

[54] **SELECTIVELY OPERATED PRESSURIZED
LIQUID APPLICATOR FOR SINK
INSTALLATION**

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4/6**

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[58] Field of Search **128/230, 229, 66, 224,
128/251; 4/6, 7**

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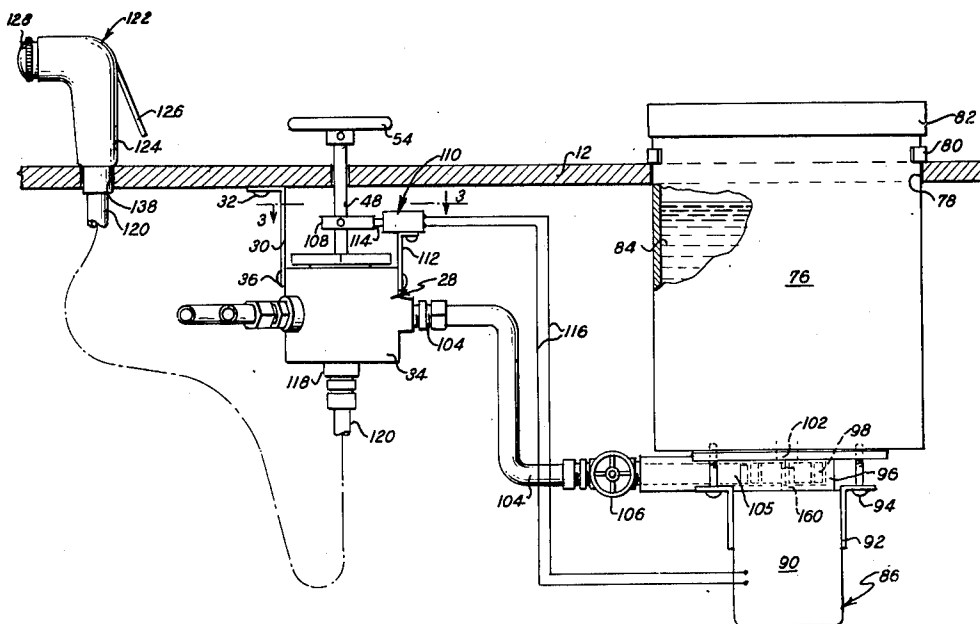
