

Oct. 12, 1965

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3,211,149

BODY CAVITY TREATING APPARATUS

Filed March 27, 1962

3 Sheets-Sheet 1

FIG. 1.

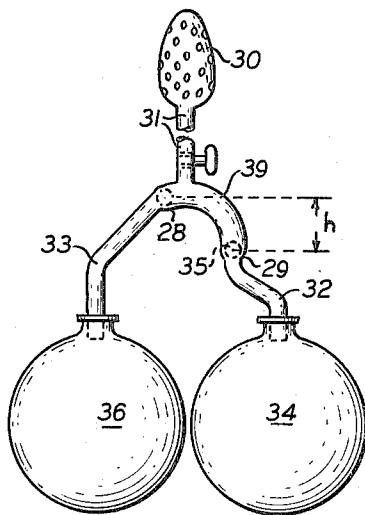
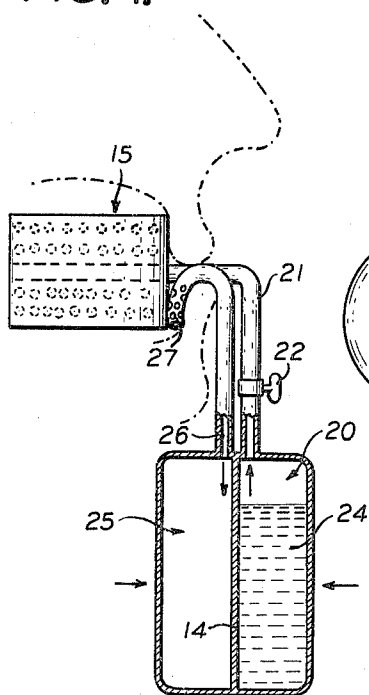


FIG. 4.

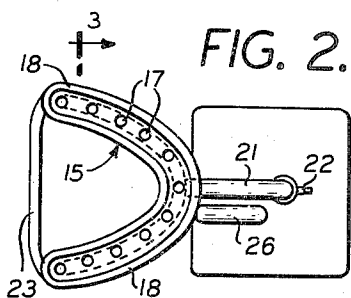


FIG. 2.

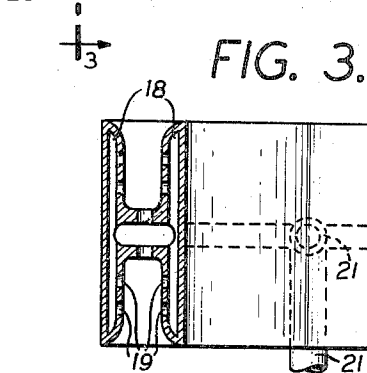


FIG. 3.

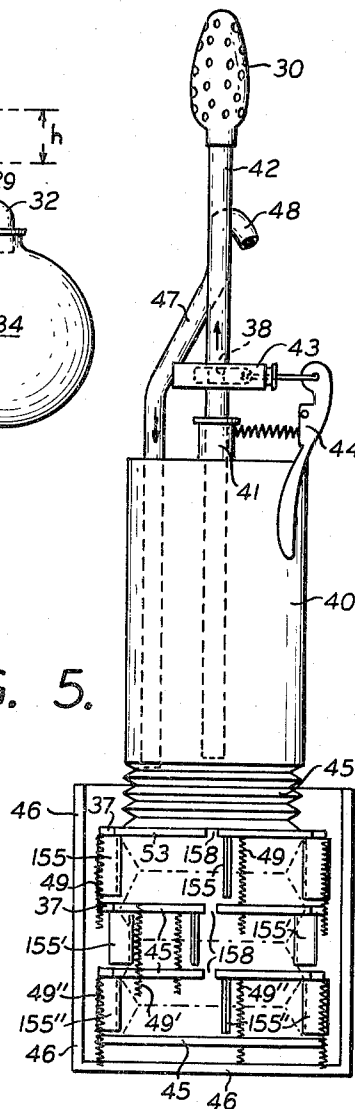


FIG. 5.

