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(54) **FOAM DISPENSER**

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## Description

### Field of the invention

[0001] The present invention relates to a foam dispenser and particularly to a hand held foam dispenser preferably made of a deformable material. The foam dispenser is in particular suitable to produce foams for cleaning hard surfaces.

[0002] The invention further relates to a method to dispense foam using such foam dispenser.

### Background of the invention

[0003] Foam dispensers are known in the art. There are mainly two types of foam dispensers known in the art: dispensers using pressurized gas and dispensers not using pressurized gas.

[0004] Foam dispenser that are not using pressurized gas are gaining more and more significant market segments because they are versatile and overcome several environmental problems. Such dispenser are preferably entirely made of plastic (and do not comprise for example metal or other materials) so that such container can be recycled. Furthermore such dispensers can be refilled after their first use and can be used for several recharges.

[0005] JP2006290365A (Lion Corp) discloses a squeeze foamer which has a mixing unit for mixing a liquid with air to form foamy air/liquid. The mixing unit consists of an outer mixing portion in which a liquid intake cylinder for taking in the content liquid and an air intake for taking in air are provided at least at one or more parts, and a cylindrical inner mixing portion which is attached to the interior of the outer mixing portion, and has an intake hole for taking the content liquid and the air taken into the outer mixing portion into a stirring chamber provided inside. The intake hole is formed at least at one or more parts.

[0006] WO0139894 A1 (Taplast SPA) discloses a spraying device for dispensing liquids under the form of foam by the deformation of a container achieved by squeezing with a hand, comprising: a first body provided with means of watertight coupling to the neck of said container; said first body enclosing a first chamber where the air-liquid mixture is made and having at least one filter element fitted on the spraying duct of said mixture suited to form the required foam and valve devices to restore the air inside the container. Said device also comprising: a second body suited to determine with said first body a second chamber suited to containing the volume of liquid found in a suction tube in said container, thereby preventing liquid from being discharged during the first spray.

[0007] There are essentially two types of foam dispensers on the market capable of spraying foam without using pressurised gas: a first type comprises a hand operated pump and mixes air and liquid in a mixing chamber to form a foam, a second type comprises a squeezable

container. By squeezing such container, liquid and air are sucked up and foam is produced by mixing the flowing streams of foamable liquid and air in a mixing chamber. The mixture of air and liquid is subsequently passed through a porous material such as a sponge-like material to produce foam.

[0008] The most important problems associated with foam dispensers presently known in the art are

- inconsistency in foam's characteristics;
- slow retraction of the dispenser so that quick and consecutive use is difficult or impossible;
- interference of the flow rate of the air and the flow rate of the liquid with as result that the quality of the foam is not guaranteed;
- difficulties to direct or jet the foam on a surface and in particular to direct or jet a foam on a surface from a distance or to apply foam on a vertical or substantially vertical surface or on difficult accessible areas or surfaces.

[0009] To solve these problems complex designs requiring complex air retraction systems and/or requiring complex valve systems are proposed in the art. Consequently, there is a need to provide a foam dispenser having a simplified design resulting in foam having constant foam consistency and quality and to provide a foam dispenser having a mechanism to direct or jet foam from a distance or to direct or jet foam on difficult accessible areas or surfaces.

### Summary of the invention

[0010] It is an object of the present invention to provide a foam dispenser, in particular a hand held foam dispenser avoiding the drawbacks of the prior art.

[0011] It is another object of the present invention to provide a foam dispenser that is not requiring the use of pressure valves, thereby avoiding the problems of valves and allowing a simplified design of foam dispensers.

[0012] It is another object of the present invention to provide a foam dispenser whereby interference of the flow rate of the air with the flow rate of the foaming liquid is avoided. It is another object of the present invention to provide foam dispenser whereby the dispensers retracts quickly so that consecutive use of the foam dispenser is possible.

[0013] It is still a further object to provide a method to apply foam on a targeted surface. It is still a further object to provide a method to apply foam on a target surface which is located at a distance from the foam dispenser.

[0014] It is still a further object to provide a method to apply foam on a vertical or substantially vertical surface or on a difficult accessible area or surface.

[0015] As used herein the term "comprising" encompasses the terms "consisting essentially of" and "consisting of". Where the term "comprising" is used, the listed steps or options need not be exhaustive. Unless other-

wise specified, numerical ranges expressed in the format "from x to y" are understood to include x and y. In specifying any range of values or amounts, any particular upper value or amount can be associated with any particular lower value or amount. Except in the examples and comparative experiments, or where otherwise explicitly indicated, all numbers are to be understood as modified by the word "about". All percentages and ratios contained herein are calculated by weight unless otherwise indicated. As used herein, the indefinite article "a" or "an" and its corresponding definite article "the" means at least one, or one or more, unless specified otherwise. The various features of the present invention referred to in individual sections above apply, as appropriate, to other sections *mutatis mutandis*. Consequently features specified in one section may be combined with features specified in other sections as appropriate. Any section headings are added for convenience only, and are not intended to limit the disclosure in anyway.