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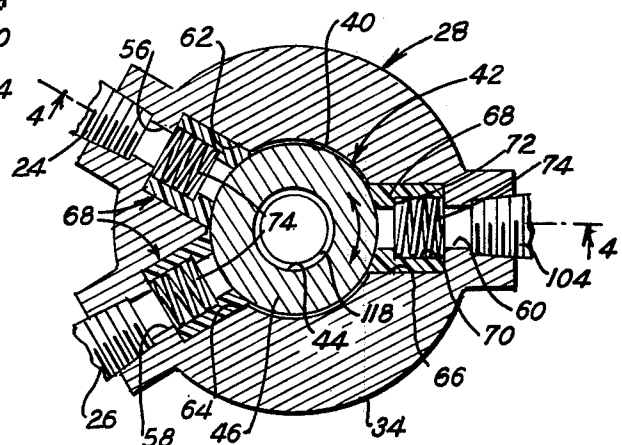
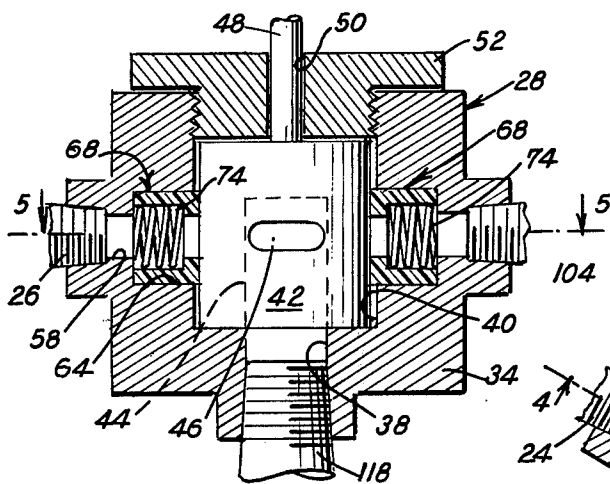
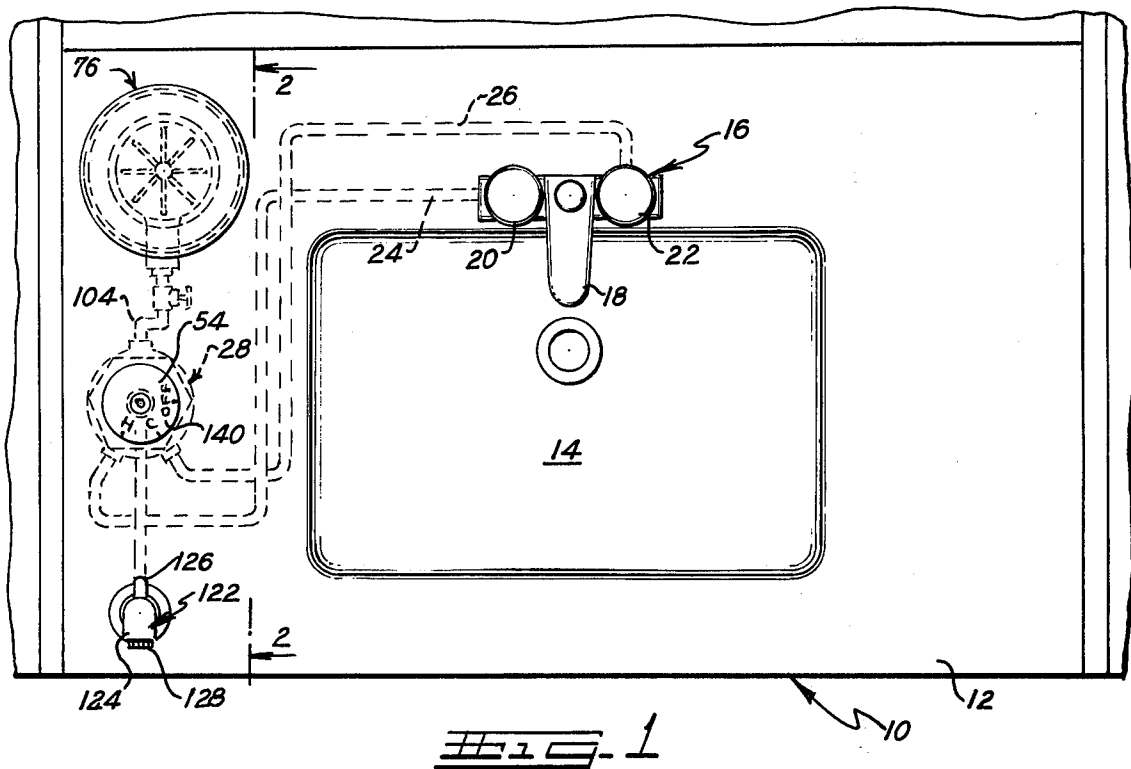
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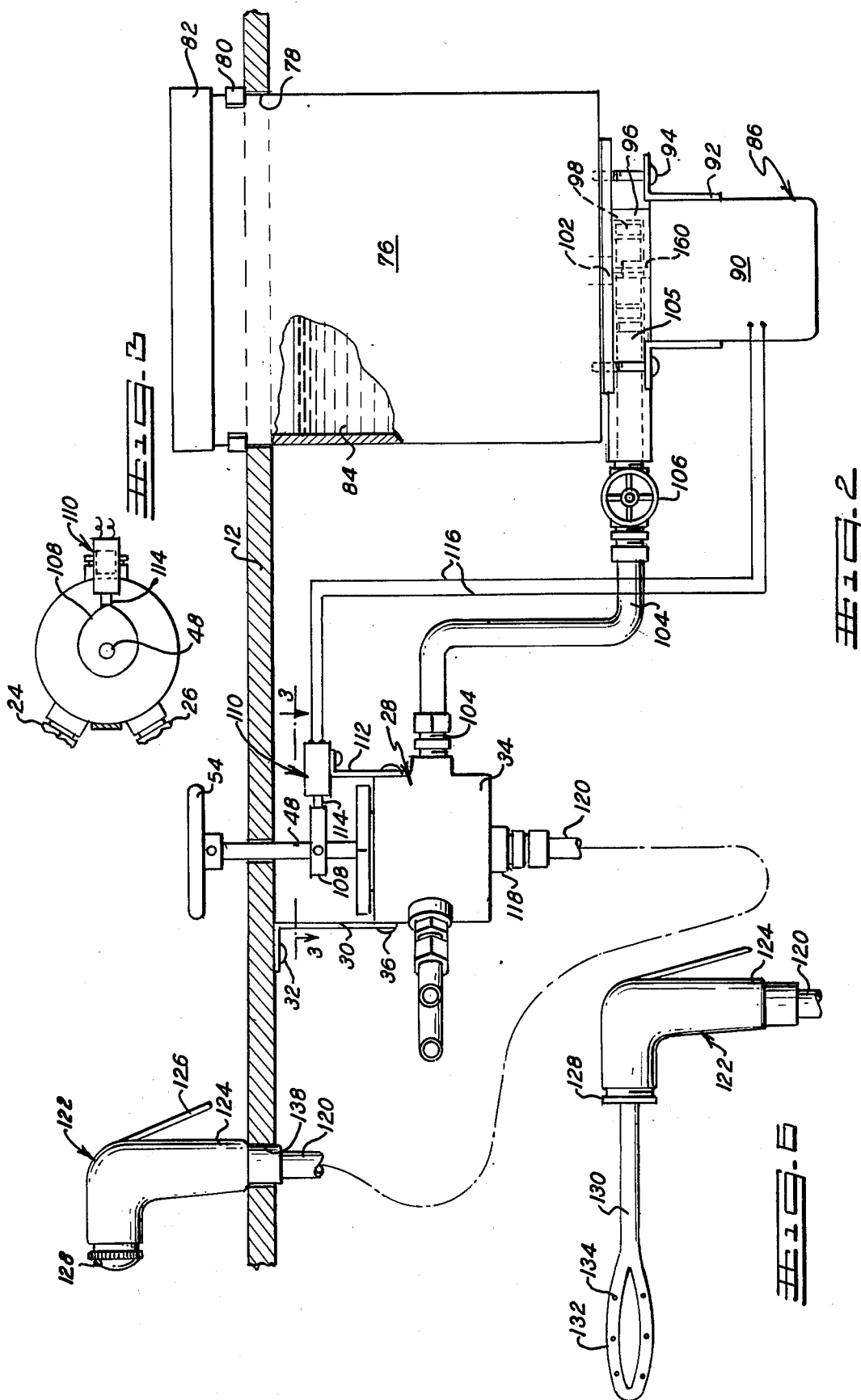
[57] **ABSTRACT**

