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(54) A cleaning apparatus

(57) A cleaning apparatus is disclosed as including a body portion with a water entry end and holes in a fluid communicable relationship with each other via a set of internal water channels, and the water entry end is connectible to an external source of water, and water from the external source enters the body portion via the water entry end and exits therefrom via the holes end, and a liquid soap container is disposed within the body portion to connect and be in a fluid communicable relationship with the set of water channels, and liquid soap from said liquid soap container is adapted to be dispensed into the set of water channels while water from the external source passes through the set of water channels.

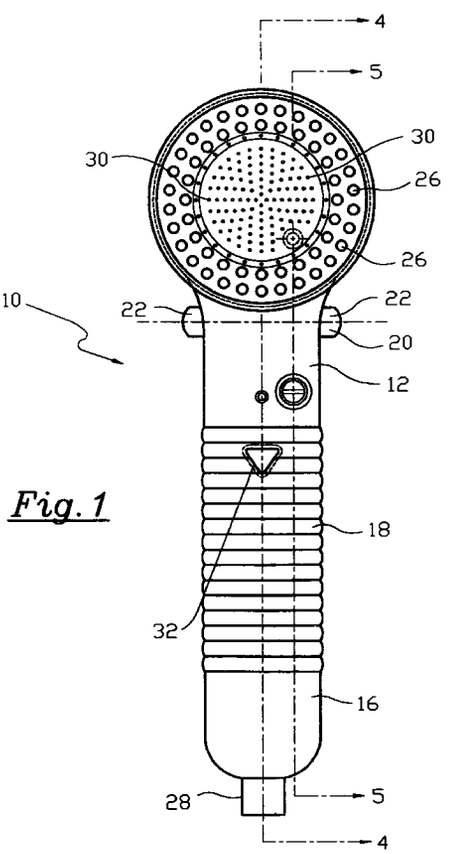

Fig. 1

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Description

This invention relates to a cleaning apparatus, and in particular a handheld cleaning apparatus for use in baths.

Handheld brushes are usually used in baths with a separate bar of soap to clean the user. There are also known cleaning apparatus which also dispense cleaning fluid, e.g. liquid soap. US Patent No. 5,094,558 issued to the present inventor discloses a cleaning apparatus having a body portion and a cleaning member supported on the body portion, in which a cleaning fluid container is situated within the body portion of the cleaning apparatus, and cleaning fluid in the container may be dispensed from the container into the body portion, and onto or adjacent the cleaning member. A user may thus obtain soap which mixes in the cleaning member with water, in order to clean a person or a car or the like.

While the above is an improvement over the relevant prior art, there is still scope for improvements. In particular, it is noted that, in the cleaning apparatus according to US Patent No. 5,094,558:-

(a) after use of the cleaning apparatus, some soap may remain in the exit passage adjacent the plunger and/or the final soap exit. Such soap may subsequently solidify and block the passage and/or exit,

(b) the cleaning fluid container is fixedly situated within the body portion of the cleaning apparatus, such that cleaning and refilling of the container may be difficult;

(c) as the rate of dispensation of cleaning fluid from the cleaning fluid container depends on the pressure of the water passing through the handle, this means that for a particular rate of inflow of water from the source of water into the cleaning, the rate of outflow of cleaning fluid from the container is fixed and cannot be adjusted for individual purposes;

(d) while the cleaning fluid exits the head portion into the cleaning and member, e.g. a foam cleaning mass, the water exits the head portion via the spray head or the outer edge holes. The soap is thus mixed with water in the cleaning member. However, as the water and the soap exit from different parts of the head portion, they may not be uniformly mixed before applying on the user.

It is therefore an object of the present invention to provide a cleaning apparatus wherein the above shortcomings are mitigated, or at least to provide a useful alternative to the public.

According to a first aspect of the present invention, there is provided a cleaning apparatus comprising a body member with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid from said external source enters said body member via said first end and exits therefrom via said second end, wherein a cleaning fluid container is disposed within said body member to connect and be in a fluid communicable relationship with said fluid passage, characterized in that cleaning fluid from said cleaning fluid container is adapted to be dispensed into said fluid passage while fluid from said external source passes through said fluid passage.

According to a second aspect of the present invention, there is provided a cleaning apparatus comprising a body member with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid from said external source enters said body member via said first end and exits therefrom via said second end, wherein a cleaning fluid container is disposed within said body member and is in a fluid communicable relationship with said fluid passage, and wherein cleaning fluid from said container exits said body member via said second end, characterised in that said cleaning apparatus further comprises adjustment means for selectively varying the concentration of said cleaning fluid exiting said second end.

According to a third aspect of the present invention, there is provided a cleaning apparatus comprising a body member with a first end and a second end, wherein said first end is connectible to an external source of fluid, wherein fluid from said external source enters said body member via said first end and exits therefrom via said second end, and wherein a cleaning fluid container is disposed within said body member whereby cleaning fluid from said container exits said body member via said second end, characterised in that said cleaning fluid container is releasably disposed within said body member.

According to a fourth aspect of the present invention, there is provided a cleaning apparatus comprising a body member with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid from said source enters said body member via said first end and exits via said second end, wherein a cleaning fluid container is disposed within said body member and is in a fluid communicable relationship with said internal fluid passage, and wherein cleaning fluid from said container exits said body member via said internal fluid passage, characterised in that said cleaning fluid is adapted to be dispensed from said cleaning fluid container into a chamber means of said internal fluid passage while said fluid from said external source passes through said

chamber means such that said cleaning fluid and said fluid from the external source are mixed in said chamber means before exiting said body member via said second end.

According to a fifth aspect of the present invention, there is provided a cleaning apparatus comprising a body member with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid enters said body member via said first end and exits therefrom via said second end, wherein a cleaning fluid container is disposed within said body member and is in a fluid communicable relationship with said internal fluid passage, and wherein said cleaning fluid container comprises pressure means for forcing cleaning fluid out from said cleaning fluid container in response to pressure of said fluid from said first end, characterised in that the cleaning apparatus further comprises selection means for selectively permitting or preventing said fluid from said first end acting on said pressure means to force said cleaning fluid out from said cleaning fluid container, and that said selection means is movable between a first position in which said fluid from said first end is permitted to act on said pressure means, a second position in which said fluid from said first end is prevented from acting on said pressure means, and a third position in which said fluid from said first end is prevented from entering said selection means.

An embodiment of a cleaning apparatus according to the present invention is described herein with reference to the accompanying drawings wherein:-

Fig. 1 is a front view of a cleaning apparatus according to the present invention in the "STOP" mode;

Fig. 2 is a rear view of the cleaning apparatus shown in Fig. 1;

Fig. 3 is a side view of the cleaning apparatus shown in Fig. 1;

Fig. 4 is a sectional view of the cleaning apparatus along line 4-4 of Fig. 1;

Fig. 5 is a sectional view of the cleaning apparatus along line 5-5 of Fig. 1;

Fig. 6 is a sectional view of the cleaning apparatus along line 6-6 of Fig. 5;

Fig. 7A is a front view of a switch used in the cleaning apparatus of Fig. 1;

Fig. 7B is a sectional view of the switch along line B-B of Fig. 7A;

Fig. 7C is a side view of the switch shown in Fig. 7A;

Fig. 7D is an end view of the switch shown in Fig. 7A;

Figs. 8 to 10 show the releasable engagement feature of the liquid soap container of the cleaning apparatus shown in Fig. 1;

Fig. 11 shows a rear view of the cleaning apparatus in Fig. 1 in the "SOAP" mode;

Fig. 12 shows a front view of the cleaning apparatus in Fig. 11;

Figs. 13A to 13F show arrangement of the switch, mixing block and liquid soap container of the cleaning apparatus shown in Fig. 11, in which Fig. 13D is the sectional view of Fig. 13A along line D-D, Fig. 13E is the sectional view of Fig. 13B along line E-E, and Fig. 13F is the sectional view of Fig. 13C along line F-F;

Figs. 14 to 16 show operation of the cleaning apparatus in Fig. 11;

Fig. 17 shows a rear view of the cleaning apparatus in Fig. 1 in the "SHOWER" mode;

Figs. 18A to 18F show arrangement of the switch, mixing block and liquid soap container of the cleaning apparatus shown in Fig. 17, in which Fig. 18A is the sectional view of Fig. 18D along line A-A, Fig. 18B is the sectional view of Fig. 18E along line B-B, and Fig. 18C is the sectional view of Fig. 18F along line C-C; and

Fig. 19 shows operation of the cleaning apparatus in Fig. 17.

A cleaning apparatus according to the present invention is shown in Figs. 1 to 3 and generally designated as 10. The cleaning apparatus 10 includes a front side 12 engaged with a rear side 14 to form a body portion 16. The body portion 16 includes a corrugated part 18 which enhances gripping action of a user's hand. On the surface of the rear side 14 are printed with the words "SHOWER", "STOP" AND "SOAP" which co-operate with a switch 20 to indicate the current mode of operation of the cleaning apparatus 10. It can be seen that each of two end rods 22 of the switch 20 extends outward from a lateral side of the body portion 16.

Secured to the front side 12 is a cap 24 having brushes 26 for enhancing the cleaning function. The body portion 16 includes a water entry end 28 from which water from an external source may enter the body portion 16 and exit via holes 30. A triangular transparent window 32 is provided on the front side 12, which allows

the user to see a part of the interior of a liquid soap container (to be discussed below) and be alerted to any need of refilling.