**[0016]** According to a first aspect of the present invention a foam dispenser according to claim 1 is provided. The foam dispenser can be a hand held foam dispenser. The dispenser comprises a container for holding a liquid and air. The container is made of a deformable material.

**[0017]** The container has a head section. The head section comprises an air chamber and a mixing chamber. The mixing chamber is positioned in the air chamber. The air chamber is provided with an air tube extending in the container for introducing air from the container in the air chamber. When the foam dispenser is its inverted position, the air tube is extending upwards, for example vertically upwards.

**[0018]** The mixing chamber is provided with at least one first inlet, with at least one second inlet and with at least one outlet.

**[0019]** The at least one first inlet allows the introduction of the liquid (for example foamable liquid) present in container into the mixing chamber. This means that the mixing chamber is in communication with the liquid present in the container by the at least one first inlet. The at least one second inlet allows the introduction of air present in the air chamber into the mixing chamber. This means that the mixing chamber is in communication with air present in the air chamber by the at least one second inlet.

**[0020]** The at least one outlet comprises a foam conveying tube. The foam conveying tube comprises at least one porous material positioned across the foam conveying tube, preferably across the cross-sectional area of the foam conveying tube.

**[0021]** Preferably the foam conveying tube is further provided with a nozzle for directing foam onto a target surface.

**[0022]** A foam dispenser according to the present invention is preferably used in an inverted orientation.

**[0023]** With "an inverted orientation" is meant an orientation of the foam dispenser in which the head section of the container is oriented downwards.

**[0024]** The present foam dispenser can be used for

the delivery of a wide range of foam products and is in particular suitable to deliver foams for cleaning bathrooms, foams for cleaning windows, foams for cleaning apparatuses as for example kitchen ovens, foams for cleaning furniture or carpets, foams for personal care such as hand soaps, shampoos, shower or bath soaps or facial products.

#### The container

**[0025]** The container is suitable for holding a liquid and air. The liquid present in the container comprises preferably a foamable liquid (for example a liquid detergent solution). The container is made of a material that can be manually deformed or squeezed. Preferably the container is made of a polymer material as for example polypropylene or polyethylene.

**[0026]** As mentioned above the container is provided with a head section. This head section can be removably connected to the container. In alternative embodiments the head section is permanently connected to the container or is even part of the container.

#### Air chamber

**[0027]** The head section of the container of a foam dispenser according to the present invention comprises an air chamber. The air chamber comprises preferably a polymer material, for example polypropylene or polyethylene. The air chamber may comprise the same material as the container or may comprise a different material.

**[0028]** The air chamber is provided with at least one air tube for introducing air from the container in the air chamber. The air chamber further comprises a mixing chamber.

#### Mixing chamber

**[0029]** The mixing chamber is preferably made of a polymer material. The polymer material of the mixing chamber may comprise the same polymer material as the polymer material of the container or may comprise another polymer material.

**[0030]** For a foam dispenser according to the present invention the mixing chamber is positioned in the air chamber. With "positioned in the air chamber" is meant that the mixing chamber is physically located in the air chamber, i.e. that the mixing chamber is surrounded by the air chamber.

**[0031]** In the mixing chamber air and liquid, such as foamable liquid are mixed. The mixture of air and (foamable) liquid is discharged from the mixing chamber to produce foam.

**[0032]** The mixing chamber is provided with at least one first inlet for introducing liquid from the container in the mixing chamber, with at least one second inlet for introducing air from the air chamber in the mixing chamber, with at least one outlet comprising a foam conveying

tube.

#### Air tube

**[0033]** The air tube is connecting the mixing chamber with the air present in the container. The air tube allows the introduction of air present in the container in the air chamber. Preferably, the air tube is extending from the air chamber to the part of the container holding the air. As air is generally present in the upper part of the container, the air tube is preferably extending to the upper part of the container. For dispersers used in an inverted orientation the air tube is preferably extending vertically upwards to the upper part of the container, i.e. the part of the container holding air.

**[0034]** Preferably, the air tube has a relatively long length compared to the height of the container, for example a length comparable to the height of the container. Preferably the length of the air tube is more than 50 %, more than 60 %, more than 70 %, more than 80 % or even more than 90 % of the height of the container.

