of which a chocolate fresh flavour was immediately perceivable by the consumer's nose.

Example 4

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An aromatizing agent was manufactured which had the following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		110	
Agglomerating agent		190	
Aroma	Leek oil	20	4
Filler	Maltodextrin	150	
	Sodium chloride	30	
TOTAL		500	

0.25% of this aromatizing agent (corresponding to 0.01% of
aroma compound) were dispersed into water together with
0.1% sodium chloride and 0.1% monosodium glutamate. A
nicely leek smelling savoury beverage was obtained of which
5 a fresh leek flavour was immediately perceivable by the
consumer's nose.

Example 5

10 An aromatizing agent was manufactured which had the
following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		110	
Agglomerating agent		206	
Aroma	Orange oil	20	4
Filler	Maltodextrin	164	
TOTAL		500	

0.125% of this aromatizing agent (corresponding to 0.005%
15 of aroma compound) were dispersed into water together with
10% sugar and 0.15% citric acid. A nicely orange smelling
refreshing beverage was obtained of which a fresh orange
flavour was immediately perceivable by the consumer's nose.

20 **Example 6**

An aromatizing agent was manufactured which had the
following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		150	
Agglomerating agent		405	
Aroma	Mushroom, powder	21.7	2.69
Filler	Maltodextrin	188.3	
	Sodium chloride	40	
	TOTAL	805	

0.93% of this aromatizing agent (corresponding to 0.025% of
aroma compound) were dispersed into water together with
5 a powdered mushroom soup. A nicely mushroom smelling soup
was obtained of which a fresh mushroom flavour was
immediately perceivable by the consumer's nose.

For comparison purpose, a similar soup was prepared while
10 using a conventional dense aroma entrapment powder
(corresponding to 0.025% of aroma compound) instead of the
present aromatizing agent. A nicely mushroom smelling soup
was obtained of which a comparatively less fresh mushroom
flavour was relatively slowly perceivable by the consumer's
15 nose.

Example 7

An aromatizing agent was manufactured which had the
20 following composition:

Compound		Amount (g)	Amount (%)
Foaming agent		150	
Agglomerating agent		300	
Aroma	Mushroom, liquid	30	4.24
Filler	Maltodextrin	188	
	Sodium chloride	40	
TOTAL		708	

0.88% of this aromatizing agent (corresponding to 0.04% of
 5 aroma compound) were dispersed into water together with
 a dehydrated cup noodle mushroom soup. A nicely mushroom
 smelling cup noodle soup was obtained of which a fresh
 mushroom flavour was immediately perceivable by the
 consumer's nose.

10 For comparison purpose, a similar cup noodle soup was
 prepared while using a conventional dense aroma entrapment
 powder (corresponding to 0.04% of aroma compound) instead
 of the present aromatizing agent. A nicely mushroom
 smelling cup noodle soup was obtained of which a
 15 comparatively less fresh mushroom flavour was relatively
 slowly perceivable by the consumer's nose.

Example 8

20 An aromatizing agent was manufactured which had the
 following composition:

Compound		Amount (%)
Foaming agent		59
Agglomerating agent		25
Aroma	leek	16
TOTAL		100

0.375% of this aromatizing agent (corresponding to 0.06% of
aroma compound) were dispersed into water together with
0.1% sodium chloride and 0.1% monosodium glutamate. A
5 nicely leek smelling savoury beverage was obtained of which
a fresh leek flavour was immediately perceivable by the
consumer's nose.

Example 9

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An aromatizing agent was manufactured which had the
following composition:

Compound		Amount (%)
Foaming agent		44
Agglomerating agent		40
Aroma	leek	16
	TOTAL	100

15 0.375% of this aromatizing agent (corresponding to 0.06% of
aroma compound) were dispersed into water together with
0.1% sodium chloride and 0.1% monosodium glutamate. A
nicely leek smelling savoury beverage was obtained of which
a fresh leek flavour was immediately perceivable by the
20 consumer's nose.

Example 10

25 An aromatizing agent was manufactured which had the
following composition:

Compound		Amount (%)
Foaming agent		59
Agglomerating agent		25
Aroma	onion	16
TOTAL		100

0.375% of this aromatizing agent (corresponding to 0.06% of
 5 aroma compound) were dispersed into water together with
 0.1% sodium chloride and 0.1% monosodium glutamate. A
 nicely onion smelling savoury beverage was obtained of
 which a fresh onion flavour was immediately perceivable by
 the consumer's nose.

10 **Example 11**

An aromatizing agent was manufactured which had the
 following composition:

Compound		Amount (%)
Foaming agent		44
Agglomerating agent		40
Aroma	onion	16
TOTAL		100

15 0.375% of this aromatizing agent (corresponding to 0.06% of
 aroma compound) were dispersed into water together with
 0.1% sodium chloride and 0.1% monosodium glutamate. A
 nicely onion smelling savoury beverage was obtained of
 20 which a fresh onion flavour was immediately perceivable by
 the consumer's nose.

Claims

1. An aromatizing agent comprising granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.
2. Aromatizing agent according to claim 1, which comprises, in % by weight, 10 to 80% of foaming agent, 1.0 to 10% of aroma compound, 1 to 80% of agglomerating agent and up to 50% of a filler.
3. Aromatizing agent according to claim 1, which comprises, in % by weight, 1 to 80% of foaming agent, 0.2 to 70% of aroma compound, 1 to 50% of agglomerating agent and up to 50% of a filler.
4. Aromatizing agent according to claim 1, in which the particles of a foaming agent comprise a matrix containing carbohydrates and protein and entrapped gas.
5. Aromatizing agent according to claim 4, in which the carbohydrates, the protein and fat respectively provide 40 to 98%, 2 to 50% and up to 30% by weight of the matrix.
6. Aromatizing agent according to claim 1, in which the gas is entrapped in the matrix in an amount to release 1 to 25 ml of gas at room temperature per g of soluble foaming agent.
7. Aromatizing agent according to claim 1, in which the particles of an aroma compound comprise a natural or synthetic aroma concentrate entrapped in a matrix of an aroma support.

8. Aromatizing agent according to claim 1, in which the droplets of an aroma compound comprise a natural or synthetic aroma concentrate dissolved in a liquid solvent.

5 9. Aromatizing agent according to claim 1, in which the agglomerating agent is fat, gum or sugar.

10. Aromatizing agent according to claim 1, in which the agglomerating agent is palm fat.

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11. Powdered dehydrated food product, in addition comprising an aromatizing agent which comprises granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.

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12. A process for manufacturing an aromatizing agent, which comprises agglomerating together particles of a foaming agent and particles and/or droplets of an aroma compound with an agglomerating agent.

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13. A method of providing a perception of fresh aroma or traditionally cooked aroma by reconstituting in a liquid an aromatizing agent which comprises granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.

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14. A method of providing a perception of fresh aroma or traditionally cooked aroma while reconstituting a powdered dehydrated food product in a liquid, which comprises adding to the dehydrated food product an aromatizing agent which comprises granules formed of particles of a foaming agent and particles and/or droplets of an aroma compound agglomerated with an agglomerating agent.

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