

PATENT SPECIFICATION

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(54) DISPENSER DEVICE

(71) We, TRISA BURSTENFABRIK AG TRIENGEN, a Swiss Company, of 6234 Triengen, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a construction of dispenser device having a reservoir for a fluent or flowable filled material i.e. a material which is to be dispensed, as well as containing a piston pump equipped with a valve arrangement. More particularly the invention relates to a toothbrush which incorporates such a dispenser device.

Dispenser devices of this type are known to the art in numerous constructional embodiments. They are typically quite complicated in construction and accordingly expensive. Furthermore, they simultaneously markedly inhibit the free construction or design of the apparatus with which such dispenser devices are employed. Thus, it is for instance difficult to construct the reservoir as a cartridge, since for the purpose of connecting the cartridge with the pump there is required a detachable conduit connection. Moreover, the valve arrangement of prior dispenser devices employ automatically activated or, more specifically, pressure-activated valves, since the positive actuation of the valves requires a complicated valve mechanism which cannot readily be employed for spatial, cost or also functional reasons.

One object of the present invention is to provide a construction of dispenser device which removes or substantially overcomes the aforementioned drawbacks and limitations of the prior art proposals.

Another object of the present invention is to devise a dispenser device which is relatively simple in construction and design, economical to manufacture, easy to use, not readily subject to malfunction or breakdown, and provides for a positive dispensing action of a fluent material which is to be dispensed.

The present invention consists in a dispenser device for dosed dispensing of a fluent material, comprising a reservoir means for

holding the fluent material, a piston pump having a cylinder part and a piston part which are movable relative to one another, and a valve arrangement coupled with one of the parts of the piston pump and reversibly controllable by relative movements of the parts of the piston pump, said valve arrangement having an inlet valve and an outlet valve, one valve of which being arranged in the piston part and the other valve being arranged in the cylinder part, each valve having a closure member, the two closure members being connected with one another by a valve stem for common actuation in the same direction, and to form a valve body, each closure member co-operating with a valve seat incorporated in the cylinder part and the piston part, respectively, and a spring arranged and acting between the closure member of the inlet valve and the pump part which is provided with the outlet valve, said spring in the rest condition of the piston pump maintaining said outlet valve closed and being tensioned after closing of the inlet valve for keeping the latter closed.

The invention also consists in a toothbrush which incorporates a dispenser device for dispensing a liquid or pasty dentifrice, having a body provided with bristles at one end and a holder for the dispenser at the other end, comprising a reservoir constructed as an exchangeable cartridge for holding the liquid and or pasty dentifrice, said cartridge being displaceably mounted in the holder, at least one passage for providing communication between the bristles and the interior of the cartridge, a piston pump for feeding the dentifrice from the cartridge through the at least one passage to the bristles, said piston pump having a cylinder part and a piston part which are movable relative to one another, and a valve arrangement coupled with one of the parts of the piston pump and reversibly controllable by relative movements of the parts of the piston pump, said valve arrangement having an inlet valve and an outlet valve, one valve of which being arranged in the piston part and the other valve being arranged in the cylinder part, each valve having a closure member, the two

closure members being connected with one another by a valve stem for common actuation in the same direction, and to form a valve body, each closure member co-operating with a valve seat incorporated in the cylinder part and the piston part, respectively, and a spring arranged and acting between the closure member of the inlet valve and the pump part which is provided with the outlet valve, said spring in the rest condition of the piston pump maintaining said outlet valve closed and being tensioned after closing of the inlet valve for keeping the latter closed.

In order that the invention will be more readily understood, reference will now be made to the accompanying drawings, in which:—

Figure 1 is a longitudinal sectional view of one embodiment of toothbrush according to the invention, having a body equipped with bristles at one end and a handle at the other end, and a replaceable cartridge not integral therewith and serving as a reservoir;

Figure 2 is a cross-sectional view through the cartridge and the holder surrounding it shown in Fig. 1, taken substantially along the line II—II therein;

Figure 3 is a perspective view of the cartridge shown in Figure 1;

Figure 4 is an enlarged longitudinal sectional view of the zone in which the toothbrush body engages the cartridge, with the cartridge protruding from the open end of the handle;

Figure 5 illustrates a similar longitudinal sectional view as shown in Fig. 4, but with the cartridge urged into the handle;

Figure 6 is a perspective partial view of another exemplary embodiment of the conduit member provided in the toothbrush body;

Figure 7 is a longitudinal sectional view of a part of the piston having inserted therein a part of the embodiment of a conduit element as shown in Fig. 6;

Figure 8 is a longitudinal sectional view of one embodiment of spray can incorporating a dispenser device according to the invention; and

Figure 9 is a longitudinal sectional view of another embodiment of spray can incorporating a dispenser device.

