

[54] **HYGIENIC DEVICE** 592,510 2/1960 Canada..... 401/43

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[51] Int. Cl.²..... **A61H 9/00; A46B 11/06**

[58] Field of Search..... 401/281, 271, 40-43, 401/270; 128/66; 15/29

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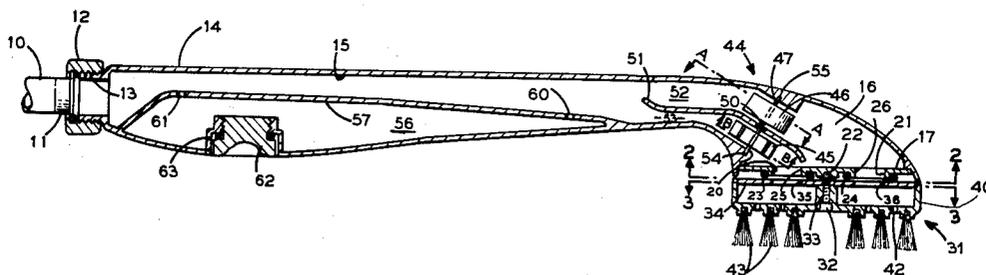
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[57] **ABSTRACT**

An illustrative embodiment of the invention discloses a light-weight shower brush that provides a physically beneficial massaging and cleaning action. The water flow intensity from the brush's scrubbing head can be varied through adjustable ports within the head that are operated by rotating the brush proper. An oscillating valve within the brush's shaft, moreover, enables the water that gushes from the scrubbing head to discharge in a pulsating manner and thereby impart an invigorating massage during application. A separate bath oil reservoir also is provided within the shaft. This reservoir communicates through two apertures with the water flowing toward the scrubbing head in order to enable measured amounts of the bath oil to mix with the water for hygienic purposes.

