

(12) UK Patent Application (19) GB (11) 2 269 090 (13) A

(43) Date of A Publication 02.02.1994

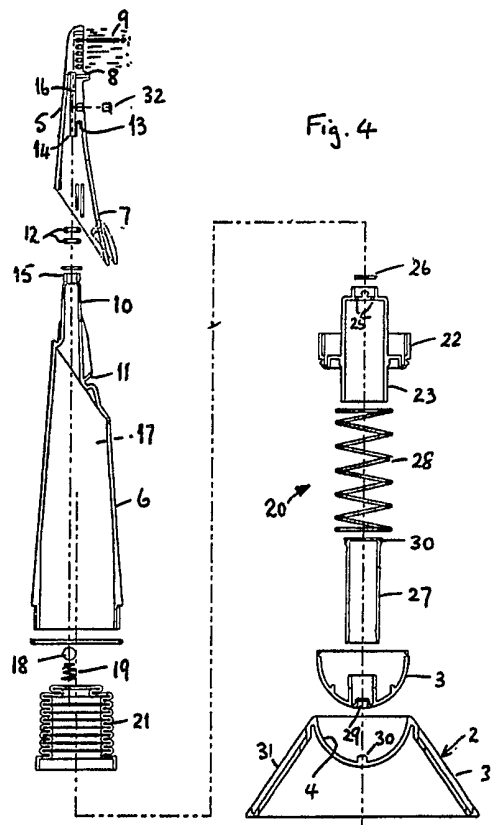
(21) Application No 9313566.3
(22) Date of Filing 01.07.1993
(30) Priority Data
(31) 9214899 (32) 14.07.1992 (33) GB

(71) Applicant(s)
Christopher Firth
7 Thurleigh Road, LONDON, SW12 8UB,
United Kingdom
(72) Inventor(s)
Christopher Firth
(74) Agent and/or Address for Service
Graham Coles & Co
24 Seeleys Road, BEACONSFIELD, Bucks, HP9 1SZ,
United Kingdom

(51) INT CL⁵
A46B 11/00 11/02
(52) UK CL (Edition M)
A4K KBA K161 K176 K184
B8D DSR2 D6 D7PY
F1R R15A
U1S S1125
(56) Documents Cited
GB 0913371 A GB 0408722 A US 4787765 A
US 4695177 A US 4201490 A US 4135831 A
US 4062635 A
(58) Field of Search
UK CL (Edition L) A4K KBA , B8D DSR2 DSS , F1R
RAA R15A R15D R3A3B
INT CL⁵ A46B 11/00
ON-LINE DATABASE: WPI.

(54) Hand-held devices for mouth hygiene

(57) The device comprises a chamber 17 located within an elongate conical body 6, and which holds liquid for selective discharge via a nozzle 8 of a brush-head 5 that is retained on an elongate nose 10 of the body 6 by a resilient clip 7. Inflation of a bellows 21 into the bottom of the chamber 17 using a retractable, manual pump 20, pressurises the liquid, and depression of the clip 7 against an inclined lip 11 pulls the head 5 down to releases liquid from the chamber 17. While the head 5 is pulled down, a spigot 14 of the head 5 displaces a sprung ball 18 to allow the liquid to flow from the chamber 17 along a channel 16 to the nozzle 8.