Referring to Figures 1 to 5 of the drawings, a toothbrush incorporates a dispenser device and comprises a body 3 provided with a set of bristles 4 at one end and a holder 5 for a cartridge 10 at the other end. The holder 5 has a rigid wall which extends from the face or end surface 3a of the body 3 facing away from the end carrying the bristles 4. The holder 5, which includes a sleeve-like portion along which the cartridge 10 is to be guidably moved, serves as a handgrip or handle, and is open at its rear end 5a. The cartridge 10

containing the material which is to be dispensed, in this case a liquid or pasty dentifrice, is inserted through the open end 5a of the holder 5. A duct or passageway 2 extends through the body 3 from its end surface 3a up to a region adjacent the bristles 4 and communicates with the bristles by means of a lateral outlet opening or duct 2a between the bristles 4. The cross-section of diameter of the passageway 2 is preferably so dimensioned at one location that it exerts a capillary action on the dentifrice flowing therethrough, depending upon the viscosity of the latter. By virtue of these measures there is extensively avoided unintentional flow of dentifrice out of the outlet opening 2a when the dispenser device of the toothbrush, is in its non-actuating position, even when the toothbrush is held with the bristles 4 pointing downwards and is shaken or jarred.

The dispenser device comprises a piston pump having a piston part 7 and a cylinder part 8, and a valve arrangement, which is coaxially disposed with respect to the piston pump and has inlet valve means and outlet valve means, is coupled with the piston 7 via a valve body 18.

The piston 7 has an axial passage or passageway 17 and is pressed with a tight fit into a widened end region 2b of the passageway 2. The dentifrice-containing cartridge 10 which is inserted in the holder 5 is provided at its end wall 10b directed towards the bristles 4 with a cylinder part having an internal chamber 9 which communicates with the interior 10a of the cartridge 10 by means of an opening 11 in a transverse wall 11a which separates the chamber 9 from the interior of the cartridge. The cylinder part 8 is arranged in the inner end wall 10b of the cartridge 10 in such a manner, and its diameter is designed such, that upon insertion of the cartridge 10 into the holder 5 the piston 7 enters the cylinder part 8 and can sealingly slide therein. The cylinder part 8 thus forms a pump cylinder which is associated with the piston 7. Prior to its insertion into the holder 5, the dentifrice-filled cartridge 10 is sealed by a membrane-like closure 11b extending across the opening 11, as best seen by referring to Figure 3. The path of insertion of the cartridge 10 is limited by a flexible nose or lateral projection 10c provided on the outer wall of the cartridge, this projection being snapped into a longitudinal slot or window 5b in the wall of the holder 5, and also is limited by impact of the projection 10c against the end wall of the slot 5b nearer the bristles 4.

A recess 13 provided in a part of the end surface 3a of the toothbrush body 3 and located internally of the holder 5 defining the handle and another recess 14 provided in the oppositely situated inner end wall 10b of the cartridge 10 are aligned with one another and

receive therein, respectively, the opposite ends of a spring element in the form of a compression spring 15 which serves as a return spring for urging the body 3 and the cartridge 10 apart. The displacement of the cartridge 10, due to the action of the compression spring 15, outwardly of the open rear end 5a of the holder 5 is limited by the abutment of the projection 10c on the cartridge 10 against the end wall of the slot 5b further from the bristles. Consequently, the cartridge 10 is prevented from dropping out of the handle formed by the holder 5. However, by pulling harder on the end of the cartridge 10 protruding from the open rear end 5a of the holder 5, the somewhat flexible projection 10c can be forced to slip out of the slot 5b, and thus, for instance, it is possible to remove an empty cartridge from the holder 5 and to replace it by a new, full cartridge. Instead of constructing the projection 10c to be flexible or resilient, it is equally possible to design the wall of the cartridge 10 to be somewhat flexible or resilient, especially in the vicinity of the projection 10c in order to serve the same purpose. In a modification (not shown) the slot may be replaced by a recess or groove provided in the inner surface of the holder wall to releasably locate the projection 10c.