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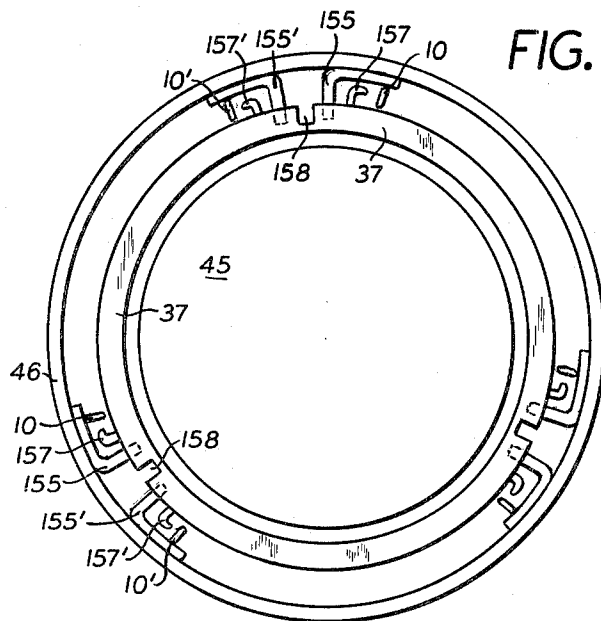


FIG. 6.

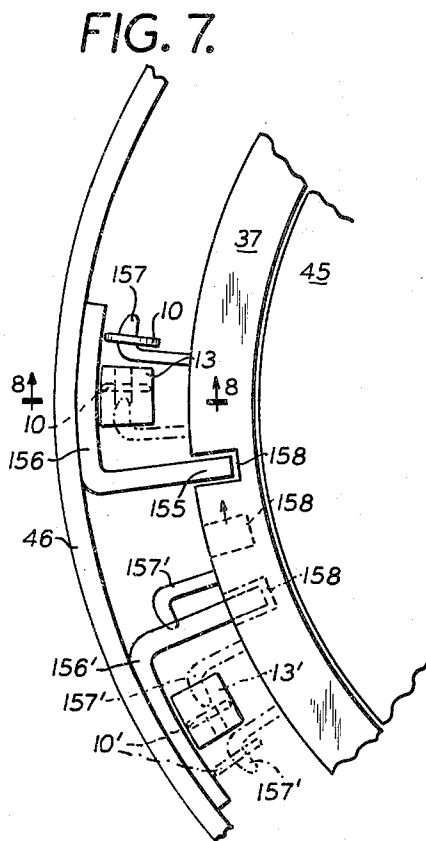


FIG. 7.

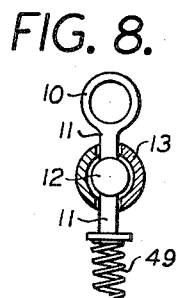


FIG. 8.

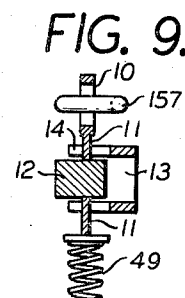


FIG. 9.

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FIG. 10.

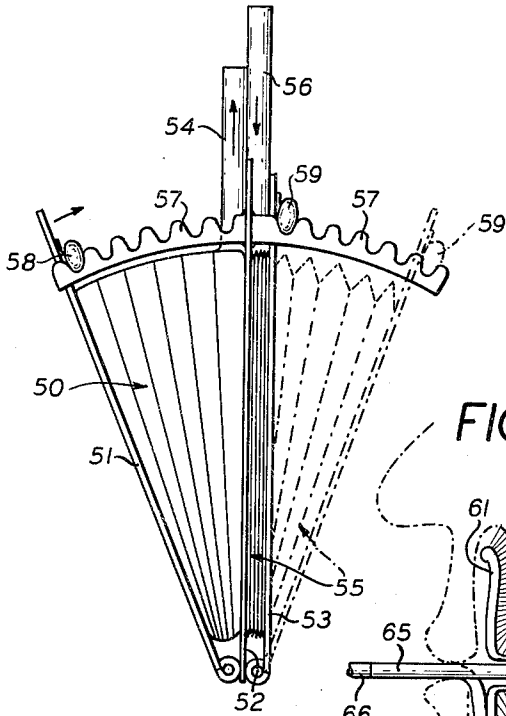


FIG. 11.