9 Claims, 7 Drawing Figures



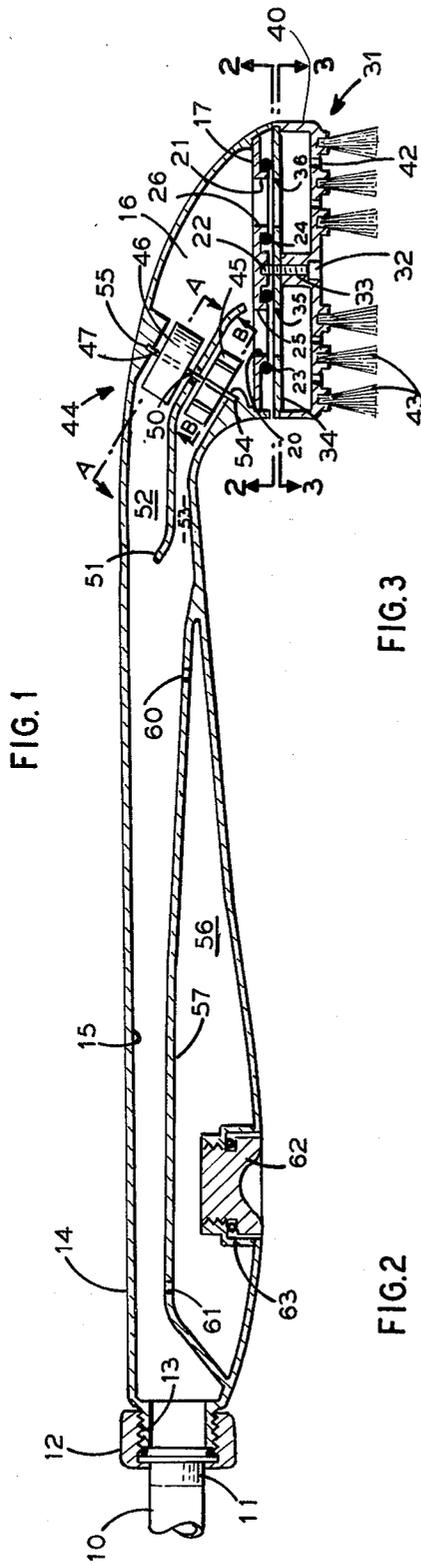


FIG. 3

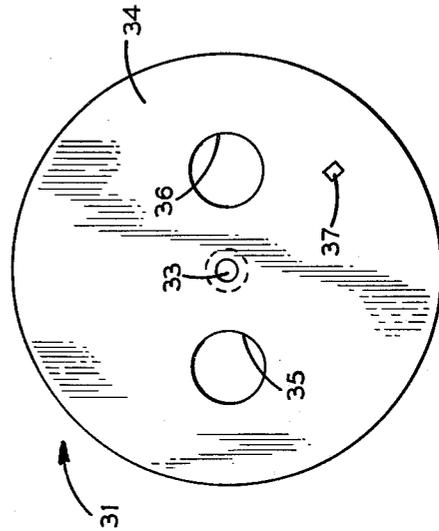


FIG. 2

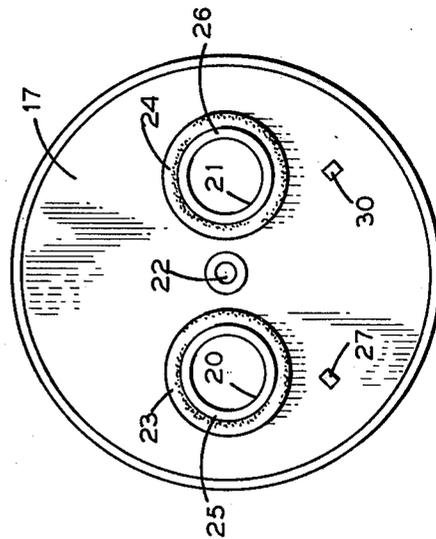


FIG. 1A

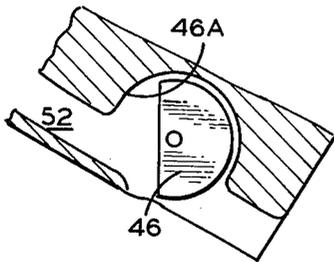


FIG. 1B

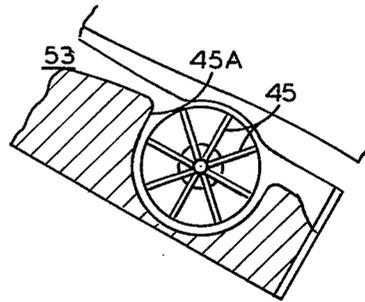


FIG. 4

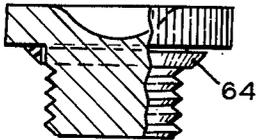


FIG. 5

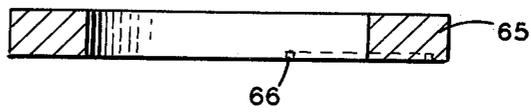


FIG. 6

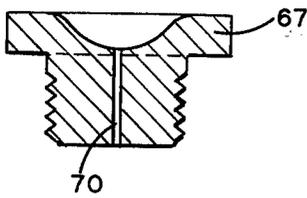
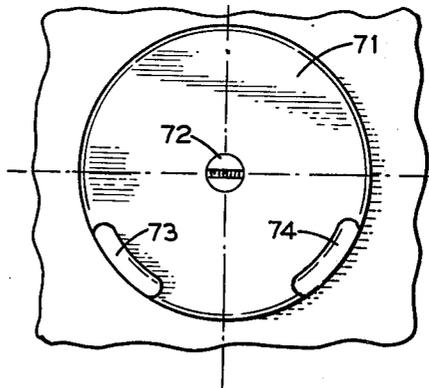


FIG. 7



HYGIENIC DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to hygienic techniques and, more particularly, to an improved brush for washing, massaging, soaping, and the like.

2. Description of the Prior Art

Through the years, a number of proposals have been advanced to combine soap dispensers with scrub brushes in order to provide an apparatus that mixes the soap with a stream of water flowing through the brush handle and out of the scrubbing head. Many of these proposed designs have been characterized by complicated and expensive valves, passageways and manufacturing methods. Other designs have required essentially permanent changes to the household plumbing — changes that are beyond the usual mechanical ability of the average home owner or apartment dweller and require the services of a skilled plumber for installation.

