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(54) Titre : DESSERT MULTICOUCHE; METHODE ET APPAREIL POUR LE PREPARER  
(54) Title: MULTILAYER DESSERT, AND PROCESS AND APPARATUS FOR ITS PRODUCTION

(57) **Abrégé/Abstract:**

The invention relates to a multilayer dessert having at least one heat-treated component, which comprises mousse, creme, jelly and/or sauce, where this component is coated with a continuous sterilized layer of fat coating or chocolate of a thickness between 0.1 and 3 mm, or in that these components (7, 8, 9) are separated by a continuous sterilized layer (10, 11) of fat coating or chocolate of a thickness between 0.1 and 3 mm, and in that the component or components have a Bostwick viscosity below 8 cm.

**Abstract****Multilayer dessert, and process and apparatus for its production**

The invention relates to a multilayer dessert having at least one heat-treated component, which comprises mousse, creme, jelly and/or sauce, where this component is coated with a continuous sterilized layer of fat coating or chocolate of a thickness between 0.1 and 3 mm, or in that these components (7, 8, 9) are separated by a continuous sterilized layer (10, 11) of fat coating or chocolate of a thickness between 0.1 and 3 mm, and in that the component or components have a Bostwick viscosity below 8 cm.

**Fig. 2**

**Multilayer dessert, and process and apparatus for its production**

The invention relates to a multilayer dessert having one or more heat-treated components which comprise  
5 mousse, creme, jelly and/or sauce. The invention further relates to the process for producing this dessert and the apparatus for carrying out the process.

In the chilled sector, multilayer desserts are already available: They comprise various components, such  
10 as mousse and creme, which lie on top of one another.

The object underlying the invention is to offer a multilayer dessert of this type, which, however, additionally contains at least one brittle thin layer, e.g. made of chocolate, in order that the consumer,  
15 during consumption, on the one hand experiences an additional cracking on penetrating the respective layer with the spoon and, on the other hand, experiences a novel mouthfeel due to the parts of the layer destroyed in advance.

20 Relating to the process of the present invention, it is already known to coat bakery products with a chocolate layer: DE-A 2239986 and US Patent 3,470,831 already relate to a process of this type. However, the apparatus which is used in accordance with this technology is a two-component nozzle, i.e. a nozzle which is  
25 operated by compressed air. And furthermore, this known process never relates to a multilayer dessert technology.

The invention relates to a multilayer dessert as specified by the preamble of Claim 1, the component being  
30 coated with a continuous sterilized layer of fat coating or chocolate of a thickness between 0.1 and 3 mm, or the components being separated by one or more continuous sterilized layers of fat coating or chocolate of a thickness between 0.1 and 3 mm and these components  
35 having a Bostwick viscosity below 8 cm.

The product of the invention is intended to be offered in the chilled sector, and it should be consumed within 4 to 6 weeks of the date of manufacture.

Various versions of the multilayer dessert are to

be contemplated, e.g. a first version, where one has only one component which is coated with the layer. The layer of fat coating or chocolate is continuous, so that breaking of the layer can effectively take place during consumption. In a second version, for example, it is possible to have a layer of mousse and then a layer of chocolate, a layer of jelly, a new layer of chocolate and finally the same mousse as mentioned above. All variations with various components are possible. In this case, it is necessary to have a continuous layer, so that the separation of the various components continues to be ensured even during storage and an additional cracking experience or mouthfeel results.

The thickness of the layer is also critical: an excessively thin layer gives no feeling of breakage and an excessively thick layer leads to too great an effort to break the layer with the spoon. It is therefore envisaged to have the thickness of the layer between 0.1 and 3 mm; preferably a layer of approximately 1 mm is taken.

Mousse is taken to mean a whipped milk fresh product. Creme is taken to mean a milk phase containing gelating agents, such as a blancmange. Jelly is taken to mean a fruit jam, and sauce denotes a milk phase or water phase containing fruit and/or flavourings, such as vanilla.

All possible combinations, such as mousse/creme, mousse/sauce/mousse, pudding/sauce/pudding, come within the scope of the invention.

The components must be heat-treated, i.e. they are either sterilized or pasteurized.

The respective components must have a certain viscosity, in order that the layer to be applied does not penetrate into this lower-lying component. The viscosity must also not be too high, otherwise smooth (even) filling is not possible. The Bostwick viscosity of the components is below 8 cm. Bostwick viscosity is taken to mean the measurement of the flow path of a product on an inclined plane for 120 sec. at 20°C. This measurement is

performed with an instrument from Kinematica AG (Littau, Switzerland). In the case of sauce, the Bostwick viscosity is in the vicinity of 8 and in the case of mousse, rather in the region of 2.