As can be seen in Figs. 4 to 6, the cleaning apparatus 10 includes a first water channel 34 leading from the water entry end 28, a water inlet valve 36, a soap water valve 38 and a shower water valve 40, the functions of all of which to be discussed below. The front side 12 and the rear side 14 are engaged fixedly with each other by a screw 42, which is covered by a screw cover 44 on the front side 12. Enclosed within the body portion 16 is a liquid soap container 46 which may be filled with liquid soap. The liquid soap container 46 carries a piston 48 which may be pushed in the direction of arrow A to push liquid soap in the container 46 into a coupling member 50. The coupling member 50 is detachably engaged with a base 52 of a soap and water mixing block 54. The mixing block 54 includes an adjustment screw 56 which may be screwed toward or away from the mixing block 54 to vary the rate of entry of the liquid soap into the mixing block 54. The mixing block 54 is led to a soap exit 58 via a second water channel 60.

The switch 20 includes two end rods 22 which may be operable by fingers of the user to move relative to the body portion 16 of the cleaning apparatus 10. The switch 20 is divided by a partition 62 into two spaces 64, such that water in one space cannot pass to the other space. The switch 20 includes orifices 68, 70, 72, 74, 76 and 78 the functions of which will be discussed below.

As can be seen in Figs. 8 to 10, a sliding cover 80 on the front side 12 of the cleaning apparatus 10 may be removed to expose the liquid soap container 46. The liquid soap container 46 is engaged with the body portion 16 via a holder 82 which may be pulled backward to release the container 46 together with the coupling member 50. The coupling member 50 includes a valve 51 which prevents the outflow of liquid soap from the container 46 when the container 46 and the coupling member 50 are disengaged as a unit from the base 52 of the soap and water mixing block 54. The coupling member 50 may then be removed from the container 46 to allow refilling of liquid soap into the container 46. After refilling, the container 46 with the coupling member 50 is returned to the interior of the body portion 16 and engaged with the holder 82. The coupling member 50 is, in this position, again engaged with the base 52 of the mixing block 54, and the valve 51 is thereby open to allow outflow of the liquid soap through the coupling member 50 into the mixing block 54. The sliding cover 80 may then be slided back to enclose the container 46. It should be noted that the interior of the container 46 may be viewed via the window 32.

Referring to Figs. 11 to 16, when the switch 20 is moved to the position shown in Figs. 11 and 12, the cleaning apparatus is in the "SOAP" mode, which means that water comes out from the body portion 16 mixed with soap. As shown in Fig. 14, water from the external source enters the first water channel 34 of the body portion 16, and then into the switch 20 via the water inlet valve 36 and the orifice 68. Part of the water exits the switch 20 via the orifice 70 and soap water valve 38, and enters a third water channel 84, and subsequently enters the liquid soap container 46 via an orifice 86. Such water acts upon the piston 48 to force the liquid soap out of the liquid soap container 46 via an orifice 88 of the coupling member 50 into the mixing block 54.

The remaining water enters the mixing block 54 via orifices 76 and 90, which are brought in line when the switch 20 is moved to the position shown in Figs. 11 and 12. Water from the orifice 90 and soap from the orifice 88 are mixed in the mixing block 54 and exit the cleaning apparatus 10 via the second water channel 60 and the soap exit 58.

The mixing block 54 includes an adjustment screw 56 having a threaded portion 92 which may be threadedly engaged with a correspondingly threaded portion 94 of a receiving member 96 of the mixing block 54. The rate of inflow of liquid soap into the mixing block 54 may be increased by turning the adjustment screw 56 away from the receiving member 96, and be decreased by turning the adjustment screw 56 towards the receiving member 96, as such will accordingly vary the rate of inflow of the liquid soap into the mixing block 54 via an orifice 98. By way of so adjusting the rate of inflow of the liquid soap from the liquid soap container 46 into the mixing block 54, the concentration of the resultant liquid soap exiting the soap exit 58 can be adjusted.

Turning to Figs. 17 to 19, the cleaning apparatus 10 is shown in the "SHOWER" mode, in which the orifice 78 is in line with the orifice 90. Water from the first water channel 34 enters the switch 20 via the water inlet valve 36 and the orifice 72. Part of the water exits the switch 20 via the orifice 74 and the shower water valve 40, and eventually exits the cleaning apparatus 10 via the holes 30. The remaining water enters the mixing block 54 via the orifices 78 and 90. Such water then exits the mixing block 54 into the second water channel 60, and then exits the cleaning apparatus 10 via the soap exit 58. This serves the purpose of cleaning any soap which may remain in the mixing block 54, in particular the region where the coupling member 50 joins the mixing block 54, from the last "SOAP" mode operation. Had the liquid soap been allowed to remain in the mixing block 54 or the region where the coupling member 50 joins the mixing block 54, such may solidify and block the passage of water and/or liquid soap in the next operation.

It should be noted that the above only illustrates an embodiment of the present invention, and modifications and alterations may be made thereto without departing from the spirit of the invention.

Claims

1. A cleaning apparatus comprising a body member

with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid from said external source enters said body member via said first end and exits therefrom via said second end, wherein a cleaning fluid container is disposed within said body member to connect and be in a fluid communicable relationship with said fluid passage, characterized in that cleaning fluid from said cleaning fluid container is adapted to be dispensed into said fluid passage while fluid from said external source passes through said fluid passage.

2. A cleaning apparatus according to Claim 1 further characterized in that said cleaning apparatus comprises selection means for selectively permitting or preventing dispensation of cleaning fluid from said cleaning fluid container into said internal fluid passage.

3. A cleaning apparatus according to Claim 1 or 2 further characterized in that said cleaning fluid container connects said internal fluid passage via connection means.

4. A cleaning apparatus according to Claim 3 further characterized in that said connection means comprises valve means adapted to prevent outflow of cleaning fluid from said cleaning fluid container.

5. A cleaning apparatus comprising a body member with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid from said external source enters said body member via said first end and exits therefrom via said second end, wherein a cleaning fluid container is disposed within said body member and is in a fluid communicable relationship with said fluid passage, and wherein cleaning fluid from said container exits said body member via said second end, characterised in that said cleaning apparatus further comprises adjustment means for selectively varying the concentration of said cleaning fluid exiting said second end.

6. A cleaning apparatus according to Claim 5 further characterised in that said adjustment means comprises an adjustment member at least partly releasably receivable within a receiving member.

7. A cleaning apparatus according to Claim 5 or 6 further characterised in that said adjustment member is movable relative to said receiving member.

8. A cleaning apparatus according to Claim 7 further characterised in that said adjustment member is translationally movable relative to said receiving member.

9. A cleaning apparatus according to any one of Claims 5 to 8 further characterised in that said adjustment member is threadedly engageable with said receiving member.

10. A cleaning apparatus comprising a body member with a first end and a second end, wherein said first end is connectible to an external source of fluid, wherein fluid from said external source enters said body member via said first end and exits therefrom via said second end, and wherein a cleaning fluid container is disposed within said body member whereby cleaning fluid from said container exits said body member via said second end, characterised in that said cleaning fluid container is releasably disposed within said body member.

11. A cleaning apparatus according to Claim 10 further characterised in comprising an internal fluid passage in a fluid communicable relationship with said first end, said second end and said cleaning fluid container.

12. A cleaning apparatus according to Claim 10 or 11 further characterised in that said cleaning fluid container comprises pressure means for forcing cleaning fluid out from said cleaning fluid container in response to pressure of said fluid from said first end.

13. A cleaning apparatus according to any one of Claims 10 to 12 further characterised in that when said cleaning fluid container is disposed within said body member, a cover member is releasably engageable with said body member to substantially enclose said container within said body member.

14. A cleaning apparatus according to any one of Claims 10 to 13 further characterised in that said cleaning fluid container is in fluid communicable relationship with said internal fluid passage via connection means.

15. A cleaning apparatus according to Claim 14 further characterised in that said cleaning fluid container is in fluid communicable relationship with said internal passage via an opening of said connection means.

16. A cleaning apparatus according to Claim 14 or 15 further characterised in that said connection means is releasably engageable with said cleaning fluid container.

17. A cleaning apparatus comprising a body member

with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid from said source enters said body member via said first end and exits via said second end, wherein a cleaning fluid container is disposed within said body member and is in a fluid communicable relationship with said internal fluid passage, and wherein cleaning fluid from said container exits said body member via said internal fluid passage, characterised in that said cleaning fluid is adapted to be dispensed from said cleaning fluid container into a chamber means of said internal fluid passage while said fluid from said external source passes through said chamber means such that said cleaning fluid and said fluid from the external source are mixed in said chamber means before exiting said body member via said second end.

18. A cleaning apparatus according to Claim 17 further characterised in that said cleaning apparatus comprises selection means for selectively permitting or preventing fluid communication between said internal fluid passage and said cleaning fluid container.

19. A cleaning apparatus according to Claim 18 further characterised in that when fluid communication between said internal fluid passage and said cleaning fluid container is prevented, at least part of said fluid from the external source entering said body member via said first end passes via said chamber means before exiting said body member via said second end.

20. A cleaning apparatus comprising a body member with a first end and a second end in a fluid communicable relationship with each other via an internal fluid passage, wherein said first end is connectible to an external source of fluid, wherein fluid enters said body member via said first end and exits therefrom via said second end, wherein a cleaning fluid container is disposed within said body member and is in a fluid communicable relationship with said internal fluid passage, and wherein said cleaning fluid container comprises pressure means for forcing cleaning fluid out from said cleaning fluid container in response to pressure of said fluid from said first end, characterised in that the cleaning apparatus further comprises selection means for selectively permitting or preventing said fluid from said first end acting on said pressure means to force said cleaning fluid out from said cleaning fluid container, and that said selection means is movable between a first position in which said fluid from said first end is permitted to act on said pressure means, a second position in which said fluid from said first end is prevented from acting on said pressure means, and a third position in which said fluid from said first end is prevented from entering said selection means.

21. A cleaning apparatus according to Claim 20 further characterised in that said fluid from said first end enters said selection means when said selection means is in said first position and said second position.

22. A cleaning apparatus according to Claim 20 or 21 further characterised in that said selection means comprises control means operable to control movement of said selection means between said first, second and third positions.