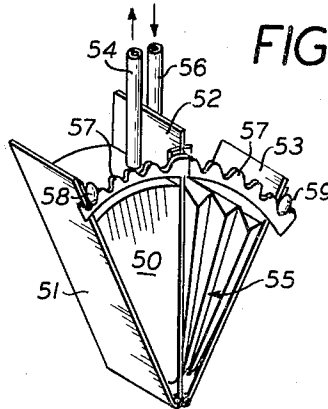


FIG. 12.

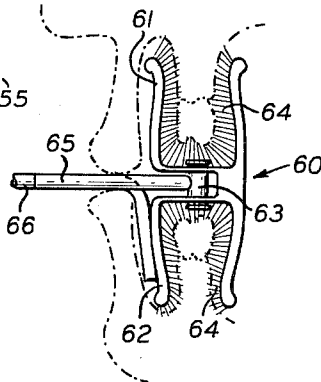


FIG. 13.

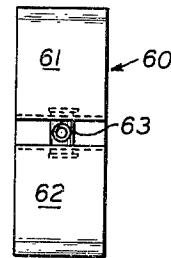


FIG. 15.

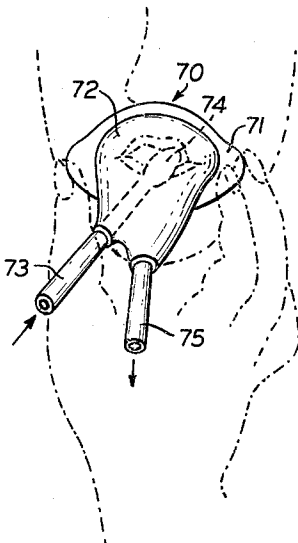


FIG. 16.

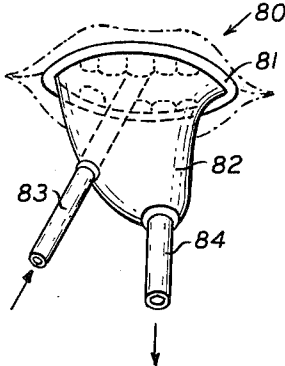
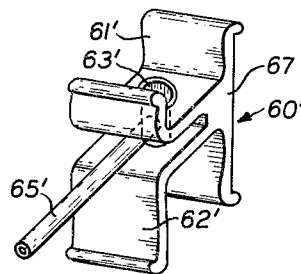


FIG. 14.



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3 Claims. (Cl. 128-232)

This invention relates to portable apparatus or devices for treating body cavities, such as the oral cavity, with treating fluids, and more particularly to an improved apparatus of this type whereby the fluid may be supplied to the cavity, in controllable quantities, and kept there for a desired period of time, with the used fluid being drained from the cavity independently of the supply of fresh fluid thereto.

It is an object of this invention to provide portable body cavity treating apparatus which is simple and easy to operate, easily applied to the respective cavity, and particularly adapted for using small quantities of expensive ingredients.

Another object of the invention is to provide such apparatus including a container for fresh fluid and a container for drained fluid, together with independent means for supplying fluid from the supply container to the body cavity and independent means for draining fluid from the body cavity.

A further object of the invention is to provide apparatus of this type including a plurality of different applicators and a plurality of different supply and drain assemblies, in which any applicator may be used with any supply and drain assembly.

A still further object of the invention is to provide apparatus of this type which is appropriately contoured or shaped to fit the body cavity to which it is applied.

A specific object of the invention is to provide flushing or cleansing apparatus for the mouth, and which is shaped to readily fit over the teeth and the gums.

