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(71) Applicant
Scholl Incorporated
 (Incorporated in USA-Delaware)
 3030 Jackson Avenue, Memphis, Tennessee 38151,
 United States of America
 (72) Inventor
Edward Tugwood
 (74) Agent and/or Address for Service
Mathys & Squire
 10 Fleet Street, London, EC4Y 1AY

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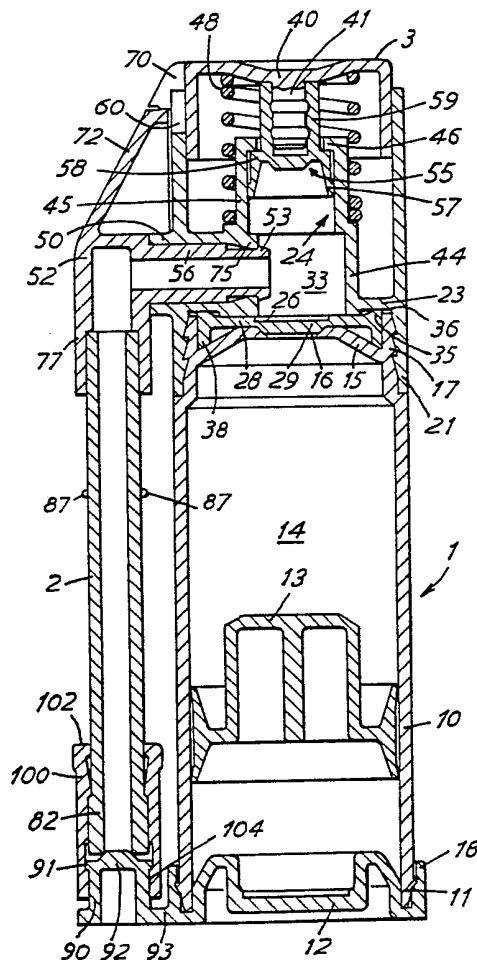
(54) **Manually-operated pump**

(57) A hand-held dispenser of medicated gels for oral use has a pivotally mounted applicator tube 2. The applicator tube can be pivoted from a rest position in which it lies adjacent the dispenser body to a range of dispensing positions which facilitate localised application of medicament to the mouth. The applicator tube is releasably held in the rest position by a sleeve-like cap 100 coaxially mounted on the applicator tube so as to cover the free end thereof and so as to engage an opposing sealing boss provided 90 on the dispenser body. By sliding movement of the cap onto the applicator tube and away from the sealing boss, free movement of the applicator tube to the dispensing positions is permitted.

The tube 2 is joined to elbow joint 52 which leads into the working chamber 33 where the gels are pressurised by movement of piston 55 when finger button 3 is depressed.

Elbow 52 bears a lug 72 which engages extension 70 on button 3 to prevent its depression.

FIG.5



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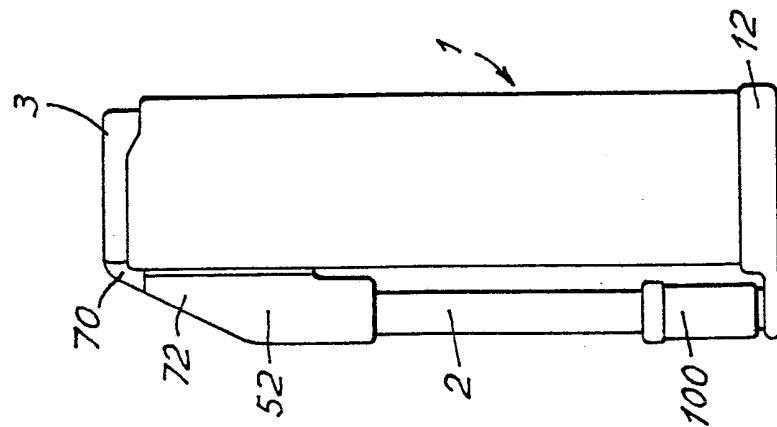


