

Dec. 27, 1955

L. POLLOCK ET AL
JET DISPENSER

2,728,609

Filed June 16, 1952

2 Sheets-Sheet 1

FIG-1

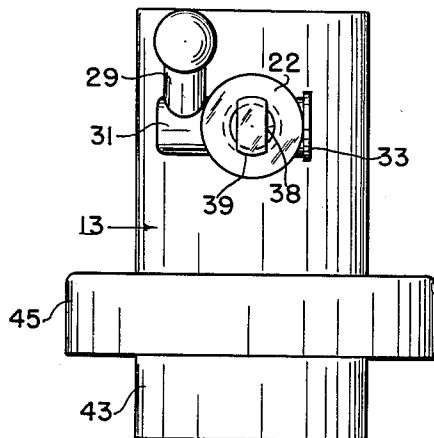
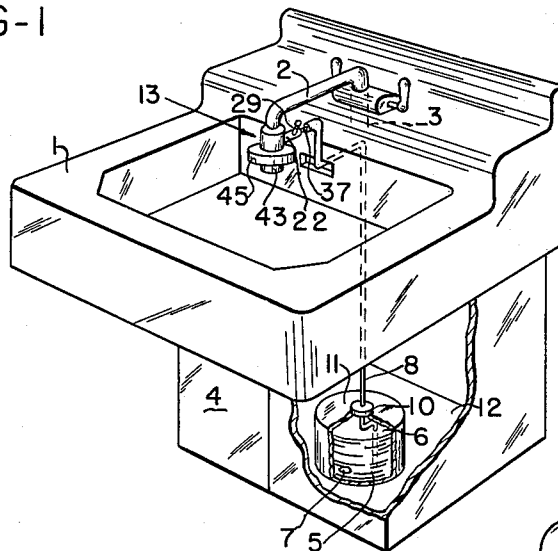