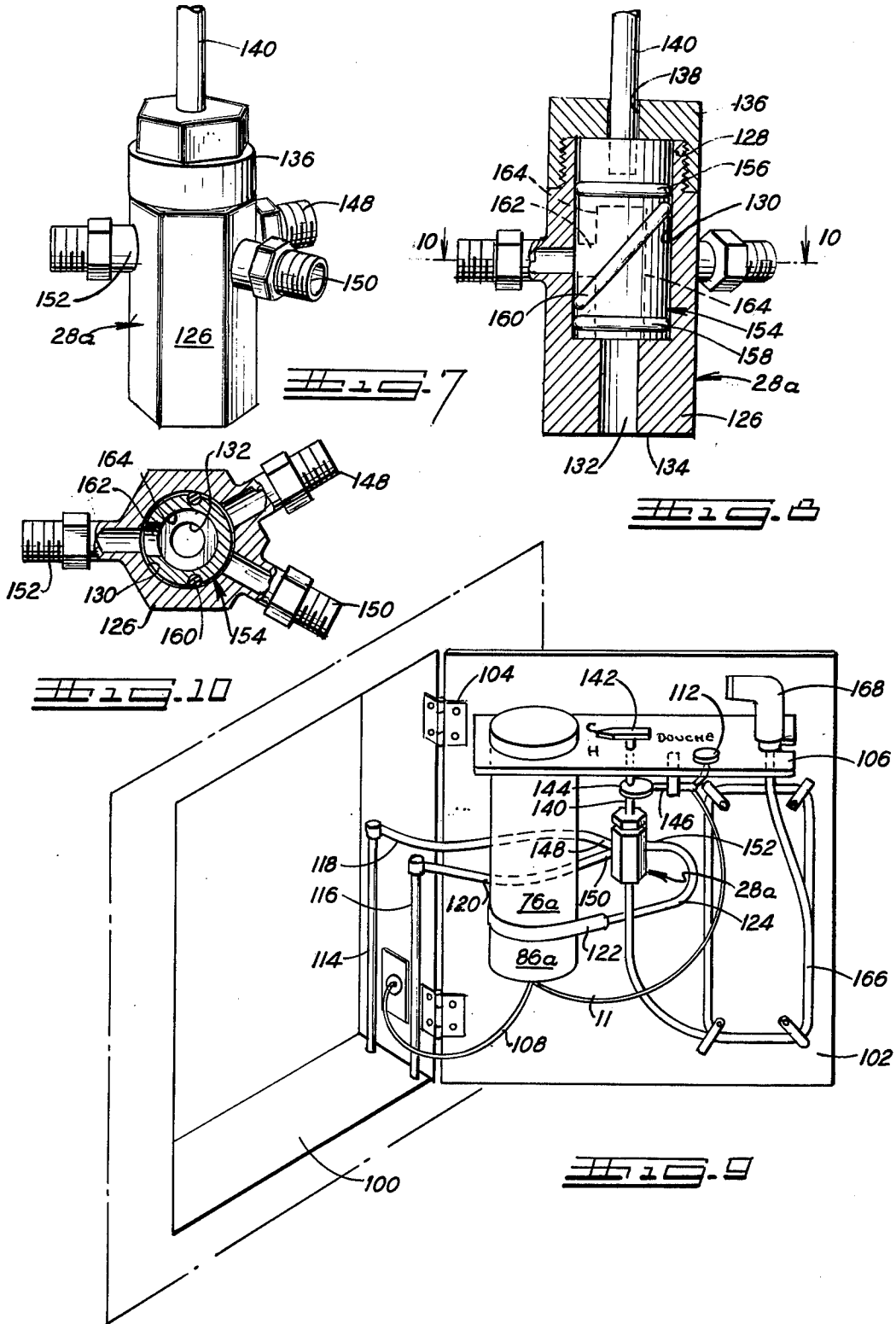
A bathroom sink, cabinet structure, or the like supports adjacent to the basin a tank holding a medicated douche liquid which is fluid coupled to one end of an extendable flexible hose which terminates at its other end in either a spray head or a replaceable douche probe. A rotary selection valve also respectively couples the spray handle to hot and cold pressurized water lines leading from the sink faucet, and energizes a pump motor associated with the douche liquid container for pumping liquid from the container under pressure to the spray handle, when fluid connection is made thereto.