In order to disengage the projection 10c from the slot 5b the projection can, instead, be pressed slightly inwardly e.g. with a fingertip and be dislodged from the slot 5b by simply pushing it outwardly of the holder, whereupon the cartridge 10 can be easily pulled out of the holder 5. For this purpose, the slot, 5b may, instead, be located nearer the other end of the holder 5 e.g. towards its central or middle region. A pin 19 projects from the valve body 18, which is slidably mounted in the piston 7, in a direction away from an end or base portion 7a of the piston 7 and is located opposite the cartridge 10. The pin 19 serves to rupture the membrane-like closure 11b when the cartridge 10 is inserted far enough into the holder 5. Preferably this occurs at the same time as the projection 10c snaps into the slot 5b, or else shortly beforehand.

During the manufacture of the toothbrush body 3 together with the holder 5 of the previously described toothbrush, difficulties are associated with the manufacture of a narrow, long passageway 2, because the required long, chain cord needle used during injection molding can easily break or become bent. Hence, the passageway 2 is produced with a larger diameter than would be desirable for a controlled outflow of the material to be dispensed, i.e. the dentifrice. There is then fixedly inserted in the wide passageway 2 a conduit element 32, preferably in the form of a hollow needle having a narrow axial channel 33 therethrough. In the wid-

ened end region 2b of the passageway 2 which is situated towards the end surface 3a of the body 3 there is fixedly seated or otherwise fixedly connected, upon the end 32a of (Figure 4) of the conduit element 32 which protrudes out of the widened end region 2b of the passageway 2, the open end 7c of the piston 7 which confronts the body 3.

At the base portion 7a confronting the cartridge 10 the piston 7 is equipped with a circumferential elastic sealing rim or edge 7b. This sealing rim or edge 7b sealingly bears against and is guided by the inner wall 8a of the cylinder chamber 9 of the cylinder part 8.

The axial piston passage 17 which is defined by a hollow piston rod portion extends through the piston 7 opens at one end at the center of the piston base portion 7a and is provided towards the middle or central zone of the piston 7 with a conically bevelled ring or annular shoulder 16. This annular shoulder 16 serves as an outlet valve seat and merges with the wider diameter throughpassage region 17b which extends from the annular shoulder 16 to the passage opening or throughpassage opening 17a facing towards the bristles 4.

In the passage 17 there is mounted the valve body 18 which comprises a sealing portion 18a of larger diameter and a sealing disc or gasket 20 which constitutes an inlet valve closure element. The latter can sealingly bear against an inlet valve seat formed by the opening 11 by contacting the inner surface of the transverse wall 11a separating the interior of the cylinder chamber 9 from the interior 10a of the cartridge 10, thereby closing the opening 11 located in the transverse wall 11a. From the sealing gasket 20 the pin 19 protrudes through the opening 11 into the interior 10a of the cartridge 10. The diameter of the pin 19 is slightly smaller than that of the opening 11. The co-operating sealing gasket 20 and transverse wall 11a thus constitute the inlet valve means.

The upperside 18b of the sealing portion 18a, can be brought into abutting contact with the base portion 7a of the piston 7 and carries a valve stem 21 which protrudes into the piston passage 17 past the annular shoulder 16 in the direction of the bristles 4. The base portion 7a and upperside 18b of the sealing portion 18a form stops for limiting the movement of the valve body 18. The valve stem 21 has an enlarged head 22 forming an outlet closure element. The head 22 possesses at the side which faces towards the annular shoulder 16 a preferably conically bevelled valve sealing surface or face 22a. The latter is constructed such that it can sealingly bear upon the annular shoulder 16. The cooperating head 22 and annular shoulder 16 thus constitute the outlet valve means. Either the annular shoulder or the head 22 is elastically deformable so that the latter can

be inserted through the former.