In spite of the relative complexity that has marked these earlier proposals, water flow regulation nevertheless was controlled through the installed faucets in the tub, sink or shower stall. This arrangement requires the person bathing or washing to interrupt the particular activity and make an awkward and inconvenient adjustment to the water flow at the faucets in order to satisfy the circumstances of the moment, or otherwise to continue washing at a less than comfortable or efficient pressure and flow rate.

A number of additional inadequacies in prior scrub-brush designs also can be identified. Those proposals, for example, which required the application of continuous manual pressure on some part of the brush structure to maintain water flow through the scrubbing head were physically inconvenient when the need arose to scrub one's own back, or to shift the brush to the other hand. In some designs, moreover, soap flow stopped if the brush was inverted or held horizontally. Water flow from the brush, save for faucet regulation or relaxing the grip on the brush handle was continuous and uninterrupted.

Clearly, there is a need for a rugged, easily manufactured scrub brush that overcomes these shortcomings. Further, a brush is needed that has qualities that are lacking in existing designs and which can be made available to the public at a reasonable cost.

SUMMARY

In accordance with the invention, the disadvantages of prior scrub-brush proposals are, to a significant extent, overcome. For example, in an illustrative embodiment of the invention, the scrubbing head is mounted on the shaft or handle by means of a spindle. Mounted in this manner, the scrubbing head can be rotated relative to the shaft in a plane that is generally perpendicular to the direction of water flow through the head. Communicating ports are provided in the base of the scrubbing head and the end of the shaft. Rotating the scrubbing head relative to the end of the shaft brings those communicating ports into complete or partial registry, as desired. This structural feature of the invention enables the user of the brush to throttle or vary the intensity of the water flow from the scrubbing head in accordance with the flow area common to the opposing ports in the end of the shaft and the base of the scrub-

bing head. Thus, through a simple manipulation, flow control is provided for the brush at the point of use.

If necessary, flow through the brush can be stopped by moving the communicating ports completely out of registry with each other.

Within the shaft, and preferably near the scrubbing head, an oscillating valve flow pulsator can be positioned in order to interrupt the water flow from the brush intermittently, or to cause the flow intensity to pulsate. This specific characteristic of the invention provides the user with a healthy, invigorating massage while bathing.

Also within the shaft, and disposed adjacent to the water conduit, the invention further may provide a reservoir for liquid soap, bath oil or some other substance. The reservoir is longitudinally disposed within the shaft and has, toward opposite extremities, respective holes, or apertures, that establish fluid communication between the reservoir and the water conduit. The swiftly flowing water in the handle establishes a relatively low pressure at the conduit surface adjacent to these apertures. The higher pressure within the liquid cleansing agent, or bath material, causes a stream of the substance within the reservoir to flow through one or both of these apertures and mix with the water.

The position of these two apertures, at opposite longitudinal ends of the reservoir, promotes continuous flow from the reservoir into the conduit in spite of the angle at which the brush is held or the particular motion that the brush may be undergoing while in use.

A further aspect of the invention is characterized by a flexible gasket on the reservoir filler cap. This gasket is flat on one side and chamfered, or bevelled, on the other side. As the bathing material flows into the conduit, air at atmospheric pressure is allowed to enter the reservoir in order to maintain the reservoir pressure high relative to the water pressure in the conduit. The chamfered edge of the gasket flexes readily in one direction to admit air to the reservoir and restore atmospheric pressure. The gasket, however, restricts soap and the like from flowing in the opposite direction out of the reservoir when water flow is terminated.

Naturally, other check valves can be used to restore higher pressure to the reservoir. Typically, a spring loaded valve can be made a part of the reservoir filler cap. Illustratively, a very small pore also can be formed either in the filler cap gasket or in the filler cap proper. The pore diameter is so chosen that viscous soaps, bath oils, and the like can not drain through the pore. Air, however, can flow with freedom through the pore and into the reservoir and thus maintain sufficient pressure to promote soap discharge.

A holder secured to the wall near the place of use can be provided in order to allow the brush to be stored neatly when it is not in use.