6 Claims, 10 Drawing Figures









SELECTIVELY OPERATED PRESSURIZED LIQUID APPLICATOR FOR SINK INSTALLATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to liquid applicators in the form of a spray handle at the end of an extensible hose to which a douche probe or a spray head may be removably attached thereto and, more particularly, to systems for selectively coupling the spray handle and hose to multiple sources of pressurized liquid.

2. Background of the Prior Art

In the prior art, it is not unusual to connect a douche system to the usual house plumbing as evidenced by U.S. patents to Lazarus Nos. 2,828,761, 3,430,267 to Van Houten, 1,752,782 to Burton, 69,675 to Ingram, 535,967 to Viale, and 2,364,491 to Traidou. Also, certain of these patents, such as Lazarus, contemplates the use of either a spray or a syringe tip at the end of a discharge hose, while the patents to Lazarus, Burton and to DiPasquale U.S. Pat. No. 3,337,629 contemplate the addition of a medicament to the douche water, while Merkel U.S. Pat. No. 3,195,148 employs a pump for pressurizing water permitting a person remote from the liquid source to apply water under pressure in an applicator sense.

It is to this general field that the present invention is directed and constitutes an improvement over the references noted above. None of the references combine multiple sources of liquid under pressure in a system permitting, in a selective manner, the coupling of an applicator and the hose thereto, and in particular, by means in which the completion of a fluid circuit from a given supply such as that of a tank holding a douche liquid including a medicament also results in the energization of a pump for pressurizing that liquid to deliver the same to the applicator under pressure sufficient to insure proper operation of the douche system set up thereby.