**[0035]** The air tube comprises for example a polymer tube. The polymer material of the air tube may comprise the same polymer material as the polymer material of the container and/or the polymer material of the mixing chamber or may comprise another polymer material. The air tube may have any possible cross-section although an air tube having a circular or substantially circular cross-section is preferred.

**[0036]** Possibly the air chamber is provided with more than one air tube, for example two or three air tubes such as two or three polymer tubes.

#### First inlet

**[0037]** The at least one first inlet is connecting the mixing chamber with the liquid, for example the foamable liquid, present in the container. The at least one first inlet allows the introduction of the liquid present in the container into the mixing chamber.

**[0038]** Possibly the mixing chamber is provided with more than one first inlet, for example with two or three first inlets such as two or three polymer tubes.

**[0039]** The first inlet comprises for example a tube such as a polymer tube connecting the mixing chamber with the container.

**[0040]** The polymer material of the first inlet may comprise the same polymer material as the polymer material of the container and/or the polymer material of the mixing chamber and/or the polymer material of the air tube or may comprise another polymer material.

**[0041]** The first inlet is extending concentrically over the mixing chamber. The first inlet and the mixing chamber are considered as concentric if the first inlet and the mixing chamber have a common center. The first inlet, i.e. the tube of the first inlet and the mixing chamber are coaxial. The first inlet and the mixing chamber are considered as coaxial if the first inlet and the mixing chamber

have a common axis. The at least one first inlet comprises a tube connecting said container with said mixing chamber and wherein said tube of said first inlet is provided with an extension whereby said extension is extending concentrically over said mixing chamber. In some embodiments the first inlet comprises a tube provided with an extension whereby the extension is preferably extending concentrically over the mixing chamber.

#### Second inlet

**[0042]** The at least one second inlet is connecting the mixing chamber with the air present in the air chamber. The at least one second inlet allows the introduction of air present in the air chamber in the mixing chamber.

**[0043]** Possibly the mixing chamber is provided with more than one second inlet, for example with two or three second inlets.

**[0044]** The at least one second inlet may comprise a tube, such as a polymer tube connecting the air chamber with the mixing chamber for allowing air from the air chamber to the mixing chamber. Alternatively, the at least one second inlet comprises a gap or a number of gaps allowing air from the air chamber to mixing chamber. The gap or gaps are for example provided in the mixing chamber, in the first inlet or between the first inlet and the mixing chamber. In this way one or more air channels are created to allow the passage of air from the air chamber to the mixing chamber.

**[0045]** In a preferred embodiment the second inlet comprises a gap or a number of gaps created between the first inlet and the mixing chamber, for example between the tube of the first inlet and the mixing chamber.

**[0046]** The first inlet comprises a tube provided with an extension whereby said extension is extending concentrically over the mixing chamber. In such embodiment the second inlet may comprise a gap or a number of gaps created between the extension of the first inlet and the mixing chamber.

#### Outlet

**[0047]** The at least one outlet comprises a foam conveying tube, i.e. a tube for conveying the mixture of air and liquid from the mixing chamber and/or for conveying foam produced in the mixing chamber or in or through the porous material present in the at least one outlet. The at least one outlet comprises for example a tube such as a polymer tube.

**[0048]** The at least one outlet preferably comprises a nozzle at the end of the foam conveying tube. The nozzle may direct the foam onto a targeted surface.

**[0049]** As nozzle any type of nozzle known in the art can be used. A preferred nozzle comprises a converging nozzle.

**[0050]** By using an outlet comprising a tube of a certain length and/or by providing the outlet with a nozzle the foam dispenser according to the present invention allows

to apply foam on a targeted surface from a distance. This is in particular advantageous for the application of foam for cleaning applications, such as toilet or bathroom cleaning applications where the user likes to be far from the surface. This is an important advantage compared to foam dispensers known in the art that do not allow to apply foam from a distance.

**[0051]** Furthermore by using a foam dispenser having an outlet of a certain length and/or by providing the outlet with a nozzle the foam dispenser according to the present invention allows to apply foam on difficult accessible areas.

**[0052]** Preferably, the outlet is provided with at least one porous material. This porous material is positioned across the at least one outlet, i.e. across the cross-sectional area of the foam conveying tube.

**[0053]** As porous material any material that is able to produce foam when a flow of air and foamable liquid is passing through such porous material can be considered. As porous material any material having a high porosity or provide with pores or perforations can be considered. The porous material may for example comprise a polymer material, a metal or metal alloy or a ceramic material.

**[0054]** Examples comprise sponge or sponge-like material, mesh or mesh-like material, a fabric or a plate or foil provided with a plurality of holes or perforations.