GB 2 269 090 A

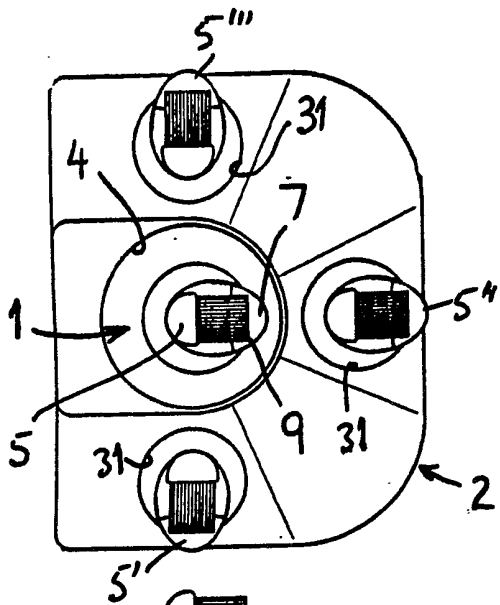


Fig. 1

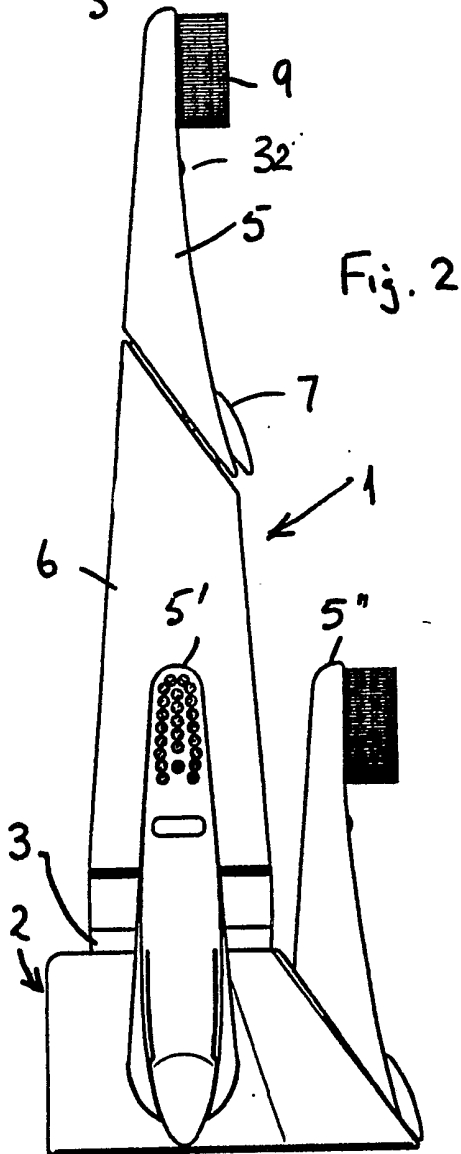


Fig. 2