SUMMARY OF THE INVENTION

The present invention relates to a pressurized liquid application system particularly as an assembly associated with a bathroom sink, cabinet, or the like, wherein a storage tank is fixed to the side of the basin and supported by the cabinet counter top which also supports the basin and hot and cold water faucets, supports the tank at generally the same level. Alternatively, the tank and related components may be attached to a cabinet door. Adjacent the tank is provided a rotatable valve assembly for selectively coupling a flexible hose and applicator to the tank or to the hot and cold water pipes of the conventional basin faucet. A centrifugal pump associated with the tank outlet directs the medicated douche liquid from the storage tank via a rotary valve assembly. Manual rotation of the valve to connect the tank to the hose and applicator causes microswitch closure energizing the pump to deliver the medicated douche liquid under pressure through the hose to the applicator. The applicator terminates in either a removable spray head or a removable douche probe depending upon the liquid being applied.

The valve, in an alternate form of the invention, may comprise a valve head with plural orifices selectively and changeable alignable with an outlet, and having O ring seals. In addition, visual indicator means in the

form of a light or the like is provided to show pump operation.

Other and further objects and advantages of the invention will become apparent to those skilled in the art from a consideration of the following specification when read in conjunction with the annexed drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the liquid applicator system of the present invention as applied to a conventional bathroom sink in accordance with the teachings of this invention;

FIG. 2 is a sectional elevational view of a portion of the system of FIG. 1 taken about lines 2—2;

FIG. 3 is a sectional view of the rotary valve assembly taken about lines 3—3 of FIG. 2;

FIG. 4 is a sectional elevational view of the rotary valve assembly forming one element of the system of the present invention;

FIG. 5 is a sectional view of the valve assembly of FIG. 4 taken about lines 5—5;

FIG. 6 is an elevational view of the applicator with the spray head removed and the douche probe coupled thereto;

FIG. 7 is a perspective view of an alternate form of the valve;

FIG. 8 is an enlarged side elevational view of the valve of FIG. 7, partially in cross section;

FIG. 9 discloses the mounting of the assembly on a cabinet door or the like; and

FIG. 10 is a transverse cross sectional view on lines 10—10 of FIG. 8, looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in more detail, a conventional bathroom sink such as 10 is in cabinet form and is provided with a counter top 12 having a large rectangular opening within the same within which is positioned the bowl or basin 14 and to the rear of which, and supported by the sink top 12, is a conventional hot and cold water faucet assembly 16. Assembly 16 includes a discharge faucet 18 and hot and cold control knobs to the left and right respectively at 20 and 22. The assembly 16 receives hot and cold water from separate sources through pipes (not shown). In this respect, the present invention is directed to providing hot and cold liquid supply lines 24 and 26 respectively, in the form of copper tubes or pipes which do not interfere with the normal provision of hot and cold water at the faucet assembly 16 but are merely taps permitting hot and cold water under pressure to be delivered to the rotary valve assembly 28 which, as seen in FIG. 2, is mounted beneath the counter top 12 and supported with respect thereto by a number of brackets 30 of L-shaped configuration, being screwed respectively to the underside of the counter top 12 as at 32 and to the exterior of the cylindrical valve casing 34 as at 36. The rotary valve assembly 28 as best seen in FIGS. 4 and 5, is oriented such that its axis is vertical, being bored at 38 and counterbored at 40. Within the counterbore 40, is positioned a cylindrical rotary valve 42, which is of a diameter slightly less than the diameter of counterbore 40. In turn, the rotary valve 42 is partially bored from its bottom end as at 44 and is provided with an intersecting radial opening 46 of oval configuration inter-