Thus, there is provided in accordance with the invention, a scrub brush that can be readily molded in plastic to make available to the public a sturdy and relatively inexpensive device that overcomes many of the inadequacies of prior designs. The flow intensity is easily adjusted at the scrubbing head, for example. Additionally, the flow of water and of soap or bath oil is uninterrupted without regard to the position of the brush or the hand of the user relative to the brush. Pulsating water flow also is available through the incorporation of an oscillating valve structure in the shaft.

For a more complete understanding of the present invention, together with other and further objects thereof, reference is had to the following description taken in conjunction with the accompanying drawing, the scope of the invention being pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevation in full section of a typical embodiment of the invention;

FIG. 1A is a plan view of a portion of the device that is shown in FIG. 1 taken along the line A—A of FIG. 1 and looking in the direction of the arrows;

FIG. 1B is a plan view of a portion of the device that is shown in FIG. 1 taken along the line B—B of FIG. 1 and looking in the direction of the arrows;

FIG. 2 is a bottom view of a portion of the embodiment of the invention that is shown in FIG. 1, taken along the line 2—2 of FIG. 1 and looking in the direction of the arrows;

FIG. 3 is a plan view of a portion of the embodiment of the invention that is shown in FIG. 1, taken along the line 3—3 of FIG. 1 and looking in the direction of the arrows;

FIG. 4 is a typical reservoir filler cap for use in accordance with the invention;

FIG. 5 is a portion of a gasket for use with a reservoir filler cap;

FIG. 6 is another reservoir filler cap for use in connection with the invention; and

FIG. 7 is a front elevation of a wall bracket for supporting the brush shown in FIG. 1 when it is not in use.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

For a more complete appreciation of the invention, attention is invited to FIG. 1 of the drawing. As shown, a scrub brush, molded in plastic or fashioned from some other suitable material, is connected to a water supply through a flexible hose 10 that terminates in a compressible fitting 11. A threaded collar 12 couples the hole to a threaded male nipple 13 that is formed on the water inlet end of a hollow brush shaft 14.

The shaft 14 has a main water flow conduit 15 that terminates, at the discharge end, in an essentially right-angle turn 16. At the end of the turn 16, the conduit 15 is partially obstructed by a partition 17. As shown in FIG. 2, the partition 17 is generally circular and has two diametrically disposed ports 20 and 21 formed in its surface. A threaded aperture 22 also is formed in the center of the partition 17. A pair of flexible gaskets 23 and 24 circumscribe respective protruding flanges 25 and 26 that establish the individual peripheries of the ports 20 and 21. A pair of stops 27 and 30 (shown in FIG. 2) protrude from the surface of the partition 17 in the same direction as the flanges 25 and 26.

Turning once more to FIG. 1, a rotatable scrubbing head 31 is secured adjacent to the partition 17. The head 31, moreover, is connected to the partition by means of a spindle 32 that penetrates a centrally disposed hole 33 formed in the head 31. The spindle 32 has a threaded end which is received in the mating threaded aperture 22 that is formed in the surface of the partition 17.

The head 31 has a base 34 that is held in engagement with the flanges 25 and 26 and the gaskets 23 and 24 on the partition 17 through the force that is applied by

the spindle 32. Because the gaskets 23 and 24 in the uncompressed state protrude slightly beyond the respective flanges, the compression force applied by the spindle 32 establishes a moderate degree of frictional resistance against rotation between the base 34 of the head 31 and the gaskets.

As shown in FIG. 3, the base 34 of the scrubbing head 31 also is provided with two radially oriented and diametrically arranged ports 35 and 36. These ports each are of the same size as the respective associated ports 20 and 21 formed in the partition 17. A travelling stop 37 also is formed on the base 34. The travelling stop (not shown in FIG. 1) is engaged between the stops 27 and 30 on the partition 17. When so engaged the stop 37 limits the travel of head 31 to enable the sets of ports 20 and 35 and 21 and 36 on the partition and the head to register in full alignment, as shown in FIG. 1, thereby permitting maximum flow through these ports, or in some degree of partial registry to provide a desired change in flow velocity. Flow is, of course, terminated when the sets of ports are completely out of alignment and are not in any degree of registry with each other. The limited movement of the stop 37 that is defined by the pair of stops 27 and 30 also aids relative orientation by enabling the user to readily identify the fully open and fully closed positions, as well as partially opens intermediate positions. The frictional forces applied by the gaskets 23 and 24, moreover, tend to stabilize the position of the scrubbing head relative to the shaft during use of the brush in order to maintain the desired flow intensity.