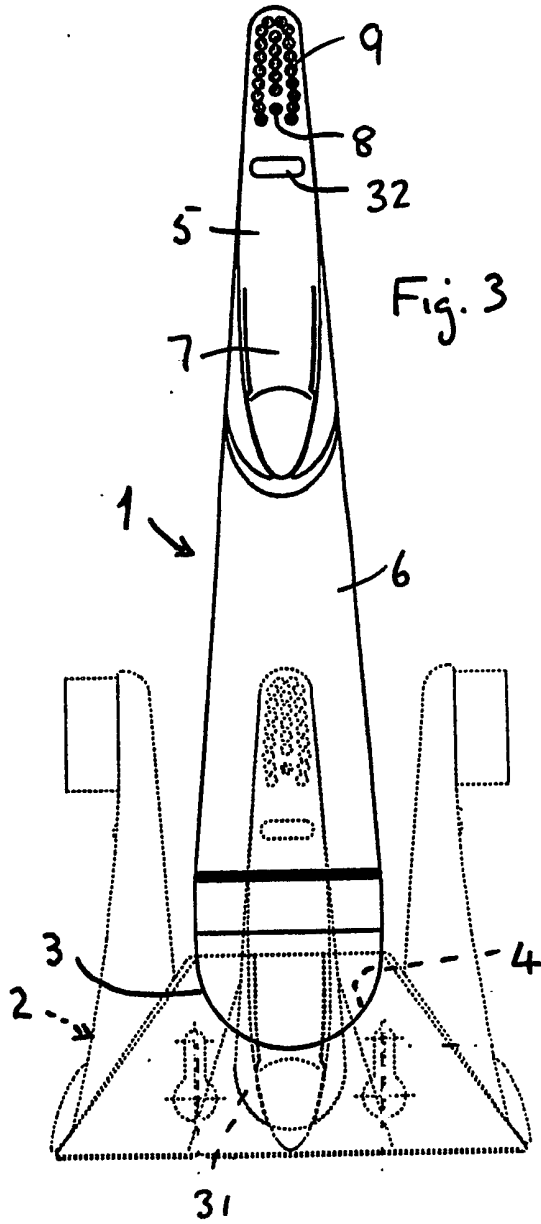


Fig. 3

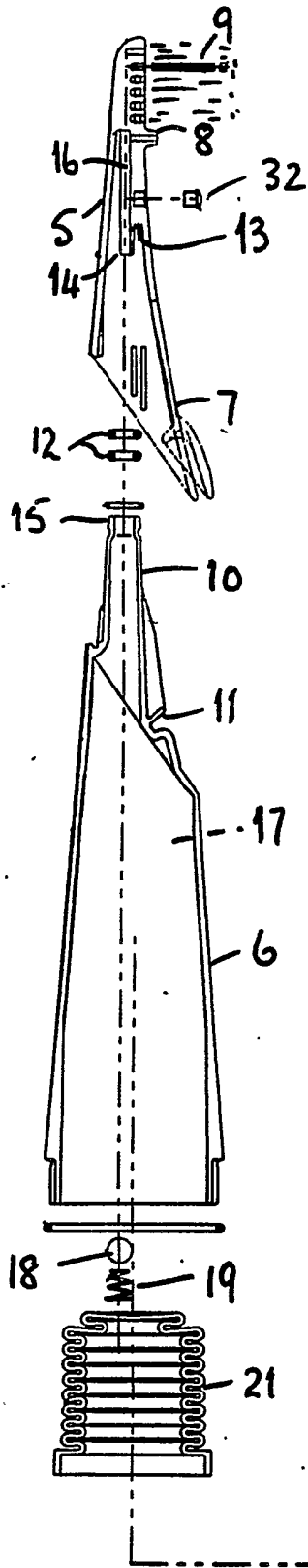
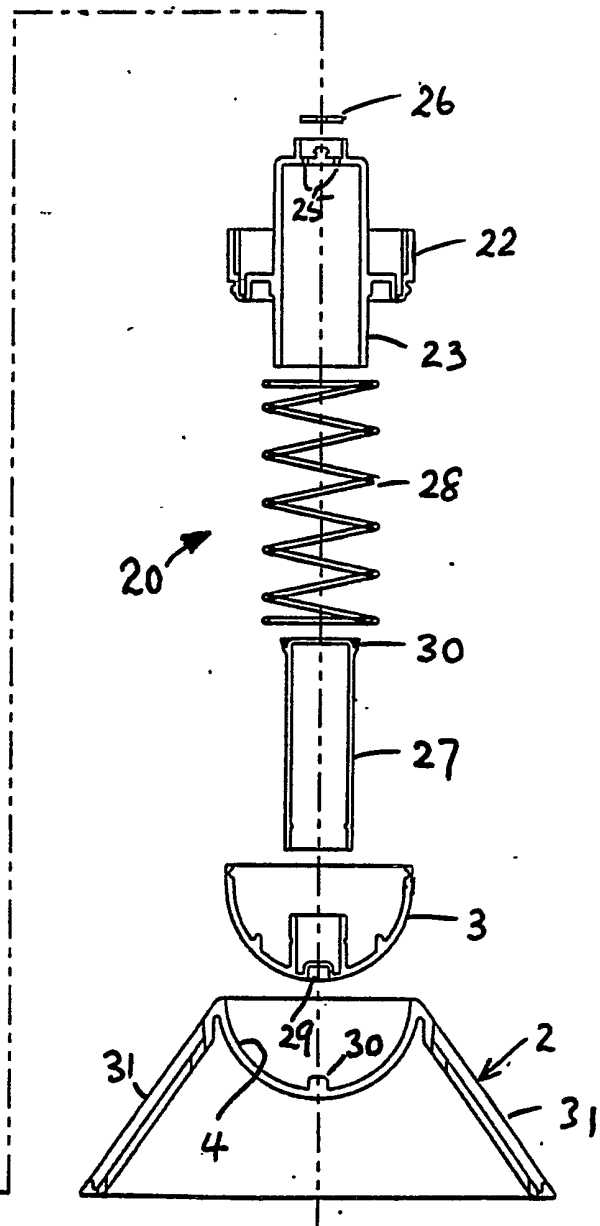


