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(54) **Oscillating dispenser pump**

(57) The present invention provides a dispenser (10) for dispensing a cosmetic liquid. The dispenser comprises a can (12), a pump assembly (24) mounted on the can (12) and adapted to dispense the cosmetic liquid from the can (12), wherein the pump assembly (24) comprises a passageway (38) communicating with an interior of the can (12) and an ambient environment, a pre-compression valve (64) adapted to selectively open and close the passageway (38) and biased by a spring (56), and a spray cap (28) having a spray insert (30) which is composed of a nozzle (32) and a spray orifice (34), wherein the nozzle (32) is recessed within the spray insert (30).

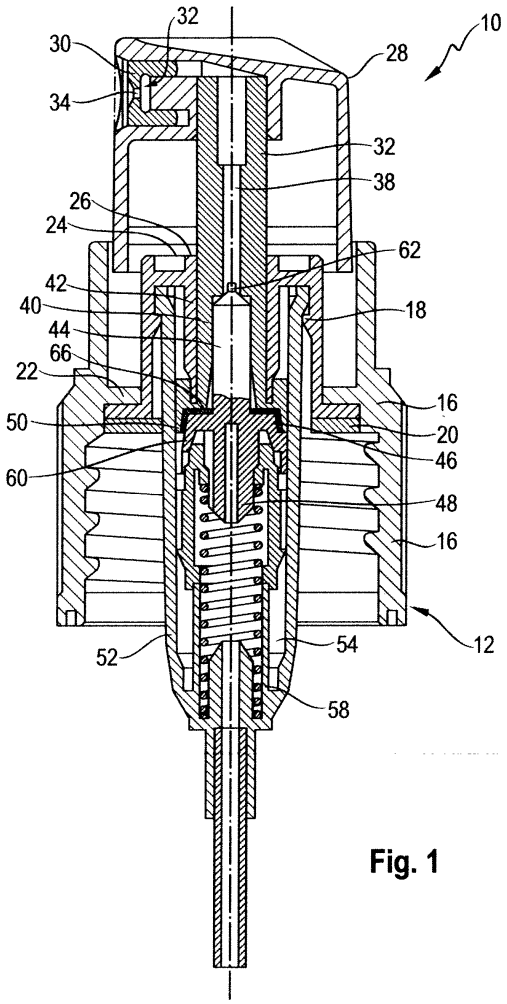

Fig. 1

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Description

[0001] The present invention relates to dispensing devices such as aerosol or liquid dispensing devices, and more particularly, to dispensing devices having an oscillating dispenser pump.

[0002] WO 03/037748 A1 discloses an automatic periodic aerosol dispenser based on pressurized gas as a pressure source for long-term periodic dispensation using an accumulation chamber. This dispenser may be used for example for repeated refreshing an active in the air. Other dispensers are based on pressurized gas, e. g. as disclosed by EP 0 062 341 A1, or a manual pump as a pressure source, e.g. as disclosed by US 3,231,153 A, US 3,861,570 A, US 3,870,205 A, US 4,139,128 A or US 4,416,398 A, wherein the dispense rate is variable according to the actuation of a valve. According to these dispensers, a dispense rate is increased when actuation of the valve is increased, e.g. as disclosed by GB 2 312 478 A1.

[0003] Such conventional dispensers generate a dispersion or an aerosol. However, there are applications, wherein not only a chemical reaction is desired but small mechanical actions or impressions improve the user's feeling and well-being and the total effect. For example, it is desirable for scalp tonics to generate a thin jet of liquid for massaging the scalp in order to improve the effect of the tonic, which is impossible if the product is merely dispersed because the mechanical effect to the skin is rather low.

[0004] Therefore, it is an object of the present invention to provide a dispenser, wherein a cosmetic product is dispensed in a pulsed fashion.

[0005] This object is solved by the present invention, which particularly allows to generate a thin jet of a cosmetic liquid. For this purpose, a spray head of a conventional dispenser, e.g. as disclosed by the above references, has to be modified.

[0006] These and other advantages and features of the various embodiments of the invention disclosed herein, will be made more apparent from the description, drawings and claims that follow.

[0007] Summarizing the ideas of the present invention, the following items are preferred:

Item 1: A dispenser for dispensing a cosmetic liquid according to the present invention comprises a can, a pump assembly mounted on the can and adapted to dispense the cosmetic liquid from the can, wherein the pump assembly comprises a passageway communicating with an interior of the can and an ambient environment, a pre-compression valve adapted to selectively open and close the passageway and biased by a spring, and a spray cap having a spray insert which is composed of a nozzle and a spray orifice, wherein the nozzle is recessed within the spray insert.