For an understanding of the principles of the invention, reference is made to the following description of typical embodiments thereof as illustrated in the accompanying drawings. In the drawings:

FIG. 1 is a part elevational and part sectional view of one form of apparatus embodying the invention;

FIG. 2 is a top plan view of the apparatus shown in FIG. 1;

FIG. 3 is a sectional view taken on the line 3-3 of FIG. 2;

FIG. 4 is an elevational view of a modified form of apparatus embodying the invention, illustrating the use of a ball check valve;

FIG. 5 is a side elevational view, partly in section, of still another form of apparatus embodying the invention;

FIG. 6 is a plan view of the bottom of the drain tank shown in FIG. 5, parts above this bottom being omitted;

FIG. 7 is an enlarged partial plan view corresponding to FIG. 6;

FIG. 8 is a sectional view taken on the line 8-8 of FIG. 7;

FIG. 9 is a sectional view at right angles to FIG. 8;

FIG. 10 is a side elevational view of a further form of apparatus embodying the invention;

FIG. 11 is a perspective view of the apparatus shown in FIG. 10;

FIG. 12 is a side elevational view of one form of apparatus, embodying the invention, particularly designed for cleaning of the oral cavity and comprising, in effect, a hollow toothbrush;

FIG. 13 is an elevational view of the apparatus shown in FIG. 12;

FIG. 14 is a perspective view of a modification of the apparatus shown in FIGS. 12 and 13;

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FIG. 15 is a perspective view of a modified form of apparatus embodying the invention; and

FIG. 16 is a perspective view of still another modified form of apparatus embodying the invention.

Referring first to the embodiment of the invention shown in FIGS. 1, 2 and 3, an applicator, generally indicated at 15, is illustrated as connected to a supply tank 20 with which is associated a drain or return tank 25. As best seen in FIGS. 2 and 3, the applicator 15, in this embodiment of the invention, is generally U or horseshoe-shaped in plan, and has a generally H-shape cross section. The applicator 15 is intended for flushing the teeth and gums, and is therefore made to have a generally conforming fit over the teeth and gums. It may be made of any suitable material, and preferably is made of a plastic composition material which may be resilient or flexible to accommodate itself conformingly to the teeth and gums.

As best seen in FIG. 3, applicator 15 is formed with a hollow central passage 16 extending therearound, and is formed with oppositely directed apertures 17 which are spaced along the passage 16. Passage 16 communicates continuously with the hollow walls or flanges 18 of the device 15 and these hollow walls, on their inner surfaces, are formed with apertures 19 for flushing the sides of the teeth and gums.

A supply pipe 21 provided with a shut-off cock 22 connects passage 16 to supply tank 20. A drain pipe 26, having an inverted and perforated inlet end 27, connects with the drain container or tank 25. The inverted J-shaped inlet end of the pipe 26 is arranged to extend over the lip of the user and into the lower portion of the mouth. A baffle 23 is provided at the rear of the applicator 15 to divert fluid from the throat.

The supply and drain tanks 20 and 25 may be formed of a plastic material which is resilient and flexible so that the outer walls of these tanks may be compressed. The two tanks are preferably formed as a unit provided with a rigid interior common separating partition 14.

The arrangement operates in the following manner. Cock 22 is opened and then either the outer wall of tank 20, or the outer walls of both tanks 20 and 25, are squeezed or compressed against the rigid partition 14. This forces the flushing or cleaning fluid 23 through the pipe 21 into the applicator 15 and outwardly through the apertures thereof into treating or washing relation with the teeth and gums. To drain the fluid from the mouth, the cock 22 is closed and the pressure on the tanks 24 and 25 is released. Alternatively, if only tank 20 has been compressed previously, tank 25 is compressed and released. This creates a vacuum within the drain tank 25 so that fluid in the mouth is sucked into the drain tank. The operation may be repeated, as described, as often as is necessary for thorough treating of the gums and teeth, as well as for flushing of the oral cavity.