The spacing between the surface of the sealing gasket 20 which bears against the transverse wall 11a at the opening 11 and the valve sealing surface 22a of the head 22 of the valve body 18, on the one hand, and the spacing between the base portion 7a and the annular shoulder 16, on the other hand, are dimensioned such that when the piston 7 sealingly bears with its base portion 7a against the upperside 18b of the sealing portion 18a and, when the sealing gasket 20 sealingly bears against the transverse wall 11a around the opening 11, the head 22 of the valve stem 21 is lifted from the annular shoulder 16. This occurs against the force of a spring element constituted by a valve resetting spring 23 which is arranged with one end bearing against the upperside of the sealing gasket 20 directed towards the piston 7 and the other end bearing against the base portion 7a of the piston 7 and urges the sealing surface 22a of the head 22 against the annular shoulder 16.

As shown in Figures 6 and 7, instead of a single axial throughflow channel 33 there can be provided in the outer wall of the conduit element 32 also two or more, for instance four longitudinal grooves 33a. In the end 32a of the conduit element 32 these longitudinal grooves 33a are covered by the inner wall of the passage 17 in the open end 7c of the piston 7 and downstream thereof are covered by the inner wall of the passageway 2 in the body 3 and, thus, form a plurality of throughflow channels the individual cross-sectional areas of which can be kept so small by providing correspondingly flat or narrow cross-sections of the grooves 33a that they are able to exert a desired capillary action on the dentifrice.

The operation of the toothbrush will now be described. Initially during introduction of the cartridge 10 into the handle formed by the holder 5, while piercing the membrane 11b closing the opening 11 by means of the pin 19 which is held in position relative to the cartridge 10 owing to the abutment of the sealing portion 18a at the base portion 7a of the piston 7, the body 3 and the cartridge 10 assume the position shown in Figure 5. In this position the sealing gasket 20 closes the opening 11 against which it has already been pressed approximately prior to reaching the position of Figure 5 by means of the compressed valve resetting compression spring 23. Now if under the action of the stronger return or restoring compression spring 15 the cartridge 10 is moved within the holder 5 away from the end surface 3a of the body 3, then the cartridge also moves relative to the piston 7 the sealing rim 7b of which sealingly bears against the inner wall 8a of the cylinder chamber 9 until it has reached the position shown in Figure 4, this position being the rest

condition of the piston pump. During this movement the sealing gasket 20 initially still retains the opening 11 closed since the spring 23 is not completely untensioned, even when the valve stem head 22 has already reached the annular shoulder 16.

During further displacement of the cartridge 10 by the compression spring 15 the valve body 18 is fixedly held by means of the valve sealing surface 22a bearing against the annular shoulder 16 and the sealing gasket 20 moves away from the opening 11. Consequently, when the toothbrush is held with the bristles 4 directed downward even a viscous dentifrice or other material to be dispensed will be sucked into the pumping space defined by the cylinder chamber 9. Any air which is present in the pumping space of the cylinder chamber 9 ascends in the form of bubbles to the outer, upper end 10b of the cartridge 10 (Figure 4).

Now if during application of pressure upon the protruding end 10d of the cartridge 10 the piston 7 is again relatively moved in the cylinder chamber 9 into the position shown in Figure 5, then initially the opening 11 is closed by the sealing gasket 20 and then during the further course of the cartridge- and piston movement, respectively, the spring 23 is compressed and thus the annular shoulder 16 is moved away from the valve stem head 22. During progressive penetration of the piston 7 into the pumping or cylinder chamber 9 liquid is expressed between the annular shoulder 16 and the valve stem head 22 and pressed into the throughflow channel 33 until the base portion 7a abuts against the upperside 18b of the sealing portion 18a.

Upon release of the cartridge the cylinder part 8 and the piston 7 again return from the position shown in Figure 5 back into the position shown in Figure 4 and the toothbrush is again ready for dispensing a new dose of dentifrice to the bristles 4.

From the above description of the operation of the toothbrush it will be seen that the inlet valve means and the outlet valve means are interconnected for common actuation in the same direction.

Good closure of the opening 11 of the cartridge 10 is of decisive importance for the positive functioning, especially also for the exact dosed delivery of liquid for the fountain toothbrush of the present invention. To this end there is required a sufficiently strong spring 23 and a sufficiently narrow intermediate space between the valve stem 21 and the throughpassage region 17b of the axial piston passage 17.