Item 2: The dispenser of item 1, wherein a valve stem having an upstanding portion and an adapter having a narrowed portion may be provided, wherein the pre-compression valve is formed by the upstanding portion.

Item 3: The dispenser of item 2, wherein the narrowed portion may form the valve seat for the pre-compression valve.

Item 4: The dispenser of item 1, wherein the spring constant of the spring of the pre-compression valve may be high such that the pre-compression valve is initially closed when the spray cap is activated.

Item 5: The dispenser of item 1, wherein the dispenser may further comprise a valve body defining a pressure chamber, wherein the stem comprises a base on which a pressure from the pressure chamber acts on.

Item 6: The dispenser of item 1, wherein the valve stem may be axially movable.

Item 7: The dispenser of item 1, wherein the pre-compression valve may be axially movable.

Item 8: The dispenser of item 1, wherein the dispenser may further comprise a lever cap having an actuation lever connected to the pump assembly.

[0008] In the dispenser according to the present invention, a pre-compression valve is arranged in the pump conduit, which is pressure-controlled and opens if a certain pressure threshold is exceeded. The pre-compression valve cooperates with a spring having a high spring constant. Upon actuation of the pump, the additional valve is closed until the pressure threshold is exceeded. The valve opens at a pressure above the pressure threshold and liquid is dispensed until the pressure provided by the pump falls below that certain pressure threshold. The nozzle is recessed with regard to the dispenser opening leading to a thin jet of liquid instead of an aerosol. In this way, an oscillating dispensation of liquid during manually pumping is provided because of the pressure variation caused by the product outflow. The pulsation effect can be preferably improved by the use of an actuating lever. Furthermore, increasing the spring constant of the additional pre-compression valve serves to accelerate the function of the valve.

[0009] The term "pre-compression valve" is to be understood as a valve associated with an outlet, requiring a certain level of force against it, and hence fluid pressure, in order to open and allow the flowable material to escape. By this means the output from the dispensing device can be of desirable form, for example a jet or spray. Preferably, the pre-compression valve is designed so that when flowable material is being pumped it is

opened by the pressurisation of the flowable material, without mechanical intervention. However during a priming operation when it is air that is being compressed, it is preferably arranged not to be opened by the air. Rather, mechanical intervention is required to open the pre-compression valve during this phase, and allow the air out.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The only figure is a schematic sectional view of an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0011] The only figure illustrates a dispenser of an embodiment of the present invention. In the figure, a dispenser 10 according to the present invention may be attached to a can 12 or container which is only partly shown and includes a cylindrical wall 14 that is closed at its upper margin 16 by a closure 18 which comprises a radially extending portion 20 inserted in an correspondingly shaped slit 22 of the wall 14. The closure 18 receives a pump assembly 24 within a central opening 26 thereof. The pump assembly 24 includes a spray cap 28 or button and defines a cavity in which a spray insert 30 is seated. The spray insert 30 is composed of a nozzle 32 and a spray orifice 34. The nozzle 32 and the spray orifice 34 may be configured to develop a suitable spray pattern. Particularly, because the nozzle 32 is recessed if compared to nozzles of conventional spray caps, the supply channels are out of order because the nozzle 32 is not recessed up to a stopper or stop position.

[0012] The spray cap 28 is seated on and secured to an elongate and cylindrical adapter 36. An upper end of the adapter 36 is snugly received in a tubular recess defined by the spray cap 28. The cylindrical adapter 36 defines an axially extending passageway 38 through which material to be dispensed from the can 12 is adapted to pass to the spray orifice 34 for discharge. A stem 40 of a valve 42 is seated in an enlarged bottom end portion of the adapter 36. The stem 40 includes a generally upstanding portion 44, which is seated in the passageway 38, a base 46 that extends generally radially outwardly from the lower end of the upstanding portion 44 and a lower portion 48. The base 46 has a peripheral edge 50.

[0013] The pump assembly 24 further includes a valve body 52 that is secured to the closure 18, for example by means of a latch or a snap-in lug. The valve body 52 defines an interior pressure chamber 54 for containing material to be dispensed through the spray orifice 34. The stem 40, adapter 36 and spray cap 28 are normally maintained in their upper position by means of a spring 56 which bears against the bottom of the base 46 of the stem 40 and is supported on a lower end portion 58 of the pressure chamber 54. The spring 56 has a greater spring constant if compared with springs of conventional pumps for dispensers. A small gap 60 is defined between the base 46 and the cylindrical wall of the pressure chamber 54. Further, the passageway 38 within the adapter 36 comprises a narrowed portion 62 and the upstanding portion 44 of the stem 40 comprises a conical upper end 64. The conical upper end 64 forms a pre-compression valve and the narrowed portion 62 forms the valve seat of the pre-compression valve as will be explained below in more detail.