Fig. 4



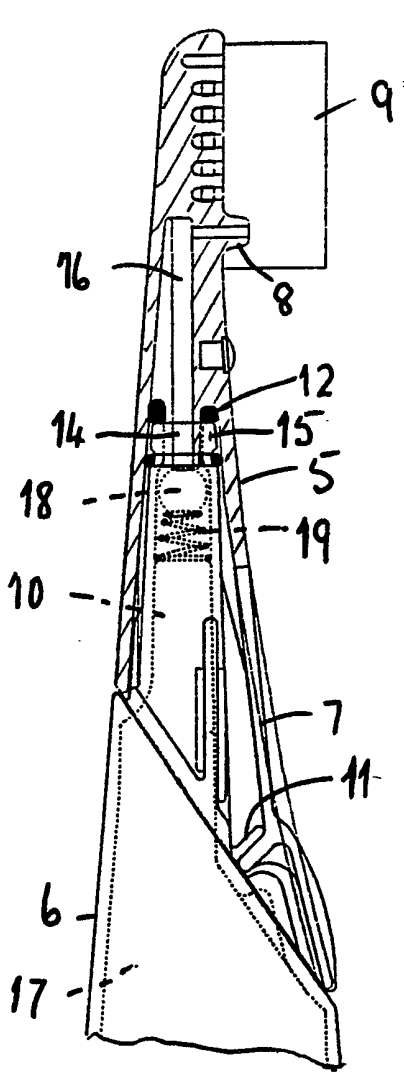


Fig. 6

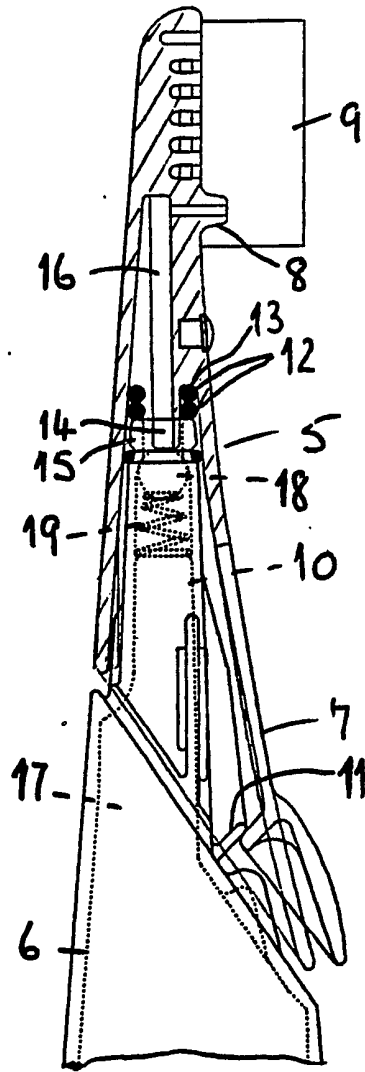


Fig. 5

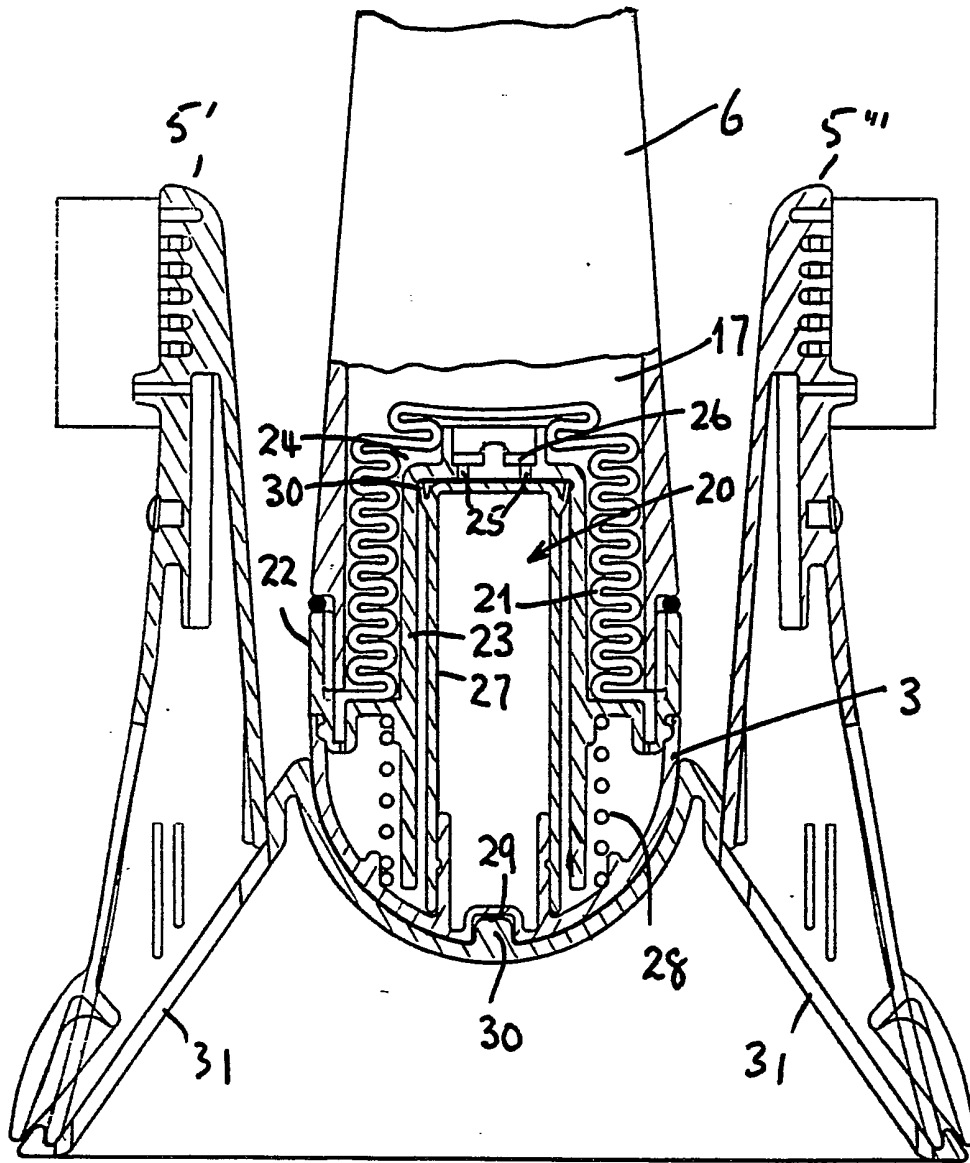


Fig. 7

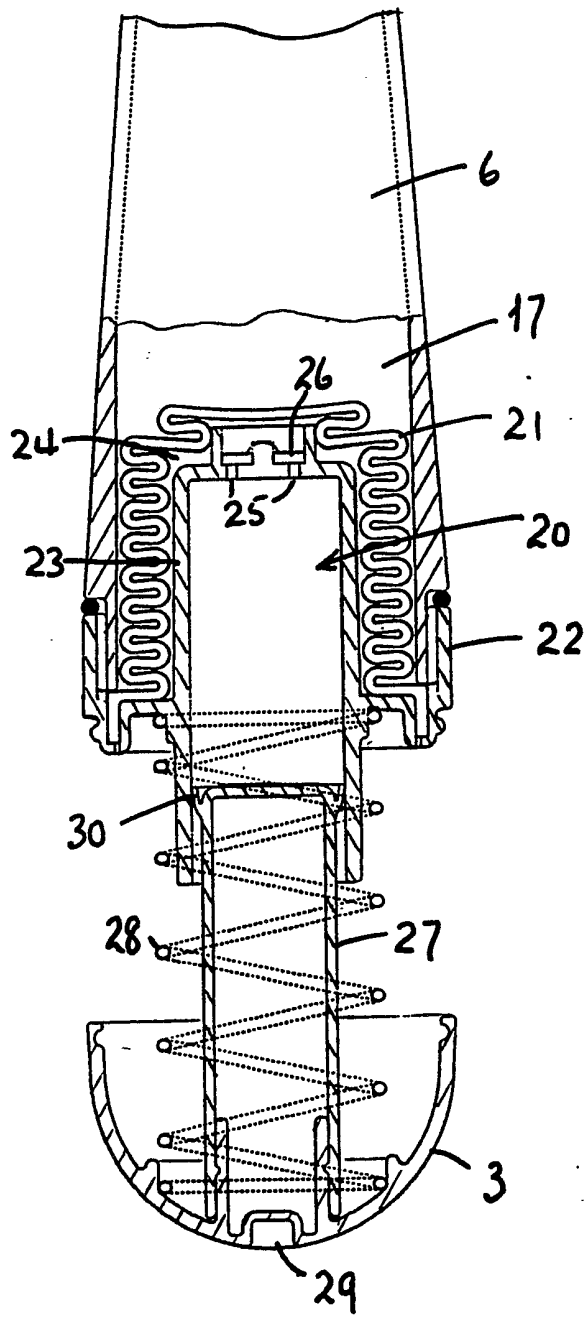


Fig. 8

Hand-Held Devices for Mouth Hygiene

5 This invention relates to hand-held devices for mouth hygiene.

10 According to one aspect of the present invention there is provided a hand-held device for mouth hygiene having a head-part for entry into the mouth and discharge of liquid therein, wherein the device includes a reservoir chamber for holding a supply of liquid, means operable to pressurise the liquid in the reservoir chamber, and means that is selectively operable to release liquid under pressure from the reservoir chamber for discharge from the head-part.

15 The means for pressurising the liquid in the reservoir chamber may include a manually-operable pump, and may involve a bellows or other flexible means that is inflated against the liquid in the chamber by the pump. The pump may be a reciprocating air-pump.

20 The head-part may be detachably mounted on a body-part of the device, and the body-part may include the reservoir chamber and an outlet valve for regulating release of the liquid from the chamber into the head-part for discharge therefrom.

25 The mounting of the head-part on the body-part in the latter circumstances may involve a resilient bias such that the head-part is displaceable with respect to the body-part against this bias, and when so displaced is effective to open the outlet valve for release of liquid from the chamber into the head-part. The outlet valve in this case may include a spring-loaded ball and the head-part a spigot to displace the ball for opening the valve when the head-part is displaced. Also, the mounting may

involve a spring clip that engages with a lip such that depression of the clip against the lip pulls the head-part down onto the body-part against the resilient bias.