Referring to FIG. 4, a modified form of arrangement is shown involving an applicator in the form of a perforated head 30 which may be inserted into a body cavity. Head 30 is connected by a pipe 31 to a bent pipe 39 having branches 32 and 33. Branch 32 is connected to a feed tank or container 34 and branch 33 is connected to a drain tank or container 36. The latter are in the form of flexible bulbs which may be squeezed to provide either pressure or a vacuum.

In this embodiment, the direction of flow is governed by a ball check valve 35 positioned in pipe 39 in such a manner as to bar access of ball valve 35 into pipes 31, 32 and 33, but allowing it to move between seats 28 and 29 at the ends of pipe 39. When supply bulb 34 is pressed, the pressure forces ball valve 35 to engage seat 28 to block drain pipe 33 so that fluid will flow through pipe 31 into applicator 30 from which it will be discharged through

the apertures therein. The supply of fluid will stop when pressure on supply bulb 34 is released, and the resultant suction in supply bulb 34 will cause a reverse flow moving ball valve 35 to engage seat 29 to prevent any used fluid flowing into the supply bulb 34.

The body cavity may be drained by pressing the drain bulb 36 and then releasing it to provide a vacuum which will cause the fluid to be drawn from the applicator through pipes 31, 39 and 33 into drain bulb 36. By choosing the difference in height h between seats 28 and 29, and the curvature of pipe 39, so that, with the apparatus held in a substantially vertical position during the draining operation, the vacuum created by the expanding drain bulb 36 cannot lift valve 35 from seat 29 to engage seat 28. The ball valve 35 will therefore remain in closing relation to supply bulb 34 and the drained fluid is thus prevented from flowing into the supply bulb 34.

In the arrangement shown in FIGS. 5 through 9, the supply tank 40 is shown, solely by way of example, as pressurized, and its outlet 41 is connected by a supply pipe 42 to an applicator 30 which is shown, purely by way of example, the same as the applicator 30 of FIG. 4. However other applicators differing from the applicator 30 may be used. A valve 43 operated by a spring biased pivotally mounted handle 44 normally blocks flow through the pipe 42 but, upon swinging movement of handle 44 in a clockwise direction, the valve 43 is opened so that its aperture 38 is coaxially aligned with the pipe 42.

In this case, the drain tank 45 is in the form of a collapsible bellows which is normally spring biased to expand into a framework generally indicated at 46. The drain tank 45 is provided with a drain pipe 47 which has an inverted end 48 quite similar to the end 27 of the drain pipe 26 of FIGS. 1, 2 and 3. The drain tank 45 is biased to the fully open or expanded position, illustrated in dotted lines in FIG. 5, by springs 48, 49', 49'', which are tension springs connected at one end to the wall of framework 46. The upper end of each spring is connected to a relatively elongated shank element 11 having a ring 10 at its upper end and a preferably cylindrical enlargement 12 intermediate its ends as seen in FIGS. 8 and 9. The springs of each set 49, 49', or 49'' are arranged preferably at equal angular distances from each other circumferentially of the framework 46, as best seen in FIG. 6.

As shown in FIG. 5, the collapsing takes place in three or more stages. In the particular embodiment shown in FIG. 5, there are two sets of vertically aligned springs 49 and 49'', the springs 49 controlling movement from the fully closed position of the tank 45 to the end of the first expansion stage and the springs 49'' controlling movement of the tank 45 to the fully open position from the end of the second expansion stage. A third set of springs 49' is angularly spaced from the springs 49 and 49'', and controls expansion of the tank 45 through the second expansion stage. While three stages are illustrated, it will be understood that as many stages may be provided as is necessary or desirable, and it should be noted that the springs controlling movement or expansion of the tank 45 in the even numbered stages are aligned vertically with each other, but these springs are angularly offset from the springs controlling expansion of tank 45 in the odd numbered stages, which latter are also vertically aligned with each other.