23. A cleaning apparatus according to Claim 22 further characterised in that said control means comprises at least one rod member extending beyond at least one lateral side of said body member.

24. A cleaning apparatus according to Claim 23 further characterised in that said control means comprises two rod members each extending beyond one of two lateral sides of said body member.

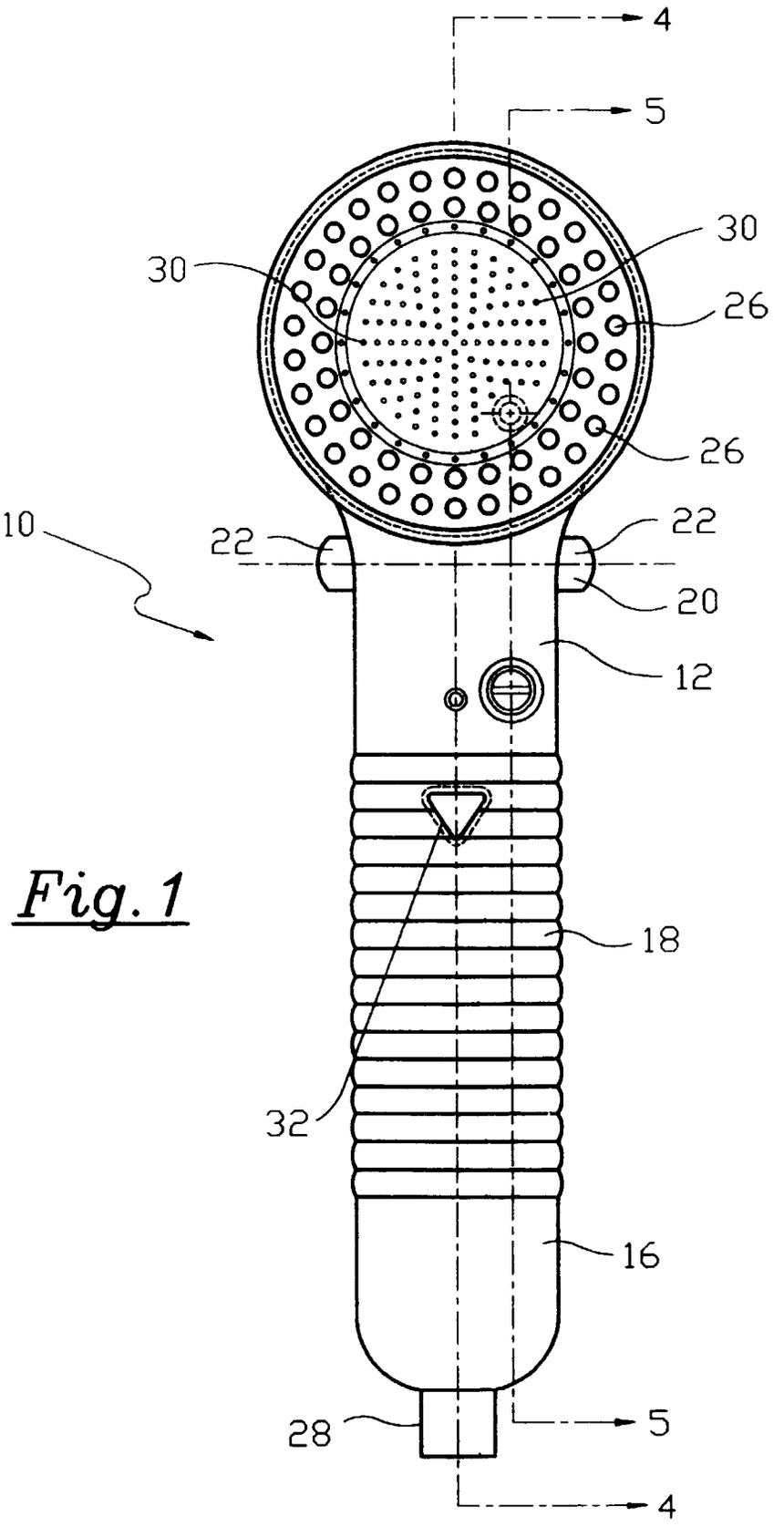


Fig. 1

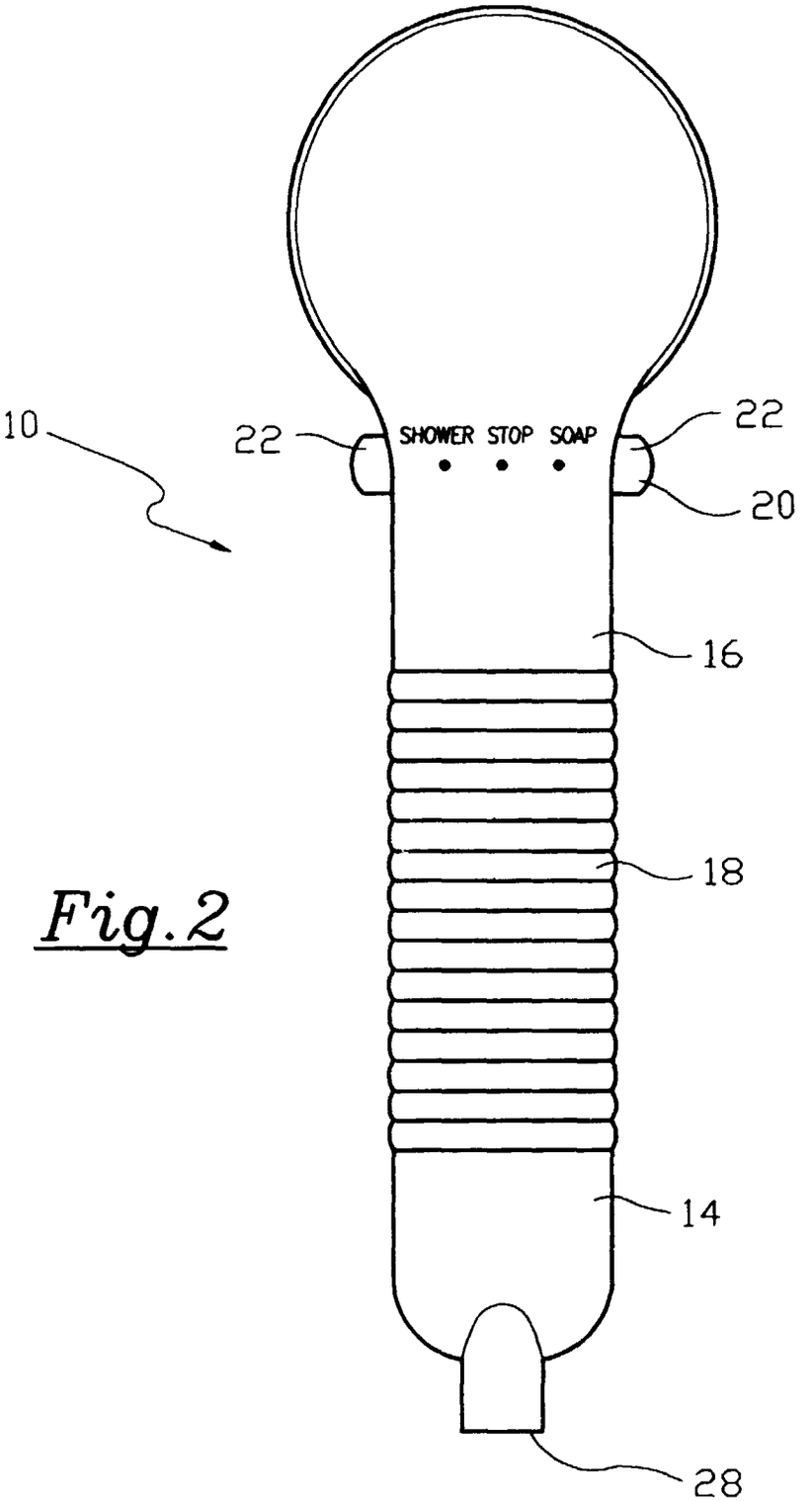


Fig. 2

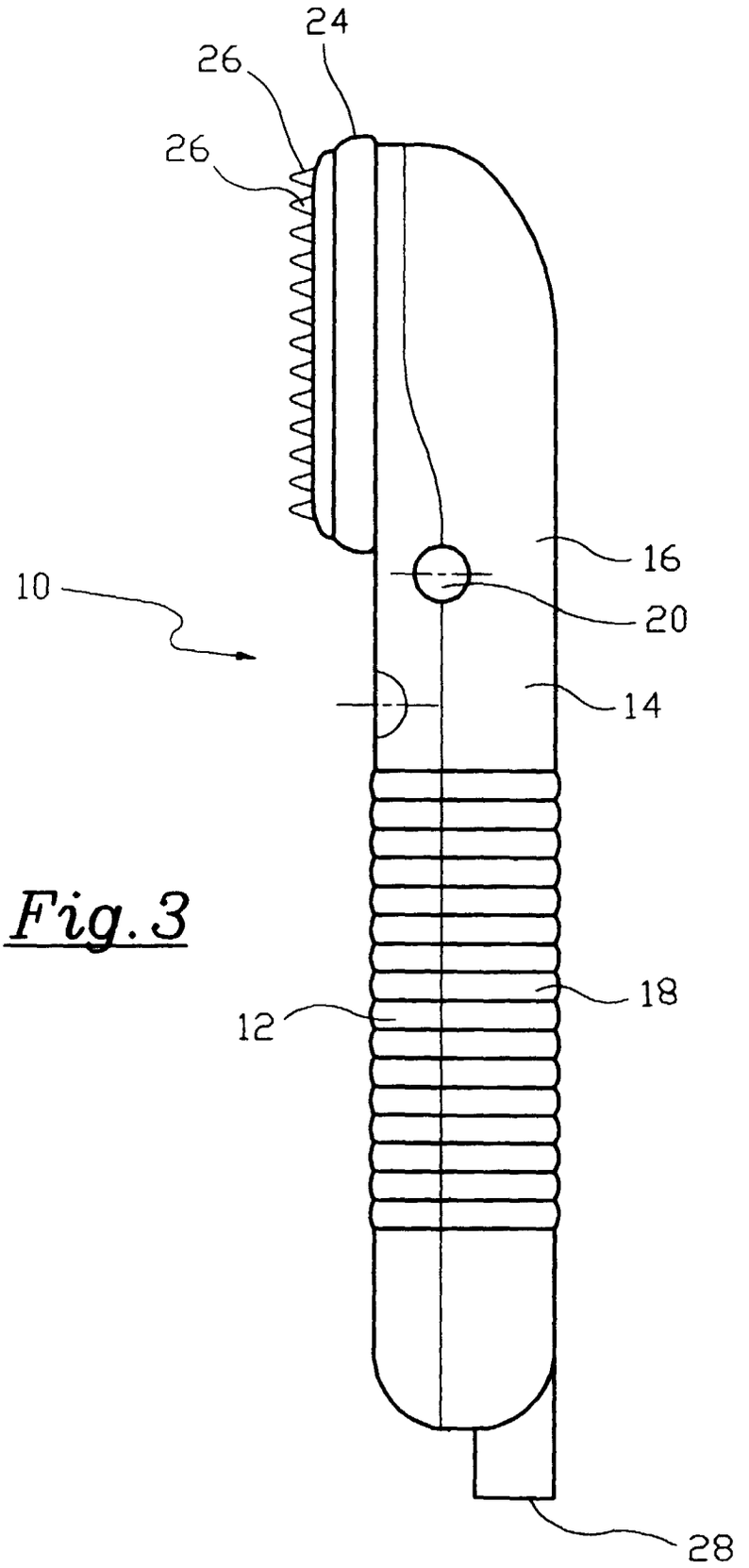


Fig.3

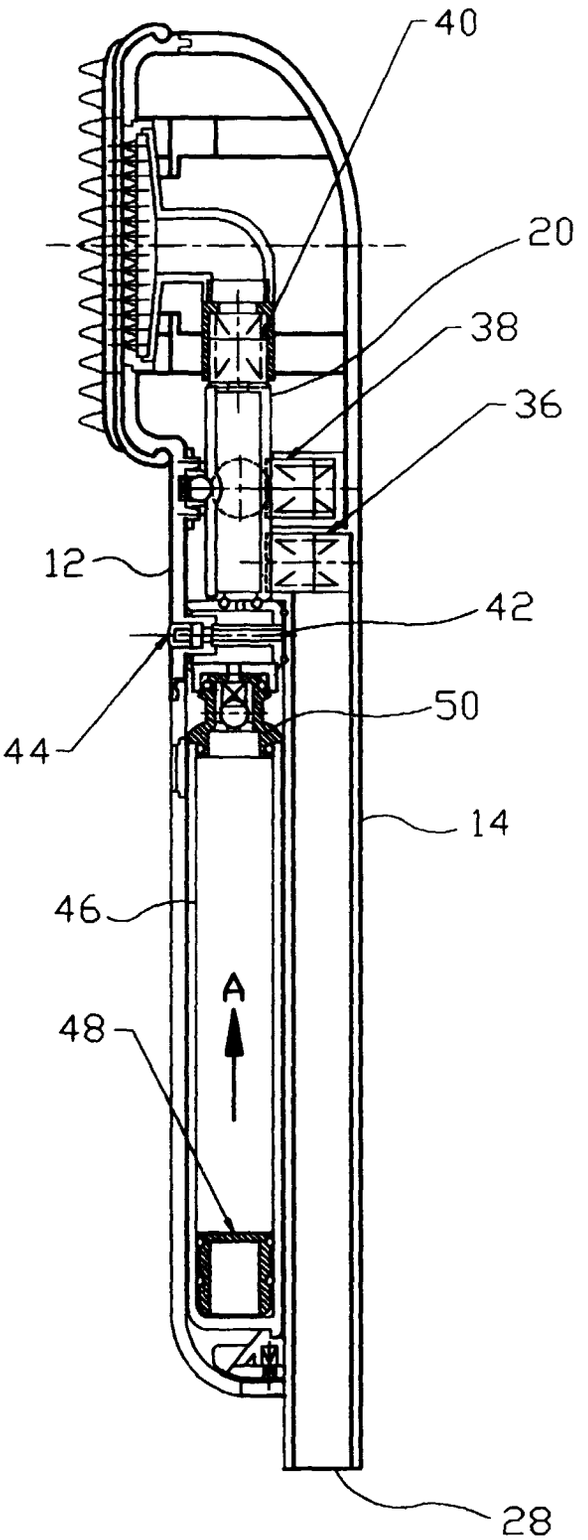


Fig. 4

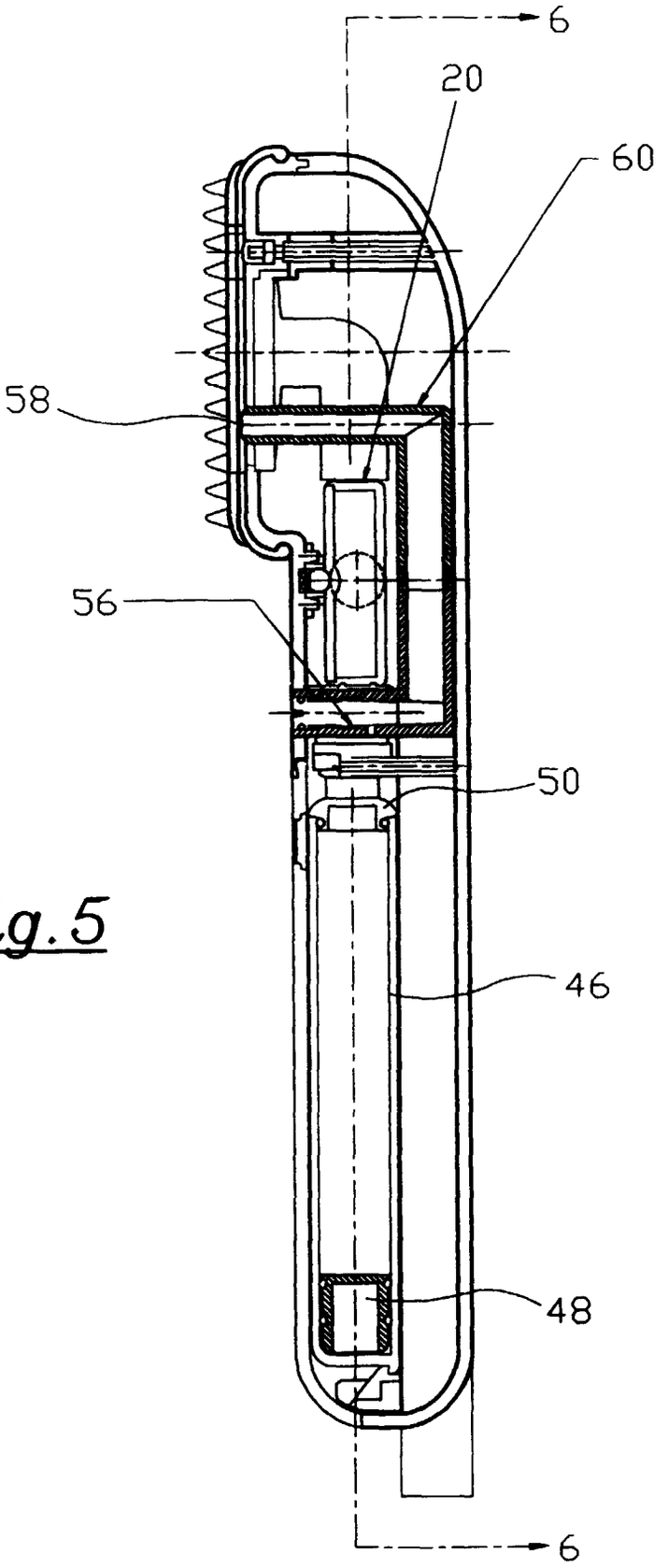


Fig.5

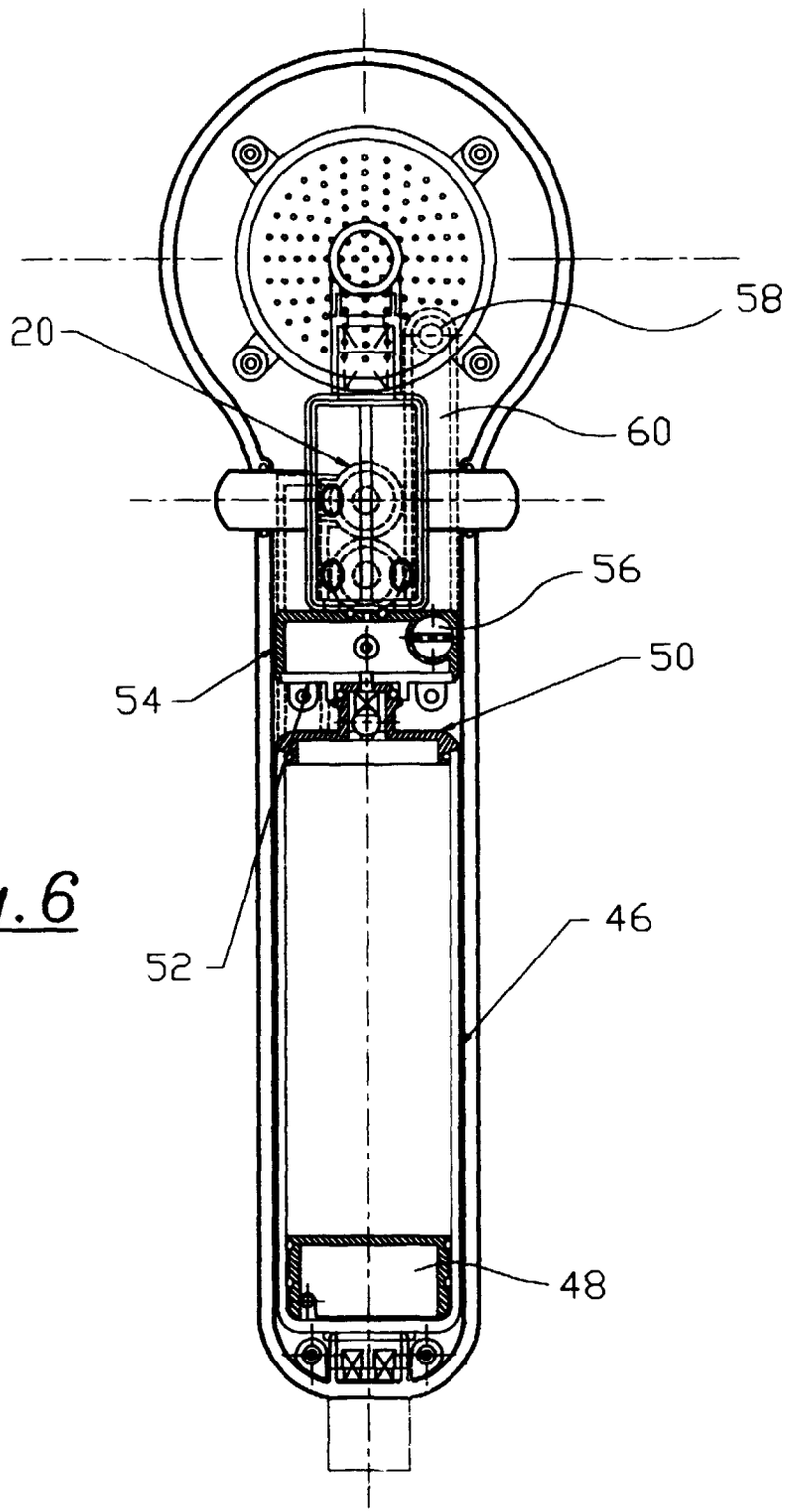