5 All percentages in the following description are taken to mean percentages by weight. The chocolate used comprises a mixture of cocoa butter, cocoa powder or chocolate liquor, sugar and flavourings. The content of cocoa butter is 50 to 90% of the mixture. The fat coating  
10 comprises vegetable fat, if appropriate cocoa powder, sugar and flavourings. Vegetable fat is taken to mean, e.g. hardened coconut fat, whose content in the mixture is 50 to 90%.

The proportion of sugar in the chocolate or fat  
15 coating is up to 17%, and is preferably in the range from 2 to 3%. The sugar used is liquid sugar.

The invention further relates to the process for the production of this multilayer dessert, the component or the components being packaged with an ultrahygienic or  
20 aseptic machine, and each chocolate layer or fat coating layer being applied with a single-component spraying system at a spraying pressure between 5 and 200 bar and at a temperature between 20 and 60°C.

In the case of the first version of the multi-  
25 layer dessert, the filling line comprises the following elements: conveyor belt to feed the sterilized cups, mousse filling station, spraying station for the chocolate layer and station for sealing the lid. In the case of the second version, in comparison with the abovementioned line, additional stations must be provided for  
30 packaging the further mousse layers. In addition, a further spraying station must be included.

The chocolate mass must be liquid during application: for this reason, the temperature of this mass must  
35 be above the melting point, i.e. between 20 and 60°C. High pressure is employed, so that the spraying proceeds uniformly. The pressure must also not be too high, because of penetration and overspray. A pressure below 80 bar is preferably employed.

Obviously, the entire line is under ultrahygienic or aseptic conditions.

The chocolate mass or fat coating mass is prepared as follows: The various products of the composition are mixed, the mixture is dispersed and sterilized, usually at a temperature of approximately 125°C for 5-10 min. The sterilized mass is then fed by a pump to a colloid mill or a homogenizer to comminute the cocoa powder agglomerate. Filtration then follows.

10 The chocolate mass or fat coating mass is then ready to be fed to the spraying system. In order to permit perfect spraying, care must be taken to ensure that a temperature above the melting point of the mass is always ensured in the feed system.

15 The spraying period depends on the particular layer thickness and the nozzle opening: Usually, the period for charging each cup is of the order of one second. This is in good agreement with the rate of existing filling machines.

20 Preferably, a spraying pressure between 70 and 80 bar is employed, and the temperature of the chocolate mass is approximately 30-40°C. This range provides the viscosity suitable for ensuring fault-free spraying.

25 The invention further relates to the apparatus for producing and spraying the fat coating or chocolate layer, the apparatus comprising two linked lines: a production line operated batchwise and a spraying line operated continuously. The production line is taken to mean a line for preparing the chocolate mass or fat coating mass.

30 The production line comprises the following interconnected elements:

- dispersion and sterilization apparatus,
- pump,
- 35 - colloid mill or homogenizer and
- filter.

The treatment in a colloid mill or a homogenizer

is necessary in order to grind the cocoa particles as finely as possible, in order to exclude a risk of blockage of the spraying system: The particle size is in the range from 100 to 200 microns.

5           When the chocolate mass is ready, it is fed to a storage vessel having temperature control and is then transported by pump to the single-component spraying system.

          Concerning the single-component spraying system,  
10 the high pressure is maintained by a single piston pump, or one piston metering pump is provided for each spraying station. In the first solution, the spraying line includes a piston pump, at least one spray gun and a counterpressure valve, each spray gun comprising a pulsed  
15 needle valve and a hollow-cone swirl nozzle. In the second solution, the single-component spraying system has at least one single-component spray feeder, each single-component spray feeder comprising a pulsed piston metering pump, a pulsed needle valve and a hollow-cone swirl  
20 nozzle.

          The single-component spray system comprises a plurality of spray guns or spray feeders, e.g. from 1 to 12.

          For more detailed description of the invention,  
25 the invention is described with reference to the drawings in the following working examples. In the drawings:

Fig. 1 shows the multilayer dessert according to the first version,

Fig. 2 shows the multilayer dessert according to the  
30 second version

Fig. 3 shows a diagrammatic representation of the apparatus of the invention, according to the second solution

Fig. 4 shows a diagrammatic representation of the apparatus of the invention according to the first solution  
35 (with only the different high-pressure part).