**[0055]** The pores of the porous material are preferably ranging between 20  $\mu\text{m}$  and 1000  $\mu\text{m}$  or more preferably between 40  $\mu\text{m}$  and 500  $\mu\text{m}$ , for example 100  $\mu\text{m}$ , 200  $\mu\text{m}$  or 300  $\mu\text{m}$ . In a preferred embodiment the foam conveying tube comprises a first porous material and a second porous material. The foam that is dispersed from the mixing chamber through the foam conveying tube passes first through the first porous material and then through the second porous material. The pores or perforations of the first porous material are preferably coarser than the pores or perforations of the second porous material, meaning that the size of the pores or perforations of the first porous material is preferably larger than the size of the pores or perforations of the second porous material. Alternatively, the first porous material has a higher porosity than the second porous material. When the mixture of air and foamable liquid passes through the first porous material a coarse foam is created; when the coarse foam passes the second porous material the coarse foam becomes more uniform in size and texture.

**[0056]** The pores of the first porous material have preferably a pore size ranging between 40  $\mu\text{m}$  and 1000  $\mu\text{m}$ ; the pores of the second porous material have preferably a pore size ranging between 20  $\mu\text{m}$  and 1000  $\mu\text{m}$ .

#### Air valve

**[0057]** In a preferred embodiment the air chamber is provided with at least one air valve, for example a one-way valve. This air valve allows air from the outside of the container into the air chamber. By providing the air chamber with such valve the intake of air is facilitate so

that the container may retract quickly for consecutive use.

**[0058]** The foam dispenser according to the present invention is in particular suitable to be used as a hand held foam dispenser.

**[0059]** According to a second aspect of the invention a method to apply foam on a targeted surface is provided. The method preferably comprises the steps of

- providing a foam dispenser according to the present invention;
- squeezing the container of the foam dispenser to allow air to be sucked from the container in the air chamber through the air tube and subsequently from the air chamber to the mixing chamber through the second inlet and to allow liquid to be sucked from the container in the mixing chamber through the first inlet;
- discharging foam from the mixing unit to the targeted surface through the at least one outlet.

**[0060]** The method to apply foam on a targeted surface according to the present invention allows to apply foam from a distance from the targeted surface.

**[0061]** With applying foam from a distance from the targeted surface is meant that the user of the foam dispenser does not need to approach the targeted surface. The distance between the foam dispenser, for example the container of the foam dispenser and the targeted surface ranges for example between 1 cm and 50 cm and more preferably between 1 cm and 20 cm.

#### **Brief description of the drawings**

**[0062]** The invention will now be described into more detail with reference to the accompanying drawings whereby

- Figure 1 shows an illustration of a foam dispenser according to the present invention.

#### **Detailed description of the invention**

**[0063]** The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. The dimensions and the relative dimensions do not correspond to actual reductions to practice of the invention.

**[0064]** Figure 1 is an illustration of a foam dispenser 1 according to the present invention. The foam dispenser 1 is shown in its inverted orientation. The foam dispenser 1 comprises a container 2 made of a manually deformable polymer material, for example made of polypropylene or polyethylene. The container comprises a foamable liquid 3 and comprises air 4. The container 2 is pro-

vided with a head section 5. In the inverted orientation of the foam dispenser 1 the head section 5 is oriented downwards. The head section 5 of the container 2 comprises an air chamber 6 and a mixing chamber 7. The mixing chamber 7 is positioned in the air chamber 6.

[0065] The air chamber 6 is provided with an air tube 8. When the foam dispenser 1 is oriented in its inverted orientation, the air tube 8 is extending vertically upwards. In this way the air tube 8 connects the air chamber 6 with the part of the container 2 holding the air.

[0066] The mixing chamber 7 is provided with a first inlet 9 for introducing the foamable liquid 3 from the container in the mixing chamber 7, with a second inlet 10 for introducing air 4 from the air chamber 6 in the mixing chamber 7 and with an outlet 11 comprising a foam conveying tube 12.

[0067] The first inlet 9 comprises preferably a tube and more preferably a tube provided with an extension. The tube of the first inlet 9 or the extension of the tube of the first inlet 9 is extending concentrically over the mixing chamber 7.

[0068] The second inlet 10 comprises for example a gap or a number of gaps. In alternative embodiments, the second inlet 10 comprises a tube, for example a polymer tube connecting the air chamber 6 with the mixing chamber 7.