mediate its ends. The bore 44 within the rotary valve 42 is in alignment with the bore 38 of casing 34, bore 38 defining the discharge path for the rotary valve assembly 28. The cylindrical, rotary valve 42 has extending from its upper end, a valve operating shaft 48 which is fixedly coupled to the rotary valve 42 and extends through bore 50 of a threaded cap or seal 52 which is threaded to the casing 34 at the upper end of counter-bore 40. Shaft 48 extends through and above the counter top 12 and terminates in a rotary valve handle 54 such that by rotating the handle 54, the rotary valve 42 rotates within casing 34. Casing 34 is further provided with radial bores 56, 58 and 60 at circumferentially spaced positions which are further counterbored at 62, 64 and 66 respectively, the counterbores each holding a spring biased tubular seal 68 formed of neoprene or the like. Each seal is counterbored at its outboard end as at 70 to define shoulder 72 against which one end of coil spring 74 abuts, the other end of the spring being in contact with the shoulder formed between the bored and counterbored portion of the housing. In turn, the radial bores are each threaded to permit fluid connections to the rotary valve assembly from the hot and cold water supply lines 24 and 26 respectively, for bores 56 and 58.

An important part of the present invention resides in the liquid storage tank or container 76 which is mounted within the cylindrical opening 78 of counter top 12, such that the upper end of the tank or container 76 protrudes above the counter top 12, being supported by rim 80 and permitting a cover 82 to be removed to add to the liquid contents 84 of the container.

Preferably, the container or storage tank 76 carries liquid 84 in the form of a medicated douche or the like. Bolted to the bottom of the storage tank or container 76 is a centrifugal pump 86 of conventional construction and constituting in general an electrical motor 90 mounted via brackets 92 and screws 94 to the bottom of tank 76 and terminating in a housing 96 within which rotates an impeller 98 mounted to the end of the motor drive shaft 160, the chamber defined by the casing 96 being open to the storage tank 76 at its center as at 102 and permitting the discharge of liquid 84 from the tank through passage 102 to a treatment liquid line or pipe 104 which is threadably coupled in turn to housing 34 of the rotary valve assembly 28 at radial bore 60. A manually operated shut off valve 106 may be provided within line 104 downstream of pump discharge passage 105 as desired.

Fixed to the rotary valve shaft 48, is a radial cam 108 as best seen in FIG. 3, and to the side of the radial cam 108 is fixed microswitch 110 via bracket 112 which is further coupled to the periphery of valve casing 34 such that switch actuator button 114 rides on the periphery of radial cam 108. Electrical line 116 connects microswitch 110 to the pump drive motor 90 and controls energization of the pump through a source (not shown).

Leading from axial bore 38 of valve casing 34, and being threadably coupled thereto, is an outlet pipe or line 118 to which is coupled a flexible hose 120, the opposite end of the hose being coupled to a hand held applicator indicated generally at 122. Applicator 122 comprises spray handle 124, pivotable valve operator 126 carried thereby and operating, internally, a discharge valve (not shown). Applicator 122 terminates in FIG. 2, in a removable spray head 128 of conventional

type which may be threadably coupled to the discharge end of spray handle 124. As further indicated in FIG. 6, spray head 128 may be replaced by douche probe 130, for instance, consisting of a hollow tubular member 130 terminating in an oval looped head 132 carrying multiple discharge outlets or openings 134 and having at its opposite end a threaded connection 136 permitting it to be sealably and threadably coupled to the discharge end of the spray handle 124. As evidenced in FIG. 1, the control handle 54 may be provided with indicia 140 which is associated with a fixed indicia on the upper surface of counter top 12, such that rotation of the valve to align certain of the indicia on the handle with the fixed indicia (not shown) on the counter top, indicates the position of the valve and also readily indicates the condition of microswitch 110 operated by radial cam 108 carried by the same shaft 48.

The counter top 12 is further provided with a circular opening 138 which is smaller in diameter than that of the spray handle 124 but larger than that of hose 120 such that the spray handle 124 is readily partially seated therein but permits extraction of a portion of the hose 120 when the applicator is raised from counter top 12.