5 The head-part of the device may incorporate a brush for use in cleaning the teeth, and may include a nozzle for discharge of the liquid therefrom through the brush.

10 A hand-held device for mouth hygiene, in accordance with the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

15 Figures 1 and 2 show the hand-held device of the present invention in plan and side-elevation respectively, as retained upright on a stand ready for use;

20 Figure 3 shows the hand-held device of Figures 1 and 2 in front elevation with detail of the stand depicted in dotted line;

25 Figure 4 is an exploded view of the hand-held device of Figures 1 to 3 and its stand;

30 Figures 5 and 6 are sectional side views of the head-part of the hand-held device of Figures 1 to 3, Figure 5 showing the normal, un-displaced condition applicable to the mounting of the head-part in the device, and Figure 6 showing an operated, displaced condition of the head-part that is applicable for discharge of liquid from the device;

35 Figure 7 is a sectional front view of the bottom of the device as mounted in its stand, showing a pump-bellows assembly used for pressurising liquid contained within the body-part of the device; and

Figure 8 is a sectional view of the bottom of the device when removed from the stand and with the pump of the pump-bellows assembly primed ready for pressurisation of the liquid.

5

The hand-held device to be described is for use in mouth hygiene, in particular for brushing the teeth and for selectively discharging a pressurised jet of water or other liquid through the brush head onto and between the teeth. The liquid may be used in this respect to flush food particles from the teeth and the brush head, and also, according to the liquid used, for combatting plaque.

10 Referring to Figures 1 to 4, the hand-held device 1 has a wall-mounted stand 2 for retaining it upright when not in use. In this respect the device 1, which is of a generally elongate conical form, has a hemispherical base-part 3 that rests in a complementary hemispherical socket 4 of the stand 2. The centre of gravity of the device 1 is low so that the device 1 remains erect on the stand 2 without tendency to fall over.

15 The device 1 has a brush-head 5 that is retained on a main-body part 6 of the device 1 by a resilient clip 7. The body-part 6 provides a reservoir for the liquid that is to be discharged into the mouth, such discharge taking place through a nozzle 8 that is located within the tufted-bristle brush 9 of the head 5.

20
30

Referring now also to Figure 5, the head 5 fits over an elongate nose 10 of the main-body part 6, and the clip 7 engages resiliently against an upstanding lip 11 beneath the nose 10, to hold the head 5 in place. With the clip 7 engaged in this way, the nose 10 is pushed up within the head 5 against two resilient sealing rings 12 that are trapped against an internal shoulder 13 of the head

35

5. A spigot 14 projects downwardly from the shoulder 13 to enter slightly into the end 15 of the nose 10, and a channel 16 extends lengthwise of the spigot 14 and opens into the nozzle 8.

5

The nose 10 defines part of a reservoir chamber 17 that is provided within the body-part 6 for the liquid that is to be discharged under pressure through the nozzle 8. A ball 18 closes the upper end of the chamber 17, the ball 18 being in this respect located within the nose 10 and urged upwardly by a trapped spring 19 to block the otherwise-open end 15. Release of the pressurised liquid to flow from the chamber 17 through the end 15 of the nose 10, and thence via the channel 16 for discharge through the nozzle 8, is achieved simply by depressing the clip 7 with the thumb. The effect of depressing the clip 7 is to push it further down against, and at an inclined angle to, the lip 11. This draws the head 5 down tighter onto the body-part 6 and pushes the nose 10 harder onto the rings 12, as illustrated in Figure 6.

Referring to Figure 6, the increased compression of the rings 12, causes the spigot 14 to enter further into the end 15 of the nose 10. The spigot 14 as a consequence depresses the ball 18 within the nose 10 against the action of the spring 19. The unblocking of the end 15 resulting from this, releases flow of the pressurised liquid from the chamber 17 to the nozzle 8. This flow continues until thumb-pressure on the clip 7 is released, whereupon the head 5 is returned to its former position (as illustrated in Figure 5) by the resilience of the rings 12.

Referring now more especially to Figure 7, liquid contained in the chamber 17 is pressurised manually using a pump 20 to inflate a bellows 21 against the liquid. The pump 20 and bellows 21 are carried by a collar 22

that screws onto the lower end of the body-part 6 to effect a seal holding the bellows 21 projecting into and closing off the lower end of the chamber 17. The collar 22 is formed as one with a cylinder 23 of the pump 20, the cylinder 23 projecting upwards centrally within the bellows 21 and closing off an air-chamber 24 for the bellows 21. The upper end of the cylinder 23 within the chamber 24 has openings 25 that are closed by a resilient washer 26. The washer 26 operates in conjunction with the openings 25 to provide a one-way valve for releasing air compressed within the cylinder 23, into the chamber 24 to inflate the bellows 21.