FIG. 1

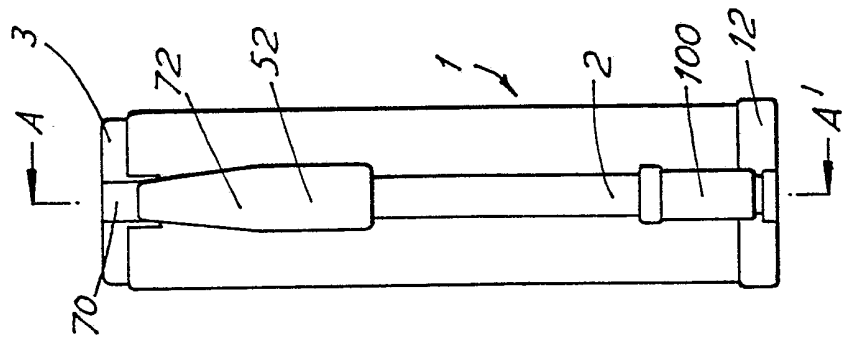


FIG. 2

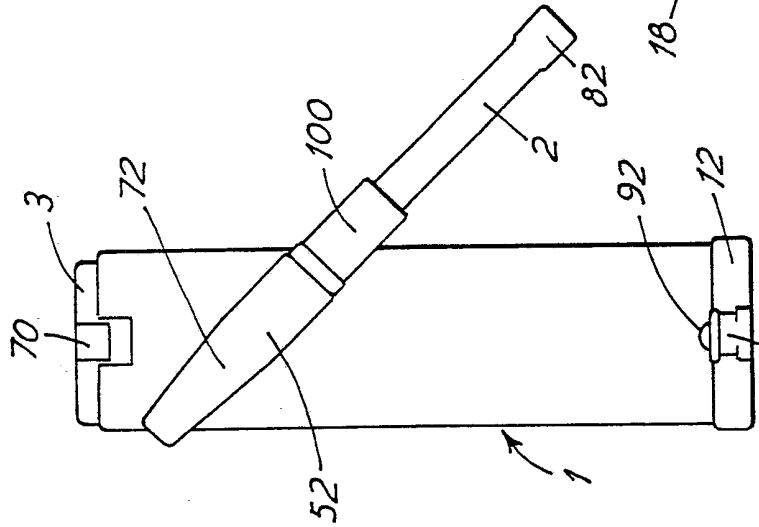


FIG. 3

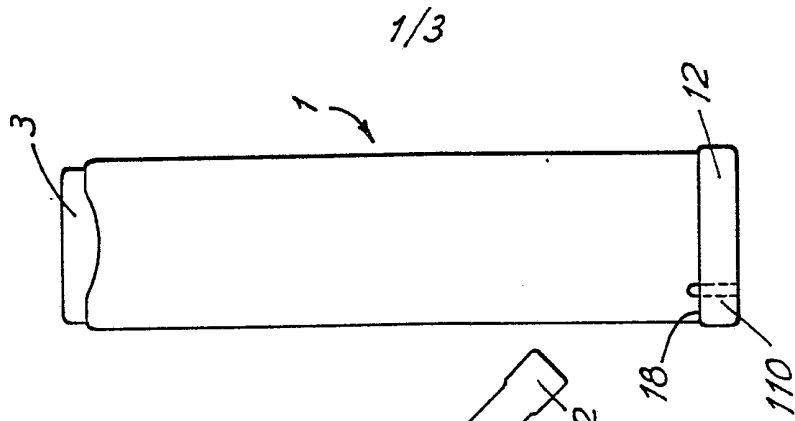


FIG. 4

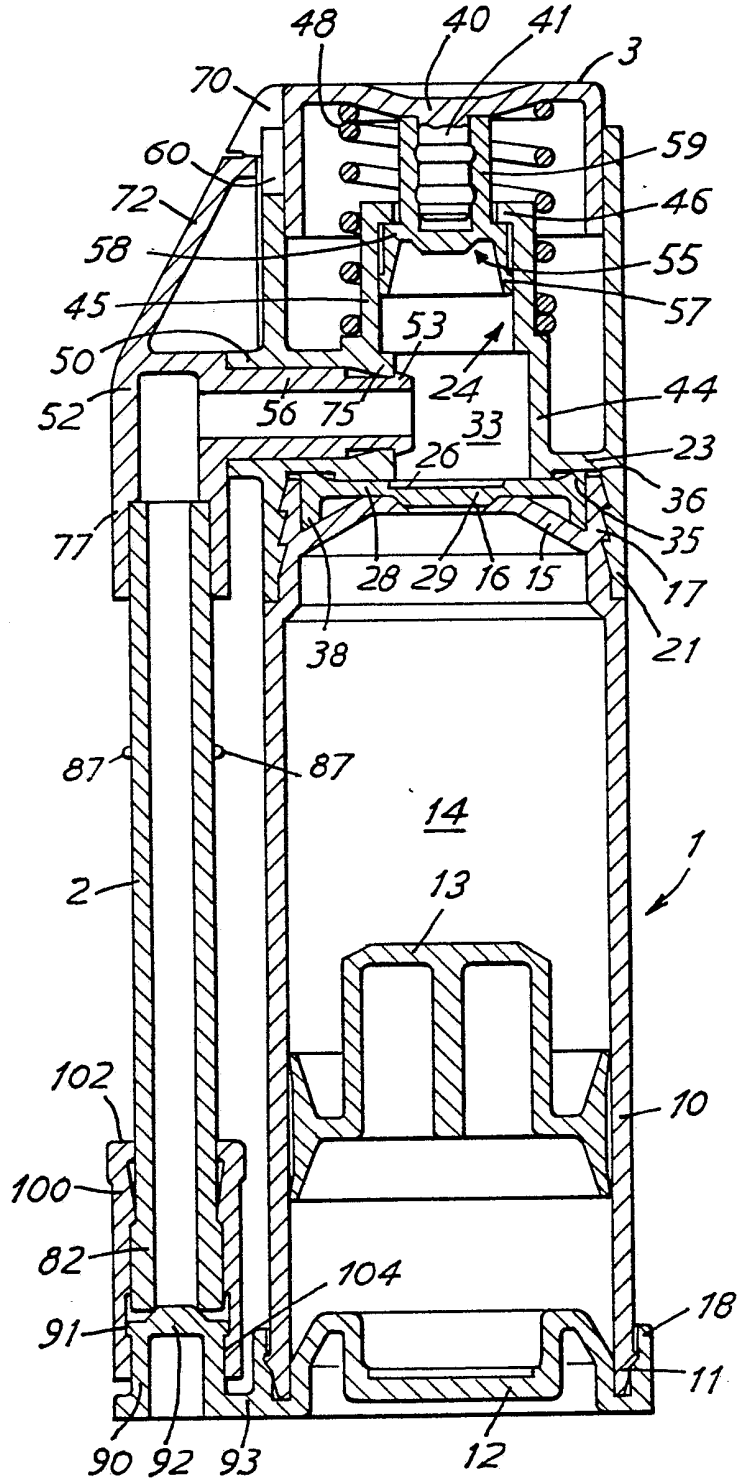


FIG. 5

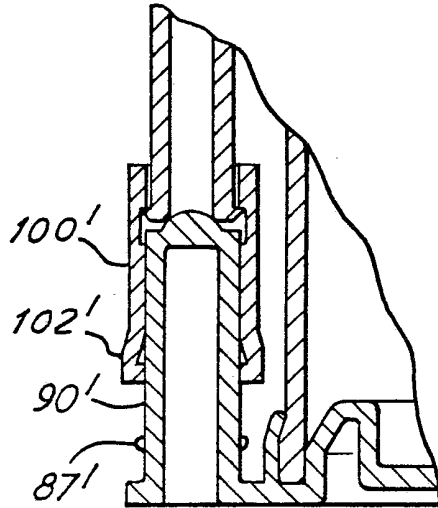


FIG. 6

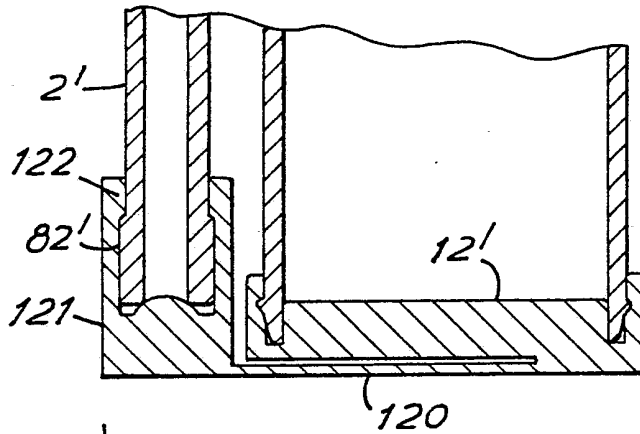


FIG. 7

The present invention relates to a hand-held fluid dispenser and in an important example to a dispenser for applying medicated gels and other appropriate fluids to the mouth.