[0069] In a particular embodiment the first inlet 9 is coaxially fixed to the mixing chamber 7 for example by a snap fit design. Between the wall of the first inlet 9 and the mixing chamber 7 an open space or gap may be created. This open space or gap creates an air channel allowing air passage from the air chamber 6 to the mixing chamber 7. In a preferred embodiment the inner wall of the first inlet 9 is provided with a number of narrow ridges around the mixing chamber 7 to create a narrow passage through which air from the air chamber 6 may enter the mixing chamber 7.

[0070] The separate air chamber 6 helps in keeping air and foaming liquid apart so that they do not interfere with each other's flow rates. Hence the air to foaming liquid ratio does not get altered and consequently the foam maintains its consistency and quality.

[0071] The outlet 11 comprises a tube for conveying foam. The tube comprises preferably a polymer tube, for example a polymer tube comprising polypropylene or polyethylene. Preferably the outlet 11 is provided with a porous material 13, preferably positioned across the outlet 11. When the mixture of liquid 3 and air 4 passes through the porous material 13, the mixture is converted into foam.

[0072] It can be preferred that the outlet 11 is provided with more than one porous material 13, for example with a first porous material 13' and with a second porous material 13". The first porous material 13' comprises for example a fabric or a metal or polymer plate provided with holes or perforations having a pore size ranging between 40 and 1000  $\mu\text{m}$ , for example 200  $\mu\text{m}$ . The second porous material 13" comprises for example a fabric or a

metal or polymer plate provided with holes or perforations having a pore size ranging between 20  $\mu\text{m}$  and 1000  $\mu\text{m}$ . When the mixture of liquid 3 and air 4 is discharged from the mixing chamber 7 through the outlet 11, the mixture first passes through the first porous material 13' and subsequently through the second porous material 13".

[0073] The outlet 11 is preferably further provided with a nozzle 14, for example a converging nozzle allowing to push the foam as a jet onto the targeted surface.

[0074] In preferred embodiments the air chamber 6 is provided with an air valve 15, for example a one-way valve to allow air from the outside of the container 2 into the air chamber 6. The valve 15 facilitates the intake of air in the container and allows quick retraction for consecutive use.

[0075] When the container 2 is squeezed manually, air 4 is sucked from the container 2 to the air chamber 6 through air tube 8 and subsequently from the air chamber 6 to the mixing chamber 7 through the second inlet 10.

[0076] By squeezing the container 2, simultaneously with the suction of air 4, liquid 3 is sucked from the container 2 to the mixing chamber 7 through first inlet 9. In the mixing chamber 7 air 4 and liquid 3 are mixed and the mixture air/liquid is discharged through outlet 11.

## Claims

1. A foam dispenser (1) comprising a container (2) made from manually deformable material; said container (2) having a head section (5) comprising an air chamber (6) and a mixing chamber (7), said mixing chamber (7) being positioned in said air chamber (6), said air chamber (6) being provided with an air tube (8) extending into said container (2) for introducing air (4) from said container (2) in said air chamber (6), said mixing chamber (7) being provided with at least one first inlet (9) for introducing liquid (3) from said container (2) in said mixing chamber (7), with at least one second inlet (10) for introducing air (4) from said air chamber (6) in said mixing chamber (7) and with at least one outlet (11), said at least one outlet (11) comprising a foam conveying tube (12) comprising at least one porous material (13) positioned across the foam conveying tube (12), wherein said at least one first inlet (9) comprises a tube connecting said container (2) with said mixing chamber (7) and wherein said tube of said first inlet (9) is provided with an extension whereby said extension is extending concentrically over said mixing chamber (7)
2. A foam dispenser (1) according to claim 1 wherein said second inlet (10) comprises a tube connecting said air chamber (6) with said mixing chamber (7).
3. A foam dispenser (1) according to any one of claims 1 or 2, wherein said second inlet (10) comprises one

or more gaps for allowing air (4) from said air chamber (6) in said mixing chamber (7).

4. A foam dispenser (1) according to any one of the preceding claims 1 to 3, wherein said second inlet comprises one or more gaps located between said first inlet and said mixing chamber.
5. A foam dispenser (1) according to any one of the preceding claims 1 to 4, wherein said foam conveying tube (12) comprises a first porous material (13') and a second porous material (13''), whereby said first porous material (13') has a higher porosity than said second porous material (13'') or whereby the size of the pores or perforations of said first porous material (13') is larger than the size of the pores or perforations of said second porous material (13'').
6. A foam dispenser (1) according to any one of the preceding claims 1 to 5, wherein said foam conveying tube (12) is provided with a nozzle (14) for directing foam on a targeted surface.
7. A foam dispenser (1) according to any one of the preceding claims 1 to 6, wherein the air chamber (6) comprises at least one one-way valve (15) for allowing air (4) from the outside of the container (2) into the air chamber (6).
8. A foam dispenser (1) according to any one of the preceding claims 1 to 7, wherein said foam dispenser (1) is a hand held foam dispenser.
9. A foam dispenser (1) according to any one of the preceding claims 1 to 8, wherein said foam dispenser (1) is used in its inverted orientation
10. A method to apply a foam on a targeted surface, said method comprising the steps of:
  - providing a foam dispenser (1) as defined in any one of claims 1 to 9;
  - squeezing the container (2) of the foam dispenser (1) to allow air (4) to be sucked from the container (2) in the air chamber (6) through the air tube (8) and subsequently from the air chamber (6) to the mixing chamber (7) through the second inlet (10) and to allow liquid (3) to be sucked from the container (2) in the mixing chamber (7) through the first inlet (9);
  - discharging foam from the mixing unit to the targeted surface through the at least one outlet (11).
11. A method according to claim 10, wherein said foam is applied from a distance to the targeted surface.