FIG-4

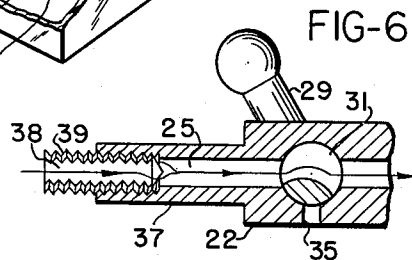


FIG-6

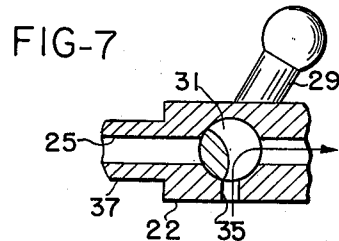


FIG-7

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FIG-3

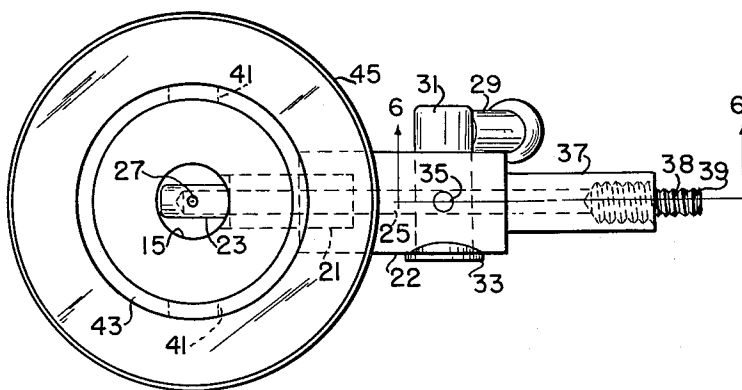


FIG-2

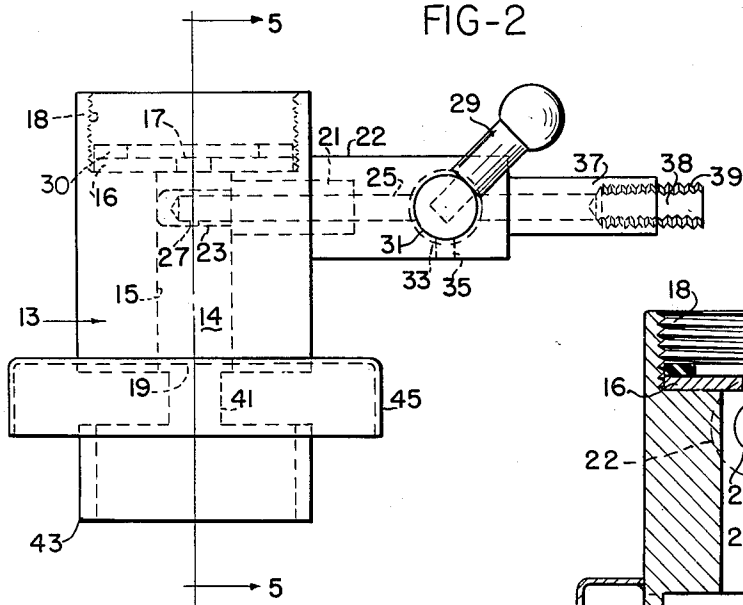
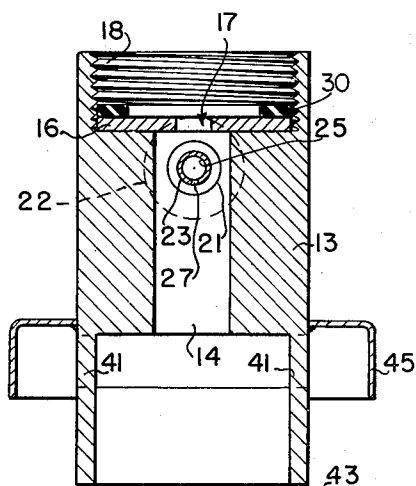


FIG-5



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2,728,609

JET DISPENSER

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Application June 16, 1952, Serial No. 293,718

6 Claims. (Cl. 299—84)

This invention relates to a jet dispenser and particularly to a dispenser for liquid cleansing materials.

This application is a continuation-in-part of application of Lou Pollock and Harold C. Wald, Serial No. 266,956, filed January 17, 1952, assigned to the same assignee as the present invention.

It is a primary object of this invention to provide a dispenser for liquid cleansing materials, such as liquid soaps, disinfectants, detergents and sanitizing solutions, which dispenser itself meets the most rigid of sanitary requirements.

It is a particular object of this invention to provide a dispenser for liquid cleansing materials in which water and the cleansing material are intimately mixed.

It is an important object of this invention to provide a dispenser for liquid cleansing materials which inhibits the back flow of liquid cleansing material to a water pressure supply line upon sudden pressure drops in the supply line.

Another object of this invention is to provide a dispenser for liquid cleansing materials which in operation continuously purges itself of excess cleansing material.

These and other allied objects of the invention are attained by providing a jet nozzle dispenser which is attachable to a city or other pressure water line; the dispenser consists essentially of a body of metal defining an open ended chamber through which the water may flow. Positioned closely adjacent the opening through which the water enters the chamber under pressure is a conduit having an aperture opening into the chamber. This conduit is connected to a source of liquid cleansing material supply and upon flow of water through the chamber past the aperture a vacuum is created within the chamber and at the aperture causing liquid cleansing material to be drawn into the flowing stream of water.

The position of the aperture is preferably in the lower peripheral portion of the conduit and must be so related to the stream of flowing water that a vacuum pressure will be developed at the aperture; that is, the aperture must be so located as to not be subject to the entrance of water.

City or other pressure lines which supply the flow of water which occasion the flow of liquid cleansing material are frequently subject to sudden pressure drops, as for example when a heavy local drain is experienced due to the operations of the fire department or line breaks. Under such a circumstance the line pressure may drop materially and the inrush of air to a dispenser unit might well force some of the liquid cleansing material into the city line thereby causing contamination of the water supply.