The cup (1) with the lid (2) contains a mousse (3) which is coated with a layer of chocolate (4). The chocolate layer comprises a mixture of 50% cocoa powder, 46% cocoa fat, 3% liquid sugar and 1% flavouring. This layer has a thickness of 1.5 mm. The mousse comprises a whipped mixture of milk, fat, chocolate powder and thickener. It has a Bostwick viscosity of 5 cm. This dessert can be kept in a refrigerator for 4 weeks.

Fig. 2 shows the second version: The cup (5) with the lid (6) contains, from bottom to top of the cup, a mousse (7), a first layer of chocolate (11), a sauce (8), a second layer of chocolate (10) and a mousse (9), which is similar to the mousse (7). The composition of the mousse and the chocolate is the same as that in Fig. 1. The chocolate layers have a thickness of 1 mm. The sauce comprises a mixture of milk, flavourings and thickener and has a Bostwick viscosity of 6 cm.

In association with Fig. 3, the apparatus for preparing and spraying the chocolate mass is seen. In the tank (12), the mixture of the cocoa powder, the cocoa butter, the liquid sugar and the flavourings is prepared. The agitator (16) ensures a homogeneous mixture: This mixture is then sterilized at a temperature of 125°C for 10 min. The pump (13) permits the sterilized chocolate mass to be fed to the colloid mill (14), the cocoa powder particles being ground to a size of approximately 100 microns. The filter (15) avoids ingress of coarse particles into the spray system. The entire apparatus is at a temperature of approximately 40°C. The filtered chocolate mass enters the tank (17), which mass is kept homogeneous with agitator (18). A pump (19) brings the mass to the respective single-component spray system, which comprises a piston metering pump (20), a needle valve (21) and a hollow-cone swirl nozzle (22). The piston metering pump forces a certain amount of chocolate into the storage chamber of the needle valve, the needle then opening and permitting the desired amount (28) of chocolate to be sprayed. Since the apparatus operates

continuously, a certain amount of chocolate remains unused each time, which returns to the tank (17) through line (27). Usually, each piston metering pump is operated at a pressure of 75 bar and the chocolate mass is kept at a temperature of 37-38°C. The piston metering pump and the needle valve operate cyclically. During the chocolate metering, the needle remains open for approximately 0.25 sec, a layer of 1.5 mm being metered. The line operates at 5000 cups per hour.

10 Fig. 4 shows only the high-pressure part of the spray line according to the first solution. Downstream of a pump (19) (Fig. 3) is then connected a single piston pump (23). It transports the chocolate to the spray guns, which comprise one pulsed needle valve (25) and one  
15 hollow-cone swirl nozzle (26) each, towards a counter-pressure valve (24). Downstream of the counterpressure valve (24), the unsprayed chocolate passes back into the tank (17) (Fig. 3). The chocolate under high pressure (between piston pump (23) and counterpressure valve (24))  
20 is transported to the nozzles (26) by opening the needle valve (25) and the desired amount (30) is sprayed there.

**CLAIMS:**

1. Multilayer dessert comprising at least one heat-treated component selected from the group of mousse, crème, jelly, sauce, and combinations thereof, the component being coated with a continuous sterilized layer of a fat coating mass or a chocolate mass of a thickness between 0.1 and 3 mm, or in that these components are separated by a continuous sterilized layer of fat coating or chocolate of a thickness between 0.1 and 3 mm, the at least one component having a Bostwick viscosity below 8 cm, wherein Bostwick viscosity means the measurement of the flow path of the component on an inclined plane for 120 seconds at 20° C.
2. Multilayer dessert according to claim 1, characterized in that the fat coating comprises vegetable fat.
3. Multilayer dessert according to claim 1, wherein the fat coating further includes at least one of cocoa powder, sugar and flavourings.
4. Multilayer dessert according to claim 1, characterized in that the chocolate comprises a mixture of cocoa butter, cocoa powder or chocolate liquor, sugar and flavourings.
5. Multilayer dessert according to claim 4, characterized in that the proportion of sugar is between 1 and 17%.
6. Process for the production of the multilayer dessert according to any one of claims 1 to 5, the component or the components being packaged by an ultrahygenic or aseptic machine, characterized in that each layer of chocolate or fat coating is applied by a single-component spray system under a spraying pressure between 5 and 200 bar and at a temperature between 20 and 60°C.
7. Process according to claim 5, characterized in that the chocolate mass or fat coating mass is sterilized, comminuted and filtered prior to the application.