At each spring location, angle irons, such as 156, 156', and 156'', are secured to the framework 46 to extend vertically thereof. The angle irons 156 extend through the first stage of expansion of the tank 45, the angle irons 156' extend through the second expansion stage, and the angle irons 156'' extend through the third stage of the expansion of tank 45. It will be noted that the angle irons 156 and 156'' are vertically aligned with each other, whereas the angle irons 156' are angularly offset from the angle irons 156 and 156''. Each angle iron has one leg secured to the framework 46 and the other leg 155, 155', or 155'' extending inwardly of the outer periphery of a

control ring 37. Secured to each angle iron leg attached to the framework 46 is a guide 13 in the form of a pipe receiving the cylindrical extension 12 and having slots 14 to receive the shank element 11, as best seen in FIGS. 8 and 9. The inwardly extending leg 155 of each angle iron 156, and correspondingly of the other angle irons, cooperates with notches 158 in the outer periphery of control ring 37, these notches normally being disposed at the central position illustrated in dotted lines in FIG. 7. At equal angular distances from notches 158, control ring 37 is provided with radially extending hooks 157 and 157', the hook ends of which extending in opposite circumferential directions.

If control ring 37, which is rotatable relative to the bottom of tank 45, is rotated clockwise an amount sufficient to align its slots 158 with the arms 155 of angles 156, the hooks 157 will move the corresponding shanks 11 and enlargements 12 out of the guides 13 and will engage in rings 10. The springs 49 are therefore released to pull the control ring 37, and thus the bottom of the tank 45, downwardly to a position where the control ring 37 will engage the upper ends of legs 155' of angle irons 156'. If the control ring 37 is now rotated counterclockwise to bring the slots 158 back to their central position, the shanks 11 and enlargements 12 associated with rings 10 will be engaged in the pipe guides 13 arranged at the lower end of the angle irons 156, so that the springs 49 will be held in this position. To effect a further expansion of tank 45, the control ring 37 is now rotated counterclockwise from its central position so that slots 158 are aligned with the legs 155' of the angle irons 156'. In such movement, the hooks 157' will move the enlargements 12' out of the pipe guides 13' and will engage the rings 10 of the shanks 11' associated with the springs 49', so that the ring 37, and thus the bottom wall of the tank 45 may be moved downwardly through the second stage by the springs 49'. The operation is then repeated as often as is necessary to expand the tank 45 through all the stages. It will be appreciated that the steps described, and in the reverse sequence, are utilized in recompressing or collapsing the tank 45. Expansion of the tank 45, of course, withdraws fluid from the body cavity, through the inlet 48 of the drain pipe 47. It will be noted that, in the arrangement of FIG. 5, as well as in those of FIGS. 1 through 4, the supply tank and the drain tank are completely independent of each other so that the fluid may be supplied and drained as independent operations.

FIGS. 10 and 11 illustrate another embodiment of the invention in which the drain tank and the supply tank are completely independent of each other so that the fluid supply and fluid draining operations may likewise be carried out independently. Referring to these figures, both the supply or feed container or tank 50 and the drain container or tank 55 are flexible impermeable bellows which are preferably wedge shaped in elevation. The bellows of feed tank 50 is arranged between an outer flat wall 51 and a rigid central wall 52, the plate 51 being pivoted, at its lower end, to the wall or plate 52. Similarly, the bellows comprising the drain tank 55 is disposed between an outer wall plate 53 and the central wall or partition 52, plate 53 being likewise pivoted, at its lower end, to the lower end of the central partition 52. A supply pipe 54 connected to the feed tank 50 may have a suitable applicator (not shown) connected to its outer or discharge end. Similarly, a drain pipe 56 is connected to the drain tank 55 and may have its outer, or inlet end, connected either to an applicator or formed as shown at 27 in FIG. 1 or 48 in FIG. 5. An arcuate rack 57, or a pair of arcuate racks 57, are secured to the central partition 52 adjacent its upper end to extend substantially at right angles thereto. The walls 51 and 53 are provided with operating knobs 58 and 59, respectively, releasably cooperable with the racks 57.