A variety of dispensers are available which are actuatable by finger pressure to dispense small quantities of fluid. There are, for example, dispensers used for dispensing tooth cleaning pastes or gels. Reference is directed, for example, to W084/00140, EP-A-0 144 879 and EP-A-0 179 342. These are not however suited for the direct application of substances to the mouth. An oral aerosol dispenser of medicaments is disclosed in US 3.610.480 which incorporates a spray directing nozzle pivotable between dispensing and non-dispensing positions. The nozzle does not, however, permit localised application as desirable, for example, with medicated gels. An aerosol dispenser has been suggested which incorporates an elongate applicator tube which can be pivoted to facilitate localised application. This has the disadvantage that the applicator tube may be accidentally dislodged (when being carried in the pocket or handbag, for example) to a position in which discharge can occur. Also, it is felt to be unsatisfactory that the end of the applicator tube which is to be placed in the mouth is left uncovered whilst the dispenser is stored or transported.

Whilst not so much a problem with aerosols, the use of an applicator tube with - for example - gels could lead to the problem that

material remaining within the tube after a dispensing operation would leak out over a period of time.

It is an object of this invention to provide an improved fluid dispenser in which the above problems are wholly or in large part overcome.

Accordingly, the present invention consists in one aspect in a hand-held fluid dispenser comprising a body having formed therein a fluid reservoir; an elongate applicator tube communicating at one end with the reservoir and mounted on the body so as to be movable between a rest position in which the free end of the tube is adjacent the body and a range of dispensing positions in which the free end of the tube projects from the body; and pump means actuable by finger pressure to dispense fluid from the reservoir through the applicator tube, wherein there is provided cap means which serves to hold the applicator tube in the rest position through engagement with the free end thereof, the cap means being displaceable relative to the applicator tube to permit movement of the applicator tube to the dispensing positions.

Advantageously, the cap means is displaceable longitudinally of the applicator tube.

The cap means may be provided on the body of the dispenser, alternatively the cap means may be provided on the applicator tube and adapted to cooperate with a member which is provided on the body of

the dispenser.

Advantageously, the cap means comprises a sleeve coaxially mounted on the applicator tube. Such cap means may be moved partially to engage a member provided on the body of the dispenser thereby to hold the applicator tube in the rest position.

Preferably, there is provided on the body a formation which opposes the free end of the applicator tube in the rest position thereof, the cap means serving to hold the applicator tube in the rest position through engagement with both the free end of the applicator tube and said formation.

According to a further aspect of the present invention, there is provided a hand-held fluid dispenser which comprises a body having formed therein a fluid reservoir; an elongate applicator tube communicating at one end with the reservoir and mounted on the body to be movable between a rest position in which the free end of the tube lies adjacent the body and a range of dispensing positions in which the free end of the tube projects from the body; and pump means actuatable by finger pressure to dispense fluid from the reservoir through the applicator tube, wherein there is provided a sealing element positioned on the body for sealing engagement with the free end of the applicator tube in the rest position thereof, there being further provided means for releasably holding the applicator tube in said rest position.

Advantageously, the means for releasably holding the applicator tube comprises complementary parts formed respectively on the free end of the applicator tube and on the body.

In one form of the invention, the pump means comprises an actuating member, there being provided formations on the actuating member and on the applicator tube respectively, which interengage in the rest position of the applicator tube to prevent actuation of the pump means.

The invention will now be described by way of example with reference to the accompanying drawings in which :-

Figure 1 is a side elevation of a fluid dispenser according to the invention;

Figure 2, is a front elevation of the dispenser shown in Figure 1;

Figure 3, is a front elevation of the dispenser shown in Figure 1 with one part in an alternative position;

Figure 4, is a rear elevation of the dispenser shown in Figure 1;

Figure 5, is a sectional view along line A - A' in Figure 2; and

Figures 6 and 7 are scrap views illustrating respective modifications.