## Patentansprüche

1. Schaumspender (1), der einen Behälter (2) umfasst, der aus einem manuell verformbaren Material hergestellt ist; wobei der Behälter (2) einen Kopfabschnitt (5) aufweist, der eine Luftkammer (6) und eine Mischkammer (7) umfasst, wobei die Mischkammer (7) in der Luftkammer (6) angeordnet ist, wobei die Luftkammer (6) mit einem Luftschlauch (8) versehen ist, der sich zum Einbringen von Luft (4) aus dem Behälter (2) in die Luftkammer (6) in den Behälter (2) erstreckt, wobei die Mischkammer (7) mit mindestens einem ersten Einlass (9) zum Einbringen von Flüssigkeit (3) aus dem Behälter (2) in die Mischkammer (7), mit mindestens einem zweiten Einlass (10) zum Einbringen von Luft (4) aus der Luftkammer (6) in die Mischkammer (7) und mit mindestens einem Auslass (11) versehen ist, wobei der mindestens eine Auslass (11) einen Schaumbeförderungsschlauch (12) umfasst, der mindestens ein poröses Material (13) umfasst, das quer zum Schaumbeförderungsschlauch (12) angeordnet ist, wobei der mindestens eine erste Einlass (9) einen Schlauch umfasst, der den Behälter (2) mit der Mischkammer (7) verbindet, und wobei der Schlauch des ersten Einlasses (9) mit einer Erweiterung versehen ist, wobei sich die Erweiterung konzentrisch über die Mischkammer (7) erstreckt.
2. Schaumspender (1) nach Anspruch 1, wobei der zweite Einlass (10) einen Schlauch umfasst, der die Luftkammer (6) mit der Mischkammer (7) verbindet.
3. Schaumspender (1) nach einem der Ansprüche 1 oder 2, wobei der zweite Einlass (10) einen oder mehrere Spalte zum Durchlassen von Luft (4) aus der Luftkammer (6) in die Mischkammer (7) umfasst.
4. Schaumspender (1) nach einem der vorhergehenden Ansprüche 1 bis 3, wobei der zweite Einlass einen oder mehrere Spalte umfasst, die zwischen dem ersten Einlass und der Mischkammer angeordnet sind.
5. Schaumspender (1) nach einem der vorhergehenden Ansprüche 1 bis 4, wobei der Schaumbeförderungsschlauch (12) ein erstes poröses Material (13') und ein zweites poröses Material (13'') umfasst, wobei das erste poröse Material (13') eine höhere Porosität als das zweite poröse Material (13'') aufweist oder wobei die Größe der Poren oder Perforationen des ersten porösen Materials (13') größer als die Größe der Poren oder Perforationen des zweiten porösen Materials (13'') ist.
6. Schaumspender (1) nach einem der vorhergehenden Ansprüche 1 bis 5, wobei der Schaumbeförderungsschlauch (12) mit einer Düse (14) zum Lenken

von Schaum auf eine als Ziel gesetzte Oberfläche versehen ist.