[0014] As will be seen in the only figure, when the pump assembly 24 is in a position of rest, the base 46 is not sealed against the lower end of the adapter 36. Further, in the position of rest, the conical upper end 64 is not disposed within the narrowed portion 62 but spaced apart a small distance, which means that the pre-compression valve is not closed. However, when the stem 40 and adapter 36 are moved downwardly by applying a pressing force onto the spray cap 28, the conical upper end 64 is disposed within the narrowed portion 62, which means that the pre-compression valve is closed. Further, as the base 46 moves downwards, the pressure in the pressure chamber 54 is increased as the volume of the pressure chamber 54 decreases as there is only a small gap 60 between the peripheral edge 50 and the wall of the pressure chamber 54. Thereby, a small flow path is provided over that peripheral edge to an upper side 66 of the base 46. Accordingly, the increasing pressure acts on the upper side 66 of the base 46 and forces the stem 40 further downwards such that the conical upper end 64 is spaced away from the narrowed portion 62. Thereby, the pre-compression valve is opened and permits fluid to pass upwardly through passageway 38 and out through orifice 34. As liquid is admitted to the pressure chamber 54, a negative pressure would tend to develop in the container 12 if venting did not occur. Therefore, to maintain atmospheric pressure in the container 12, ambient air is permitted to replace withdrawn liquid through a not shown passage.

[0015] Due to the dispensing of the fluid, the pressure within the pressure chamber 54 is decreased and falls below a threshold determined by the spring constant of the spring 56 after a certain time such that the stem 40 moves upwards and the conical upper end 64 is disposed within the narrowed portion 62, which means that the pre-compression valve is closed again. However, due to the continuing downwardly pressing of the adapter 36, the pressure within the pressure chamber 54 subsequently increases again because the pre-compression valve is closed at that time and the fluid may not enter the passageway 38 such the pre-compression valve opens again if the pressure threshold is exceeded again after a certain time. As a result, the pre-compression valve opens and closes in a fast series during for example a single pressing operation of the pump assembly 24. For example, if a liquid is stored in the can 12 a jet of the liquid is expelled from the orifice 34 in an oscillating and pulsating manner.

[0016] The can 12 may store a cosmetic product, e.g. a hair tonic. Particularly, because the nozzle 32 is recessed, the supply channels are out of order because

the nozzle is not recessed up to the stopper. Thus, the cosmetic product may directly be expelled out of the nozzle hole and has not to be put into rotation by means of the supply channels. Thereby, the flow resistance is decreased.

[0017] Further, the above effect is improved if the pump assembly is activated by means of a lever cap. Thereby, the activation way is longer and the velocity is reduced. Thus, the pump assembly and, as a result, the jet expelled from the nozzle 32 is slower pulsated but the above effect is clearly recognizable.

Claims

1. Dispenser (10) for dispensing a cosmetic liquid comprising a can (12), a pump assembly (24) mounted on the can (12) and adapted to dispense the cosmetic liquid from the can (12), wherein the pump assembly (24) comprises a passageway (38) communicating with an interior of the can (12) and an ambient environment, a pre-compression valve (64) adapted to selectively open and close the passageway (38) and biased by a spring (56), and a spray cap (28) having a spray insert (30) which is composed of a nozzle (32) and a spray orifice (34), wherein the nozzle (32) is recessed within the spray insert (30).

2. Dispenser (10) for dispensing a cosmetic liquid of claim 1, wherein a valve stem (40) having an upstanding portion (44) and an adapter (36) having a narrowed portion (66) are provided, wherein the pre-compression valve (64) is formed by the upstanding portion (44).

3. Dispenser (10) for dispensing a cosmetic liquid of claim 2, wherein the narrowed portion (66) forms the valve seat for the pre-compression valve (64).

4. Dispenser (10) for dispensing a cosmetic liquid of claim 1, wherein the spring (56) constant of the spring (56) of the pre-compression valve (64) is high such that the pre-compression valve (64) is initially closed when the spray cap (28) is activated.

5. Dispenser (10) for dispensing a cosmetic liquid of claim 1, further comprising a valve body (52) defining a pressure chamber (54), wherein the stem (40) comprises a base (46) on which a pressure from the pressure chamber (54) acts on.