In operation and with the removable spray head 128 coupled to the applicator 122, the rotary handle 54 may be rotated to a position such that oval opening 46 of the rotary valve 42 is in axial alignment with a given radial bore of the valve casing 34, as for instance 56 permitting fluid coupling of the hot water line 24 to the applicator 122 and permit the user to spray various parts of the body with hot water such as employed when washing one's hair, for instance. Alternatively, the valve assembly 28 may be actuated by rotation of rotary valve handle 54 such that cold water is supplied to the applicator 122, or a combination, or as further desired, rotation of the valve handle 54 to the off position seals opening 46 from any one of the liquid supply inlets as shown in FIG. 5, for instance. In this case, the spring biased seals 68 closely abut the periphery of cylindrical valve member 42 and thus permitting the removable spray head 128 to be removed and replaced with the douche probe 130 for instance as evidenced in FIG. 6 without leakage. With the douche probe 130 attached or any other similar device, the selection handle may then be readily turned to permit alignment of the radial opening 46 of the rotary valve 40 with bore 60, thus fluid coupling the storage tank or container 76 to applicator 122 permitting medicated douche liquid 84 for instance under pressure provided by pump 86 to be discharged through the multiple openings 134 of probe 130. Pressurization is automatically achieved since the radial cam 108 moves to the position shown in FIG. 3 to displace microswitch actuator 114 sufficient to close the circuit to the pump drive motor 90. Centrifugal pump 86 is of the nonloading type which runs without moving a liquid as would be the case, for instance when the shut off valve 106 is closed and the pump actuated. It is to be noted that within the rotary valve assembly 28, the spring loaded neoprene seals ride against the rotary valve 42 and the valve casing holding liquids in their proper area with the liquid pressure pushing the seals against the valve body and each spring pushing its seal against the rotor to prevent leaks. Further, the oval opening 46 is designed so that it will not tear the tubular neoprene seals 68 as it turns past the seals, and further, the opening 46 is designed such that it will span

the openings in the two seals aligned with bores 56 and 58 permitting the control of water temperature at applicator 122 by permitting both cold and hot water to be mixed and discharged through hose 120.

FIGS. 7 through 10 discloses modifications of the invention as to valve structure and mounting assembly. Referring to FIG. 9, the cabinet structure for the sink includes an opening frame 100 to which is connected a door 102 secured to the frame by hinges 104. A horizontal shelf 106 projects from the inner surface of the door and supports a tank 76a with a pump 86a thereon. The pump is energized via an electrical line 108, and a line 110 extends to a light bulb or other indicator 112 on the shelf to denote operation of the unit and to complete the operational circuit as indicated below. Hot and cold water sources 114, 116 extend into the frame, and have flexible tubes 118, 120, respectively, operatively secured thereon. An outlet conduit 122 for materials stored in the tank has a flexible tube 124 thereon and extends from the pump.

A modified form of mixing valve 28a is shown in FIGS. 7-10. The valve 28a comprises a body portion 126 having a reduced, externally threaded upper end 128. A bore 130 is formed in the body portion to serve as a main valve chamber, and a co-axial outlet 132 extends therefrom to the lower end 134 of the body. A cap 136 is threadably engaged on the upper end 128, said cap having a vertical opening 138 formed therein. An actuating rod 140 extends through the opening to a control handle 142 located above the shelf 106. The rod 140 carries a cam surface switch 144 to contact a switch 146 of the wire 110 resulting in actuation of the pump and in actuation of the light indicator 112 when the handle 142 is moved to pump operating position to dispense material from the tank. Suitable indicia indicating hot, cold or tank material application is provided adjacent the handle 142 on the shelf. The valve has closely spaced inlet openings for hot or cold water with fittings 148, 150 to which are connected the conduits 118, 120, respectively. An opening for material from the tank 86a has a fitting 152 to which the line 124 is connected.

A valve member 154 is rotatably seated in the bore 130 and comprises a substantially cylindrical member fixedly secured to the rod 140 for movement therewith. Upper and lower seals 156, 158, and an intermediate angular seal 160 extend about the member, the seals being of rubber, neoprene or similar material. The member has a lateral inlet bore 162 which intersects a vertical discharge bore 164. Movement of the rod serves thus to provide for selective alignment of the bore 162 with either the hot or cold water inlets (or a combination of these) or alternatively with the inlet for the material from the tank.

The outlet 132 leads to a discharge hose 166 having a spray head 168 or other discharge device thereon, the latter being conveniently seated on the shelf 106.

Having described and illustrated embodiments of this invention in some detail, it will be understood that this description and illustration have been offered only by way of example, and that the invention is to be limited in scope only by the appended claims.