As illustrated in FIG. 1, the scrubbing head 31 terminates in a skirt 40 and a brush plate that is generally transverse to the direction of water flow from the shaft 14. The brush plate has a group of perforations 42 that enable water from the ports to flow out of the scrubbing head. As shown in the drawing, tufts of bristles 43 are received in, and complete the head 31. Alternatively, a number of scrubbing or scouring members can be used on the head 31. Molded rubber fingers, suction cups or a porous foam rubber sponge are typical of the cleansing, body-contact devices that can be used with the invention.

Within the shaft 14, and just within the right angle 16, a flow pulsator or interrupter 44 is positioned. For illustrative purposes, the pulsator 44 has a paddle wheel 45 and a parallel vane or intermittent flow cylinder 46. The wheel 45 and the vane 46 are secured to an axle 47 that is disposed transverse to the direction of flow within the shaft 14. The axle 47 is supported in a journal 50 that is formed in a flow dividing fin 51 that separates the conduit 15 into a vane channel 52 and a paddle wheel channel 53. The extreme ends of the axle 47 are received in axle bearings 54 and 55 formed in the inner surface of the shaft.

As shown in FIG. 1A, the vane 46 is, illustratively, a solid member of slightly greater than semicircular shape. The vane channel 52, moreover, is somewhat reduced in cross-sectional area adjacent to a recess 46A that accommodates the vane 46. The paddle wheel 45, as shown in FIG. 1B, is received in a recess 45A. The paddle wheel channel 53 also is reduced in cross-sectional area adjacent to the wheel 45. The constricted channel areas tend to increase liquid flow velocity as the liquids impinge on the paddle wheel 45 or the vane 46.

Water flowing through the paddle wheel channel **53** imparts rotary motion to the wheel **45**, which causes the axle **47** to turn. The vane **46** (which can be somewhat more than one-half of a cylinder as shown in the drawing, a simple flat vane, or a cylinder with an asymmetric or off-center bore, for instance) also turns with the axle **47** to block and then permit water to flow toward the scrubbing head **31**. The intermittent, pulsating action of the flow through the head can provide the user of the brush with a pleasing, healthy and invigorating massage while bathing.

Naturally, a number of different types of automatically oscillating valves are suitable for this use and can be modified to provide physically beneficial water flow patterns. Thus, the period and frequency of the pulsations, the duration of the individual pulses, and the like, can be provided to suit individual wishes.

In order to mix soap, bath oil, medications or other substances with the water flowing through the conduit **15**, a reservoir **56** is provided in the shaft **14**. As shown, the reservoir **56** is formed by a partition **57** that forms one side of the conduit **15**. A pair of apertures **60** and **61** are formed in the longitudinal extremities of the reservoir partition **57** to establish liquid communication between the reservoir **56** and the conduit.

Water, flowing through the conduit **15** at high velocity, establishes low pressures in the vicinities of the apertures **60** and **61**. The somewhat higher pressure in the reservoir **56** forces the substance within the reservoir to flow through the apertures **60** and **61** and mix with the stream of water. Natural flow turbulence within the conduit **15** tends to produce good mixing, and tends to produce a lather in the event that soap is dispensed. For the apertures **60** and **61**, diameters of 3/64 inch to 5/64 inch should be generally adequate for the purpose of the invention.

To fill and replenish the reservoir **56** with dispensable matter, a threaded filler cap **62** is received in a mating threaded recess **63** that is formed in the outer surface of the shaft **14**. For the purpose of enabling the user to have a firm, comfortable grip on the shaft **14**, the top of the cap **62**, when fully seated in the recess **63**, is flush with the outer shaft surface. If desired, this general surface area also can be corrugated, knurled, or the like, to provide a fine gripping surface.