Air within the cylinder 23 is compressed by a piston 27 of the pump 20, attached to the hemispherical base-part 3. The rim of the base-part 3 is releasably secured to the collar 22 through a lug-in-slot locking engagement that can be broken to release the part 3 from the collar 22, simply by twisting the base-part 3 through 90 degrees with respect to the collar 22. When released from the collar 22, the part 3 is freed to move away from it and withdraw the piston 27 within the cylinder 23, under the action of a spring 28. As the piston 27 is withdrawn, air is sucked into the cylinder 23 past an integral, annular flap 30 at the head of the piston 27. Pressure on the base-part 3 to push the piston 27 back along the cylinder 23 causes the washer 26 to lift resiliently and allow the compressed air in the cylinder 23 to pass into the chamber 24.

Actuation of the pump 20 through repeated reciprocation of the piston 27 in the cylinder 23, enables the air pressure in the chamber 24 to be increased to whatever is required to produce the desired pressurisation of the liquid in the chamber 17. The priming action of the spring 28 facilitates the pumping process, more especially to the extent that it enables actuation of the

pump 20 to be carried out using just one hand. In this respect, the pump 20 can be actuated simply by holding the body-part 6 in the hand and pressing it down repeatedly while the base-part 3 is against some
5 convenient, fixed object.

The device 1 is readily brought into use for cleaning the teeth and mouth-hygiene purposes generally. In this it is first lifted clear of the stand 2, and if the chamber
10 17 is not already charged with pressurised liquid, steps are taken to bring this about. More particularly, the chamber 17 is charged with liquid by unscrewing the collar 22 so as to detach the collar 22, and with it the
15 base-part 3 and accompanying assembly of pump 20 and bellows 21, from the body-part 6. The liquid, which may be, for example, water or a solution of plaque-remover, is poured into the opened chamber 17. Once the chamber 17 is full, the collar 22 with its attached base-part 3 and pump-bellows assembly (20, 21), is re-screwed onto
20 the body-part 6 to close the chamber 17 again.

In order to pressurise the liquid, the base-part 3 is next unlocked from the collar 22 and the pump 20 actuated through some five to ten pumping strokes. When
25 pressurisation has been completed, the base-part 3 is pushed up onto the collar 22 against the action of the spring 28, and twisted to re-lock it to the collar 22.

Once the chamber 17 is filled with the appropriate liquid and the liquid has been pressurised using the pump 20,
30 the head 5 of the device 1 is entered into the mouth for conventional cleaning of the teeth using the brush 9. The slim tapering form enables the device 1 to be grasped comfortably and with a firm grip within the palm of the
35 hand, during the cleaning process. Thumb (or finger) pressure on the clip 7 intermittently during this process, releases jets of the liquid into the mouth

through the nozzle 8, to clear food particles from the teeth and/or brush 9 and, according to the liquid used, to combat plaque.

5 As the reserve of liquid in the chamber 17 is depleted, the bellows 21 expands further into the chamber 17 maintaining pressurisation of the liquid for jet-
10 discharge from the nozzle 8. If at any time the jet-pressure falls below a desired level, that situation can be rectified by further actuation of the pump 20 to restore the air pressure within the expanded bellows 21.

The device 1 is restored to the stand 2 after use, and location of the base-part 3 in the stand 2 is in this
15 respect facilitated by engagement of a recess 29 in the base-part 3 with a central projection 30 within the socket 4. The stand 2 accommodates three brush-heads 5' to 5''' that are interchangeable with the head 5, these being retained upright within individual sockets 31 of
20 the stand 2. The different heads 5 to 5''' may, for example, be assigned to different members of a household who use the device 1 in common, each member fitting whichever of the heads 5 to 5''' is assigned to them as he/she comes in turn to use the device 1. In the latter
25 respect, and in order to enable the heads 5 to 5''' to be distinguished one from the other, each incorporates a marker 32 of a respective, distinct colour. Aside from the differently-coloured markers 32, the heads 5 to 5''' are identical to one another, but this is not necessarily
30 the case.

The device 1 described above with reference to Figures 1 to 8 has the advantage of lightweight portability without any connecting tubes, leads of other encumbrances. It
35 may be principally of a plastics construction, and in this respect the head-parts 5 to 5''', the body-part 6 and the base-part 3, together with the stand 2, may be of

polystyrene. The bellows 21 may be of natural rubber or a blow-moulding of polypropylene.