The unit of invention is structurally adapted to avoid the possibility of such contamination. First, the conduit body preferably extends across the chamber closely adjacent the water entrance opening and the aperture thereof is remotely positioned from this water entrance opening. Secondly, the water entrance opening to the chamber is materially reduced in diameter over the supply

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line or cavity diameter adjacent the opening, and is also reduced over the chamber diameter into which the water is ejected. Thus the highest velocity and lowest static pressure of a moving fluid will be attained at this chamber opening. The relatively small size of this opening and consequent high jet velocity of the water aid the rapid establishment of vacuum pressure in the chamber in the normal operation of the structure, and also inhibits the flow of water or liquid cleansing material mixture to the supply line upon failure of pressure therein. In this connection the conduit aperture and the conduit itself should be small in diameter in order that only a small volume of air need be moved to occasion control of the liquid-cleansing material flow. However this conduit is larger than the small water entrance opening and virtually blocks off liquid flow from the lower portion of the chamber to the supply line upon the occasion of a sudden low pressure in the pressure line.

An additional feature lending to the cleanliness of the unit is attained by providing adjacent the lower chamber opening a ring member through which the water courses in the operation of the dispenser; surrounding the lower opening, the ring member and the spacing therebetween is a skirt portion and in operation the flow of water tends to cause air to be drawn over the ring into the flowing stream. When the water flow ceases air continues temporarily to be drawn over the ring in the wake of the water and accordingly the ring and lower exposed portions of the structure are freed of liquid cleansing material and water thereby.

The invention will be more fully understood by reference to the following detailed description and accompanying drawing wherein:

Figure 1 is a schematic view illustrating the device of invention mounted secured to a water pressure supply line;

Figure 2 is a front elevational view of the device of invention;

Figure 3 is a bottom plan view of the device of Figure 2;

Figure 4 is a right hand elevational view of the structure of Figure 2;

Figure 5 is a sectional view taken on line 5—5 of Figure 2;

Figure 6 is a fragmentary view partially in section of the valve structure taken on line 6—6 of Figure 3; and

Figure 7 is a view similar to that of Figure 6 with the valve in a closed position.

Referring to Figure 1 there is shown a basin 1 supporting a faucet 2 connected to a water pressure line 3. Mounted below the basin is a cabinet 4 having a metal container 5 of liquid cleansing material 6 the container being provided with a normally closed port 7 in the base thereof; a bubble tube 8, which may be more generally termed a suction line, is shown extending from the container 5 and closure assembly 10 in the top 11 of the container through wall 12 to the dispenser of invention indicated generally at 13. The top 11 of the container is open to the atmosphere and a flow of water through line 2 and dispenser 13 occasions a vacuum pressure to be applied to the liquid cleansing material 6 which rises to the dispenser and is ejected with the flowing water to the basin 1 for use.

The dispenser 13, as shown more clearly in Figures 2 and 3 comprises an upper cylindrical stainless steel body portion having a longitudinal chamber 14 defined by walls 15 and having a lower opening 19. A relatively large cavity in the upper body portion contains a metal disc 16, apertured as at 17 to provide a small opening between the cavity and chamber; disc 16 is held in place by a rubber washer 30 which fits snugly within the threaded wall 18 of the cavity. Disc 16 is accordingly readily removable and the size of opening 17 may therefore be changed by

simply changing discs. It is to be understood however that the walls of the chamber at the upper end could form opening 17 if so desired rather than utilizing the preferred disc.

Adjacent the upper opening 17 and between openings 17 and 19 a conduit or conduit casing 23 extends into and across the chamber 14, thus nearly blocking off opening 17 as may be seen from Figure 2. Water issuing from jet opening 17 may however readily stream over the conduit to opening 19. Preferably conduit 23 is so closely positioned that all water passing the jet opening must contact the conduit.