Fig.6

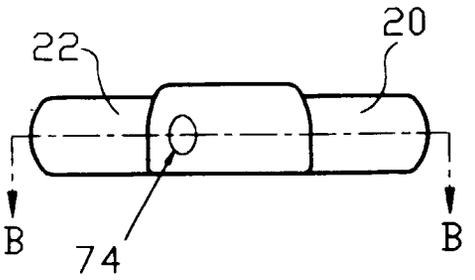


Fig.7A

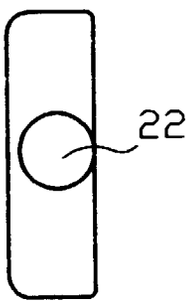


Fig.7C

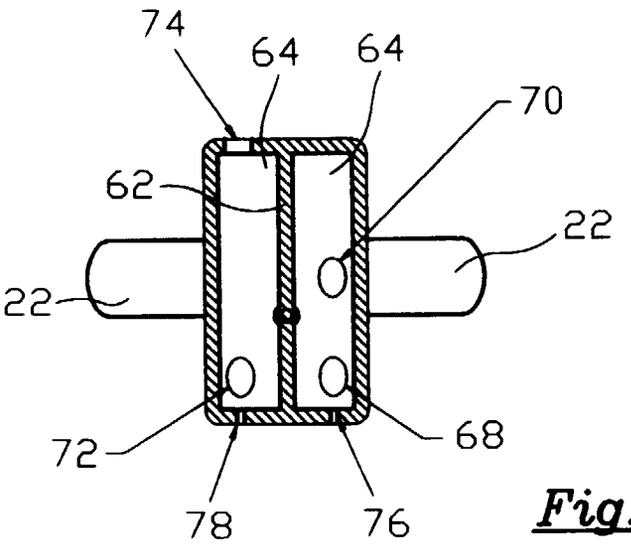


Fig.7B

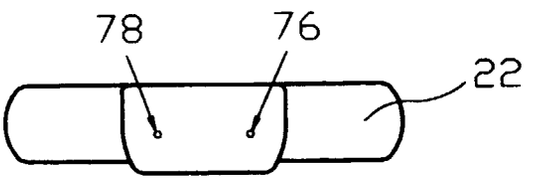


Fig.7D

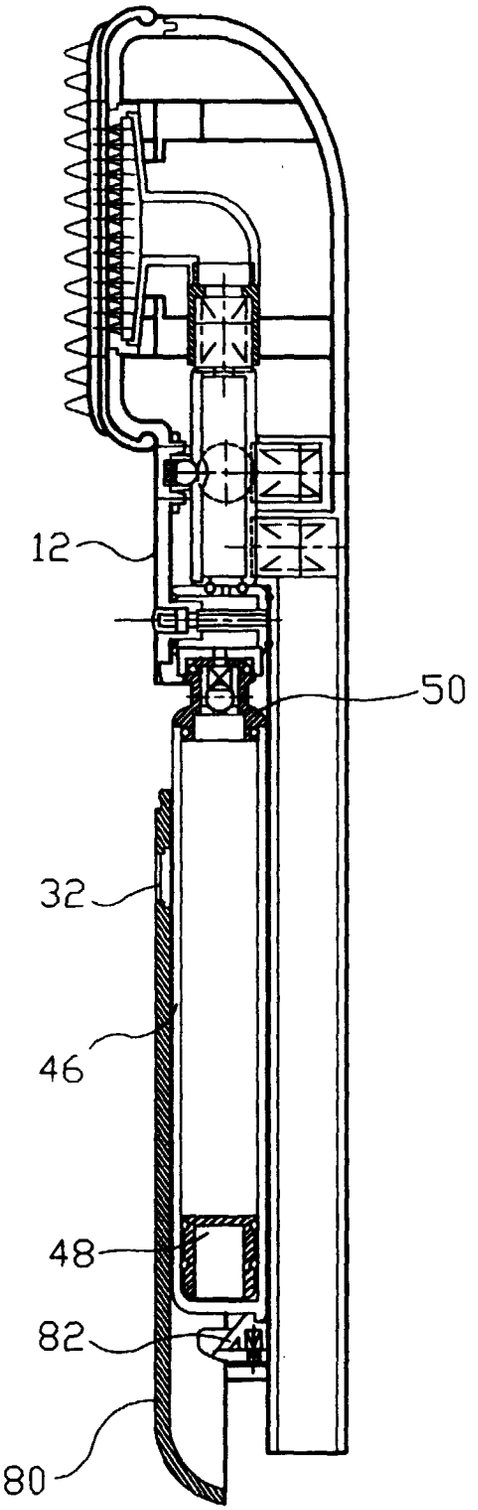


Fig.8

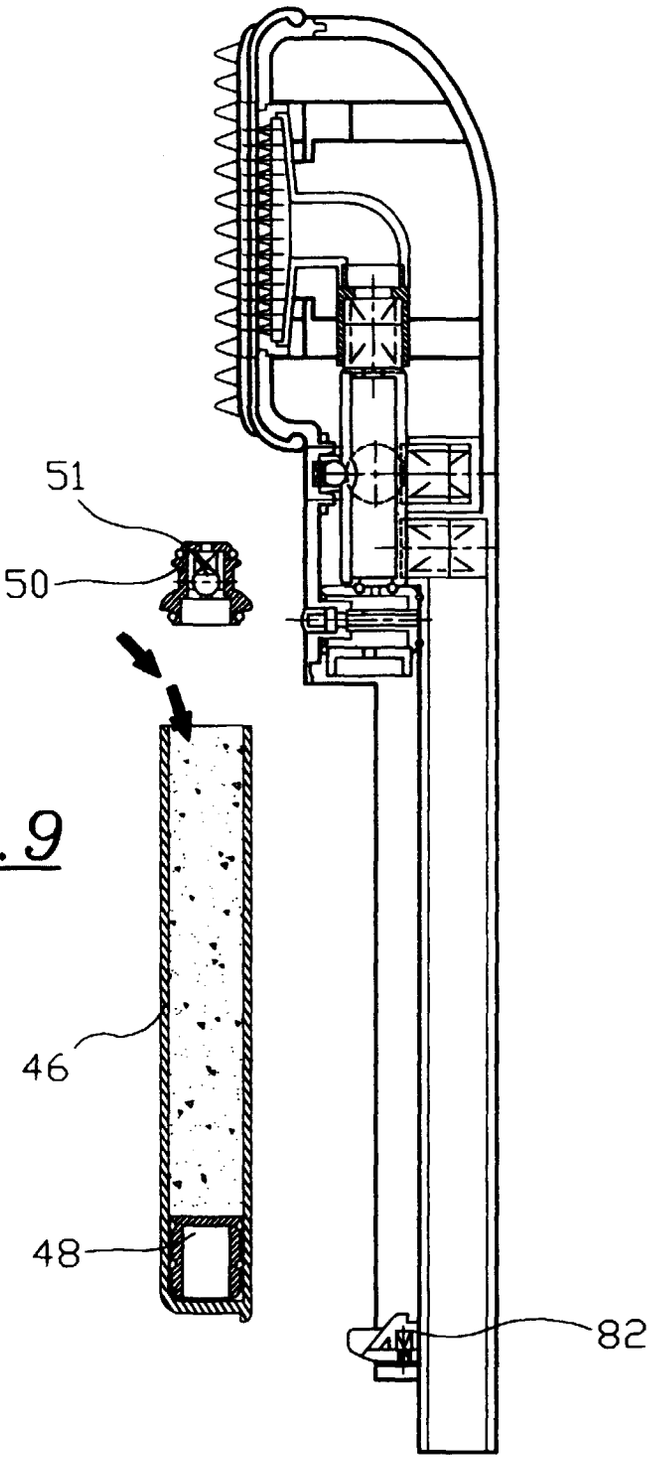


Fig. 9