In order to demonstrate the various possible fields of application of a dispenser device according to the invention, there will now be considered a number of other applications. The handle of the above described tooth-

brush with the valve arrangement housed therein and the cartridge can be used, for instance, directly as the bristle carrier for a hand brush or the like. Such handle or
5 handgrip furthermore could possess a particular aesthetic construction, and the cartridge could contain cosmetics or the like. In the same manner it is however also possible to use the dispenser device for the dispensing
10 of medication, by virtue of the dosage accuracy. Since a toothbrush is often carried in a pocket book or the pocket of a jacket, there must be present both positive operational reliability in conjunction with lack of leakage of the material to be dispensed. It has
15 been found in practice that in the case of the above described toothbrush, these requirements are totally fulfilled.

What has been explained heretofore is analogously applicable with regard to the
20 embodiments of spray cans shown in Figures 8 and 9. For the purposes of simplicity the same or slightly modified reference numerals have been conveniently employed for the same components, so that further detailed
25 explanations are not believed to be necessary beyond what is stated hereinafter. The piston pump is accommodated in a container cap or closure 50 which is attached to a reservoir 10
30 which may be constructed in the form of an exchangeable cartridge. The piston 7 engages by means of a hollow piston rod 60 with an actuation part or component 51. A hose 53 is
35 connected to and extends downwardly from the opening 11.

With the embodiment of Figure 9 the closure 50 is provided at the end of the cartridge or reservoir 10 which faces away from the actuation part 51. Instead of using
40 the hose 53, in this case there are provided connection channels 53a. The piston 7 is connected with the actuation part by means of a tube 54.

In all of the above described embodiments a narrow passage between the valve stem 21 and the surrounding piston rod portion
45 forms an especially effective throttle location or throttle means between the outlet valve means and the cylinder chamber 9, also upon release of the cartridge, and which prevents
50 sucking-up of undesirable amounts of air. The negative pressure which prevails in the cylinder chamber due to the throttling action can bring about lifting of the sealing gasket
55 20 from its seat before the valve stem head 22 will be seated upon its seat 16.

WHAT WE CLAIM IS:—

1. A dispenser device for dosed dispensing of a fluent material, comprising a reservoir means for holding the fluent material, a
60 piston pump having a cylinder part and a piston part which are movable relative to one another, and a valve arrangement coupled
65 with one of the parts of the piston pump and

reversibly controllable by relative movements of the parts of the piston pump, said valve arrangement having an inlet valve and an outlet valve, one valve of which being
70 arranged in the piston part and the other valve being arranged in the cylinder part, each valve having a closure member, the two closure members being connected with one another by a valve stem for common actuation in the same direction, and to form a
75 valve body, each closure member co-operating with a valve seat incorporated in the cylinder part and the piston part, respectively, and a spring arranged and acting between the closure member of the inlet valve and the pump part which is provided with the outlet valve, said spring in the rest condition of the piston pump maintaining
80 said outlet valve closed and being tensioned after closing of the inlet valve for keeping the latter closed.

2. A dispenser device as claimed in claim 1, in which the reservoir means has an opening forming the valve seat of the inlet valve.
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3. A dispenser device as claimed in claim 2, in which the cylinder part of the piston pump is connected with the reservoir and has a cylinder chamber connected with said opening and the valve body is coupled with
95 the piston part of the piston pump and displaceable relative thereto against the pressure of said spring.

4. A dispenser device as claimed in any of the preceding claims, in which the valve
100 body is limited in its movement against the spring by stops.

5. A dispenser device as claimed in claim 4, in which the stops are formed by portion of the valve body and by a base portion of the
105 piston part.

6. A dispenser device as claimed in any of the preceding claims, in which the cylinder part is formed by a part surrounding the opening and which part is attached to the
110 reservoir means.

7. A dispenser device as claimed in any of the preceding claims, in which the piston part forms an axial passageway with the valve seat incorporated therein and into
115 which axial passageway extends the valve stem.

8. A dispenser device as claimed in any of the preceding claims, in which the reservoir means is constructed as an exchangeable
120 cartridge.

9. A dispenser device as claimed in 8, as dependent on claim 3, in which a wall of the cartridge surrounding the opening between the cylinder chamber and an interior of the
125 cartridge is releasably connected with a closure for the opening.