Conduit 23 is a continuation of bore 25 in stainless steel wing element 22 and bore 25 extends through valve 31 and nipple 37 and accordingly serves to convey cleansing liquid passing upwardly from the container 5. Within the chamber 14 conduit 23 is apertured as at 27 to permit ingress of the cleansing material into chamber 14 when suction is applied to aperture 27 and conduit 23. To accommodate the conduit 23, which is preferably of brass, the chamber wall and wing element are bored out as at 21 and the conduit 23 is fitted into the recess thus formed, which recess may preferably be somewhat larger in diameter than the conduit.

The valve in wing element 22 having handle 29 is provided with a member 31, rotatable with the handle 29; member 31 is slotted centrally as indicated in Figures 6 and 7 and in the Figure 6 position is adapted to permit the flow of cleansing material through the valve. As also indicated in Figures 6 and 7 a channel 35 extends upwardly through from the bottom through wing element 22 to the valve and in the closed position (Figure 7) for the passage of cleansing material, the interiors of conduit 23 and chamber 14 are connected to the atmosphere through channel 35.

A threaded metering body 39 having flat sides 39 engages in a threaded extremity of bore 25 and may be pre-set therein to meter the flow of liquid cleansing material which passes between body 39 and the wall of bore 25. Body 39 may where desired be eliminated and unrestricted flow up to the valve portion 31 may then take place upon the application of differential pressure to the liquid in container 5.

Returning to Figures 2, 3 and 5 a pair of oppositely disposed vertically positioned limbs 41 secure a ring member 43 to the body portion of dispenser 13. A depending skirt 45 bridges the spacing between the body ring member 43 and extends outwardly of and surrounds opening 19.

In operation, with city or other pressured water flowing through line 2, and with valve handle 29 in the Figure 7 position, the passage of water from the cavity to the small opening 17 creates a high velocity and the water jetting onto the conduit 23 past aperture 27 will create a low pressure condition in the chamber and at the aperture, and air will be drawn from the atmosphere through channel 35, bore 25 and conduit 23 flushing the same continuously. Water only will be obtained in basin 1 under this condition.

When a liquid cleansing material-water mixture is desired handle 29 is thrown to the Figure 6 position, thereby closing channel 35 and opening bore 25 to the supply of cleansing material. Under the influence of the low pressure in chamber 14, and the low pressure in conduit 23 created by the rapid flow of water past aperture 27, the cleansing material moves from container 5 and is mixed with the water stream, thus providing the detergent, disinfectant etc. as required in basin 1.

Liquid cleansing material will then be drawn through conduit 23 as long as the high velocity water flow persists and valve handle 29 is in the Figure 6 position. However as pressured water lines are subject to sudden decreases in pressure it is to be anticipated that the pressure in line 2 might fall while handle 29 is in the Figure 6 position. While the air of the atmosphere rushing into the

opening 19 would break the vacuum in the chamber and conduit and halt this cleansing material flow some small quantity of water and cleansing material in the chamber might normally be trapped by this air and carried towards opening 17. In the construction of invention flow to the opening 17 is inhibited by the presence of the conduit in the chamber and the proportionally small size of the opening 17. This feature of the invention is of great importance since as already noted, contamination of the water supply is prevented thereby.

In the normal operation of the structure of invention the mixture of water and liquid cleansing material will pass through opening 19 and ring 43 to the basin 1. As this mixed liquid flows through the spacing defined by ring 43 air will be drawn towards the spacing from below skirt 45; when the flow of water is terminated the air drawn through ring 43 tends to remove therefrom and from the upper portions 41 any liquid cleansing material or water clinging thereto. Thus the unit is maintained in a sanitary condition.