Referring to Figures 1 to 4 of the drawings, the fluid dispenser comprises a body for storing fluid indicated generally by 1, an

applicator tube 2 and pump means, activated by a push-button 3, for dispensing the fluid.

As shown more particularly in Figure 5, the dispenser body 1 comprises base and top body portions 10 and 20 respectively which are hollow and cylindrical. The base portion 10 is open to the bottom and provided with a contoured rim 11 for locking assembly with a base cap 12. To ensure correct alignment of the base cap 12 with the base portion 10, a small notch 110 (see Figure 4) is provided in the rim 11 of the base portion 10 for engagement with an alignment rib (not shown) protruding from the base cap 12. The notch 110 extends slightly above the rim 18 of the base cap 12 to allow entry of air into the base portion 10 for a purpose more fully described hereinafter. The top end wall 15 of the base portion 10 is frustoconical in shape with a central circular aperture 16 and a circular rim 17 outwardly contoured for locking assembly with a contoured interior surface 21 of the top body portion 20.

A freely movable base piston 13 is provided within the base body portion 10 and defines the bottom of a fluid reservoir 14. The precise structure of the base piston forms no part of this invention and detailed description is not considered necessary.

The top body portion 20 has the same external diameter as base portion 10. It is connected by a radially disposed flange 23 to an inner cylindrical portion indicated generally by 24. This inner portion 24

is stepped to form upper and lower inner portions 45 and 44 of different diameter, portion 44 being narrower than portion 45. Portions 44 and 45 are connected by a step 47.

A separate non-return valve plate 28 is positioned between the flange 23 of the top body portion 20 and the frustoconical end wall 15 of the base portion 10. It is located in position by an upwardly projecting ring 35 which is received by an annular recess 36 in the underside of flange 23 and by a downwardly projecting ring 38 which abuts the end wall 15. An integral non-return valve element 29 is connected with the valve plate 28 via a radial filament hinge 26, and normally lies in sealing engagement with the aperture 16 of the end wall 15.

The push-button actuator pump 3 is of inverted cup shape and slidably mounted within the top body portion 20. The end wall 40 of the actuator is concave and provides a mounting for a spigot 41 extending axially inward. The actuator 3 is also provided with a radially protruding lug 70 of wedge shape. This is slidably received in an open ended slot 60 in body portion 20.

A top piston 55 is adapted to slide within the upper internal portion 45. This piston comprises a mounting sleeve 59 connected via a radial flange 58 with a flexible skirt 57 which is outwardly flared for sealing engagement with the inside wall of the portion 45. The mounting sleeve 59 is internally contoured to provide a locking engagement assembly with complementary contours on the spigot 41. A

return compression spring 48 rests on the step 47 between the portions 44 and 45. This spring 48 acts on the push-button 3 to return it, and therefore also the top piston 55, to the position shown in the drawings, following depression of the push-button 3. The upper portion 45 is provided with an inwardly turned rim 46 to prevent the top piston 55 being forced upwardly out of the inner portion 24 by the spring 48. The space defined by the interior of the inner portion 24, the non-return valve element 29 and the top piston 55 provides an upper fluid chamber 33 from which fluid is to be dispensed during operation of the dispenser.

A cylindrical wall 50 extends radially outward from the lower internal portion 44 and through the top body portion 20 to define a passageway. One arm 56 of a right-angled elbow tube 52 lies within the passageway and is adapted to rotate relative to that passageway, thus forming a swivel joint. This arm 56 has an enlarged rim 53 which abuts the inwardly facing edge 75 of the wall 50. This rim 53 prevents removal of the arm 56 from the passageway and also helps to ensure that the swivel joint is leak-proof. The other arm 77 of the elbow tube 52 is adapted to receive the applicator tube 2. Elbow tube 52 also has an extension 72 which abuts the lug 70 when the applicator tube is aligned vertically in the rest position, as shown in Figure 5.