6. Dispenser (10) for dispensing a cosmetic liquid of claim 1, wherein the valve stem (40) is axially movable.

7. Dispenser (10) for dispensing a cosmetic liquid of claim 1, wherein the pre-compression valve (64) is axially movable.

8. Dispenser (10) for dispensing a cosmetic liquid of claim 1, further comprising a lever cap having an actuation lever connected to the pump assembly (24).

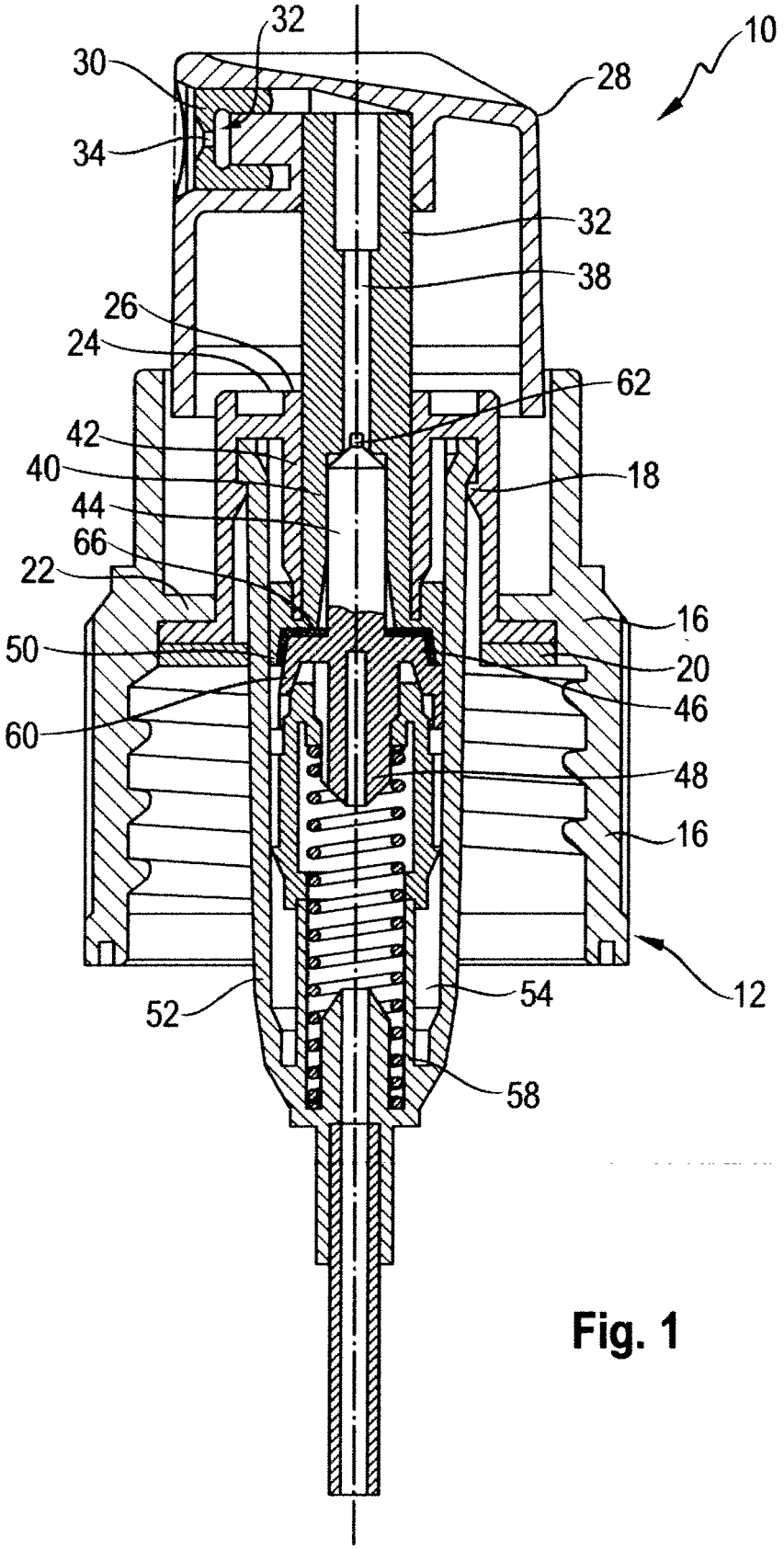
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Fig. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 14 16 6446

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 342 651 A1 (STEP SOC TECH PULVERISATION [FR]) 23 November 1989 (1989-11-23) * column 4, line 53 - column 18, line 55; figures *	1-8	INV. B05B11/00 B05B1/08
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 October 2014	Endrizzi, Silvio

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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