In operation, the knob 58 associated with plate 51 may be lifted and the plate 51 may be moved toward the cen-

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tral partition 52. This will force fluid from the feed container 50 through the pipe 54 to the applicator for discharge into the body cavity. It will further be noted that this operation is entirely independent of any operation of the drain tank 55. During pressure operation of the feed tank 50, the drain tank 55 is maintained in the collapsed condition illustrated in solid lines in FIG. 10, or in case of use in stages, in any partly expanded condition. To drain fluid from the body cavity, the knob 59 associated with the plate 53 is lifted from the associated rack 57 and the drain tank 55 is expanded. This creates a vacuum which will drain fluid from the body cavity through the drain pipe 56 into the container 55. During this latter operation, the feed tank 50 is preferably latched in the fully or partially collapsed condition.

In connection with the foregoing description, it should be noted that any of the described drain tank and feed tank assemblies are usable with any of the applicators, and that any drain tank may be used with any feed tank. Thus, either or both of the tanks may be flexible or collapsible and have a common rigid wall, but work by alternating pressing either the supply tank or the drain tank, with or without check valves and either hand or spring operated. Thus, bellows arrangements of the types shown in FIGS. 10 and 11, or of the cylindrical type, may be used for either or both of the supply tank and the drain tank. Also, piston operated feed and drain tanks may be used.

FIGS. 12 and 13 illustrate an applicator particularly adapted for treatment of the teeth. This applicator, generally indicated at 60, includes upper and lower reversely directed applicator elements 61 and 62 which are generally U-shaped in cross section so as to fit closely around the upper and lower teeth. The bases of the two U-shaped sections are pivotally interconnected by a nipple 63 which opens through both bases. The inner surfaces of the side walls of each section are provided with bristles 54, and such bristles may also form an annular brush around each discharge end of nipple 63. Nipple 63 is connected to a feed pipe 65 whose inlet end may be connected to any one of the several feed or supply containers illustrated and previously described. The arrangement further includes a drain pipe 66 which may have a bent end and be formed similarly to the drain pipes 26 and 47 of FIGS. 1 and 5. Drain pipe 66 has its outlet end connected to any one of the drain containers shown in FIGS. 1 through 11.

The device 60 may be moved back and forth along the teeth giving a brushing or wiping action thereon, depending upon whether it is provided with bristles 64 or with sponges (not shown) in place of the bristles. During this time, the feed container is operated to supply cleansing fluid through the feed pipe 65 and thus into the nipple 63 from which it is discharged at each end into the interior of the sections 61 and 62. At any time, or at the end of the cleaning operation, the drain tank may be activated to withdraw used fluid through the drain pipe 66 into the drain container. The feed pipe has a rigid portion so that it may be used as a manipulating handle.

FIG. 14 illustrates a modified form of the arrangement shown in FIGS. 12 and 13, and which is formed of an elastic or flexible material. In this instance, the applicator 60' also includes upper and lower sections 61' and 62' but these are interconnected, at their inner ends, by a relatively solid partition 67 which is integral with the sections 61' and 62' and made of the same material. The bases of the sections 61' and 62' are again pivotally connected to the ends of a nipple 63' opening through both bases, and the feed pipe 65' is connected, in communication relation, with the nipple 63'. The applicator 60' of FIG. 14 is otherwise substantially identical to the applicator 60 of FIGS. 12 and 13.

FIG. 15 illustrates an applicator particularly adapted for flushing and rinsing, or otherwise fluid treating, the oral cavity. This applicator, which is generally indicated at 70, includes a frame or mask 71, which may be made of

flexible material, and which may be adhered to the face by suitable pressure sensitive adhesive or which may be held in position by the hand as illustrated. A bag or sack 72, of impermeable material, is preferably integral with the mask 71 and opens therethrough. Alternatively, bag or sack 72 may be sealed in fluid-tight relation to the mask or frame 71. A feed pipe 73 extends in fluid-tight relation into the interior of the bag or sack 72 and has an applicator 74, similar to the applicator 30, on the inner end thereof and which may extend into the mouth. A drain pipe 75 is also connected to the sack 72. Feed pipe 73 may be connected to any one of the feed or supply containers previously described, and drain pipe 75 may be connected to any one of the drain containers previously described, for independent operations of supplying fluid to the oral cavity and of draining fluid therefrom. This embodiment of the invention, as well as other embodiments thereof when provided with suitable applicators, may be used in treating the genital organs, such as the vaginal cavity.