A sealing boss 90 having a protruding rim 91 is mounted on the base 12 by a radially extending strip 93. In the rest position shown in Figure 1 and Figure 5, the free end 82 of the applicator tube 2 is in

sealing engagement with the domed upper surface 92 of the sealing boss 90.

A sleeve 100 is mounted for sliding movement over the length of the applicator tube 2. In the rest position the sleeve 100 overlies both the end 82 of the applicator tube 2 and the sealing boss 90. The sleeve 100 has an inwardly turned rim 104 at its lower end which grips beneath rim 91 and therefore locks the applicator tube 2 in that position. The interior of the sleeve 100 is also contoured to prevent it slipping off the slightly enlarged end 82 of the applicator tube 2. The sleeve 100 can be slid upwardly along the applicator tube and held in the released position shown in Figure 3 by snap engagement between its inwardly protruding rim 102, and the lugs 87 provided integrally with the tube.

The fluid dispenser is filled with fluid in the following manner. The base 12 and the bottom piston 13 are removed, the dispenser inverted and fluid poured into the fluid reservoir 14. The bottom piston 13 is then reinserted into the reservoir 14 and the air expelled. The push-button 3 is depressed to push down the piston 55 and the bottom piston 13 is further inserted into cylinder 10. This causes air to be forced from the upper fluid reservoir 33 and replaced with fluid. The bottom cap 12 is then replaced. The conical shape of the top 15 of the cylinder 10 facilitates expulsion of air from the reservoir 14 and also reduces frictional resistance to the fluid flow through the aperture 16.

In the case of a viscous fluid, that fluid is retained within the upper reservoir 33 without need for a non-return valve at the entrance to the elbow 52. However, in the case of a non-viscous fluid it may be necessary to include such a valve.

Before the dispenser can be operated, the applicator tube 2 must first be unlocked from the rest position by sliding the sleeve 100 off the sealing boss 90 and up the tube 2. The sleeve 100 can then be held in the retracted position on the tube 2 by engagement of the rim 102 with the lugs 87. The tube 2 can then be rotated from the rest position to a dispensing position as shown in Figure 3 in which its free end projects away from the body 1 of the dispenser.

The dispenser cannot be operated when the tube 2 is in the rest position shown in Figure 1. This is because the extension 72 on the applicator tube then abuts the lug 70 of the push button and prevents depression. Accidental operation of the dispenser is thus avoided. When the tube has been pivoted to project away from the body 1, as shown for example in Figure 3, the extension 72 no longer abuts the lug 70 which becomes free to slide in the slot 60.

To operate the fluid dispenser, push-button 3 is depressed. This causes the pressure in the chamber 33 to increase, the non-return valve 29 seals firmly and fluid is forced out of the chamber 33 through the applicator tube 2. When the push-button 3 is subsequently released, the pressure in the top cylinder is reduced below

atmospheric pressure and the non-return valve 29 opens. Pressure within the dispenser is then equalised as fluid flows from the lower fluid reservoir 14 into the upper fluid reservoir 33 under the action of the base piston 13, with air entering the body portion 10 below the piston 13 via the notch 110. The dispenser is thus again ready for use.

It will be recognised that the cap formed by sleeve 100 holds the applicator tube in the sealed position and therefore prevents leakage of fluid remaining within the applicator tube. It further ensures that the end of the applicator tube that is placed in the mouth is maintained clean. Accidental operation of the dispenser is prevented by the described interlocking engagement between the extension 72 and the lug 70.

The components of the dispenser may be formed of injection moulded plastics or other suitable materials.

Referring now to Figure 6, there is illustrated a modification to the above described dispenser. It will be seen that the length of the sealing boss 90' is increased and the sleeve 100' generally inverted so as to remain captive upon the sealing boss rather than on the tube 2'. The sleeve 100' can be held in a retracted position, in which the tube 2' is free to pivot, by snap engagement between the sleeve rim 102' and lugs 87' provided on the sealing boss.

An alternative and more radical modification is illustrated in Figure 7. The base cap 12 is adapted through a filament hinge 120 to provide a mounting for cap 121. In the rest position, cap 121 is held in engagement with the free end 82' of the applicator tube by means of an inwardly directed cap rim 122 engaging behind the enlarged end of the tube. Hinged movement of the cap 121 in the arrowed direction frees the tube for pivoting.