To maintain flow from the reservoir **56** into the conduit **15**, higher pressure should be maintained within the reservoir relative to the pressure in the conduit **15**. In accordance with a feature of the invention, and as shown in FIG. 4, air flow into the reservoir is provided by means of a bevelled or chamfered gasket **64**. The thin edge of the gasket **64** acts as a check valve that allows air to flow into the reservoir, while preventing fluids within the reservoir from flowing out in the opposite direction. A spring-loaded pressure relief valve also could be incorporated into the brush structure for this purpose.

A somewhat different solution to this problem is shown in FIG. 5. Thus, a gasket **65** that circumscribes the shank of the filler cap has a small passageway **66**. The passageway **66** establishes free gas communication between the reservoir and the atmosphere. The dimensions of the passageway are so small, however, that the more viscous bath oils and the like are not able to flow out of the handle in the opposite direction.

Relying on essentially the same physical principle, FIG. 6 shows a filler cap **67** that has a gas or air pas-

sageway **70** formed in the center of the shank. As hereinbefore mentioned, air flows through this tiny hole and into the reservoir, while the more viscous liquids within the reservoir can not flow the other way. For manufacturing simplicity, it may be preferable to shape the passageway **70** in a slightly conical form.

In order to store the scrub-brush when it is not in use, FIG. 7 shows a suitable wall bracket **71**. The bracket **71** has a flat, circular portion that is erected flush with a wall. Because mountings for this device will frequently be placed in tile bath rooms, a screw **72** at the center of the circular bracket **71** joins the bracket to the wall at a cemented point that is common to four tiles. In this way, the screw **72** can easily penetrate and remain in the cement without resorting to tile drills or other special equipment. Two protruding ears **73** and **74** extend away from the wall and the bracket in order to engage and support the lower edge of the scrubbing head **31** (not shown in FIG. 7).

The flexible hose **10** can be attached to a water tap through a temporarily applied rubber sleeve or made a part of a more permanent installation. In this last regard, a Tee connection at the shower nozzle that diverts water either in whole or in part from the shower proper to the brush can be installed through a simple manipulation or threaded couplings.

I claim:

1. A hygienic device comprising a shaft having a conduit formed therein for promoting continuous flow, a scrubbing head secured to said shaft and having at least one port formed therein for fluid communication with said conduit, means for regulating said fluid communication, said scrubbing head being rotatable relative to said shaft for selectively registering said scrubbing head port with said conduit port, and means within said conduit for automatically varying the intensity of said fluid flow through said shaft.

2. A device according to claim 1 wherein a spindle connects said scrubbing head to said shaft for rotation relative thereto.

3. A device according to claim 2 wherein means for establishing frictional forces between said shaft and said scrubbing head are interposed therebetween.

4. A device according to claim 3 wherein said frictional means further comprises a gasket associated with one of said ports.

5. A device according to claim 1 wherein said automatic flow intensity varying means comprises a fin within said shaft conduit to establish two flow channels, a flow-powered driving means in one of said channels, and a flow interruptor in said other channel driven by said driving means and automatically obstructing and opening said respective channel to flow therethrough.

6. A device according to claim 1 further comprising a longitudinally disposed reservoir formed in said shaft, said reservoir having a partition separating said reservoir from said conduit and having apertures formed at the longitudinal extremities of said partition to establish liquid communication between said reservoir and said conduit.

7. A device according to claim 6 further comprising a filler cap in engagement with said shaft in order to establish means for filling said reservoir, and a gasket bevelled on one side thereof interposed between said cap and said shaft to promote a pressure in said reservoir that is higher than the pressure in said conduit.

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8. A device according to claim 6 further comprising a filler cap in engagement with said shaft in order to establish means for filling said reservoir, said cap having a passageway formed therein to enable gas to flow into said reservoir and to block liquid flow out of said reservoir.

9. A device according to claim 6 further comprising

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a filler cap in engagement with shaft in order to establish means for filling said reservoir, and a gasket interposed between said cap and said shaft, said gasket having a passageway formed therein to enable gas to flow into said reservoir and to block liquid flow out of said reservoir.

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