5 Although the device 1 has been described above in the context of discharging a jet of water or a solution of plaque-remover, into the mouth, it is to be understood that the device 1 may instead be used with liquids that have a much higher viscosity. For example, the chamber 17 may be filled with a tooth-cleaning paste or cream to
10 be available to be dispensed through the nozzle 8 simply on depression of the clip 7.

15 Furthermore, it will be appreciated that rather than providing for manual pressurisation of the liquid used, the device described may be modified to incorporate, for example, a battery-operated pump. Alternatively, a canister or other container that holds the liquid in an already-pressurised condition may be utilised. In the
20 latter regard, the head-part 5 may fit to the container in a manner comparable with the way in which it fits to the nose 10 in the device described above, such that depression of the head-part 5 brings about selective release of the liquid into the head-part 5 for discharge therefrom through the nozzle 8.

Claims:

1. A hand-held device for mouth hygiene having a head-part for entry into the mouth and discharge of liquid therein, wherein the device includes a reservoir chamber for holding a supply of liquid, means operable to pressurise the liquid in the reservoir chamber, and means that is selectively operable to release liquid under pressure from the reservoir chamber for discharge from the head-part.
2. A device according to Claim 1 wherein the means for pressurising the liquid in the reservoir chamber includes a manually-operable pump.
3. A device according to Claim 2 wherein the means for pressurising the liquid in the reservoir chamber involves a bellows or other flexible means and the pump is operable to inflate the bellows or other means against the liquid in the chamber.
4. A device according to Claim 2 or Claim 3 wherein the pump is a reciprocating air-pump.
5. A device according to Claim 4 wherein the pump has a piston that is biased resiliently to project from a body-part of the device, and wherein the piston is selectively lockable closed up to the body-part against the resilient biasing.
6. A device according to Claim 5 wherein the body-part is elongate and the piston reciprocates lengthwise of the body-part.

7. A device according to any one of Claims 1 to 4 wherein the head-part is detachably mounted on a body-part of the device.
8. A device according to any one of Claims 5 to 7 wherein the body-part includes the reservoir chamber and an outlet valve for regulating release of the liquid from the chamber into the head-part for discharge therefrom.
9. A device according to Claim 8 wherein the head-part is mounted on the body-part against a resilient bias such that the head-part as so mounted is displaceable with respect to the body-part against the bias, and when so displaced is effective to open the outlet valve for release of liquid from the chamber into the head-part as aforesaid.
10. A device according to Claim 9 wherein the outlet valve includes a spring-loaded ball and the head-part includes a spigot to displace the ball for opening the valve when the head-part is displaced with respect to the body-part against said bias.
11. A device according to Claim 9 or Claim 10 wherein the mounting of the head-part on the body-part involves a spring clip that engages with a lip, and wherein depression of the clip against the lip pulls the head-part down onto the body-part against said bias.
12. A device according to any one of Claims 5 to 11 wherein the body-part is of a generally elongate conical form.
13. A device according to Claim 12 including a substantially hemispherical base-part that is selectively lockable to the bottom of the body-part.

14. A device according to any one of Claims 1 to 13 wherein the head-part incorporates a brush for use in tooth cleaning.

15. A device according to Claim 14 wherein a nozzle for discharge of the liquid from the head-part is located within the brush.

16. A hand-held device for mouth hygiene, substantially as hereinbefore described with reference to the accompanying drawings.

Relevant Technical Fields

- (i) UK Cl (Ed.L) A4K (KBA), F1R (R3A3B R15A R15D
 RAA) B8D (DSR2 DSS)
- (ii) Int Cl (Ed.5) A46B 11/00

Search Examiner
 DR C L DAVIES

Date of completion of Search
 29 OCTOBER 1993

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ON-LINE DATABASE: WPI

Documents considered relevant following a search in respect of Claims :-
 1-16

Categories of documents

- X:** Document indicating lack of novelty or of inventive step. **P:** Document published on or after the declared priority date but before the filing date of the present application.
- Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category. **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A:** Document indicating technological background and/or state of the art. **&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 0913371 (DAVENPORT) see whole document	1,2,3,4,14,15
X	GB 0408722 (POOLE) see Figures and page 1 lines 18-27 and lines 53-56	1,2,4,7,12,14,15
X	US 4787765 (KUO) see Figures	1,2,7,14,15
X	US 4695177 (KUO) see Figures column 2 lines 15-26	1,2,14,15
X	US 4201490 (D'ANGELO) see Figures	1,2,7,14,15
X	US 4135831 (REITKNECHT) see Figures	1,2,7,14,15
X	US 4062635 (TEH-SHENG) see Figures	1,2,14,15

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).