It should be understood that this invention has been described by way of example only, and a wide variety of further modifications are possible without departing from the scope of the invention as set forth in the appended claims.

The pump means may, for example, be of the kind described but may also be provided by other means, for example, an aerosol. This would be actuated by finger pressure on a button or other release member.

The present invention has been described with particular reference to its use as a dispenser for oral use. However, it will be understood that the hand-held dispenser of the present invention can be used for other purposes where it is desired to apply a fluid to a particular location and also to carry or store the dispenser in, for example, a pocket, handbag or drawer, without fear of accidental operation and spillage.

CLAIMS:

1. A hand-held fluid dispenser comprising: a dispenser body providing a fluid reservoir; an elongate applicator tube mounted at one end thereof upon the dispenser body so as to be movable between a rest position in which the free end of the tube lies adjacent the dispenser body and a range of dispensing positions in which the free end of the applicator tube projects from the dispenser body; fluid delivery means communicating between the fluid reservoir and said one end of the applicator tube, said delivery means including pump means actuable by finger pressure to dispense fluid through the applicator tube; and cap means displaceable relatively to the applicator tube from a first position in which the cap means substantially covers the free end of the applicator tube and through engagement with the dispenser body locks the applicator tube in said rest position, to a second position in which the free end of the applicator tube is uncovered and the applicator tube is able to move to said range of dispensing positions.

2. A dispenser according to Claim 1, wherein the cap means is displaceable longitudinally of the applicator tube and engages in said first position a cap retaining formation mounted on the dispensing body.

3. A dispenser according to Claim 2, wherein said cap retaining formation is aligned axially with the applicator tube.

4. A dispenser according to Claim 2 or Claim 3, wherein the cap means comprises a sleeve coaxially mounted upon the applicator tube.

5. A dispenser according to any one of the preceding claims, wherein the cap means is slidably mounted upon the applicator tube and captive thereon.

6. A dispenser according to any one of Claims 2, 3 and 4, wherein the cap means is slidably mounted upon the cap retaining formation and captive thereon.

7. A dispenser according to Claim 1 wherein the cap means is hingedly mounted on the dispensing body.

8. A dispenser according to any one of the preceding claims, wherein said pump means comprises an actuating member, there being provided formations on the actuating member and on the applicator tube respectively which inter-engage in the rest position of the applicator tube to prevent actuation of the pump means.

9. A hand-held fluid dispenser comprising: a dispenser body providing a fluid reservoir; an elongate applicator tube mounted at one end thereof on the dispensing body for pivotal movement about at least an axis perpendicular to the length of the applicator tube between a rest position in which the free end of the tube lies adjacent the dispenser body and a range of dispensing positions in which the free end of the

applicator tube projects from the dispenser body; delivery means communicating between the reservoir and said one end of the applicator tube, said delivery means including pump means actuable by finger pressure to dispense fluid through the applicator tube; a sealing element mounted on the dispensing body and positioned for sealing engagement with the free end of the applicator tube in the rest position thereof; and releasable locking means for releasably holding the applicator tube relatively to the dispenser body in said rest position of the applicator tube.

10. A dispenser according to Claim 9, wherein said releasable locking means comprises a sleeve slidable longitudinally of the applicator tube.

11. A dispenser according to Claim 9 or Claim 10, wherein said sealing element comprises a sealing boss axially aligned with the applicator tube and of generally the same transverse dimension.

12. A dispenser according to Claim 11 wherein said releasable locking means comprises a sleeve which coaxially engages both the free end of the applicator tube and the sealing boss in said rest position of the applicator tube.

13. A dispenser according to any of Claims 9 to 12, wherein the pump means comprises an actuating member having abutment means and wherein there is mounted on said applicator tube a lever projecting from said

axis and opposed to the applicator tube, the arrangement being such that in the rest position of the applicator tube engagement of said lever with said abutment means prevents actuation of the pump means, pivotal movement of said applicator tube serving to displace said lever from engagement with the abutment means.

14. A hand held fluid dispenser substantially as hereinbefore described with reference to and as shown in Figures 1 to 5; Figures 1 to 4 and 6 or Figures 1 to 4 and 7 of the accompanying drawings.