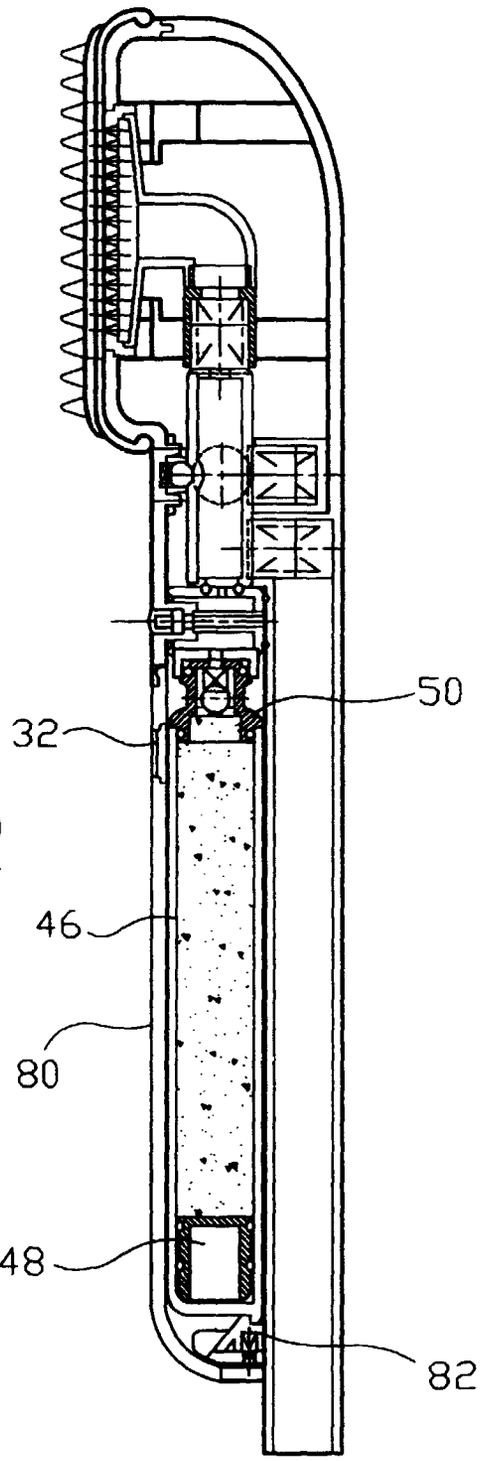


Fig. 10

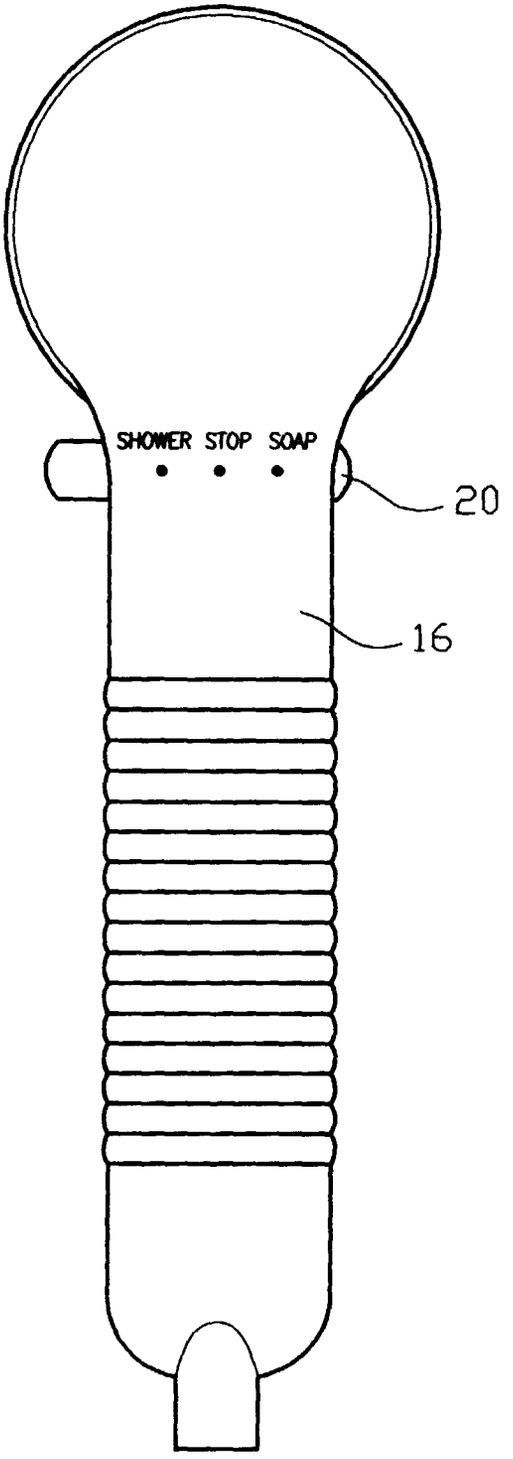


Fig. 11

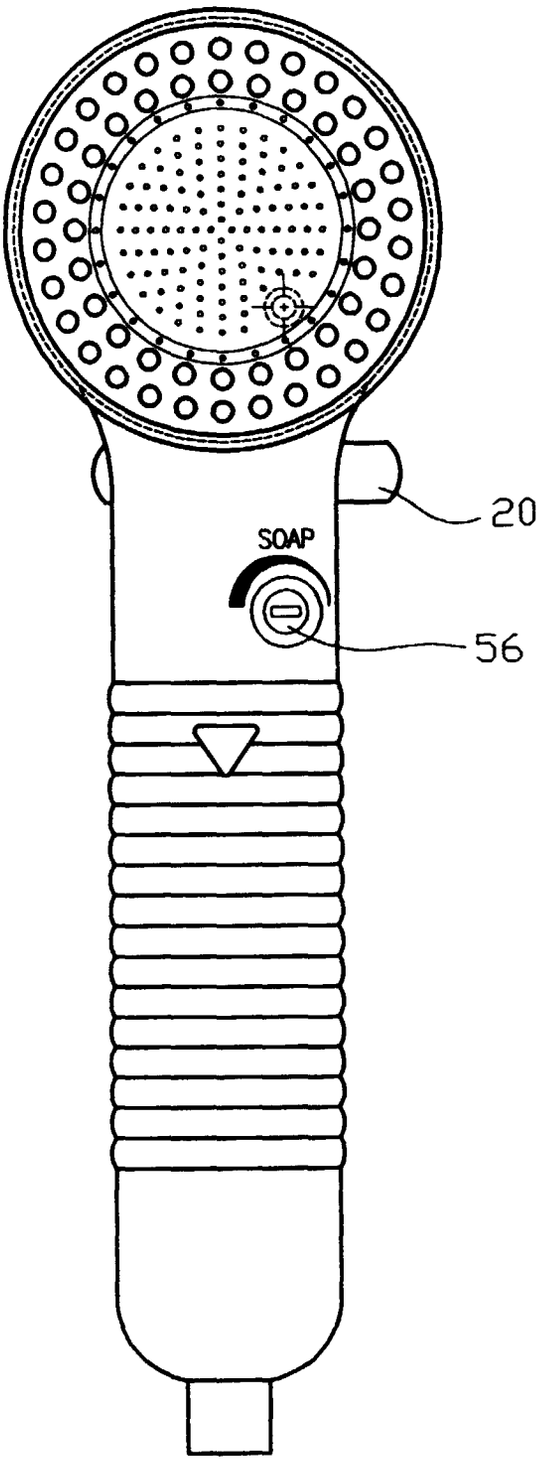


Fig. 12

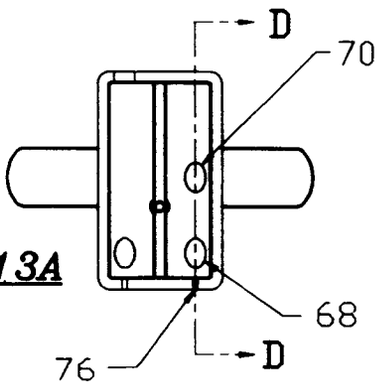


Fig.13A

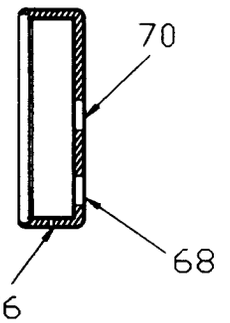


Fig.13D

Fig.13B

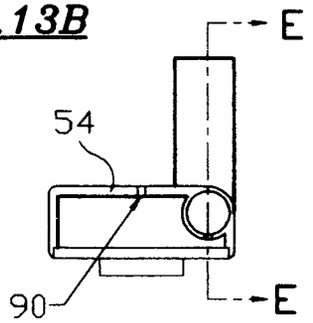
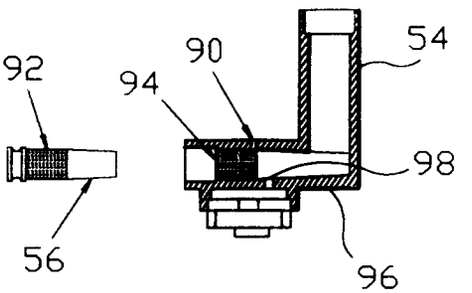