7. Schaumspender (1) nach einem der vorhergehenden Ansprüche 1 bis 6, wobei die Luftkammer (6) mindestens ein Einwegventil (15) zum Durchlassen von Luft (4) von außerhalb des Behälters (2) in die Luftkammer (6) umfasst. 5
8. Schaumspender (1) nach einem der vorhergehenden Ansprüche 1 bis 7, wobei der Schaumspender (1) ein Handschaumspender ist. 10
9. Schaumspender (1) nach einem der vorhergehenden Ansprüche 1 bis 8, wobei der Schaumspender (1) in seiner umgekehrten Ausrichtung verwendet wird. 15
10. Verfahren, um Schaum auf eine als Ziel gesetzte Oberfläche aufzubringen, wobei das Verfahren die folgenden Schritte umfasst: 20
  - Bereitstellen eines Schaumspenders (1) nach einem der Ansprüche 1 bis 9;
  - Quetschen des Behälters (2) des Schaumspenders (1), um zu ermöglichen, dass Luft (4) durch den Luftschlauch (8) aus dem Behälter (2) in die Luftkammer (6) und anschließend durch den zweiten Einlass (10) aus der Luftkammer (6) zur Mischkammer (7) gesaugt wird, und um zu ermöglichen, dass Flüssigkeit (3) durch den ersten Einlass (9) aus dem Behälter (2) in die Mischkammer (7) gesaugt wird; 25
  - Auslassen von Schaum durch den mindestens einen Auslass (11) aus der Mischeinheit zu der als Ziel gesetzten Oberfläche. 30
11. Verfahren nach Anspruch 10, wobei der Schaum aus einem Abstand auf die als Ziel gesetzte Oberfläche aufgebracht wird. 35

## Revendications

1. Distributeur de mousse (1) comprenant un récipient (2) constitué d'un matériau manuellement déformable ; ledit récipient (2) présentant une section de tête (5) comprenant une chambre à air (6) et une chambre de mélange (7), ladite chambre de mélange (7) étant positionnée dans ladite chambre à air (6), ladite chambre à air (6) étant munie d'un tube d'air (8) s'étendant dans ledit récipient (2) pour introduire de l'air (4) à partir dudit récipient (2) dans ladite chambre à air (6), ladite chambre de mélange (7) étant munie d'au moins une première entrée (9) pour introduire du liquide (3) à partir dudit récipient (2) dans ladite chambre de mélange (7), d'au moins une seconde entrée (10) pour introduire de l'air (4) 45

à partir de ladite chambre à air (6) dans ladite chambre de mélange (7) et d'au moins une sortie (11), ladite au moins une sortie (11) comprenant un tube d'acheminement de mousse (12) comprenant au moins un matériau poreux (13) positionné à travers le tube d'acheminement de mousse (12), dans lequel ladite au moins une première entrée (9) comprend un tube connectant ledit récipient (2) avec ladite chambre de mélange (7) et dans lequel ledit tube de ladite première entrée (9) est muni d'une extension selon lequel ladite extension s'étend concentriquement sur ladite chambre de mélange (7).

2. Distributeur de mousse (1) selon la revendication 1, dans lequel ladite seconde entrée (10) comprend un tube connectant ladite chambre à air (6) avec ladite chambre de mélange (7).
3. Distributeur de mousse (1) selon l'une quelconque des revendications 1 ou 2, dans lequel ladite seconde entrée (10) comprend un ou plusieurs espaces pour laisser de l'air (4) passer de ladite chambre à air (6) dans ladite chambre de mélange (7).
4. Distributeur de mousse (1) selon l'une quelconque des revendications 1 à 3 précédentes, dans lequel ladite seconde entrée comprend un ou plusieurs espaces disposés entre ladite première entrée et ladite chambre de mélange.
5. Distributeur de mousse (1) selon l'une quelconque des revendications 1 à 4 précédentes, dans lequel ledit tube d'acheminement de mousse (12) comprend un premier matériau poreux (13') et un second matériau poreux (13''), selon lequel ledit premier matériau poreux (13') présente une porosité plus élevée que ledit second matériau poreux (13'') ou selon lequel la taille des pores ou perforations dudit premier matériau poreux (13') est plus large que la taille des pores ou perforations dudit second matériau (13'').
6. Distributeur de mousse (1) selon l'une quelconque des revendications 1 à 5 précédentes, dans lequel ledit tube d'acheminement de mousse (12) est muni d'une buse (14) pour diriger de la mousse sur une surface ciblée.
7. Distributeur de mousse (1) selon l'une quelconque des revendications 1 à 6 précédentes, dans lequel la chambre à air (6) comprend au moins une vanne unidirectionnelle (15) pour laisser l'air (4) passer de l'extérieur du récipient (2) dans la chambre à air (6).
8. Distributeur de mousse (1) selon l'une quelconque des revendications 1 à 7 précédentes, dans lequel ledit distributeur de mousse (1) est un distributeur de mousse tenu à la main. 55