8. Process according to claim 5 or 6, characterized in that the application of the fat covering layer or chocolate layer is metered and that each metered application of the fat coating layer or chocolate layer is performed in the order of one second.
9. Process according to any one of claims 5 to 7, characterized in that the chocolate layer or fat coating layer is charged at a pressure between 70 and 80 bar and at a temperature of 30-40°C.
10. Apparatus for metering the fat coating or chocolate layer in a multilayer dessert as defined in any one of claims 1 to 9, characterized in that the apparatus comprises two connected lines: a production line operated batchwise and a spray line operated continuously.
11. Apparatus according to claim 10, characterized in that the production line comprises the following inter-connected elements:
- dispersion and sterilization apparatus,
  - pump,
  - colloid mill or homogenizer and
  - filter.
12. Apparatus according to claims 10 or 11, characterized in that the spray line comprises the following elements:
- storage vessel having temperature control,
  - pump and
  - single-component spray system.
13. Apparatus according to claim 12, characterized in that the single-component spray system has at least one single-component spray feeder, each single-component spray feeder comprising a pulsed piston metering pump, a pulsed needle valve and a hollow-cone swirl nozzle.

- 10 -

14. Apparatus according to claim 12, characterized in that the single-component spray system comprises a piston pump, at least one spray gun and a counterpressure valve, each spray gun comprising a pulsed needle valve and a hollow-cone swirl nozzle.
15. Apparatus according to claim 13 or 14, characterized in that the single-component spray system has between 2 and 12 single-component spray feeders or spray guns.
16. Multilayer dessert according to claim 5, wherein the sugar is in the form of liquid sugar.

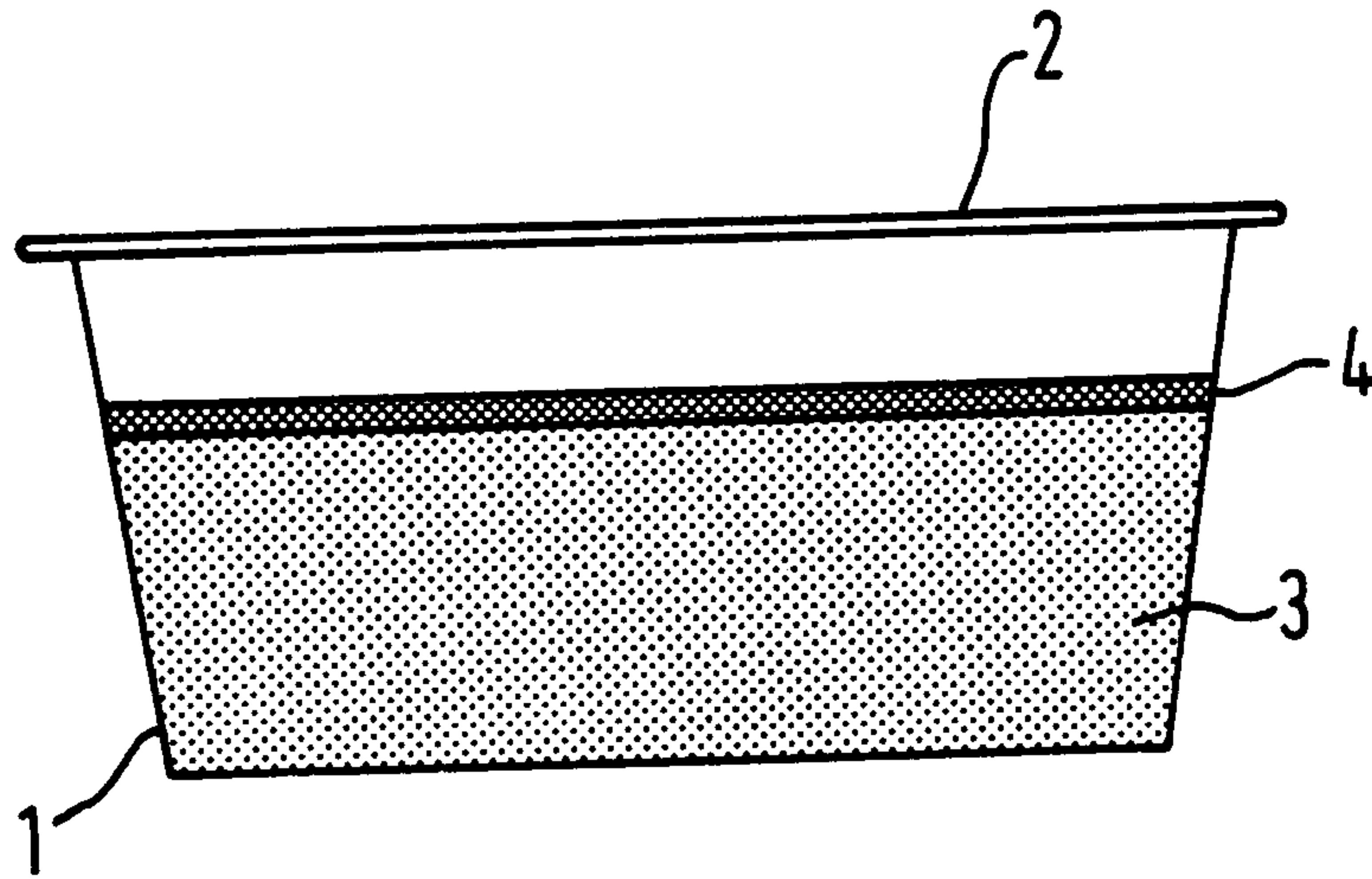


FIG. 1.