I claim:

1. A pressurized liquid applicator system for selectively applying diverse liquids to the human body, said system adapted for use with a bathroom sink structure having a basin supported on a counter top thereof, said

system having a first pressurized liquid source in the form of a hot and cold water faucet overlying said basin and a second pressurized liquid source in the form of a storage tank for liquid medicament mounted on said counter top, a rotary valve assembly fixed to the bottom of said counter top and including a cylindrical valve casing whose axis is substantially at right angles to the plane of the counter top, said casing having a plurality of radial circumferentially spaced bores defining liquid inlet openings, said liquid inlet openings being fluid coupled to said tank and said hot and cold water faucet respectively, said casing having an axial bore which intersects said radial bores, a cylindrical valve member disposed for rotation within said casing axial bore, said valve member having an axial bore and a radial opening leading therefrom, the casing axial bore being aligned with the axial bore of the valve member and defining therewith a liquid discharge opening for said valve assembly, an extensible hose terminating in a liquid applicator and being coupled with said discharge opening for the valve assembly, said radial opening of said cylindrical valve member rotatable with the valve member into selective registration with the radial bores of the valve casing, whereby said discharge opening and hose are selectively fluid coupled with said first and second pressurized liquid sources, a rotary valve shaft secured to said valve member and having a handle fixed thereto above said counter top, pump means operatively associated with said tank, and means automatically responsive to operation of said rotary valve assembly for energizing said pump means in order to deliver said liquid medicament from said tank to said rotary valve assembly under pressure.

2. The structure of claim 1, wherein said rotary valve shaft carries a radial cam, and a microswitch and a microswitch actuator, said microswitch being operatively positioned relative to said cam such that said microswitch actuator contacts the radial cam periphery and said microswitch changes state in response to rotation of said rotary valve shaft, and also including an electrical motor which drives said pump means and said microswitch controls energization of the pump means drive motor in response to fluid coupling of said tank to said hose via said rotary valve assembly.

3. The structure of claim 2, wherein said radial bores of said valve casing are counterbored at their radially inner ends, tubular neoprene seals carried within the counterbored portions of said radial bores and having their inner ends spring biased against the periphery of said cylindrical valve member to effectively seal said inlet openings from each other and permit discharge of fluid from any one inlet opening only through said discharge opening of said valve assembly.

4. The improvement as claimed in claim 3, wherein said tubular neoprene seals are counterbored at their radially outer ends and said spring biasing means each comprise a coil spring having one end contacting the shoulder created by the counterbore within its tubular neoprene seal and its other end contacting the shoulder created by the radial counterbore in said valve casing.

5. A pressurized liquid applicator system comprising a sink counter top, an upright axis rotary selector valve assembly secured to the bottom of said counter top and having a manipulating handle arranged above the counter top, a tank for a liquid medicament supported by the counter top and including a delivery pump beneath the counter top, said rotary selector valve assembly

bly having a liquid inlet and said inlet being fluid coupled with said delivery pump, hot and cold water conduits beneath said counter top, said selector valve assembly having additional liquid inlets which are fluid coupled to said conduits, said rotary selector valve assembly having a liquid outlet common to said first and second named liquid inlets, said valve assembly including a rotary member coupled with said manipulating handle and having a port movable selectively into registration with any one of said liquid inlets and having a passage communicating with said port and being in registration with said liquid outlet, an extensible hose terminating in a liquid applicator and being accessible above said counter top and being coupled with said liquid outlet of said selector valve assembly, and control means for said delivery pump activated in response to rotation of said handle above said counter top.

6. A pressurized liquid applicator system comprising a support, a rotary selector valve assembly attached to the support and having a manipulating handle, a tank

for a liquid medicament mounted on the support and including a delivery pump, said rotary selector valve assembly having a liquid inlet which is fluid coupled with said delivery pump, hot and cold water conduits adjacent said support, said selector valve assembly having additional liquid inlets which are fluid coupled to said conduits, said rotary selector valve assembly having a liquid outlet common to said first and second named liquid inlets, said valve assembly including a rotary member coupled to said manipulating handle and having a port movable selectively into registration with any one of said liquid inlets and having a passage communicating with said port and being in registration with said liquid outlet, an extensible hose terminating in a liquid applicator and coupled with said liquid outlet of said selector valve assembly, said support including a rest portion for the liquid applicator of the hose, and control means for said delivery pump activated in response to rotation of said manipulating handle.

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