9. Distributeur de mousse (1) selon l'une quelconque des revendications 1 à 8 précédentes, dans lequel ledit distributeur de mousse (1) est utilisé dans son orientation inversée. 5
10. Procédé d'application d'une mousse sur une surface ciblée, ledit procédé comprenant les étapes de :
- fourniture d'un distributeur de mousse (1) comme défini dans l'une quelconque des revendications 1 à 9 ; 10
  - serrage du récipient (2) du distributeur de mousse (1) pour laisser l'air (4) être aspiré du récipient (2) dans la chambre à air (6) à travers le tube d'air (8) et ensuite de la chambre à air (6) jusqu'à la chambre de mélange (7) à travers la seconde entrée (10) et pour permettre au liquide (3) d'être aspiré du récipient (2) dans la chambre de mélange (7) à travers la première entrée (9) ; 15 20
  - décharge de mousse de l'unité de mélange vers la surface ciblée à travers la au moins une sortie (11). 25
11. Procédé selon la revendication 10, dans lequel ladite mousse est appliquée à partir d'une distance vers la surface ciblée. 30

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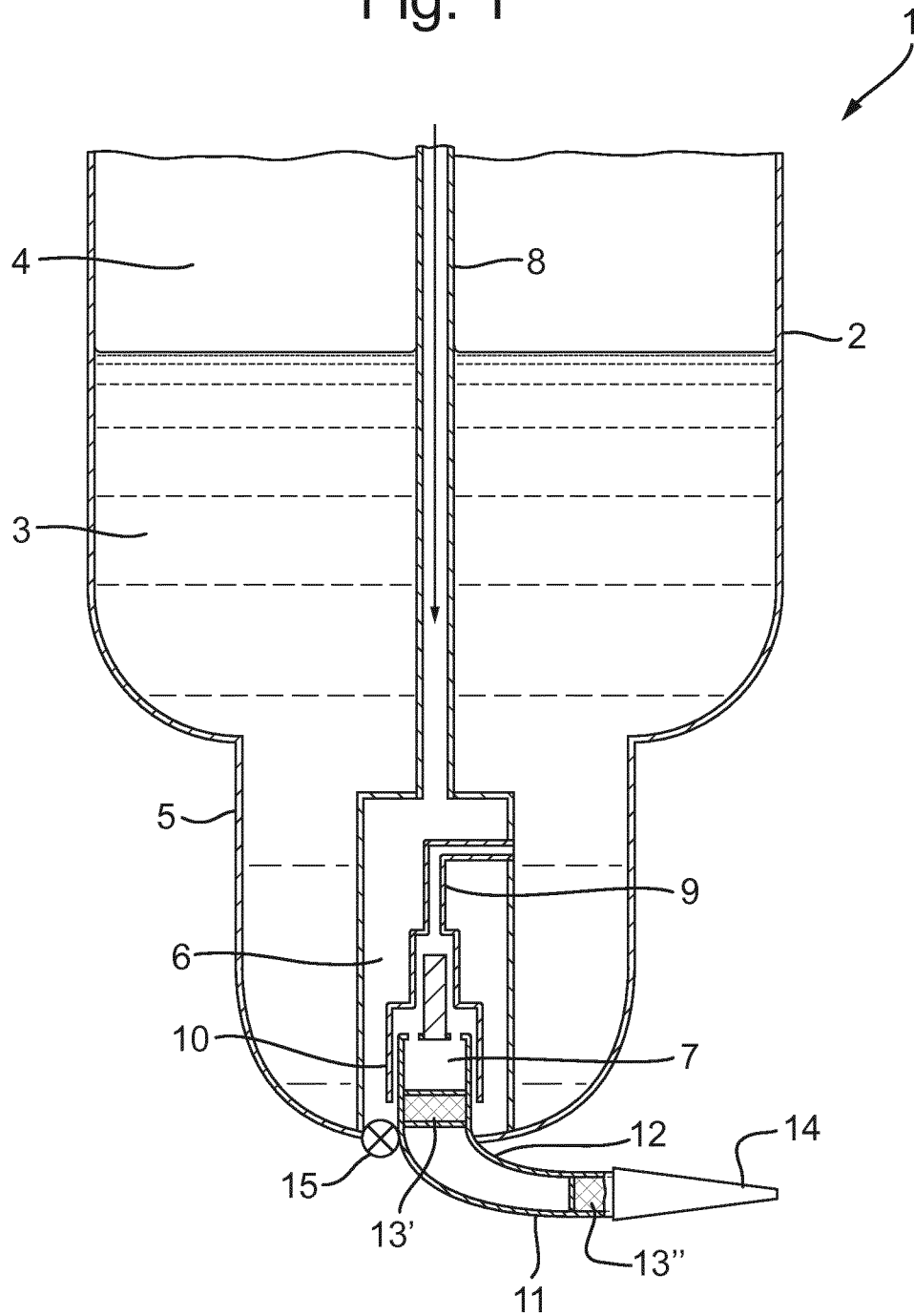
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Fig. 1



**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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