FIG. 16 illustrates another arrangement for flushing the oral cavity. In this case, there is a rigid or substantially rigid frame 81 which is held between the lips by pressure thereon. A bag or sack 82 opens in fluid-tight relation through the frame 81 for communication with the oral cavity, and a feed pipe 83 extends into the bag or sack 82 and into the oral cavity, this feed pipe likewise being in fluid-tight relation with the bag or sack 82. A drain pipe 84 is connected in fluid-tight relation to the sack or bag 82. The arrangement otherwise operates in exactly the same manner as previously described, particularly for FIG. 15.

While specific embodiments of the invention have been shown and described in detail in order to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. Portable apparatus, for treating body cavities with treating fluids, comprising, in combination, an applicator formed with a fluid-receiving chamber and perforations communicating with said chamber for discharge of fluid therefrom into the body cavity; a fluid supply container for containing the entire supply of fresh treating fluid; a feed pipe connecting said container to said chamber; a drain container associated with said supply container to form a combined supply and drain assembly, said containers being sealed off from each other in a fluid-tight manner and operable independently of each other; a drain pipe connected to said drain container and having an inlet end communicable with the body cavity; said containers, during use of the apparatus, being sealed except for the respective feed pipe and drain pipe connected thereto; and means operable to activate said containers independently of each other, to supply treating fluid to the body cavity and to withdraw treating fluids therefrom, respectively, whereby the treating fluid supply and treating fluid drainage may take place independently of each other; said drain container requiring positive activation by said activating means to withdraw treating fluid thereunto, so that treating fluid may be maintained in the body cavity at will; said containers including outer walls of flexible material and a common inner wall of rigid material, separating said containers; feeding of treating fluid to said applicator being effected by compressing at least said supply container against said rigid common wall.

2. Portable apparatus, for treating body cavities with treating fluids, comprising, in combination, an applicator formed with a fluid-receiving chamber and perforations communicating with said chamber for discharge of fluid therefrom into the body cavity; a fluid supply container for containing the entire supply of fresh treating fluid; a feed pipe connecting said container to said chamber; a drain container associated with said supply container to form a combined supply and drain assembly, said con-

containers being sealed off from each other in a fluid-tight manner and operable independently of each other; a drain pipe connected to said drain container and having an inlet end communicable with the body cavity; said containers, during use of the apparatus, being sealed except for the respective feed pipe and drain pipe connected thereto; and means operable to activate said containers independently of each other, to supply treating fluid to the body cavity and to withdraw treating fluids therefrom respectively, whereby the treating fluid supply and treating fluid drainage may take place independently of each other; said drain container requiring positive activation by said activating means to withdraw treating fluid thereunto, so that treating fluid may be maintained in the body cavity at will; said containers being collapsible and feeding of treating fluid to said applicator is effected by collapsing said supply container, with draining of the fluid from the body cavity being effected by expanding the collapsed drain container; said containers being in the form of bellows and said assembly is generally wedge-shaped in side elevation; a common intermediate wall for the two bellows and separating the same from each other; said bellows having an outer wall; said walls being pivotally interconnected at the narrow edge of the assembly; said two bellows being operable by movement of the respective outer walls with respect to said common inner wall; and means selectively operable to latch said outer walls at predetermined angular positions with respect to said common inner wall.

3. Portable apparatus, for treating body cavities with treating fluids, as claimed in claim 2, in which said last-

named means comprises rack means extending in each direction from said common inner wall at substantially right angles thereto; and releaseable catches mounted on each of said outer walls and selectively engageable with said rack means.

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