Claims

1. A dosing system for an inhalation device, comprising

(a) a filling chamber (1) for receiving a liquid to be aerosolized, the filling chamber (1) having a lateral wall (42), an inlet opening (2) and an outlet opening (3) with a closing means (11) for closing the outlet opening (3) ;

(b) an overflow chamber (5) surrounding the inlet opening (2) of the filling chamber (1) for isolating any excess volume of liquid which is not supposed to be administered to the user so that it cannot be re-dosed accidentally; and

(c) a plunger (4) which is at least partially insertable into the filling chamber (1), and which sealingly contacts the lateral wall (42) while being at least partially inserted into the filling chamber (1) such as to push, after the filling chamber (1) has received at least a predefined fill volume of the liquid, a metered volume of the liquid out from the filling chamber (1) through the outlet opening (3), wherein the metered volume is smaller than the fill volume, wherein the filling chamber has a portion into which the plunger (4) is inserted, and wherein the plunger has a portion which is insertable into the filling chamber (1); and
wherein the filling chamber (1), or the portion of the filling chamber (1) into which the plunger (4) or the insertable portion of the plunger (4) is inserted; and/or the plunger (4), or the portion of the plunger (4) which is insertable into the filling chamber (1), is made of a flexible material.

2. The dosing system according to claim 1, wherein the inhalation device comprises a nebulizer selected from ultrasonic nebulizers, jet nebulizers or vibrating mesh nebulizers.

3. The dosing system according to any of the preceding claims, wherein the dosing system has an operating orientation, and wherein the filling chamber has an upper end and a lower end, and wherein, in the operating orientation, the inlet opening (2) is located at the upper end of the filling chamber (1), and the outlet opening (3) is located at the lower end of the filling chamber (1).

4. The dosing system according to any of the preceding claims, wherein the outlet opening (3) is closable by means of a capillary tube, a liquid flow resistor, a nozzle, a valve, a one-way valve, a duckbill valve, a slit valve or a ball valve.

5. The dosing system according to claim 2, wherein the dosing system has an operating orientation, and wherein the nebulizer is a vibrating mesh (8) nebulizer; and wherein, in the operating orientation, the mesh (8) of the vibrating mesh nebulizer is positioned below the outlet opening (3) and has a horizontal orientation.

6. The dosing system according to any of the preceding claims, ~~wherein the filling chamber has a portion into which the plunger (4) is inserted, and wherein the plung-~~

~~er has a portion which is insertable into the filling chamber (1); and~~
wherein the filling chamber (1), or the portion of the filling chamber (1) into which the plunger (4) or the insertable portion of the plunger (4) is inserted; and/or
the plunger (4), or the portion of the plunger (4) which is insertable into the filling chamber (1), is substantially cylindrical ~~and/or is made of a flexible material~~.

7. The dosing system according to any of the preceding claims,
wherein the dosing system comprises a lid (9), and
wherein the plunger (4) is connectable to, or an integral part of, the lid (9) and is sized and shaped such as to be capable of closing the filling chamber (1), or
wherein the plunger (4) is connectable to, or an integral part of, the lid (9) and
wherein the lid (9) is capable of closing the filling chamber (1).

8. The dosing system according to claim 7, wherein the plunger (4) is at least partially inserted into the filling chamber (1) when closing the lid (9), and wherein during its insertion, the plunger (4) seals the filling chamber (1) towards the inlet opening (2) such that no liquid leaves the filling chamber (1) through the inlet opening (2).

9. The dosing system according to claim 7 or ~~8~~9, wherein, wherein the lid (9) is a flip-top lid (9).

10. The dosing system according to any of the preceding claims, wherein the outlet opening (3) is surrounded by a residual pocket (12).

11. The dosing system for an inhalation device according to any of the preceding claims, wherein
(a) the lateral wall (42) has an upper end, and wherein the upper end of the lateral wall (42) forms a bulge (44), and/or
(b) wherein the overflow chamber (5) has an outer wall (45) with an upper end, and wherein the upper end of the outer wall forms a bulge.

12. The dosing system according to any of the preceding claims, wherein the lateral wall (42) has an outer side (46) facing the overflow chamber (5) and the outer wall (45) of the overflow chamber (5) has an inner side (47) facing the overflow chamber (5), wherein the outer side (46) and/or the inner side (47) is concavely curved or leaning towards the overflow chamber (5).

~~13. A dosing system for an inhalation device, comprising~~

~~(a) a nebulizer chamber (7);~~

~~(b) an aerosol head component (14);~~

~~(c) a filling chamber (1a) for receiving a liquid to be aerosolized, formed by the nebulizer chamber (7) and the aerosol head component (14), the filling chamber (1a) having a lateral wall (42), an inlet opening (2), an outlet opening (3) and a mesh (8) affixed to the outlet opening (3); and~~

~~(d) a plunger (4) which is at least partially insertable into the filling chamber (1a), and which sealingly contacts the lateral wall (42) of the filling chamber (1a) upon being at least partially inserted into the filling chamber (1a) after the filling chamber (1a) has received at least a predefined fill volume of the liquid such as to isolate a metered volume of the liquid;~~

~~wherein the metered volume is smaller than the fill volume.~~

~~14.~~13. An inhalation device comprising the dosing system of claims 1 to 12~~3~~.

~~15.~~14. A method for dosing a liquid to be aerosolized comprising the steps of:

(1) providing a filling chamber (1) for receiving a liquid to be aerosolized, the filling chamber having (a) a lateral wall (42), (b) an inlet opening (2) and (c) an outlet opening (3) with a closing means (11) for closing the outlet opening (3);

(2) providing an overflow chamber (5) surrounding the inlet opening (2) of the filling chamber (1) for isolating any excess volume of liquid which is not supposed to be administered to the user so that it cannot be re-dosed accidentally; and

(3) providing a plunger (4) which is at least partially insertable into the filling chamber (1), and which sealingly contacts the lateral wall (42) while being at least partially inserted into the filling chamber (1) such as to push, after the filling chamber (1) has received at least a predefined fill volume of the liquid, a metered volume of the liquid out from the filling chamber (1) through the outlet opening (3); wherein the filling chamber has a portion into which the plunger (4) is inserted, and wherein the plunger has a portion which is insertable into the filling chamber (1); and wherein the filling chamber (1), or the portion of the filling chamber (1) into which the plunger (4) or the insertable portion of the plunger (4) is inserted; and/or the plunger (4), or the portion of the plunger (4) which is insertable into the filling chamber (1), is made of a flexible material, and

(4) filling the filling chamber (1) with at least a predefined fill volume of the liq

uid; and

(5) at least partially inserting the plunger (4) such as to push a metered volume of the liquid out from the filling chamber (1) through the outlet opening (3), wherein the metered volume is smaller than the fill volume.