It will be understood that this invention is susceptible to modification in order to adopt it to different usages and conditions and accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

We claim:

1. In a jet dispenser for liquids, a body member comprising wall portions defining a chamber, the body member having open ends and being adapted for the flow of a first liquid between the ends, a conduit casing projecting transversely through a wall portion of the body member into said chamber adjacent one of said open ends, said conduit casing having a cross section larger than one said open end and spanning the opening of one said end, said conduit casing also having an aperture therein on the side thereof remote from one said end, the conduit and aperture being adapted for the flow of a second liquid through the aperture into the chamber, the conduit casing being constructed and arranged such that liquid coursing through said chamber in one direction from one said open end past said aperture creates a pressure drop in said conduit and liquid flow to one said open end in the opposite direction is inhibited by said conduit casing.

2. In a jet dispenser for liquids, a body member comprising wall portions defining a chamber having upper and lower centrally positioned open ends, a conduit casing extending diametrically into said chamber through a lateral wall portion thereof between said open ends and closely adjacent said upper open end and spanning the opening of the said end, said conduit casing having a cross-section greater than said upper open end and also having an aperture in the lower peripheral portion thereof the conduit casing being so constructed and arranged that liquid coursing through said upper chamber end to said lower end past said aperture creates a pressure drop in said conduit, and flow to said upper chamber end in the opposite direction being inhibited by said conduit casing.

3. In a jet dispenser for liquids, a body member comprising wall portions defining a chamber having upper and lower open centrally positioned ends, a conduit casing extending transversely into said chamber through a lateral wall portion thereof adjacent said upper open end and spanning the opening of the upper end, said conduit casing having a cross-section larger than said upper open end and also having an aperture in the lower portion thereof in line with the openings of said chamber, the conduit and aperture being adapted for the flow of liquid therethrough into the chamber, the conduit casing being constructed and arranged such that liquid coursing through said upper end to said lower chamber end past said aperture creates a pressure drop in said conduit and flow to said upper chamber end in the opposite direction being inhibited by said conduit casing.

4. In a jet dispenser for liquids, a body portion having an upper circular wall portion internally threaded for

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connection with a pressure line, said upper wall portion defining a cavity, said body portion having a lower circular chamber provided with a first opening in the lower portion thereof and connected with said cavity by a second and circular opening smaller in diameter than either said chamber or said cavity, and a conduit casing extending into said chamber through a wall portion thereof and spaced closely below said second opening and spanning the second opening, said conduit casing being greater in diameter than said second opening and having an aperture in a lower peripheral portion thereof and being so constructed and arranged that liquid coursing through said chamber in one direction from said second opening to said first opening past said aperture creates a pressure drop in said conduit and liquid flow to said second and circular opening in the opposite direction is inhibited by said conduit casing.

5. In combination in liquid mixing and dispensing apparatus, a body member comprising wall portions defining a chamber and having a first opening in an end wall of the body portion for the supplying of liquid to the chamber, a conduit casing projecting through a wall portion of the member into the chamber closely adjacent the first opening in said end wall and being of a cross section larger than the opening and spanning the opening, the said conduit having an aperture therein on a portion thereof remote from the first opening, the body portion also having a second opening for the escape of liquid from the chamber and the second opening being opposed to the first opening and on the side of the conduit remote from the first opening, the conduit and aperture therein being so constructed and arranged that

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liquid coursing through said chamber from said first opening past said aperture creates a pressure drop in said conduit and flow in an opposite direction to said first opening is inhibited by said casing.

6. In a jet dispenser, a body portion defining a chamber having upper and lower openings, an apertured conduit in said chamber adjacent said upper opening for connection with a source of a liquid detergent, spaced limbs extending downwardly from the body portion and supported thereby, a ring portion below said lower opening supported on said limbs and defining a spacing with the body portion; and a skirt above the bottom edge of said ring spaced from said body portion and spanning said spacing to provide a tortuous path for a flow of air upwardly under said skirt through said spacing over said ring and downwardly therethrough to remove any detergent or water clinging to the upper portions of said ring by the flow of air therepast.

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