10. A dispenser device as claimed in claim 9, in which the valve body has a mandrel pin confronting the opening.
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brush with the valve arrangement housed therein and the cartridge can be used, for instance, directly as the bristle carrier for a hand brush or the like. Such handle or handgrip furthermore could possess a particular aesthetic construction, and the cartridge could contain cosmetics or the like. In the same manner it is however also possible to use the dispenser device for the dispensing of medication, by virtue of the dosage accuracy. Since a toothbrush is often carried in a pocket book or the pocket of a jacket, there must be present both positive operational reliability in conjunction with lack of leakage of the material to be dispensed. It has been found in practice that in the case of the above described toothbrush, these requirements are totally fulfilled.

What has been explained heretofore is analogously applicable with regard to the embodiments of spray cans shown in Figures 8 and 9. For the purposes of simplicity the same or slightly modified reference numerals have been conveniently employed for the same components, so that further detailed explanations are not believed to be necessary beyond what is stated hereinafter. The piston pump is accommodated in a container cap or closure 50 which is attached to a reservoir 10 which may be constructed in the form of an exchangeable cartridge. The piston 7 engages by means of a hollow piston rod 60 with an actuation part or component 51. A hose 53 is connected to and extends downwardly from the opening 11.

With the embodiment of Figure 9 the closure 50 is provided at the end of the cartridge or reservoir 10 which faces away from the actuation part 51. Instead of using the hose 53, in this case there are provided connection channels 53a. The piston 7 is connected with the actuation part by means of a tube 54.

In all of the above described embodiments a narrow passage between the valve stem 21 and the surrounding piston rod portion forms an especially effective throttle location or throttle means between the outlet valve means and the cylinder chamber 9, also upon release of the cartridge, and which prevents sucking-up of undesirable amounts of air. The negative pressure which prevails in the cylinder chamber due to the throttling action can bring about lifting of the sealing gasket 20 from its seat before the valve stem head 22 will be seated upon its seat 16.

WHAT WE CLAIM IS:—

1. A dispenser device for dosed dispensing of a fluent material, comprising a reservoir means for holding the fluent material, a piston pump having a cylinder part and a piston part which are movable relative to one another, and a valve arrangement coupled with one of the parts of the piston pump and

reversibly controllable by relative movements of the parts of the piston pump, said valve arrangement having an inlet valve and an outlet valve, one valve of which being arranged in the piston part and the other valve being arranged in the cylinder part, each valve having a closure member, the two closure members being connected with one another by a valve stem for common actuation in the same direction, and to form a valve body, each closure member co-operating with a valve seat incorporated in the cylinder part and the piston part, respectively, and a spring arranged and acting between the closure member of the inlet valve and the pump part which is provided with the outlet valve, said spring in the rest condition of the piston pump maintaining said outlet valve closed and being tensioned after closing of the inlet valve for keeping the latter closed.

2. A dispenser device as claimed in claim 1, in which the reservoir means has an opening forming the valve seat of the inlet valve.

3. A dispenser device as claimed in claim 2, in which the cylinder part of the piston pump is connected with the reservoir and has a cylinder chamber connected with said opening and the valve body is coupled with the piston part of the piston pump and displaceable relative thereto against the pressure of said spring.

4. A dispenser device as claimed in any of the preceding claims, in which the valve body is limited in its movement against the spring by stops.

5. A dispenser device as claimed in claim 4, in which the stops are formed by portion of the valve body and by a base portion of the piston part.

6. A dispenser device as claimed in any of the preceding claims, in which the cylinder part is formed by a part surrounding the opening and which part is attached to the reservoir means.

7. A dispenser device as claimed in any of the preceding claims, in which the piston part forms an axial passageway with the valve seat incorporated therein and into which axial passageway extends the valve stem.

8. A dispenser device as claimed in any of the preceding claims, in which the reservoir means is constructed as an exchangeable cartridge.

9. A dispenser device as claimed in 8, as dependent on claim 3, in which a wall of the cartridge surrounding the opening between the cylinder chamber and an interior of the cartridge is releasably connected with a closure for the opening.