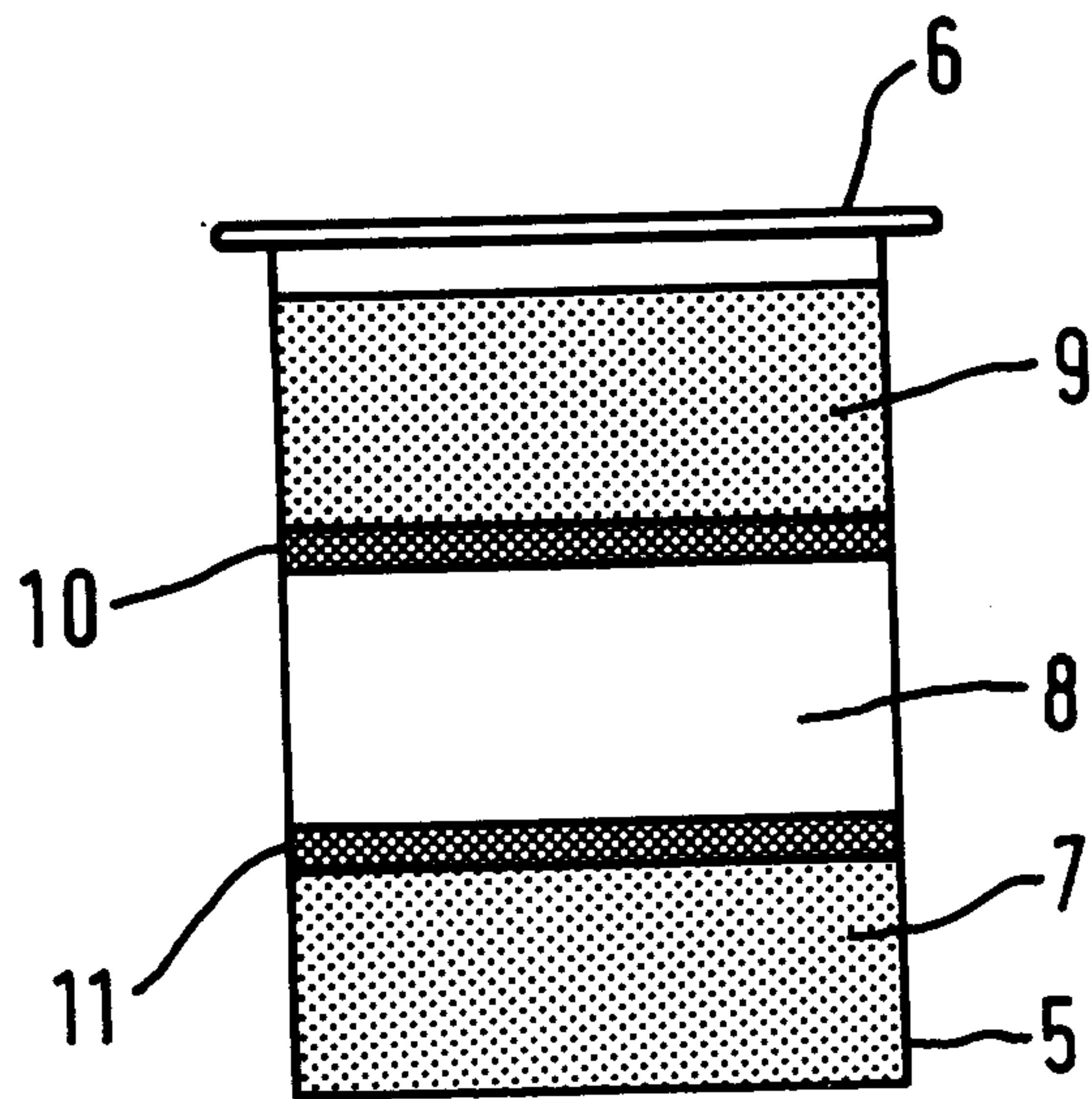


FIG. 2.