Fig.13E



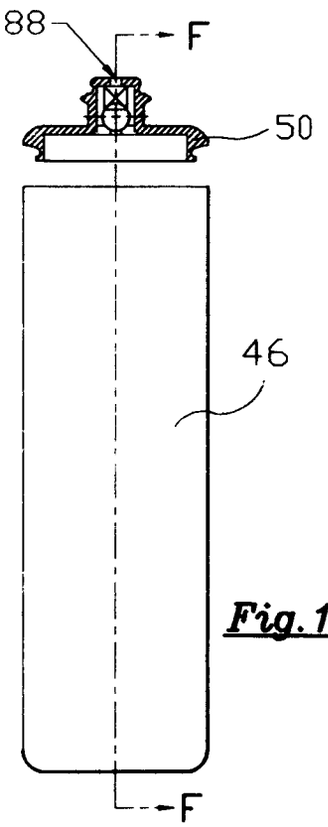


Fig.13C

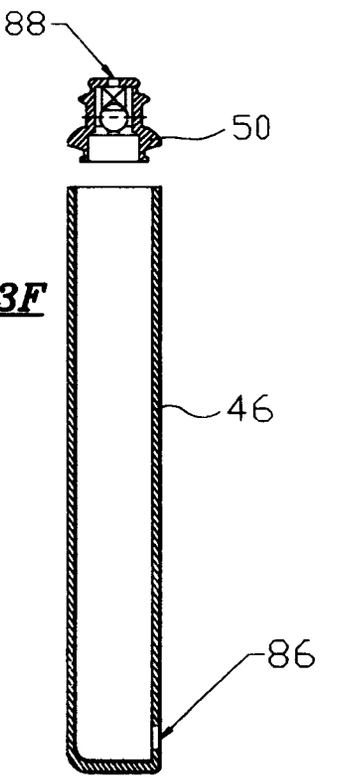


Fig.13F

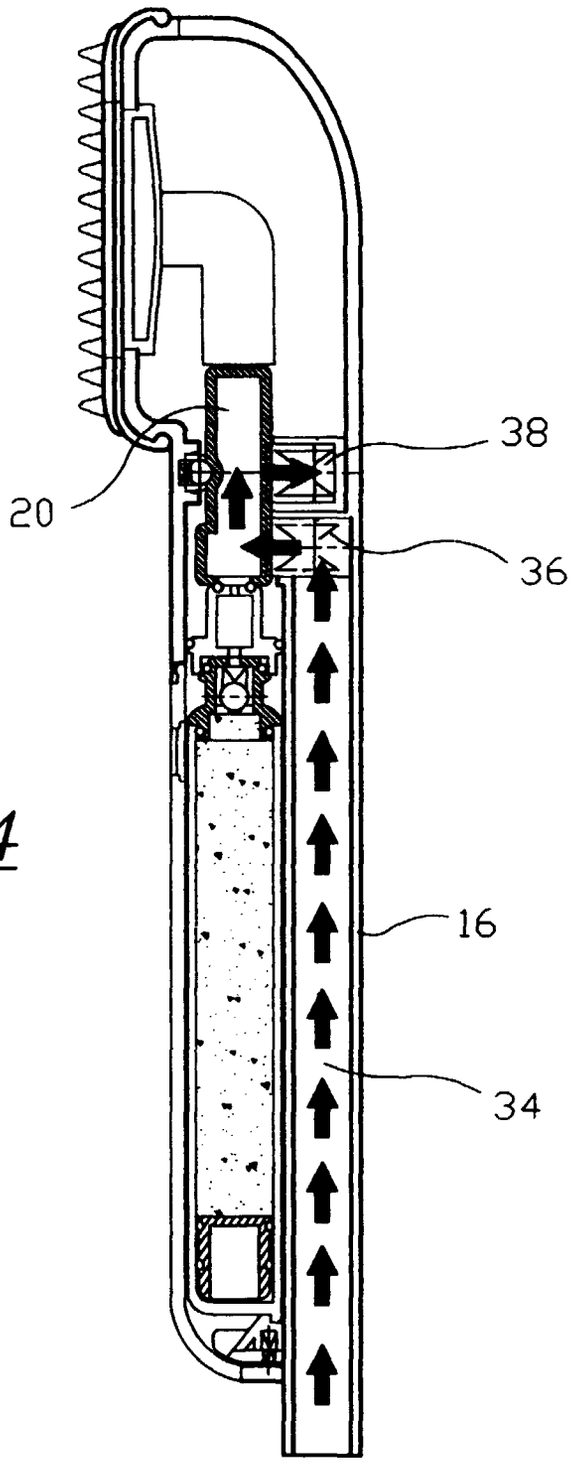


Fig. 14

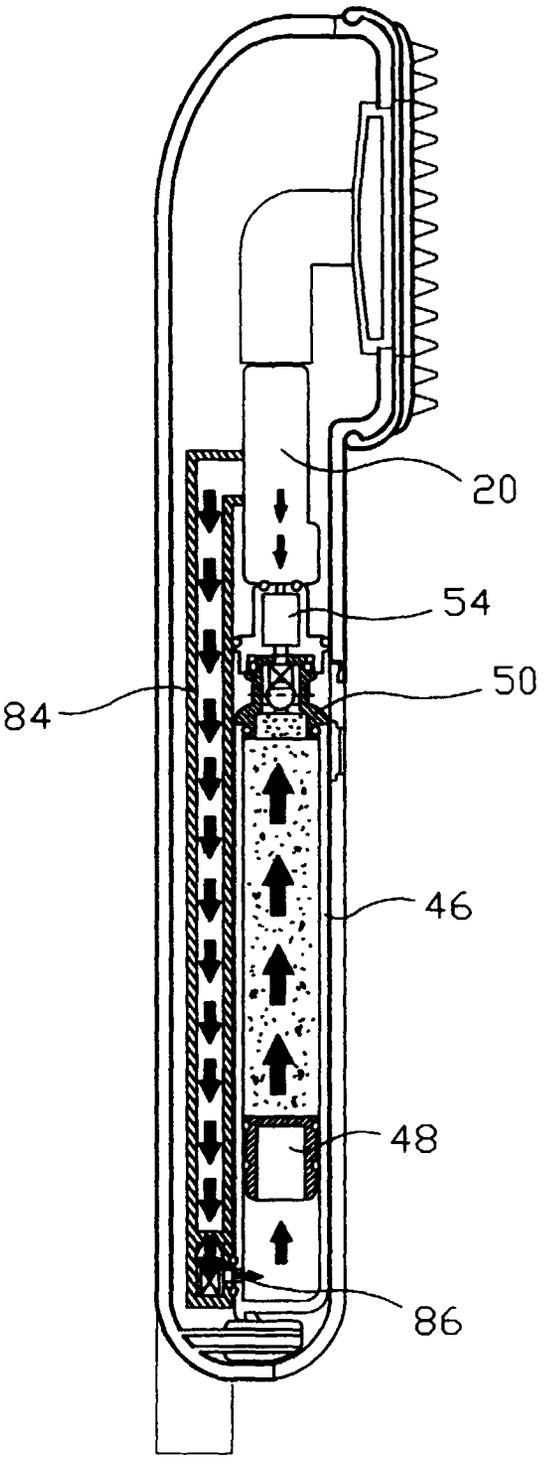


Fig. 15

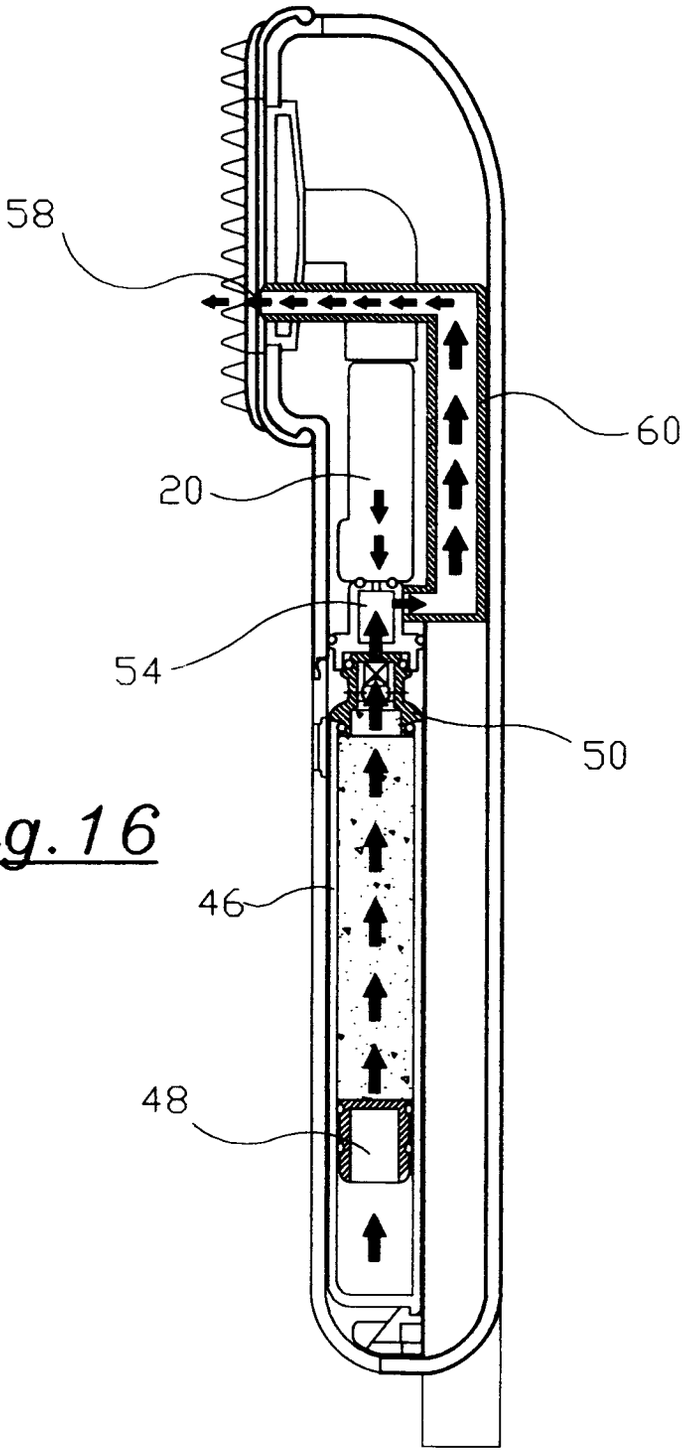


Fig. 16

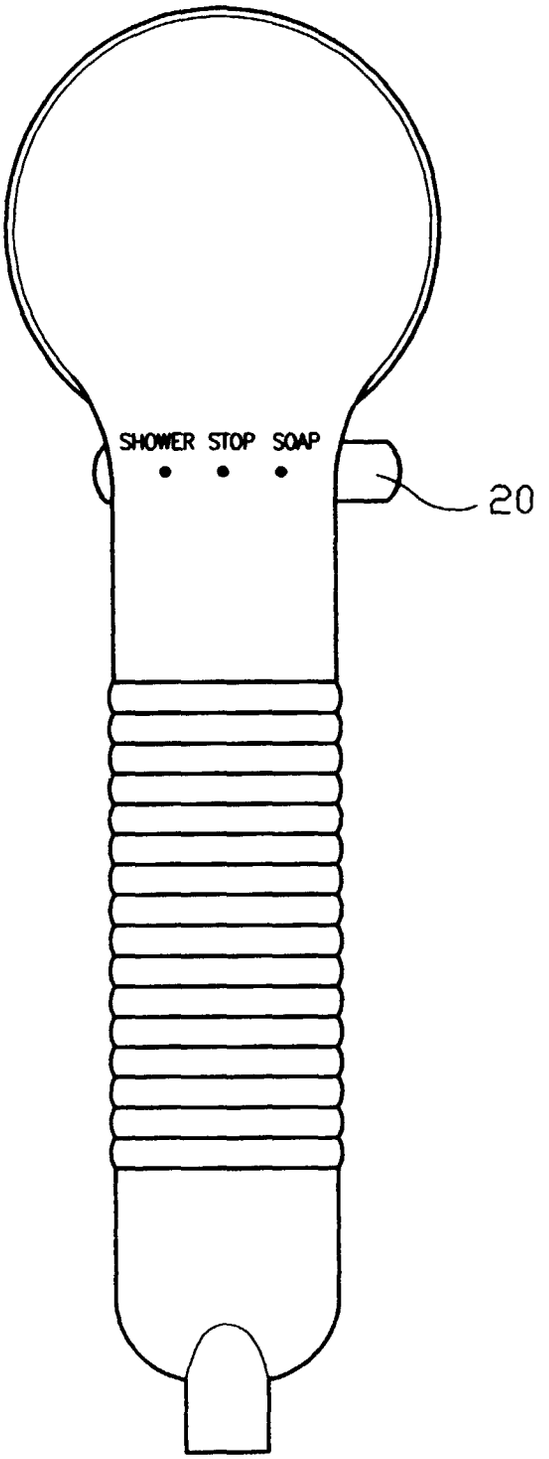


Fig. 17

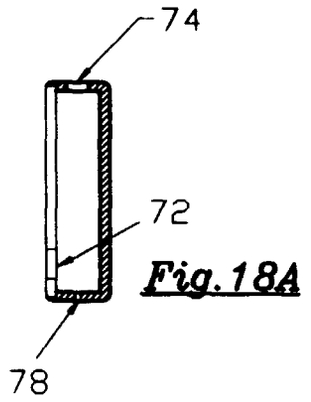


Fig.18A

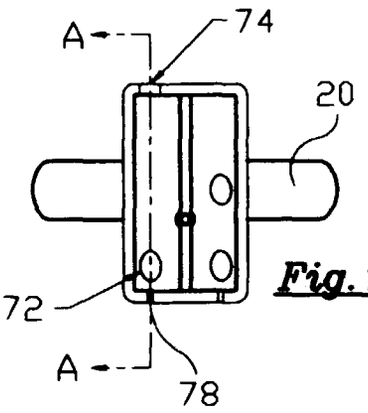
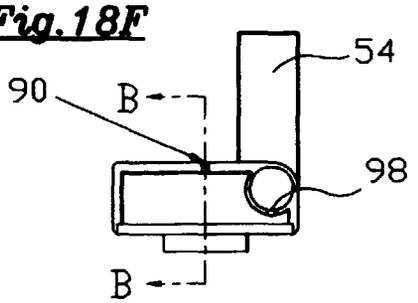


Fig.18D

Fig.18B

Fig.18F



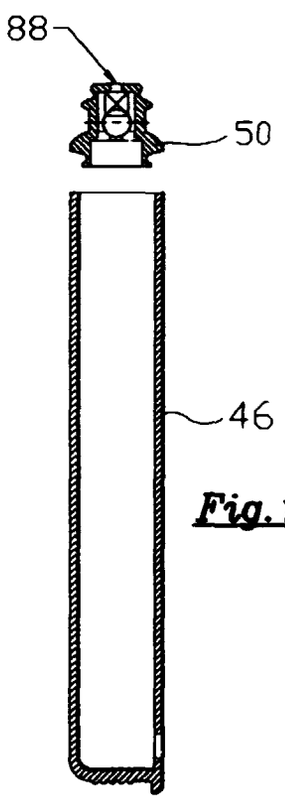


Fig.18C

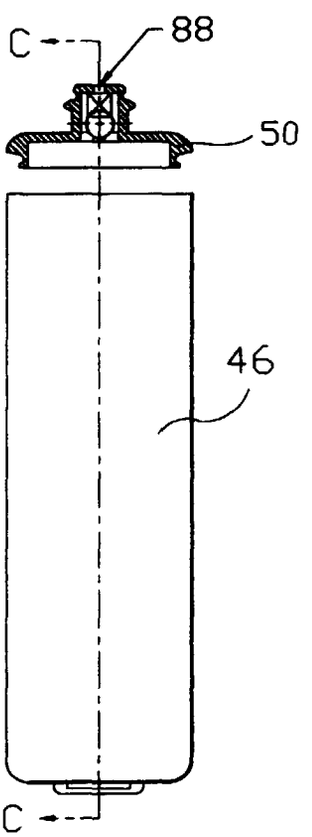


Fig.18F

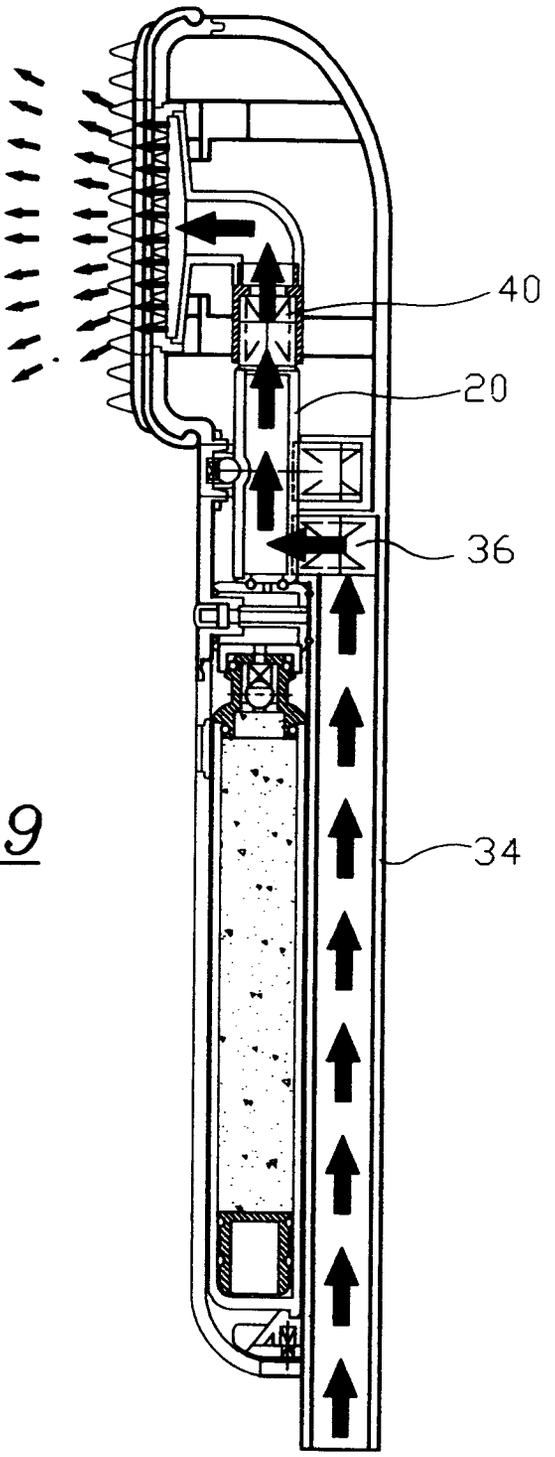


Fig. 19

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 30 2892

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 1 094 585 A (MORAWSKI) 13 December 1967 * page 2, line 8 - page 4, line 98; figures *	1-4, 17-19	A46B11/06
X	US 2 593 178 A (PAUL) 15 April 1952 * column 3, line 22 - line 62; figure 7 *	5-9	
X Y	US 1 677 645 A (LUTHANDER) 17 July 1928 * page 1, line 82 - page 3, line 15; figures *	10-16 20-22	
Y	US 4 764 047 A (JOHNSTON DAMON A ET AL) 16 August 1988 * column 3, line 4 - column 6, line 17; figures *	20-22	
A	FR 69 899 E (DEFOUR) 9 January 1959 * the whole document *	10	
A	CA 1 058 360 A (STOYSHIN DONALD A) 17 July 1979 * page 2, line 7 - page 3, line 21; figures *	1,17,20	TECHNICAL FIELDS SEARCHED (Int.Cl.6) A46B
A	US 2 975 804 A (DUNN) 21 March 1961 * figures *	23,24	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 September 1997	Ernst, R

CATEGORY OF CITED DOCUMENTS

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