10. A dispenser device as claimed in claim 9, in which the valve body has a mandrel pin confronting the opening.

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11. A dispenser device as claimed in claim 7, or in claim 8, 9 or 10 as dependent on claim 7, in which one of the valve seat and the closure element of the outlet valve is elastically deformable so that the closure elements can be inserted through the valve seat.

12. A dispenser device as claimed in claim 3, or in any of claims 4 to 11 as dependent on claim 3, in which a throttle location is provided between the outlet valve and the cylinder chamber.

13. A toothbrush which incorporates a dispenser device for dispensing a liquid or pasty dentifrice, having a body provided with bristles at one end and a holder for the dispenser at the other end comprising a reservoir constructed as an exchangeable cartridge for holding the liquid or pasty dentifrice, said cartridge being displaceably mounted in the holder, at least one passage for providing communication between the bristles and the interior of the cartridge, a piston pump for feeding the dentifrice from the cartridge through the at least one passage to the bristles, said piston pump having a cylinder part and a piston part which are movable relative to one another, and a valve arrangement coupled with one of the parts of the piston pump and reversibly controllable by relative movements of the parts of the piston pump, said valve arrangement having an inlet valve and an outlet valve, one valve of which being arranged in the piston part and the other valve being arranged in the cylinder part, each valve having a closure member, the two closure members being connected with one another by a valve stem for common actuation in the same direction, and to form a valve body, each closure member co-operating with a valve seat incorporated in the cylinder part and the piston part, respectively, and a spring arranged and acting between the closure member of the inlet valve and the pump part which is provided with the outlet valve, said spring in the rest condition of the piston pump maintaining said outlet valve closed and being tensioned after closing of the inlet valve for keeping the latter closed.

14. A toothbrush as claimed in claim 13, in which the reservoir means has an opening forming the valve seat of the inlet valve.

15. A toothbrush as claimed in claim 14, in which the cylinder part of the piston pump is connected with the reservoir and has a cylinder chamber connected with said opening and the valve body is coupled with the piston part of the piston pump and displaceable relative thereto against the pressure of said spring.

16. A toothbrush as claimed in any of claims 13 to 15, in which the valve body is limited in its movement against the spring by stops.

17. A toothbrush as claimed in claim 16, in which the stops are formed by portion of the valve body and by a base portion of the piston part.

18. A toothbrush as claimed in any of claims 13 to 17, in which the cylinder part is formed by a part surrounding the opening and which part is attached to the cartridge.

19. A toothbrush as claimed in any of claims 13 to 18, in which the piston part forms an axial passageway with the valve seat incorporated therein and into which axial passageway extends the valve stem.

20. A toothbrush as claimed in claim 15, or in any of claims 16 to 19 as dependent on claim 15, in which a wall of the cartridge surrounding the opening between cylinder chamber and an interior of the cartridge is releasably connected with a closure for the opening.

21. A toothbrush as claimed in claim 20, in which the valve body has a mandrel pin confronting the opening.

22. A toothbrush as claimed in any of claims 13 to 21, in which the piston part comprises a hollow piston rod which engages in a channel in the toothbrush body.

23. A toothbrush as claimed in claim 22, in which the hollow piston rod is connected by a means of a conduit element engaging therein with an outlet opening in the region of the bristles.

24. A toothbrush as claimed in claim 23, in which the conduit element forms at least one capillary channel.

25. A toothbrush as claimed in claim 24, in which the capillary channel extends between an outer surface of the conduit element and a wall of the toothbrush body.

26. A toothbrush as claimed in claim 19, or in any of claims 20 to 25, as dependent on claim 19, in which, one of the valve seat and the closure element of the outlet valve is elastically deformable so that the closure element can be inserted through the valve seat.

27. A toothbrush as claimed in claim 15, or in any of claims 16 to 26 as dependent on claim 15, in which a throttle location is provided between the outlet valve and the cylinder chamber.

28. A toothbrush which incorporates a dispenser device for dispensing a liquid or pasty dentifrice, substantially as hereinbefore described with reference to Figures 1 to 5, or Figures 1 to 5 as modified by Figures 6 and 7 of the accompanying drawings.

29. A dispenser device substantially as hereinbefore described with reference to Figure 8 of the accompanying drawings.

30. A dispenser device substantially as hereinbefore described with reference to Figure 9 of the accompanying drawings.

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