

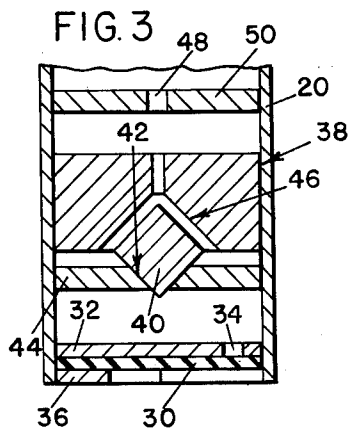
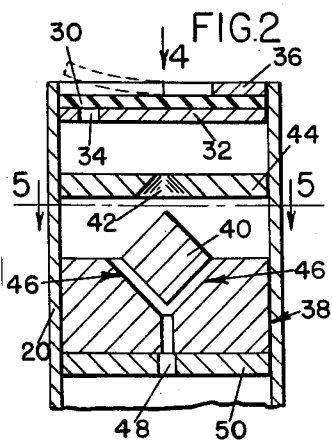
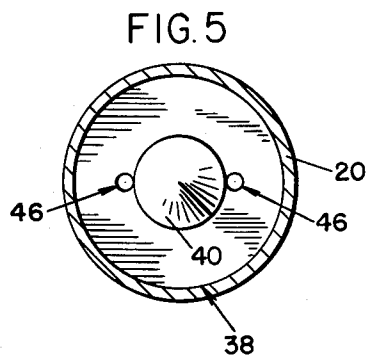
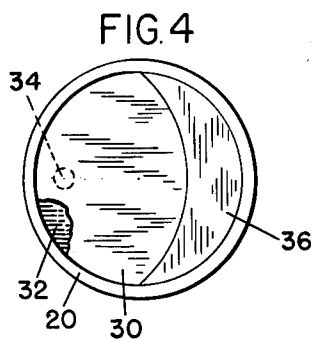
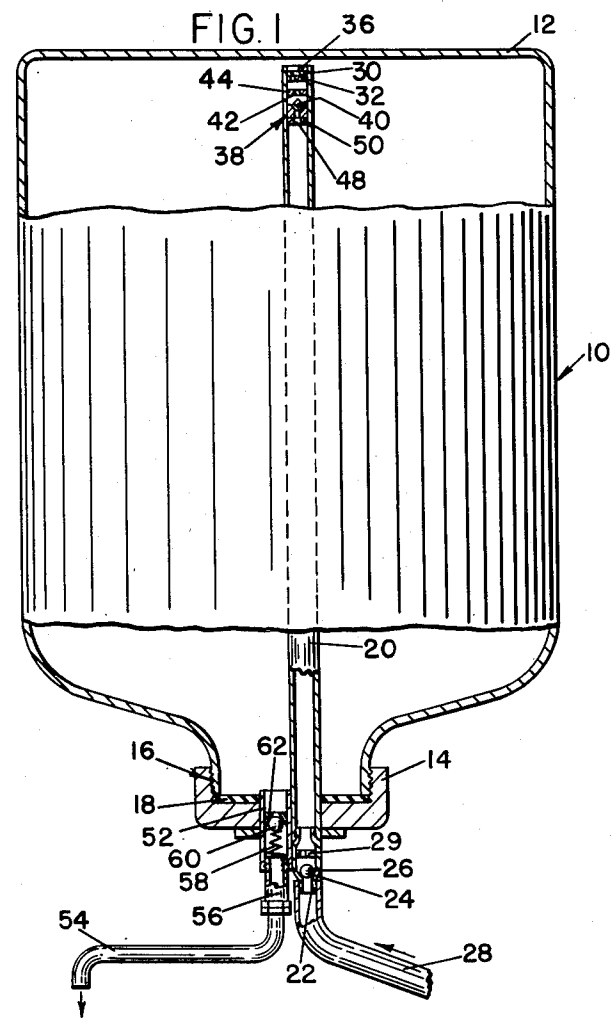
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DISPENSING DEVICE

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3,127,073

DISPENSING DEVICE

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This invention relates to a new and improved dispensing device particularly adapted for dispensing fluid materials such as for example detergents from a relatively large container say for instance a gallon jug with the jug in inverted position, together with means for preventing drip of the material being dispensed between periods of dispensing and including some kind of pressure means applied to the contents of the container in order to express the same in generally measured quantities through a nozzle at the lower end of the inverted container.

A further object of the invention resides in the provision of a device for the dispensing of materials from a more or less conventional container, by applying the novel device to the mouth of the container and inverting the same, supporting the container in any conventional or desired manner and applying some pump or air pressure means as for instance by a foot treadle in order to apply substantially instantaneous pressure to the contents of the container so as to express the same through a nozzle made and provided for the purpose, the invention providing convenient means for utilizing a relatively large conventional container normally stored in upright position but inverted and applied to a stand or the wall for quantities of material to be expressed therefrom, together with drip prevention means at the delivery point of the nozzle.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

FIG. 1 is a view in elevation with parts in section illustrating the invention in position for use;

FIG. 2 is an enlarged section of a valve utilized in the invention;

FIG. 3 is a similar view showing the valve of FIG. 2 in closed position;

FIG. 4 is a plan view, looking in the direction of arrow 4 in FIG. 2, and

FIG. 5 is a sectional view on line 5-5 of FIG. 2.

Referring to the drawings, the reference numeral 10 indicates generally a conventional container for the material which is to be dispensed. Normally of course the container rests on its bottom 12, it being shown inverted in FIG. 1. When it is inverted, it may be mounted on a wall or a stand in a conventional manner well known to those skilled in the art and when stored on its bottom 12 it may be provided with an ordinary closure cap. The present invention however contemplates the use of a special new and improved cap which is applied to the container before it is inverted and this cap is shown at 14 applied to container 10 in its inverted position ready for use.

The cap is screw-threaded in the normal manner to the container or applied by any other desired or convenient means. This cap is shown supplied with screw threads at 16 for securing the same to the neck of the container. A diaphragm or washer 18 is preferably used in order to prevent leakage. Whereas this cap may assume many different forms without departing from the scope of the invention, it is however provided with an elongated tube 20 which extends substantially but not quite to the bottom 12.

At the lower end of the tube as shown in FIG. 1, it is provided with a detachable fixture 22 which has converg-

ing sides at 24 forming a valve seat for a steel ball 26. This steel ball will be seen to rest on the valve seat 24 in the position of the parts in FIG. 1. The fixture 22 is supplied with a tube 28 by which means air pressure can be applied to dislodge the ball 26 and provide for air pressure in the tube 20. Means such as the stop at 29 is provided to prevent the steel ball from running down the tube when the container 10 is in normal upright condition.

The upper end of the tube as shown in FIG. 2, which is the lower end of the tube when the container is upright, is provided with sealing means for the prevention of access of material in the container 10 into the tube when the same is upright, as in FIG. 3.

There are two seals provided, one of which is a flat rubber flutter type valve best shown in FIG. 2, this valve taking up the entire interior of the tube 20 and being indicated at 30. A shelf or rest 32 with a relatively small hole 34, together with a clamping means at 36 is provided to hold this flutter valve in the solid line position shown in FIGS. 2 and 3 but when the air pressure from tube 28 is applied to tube 20, it will flow through the opening at 34 and cause the valve to flex as seen in dotted lines in FIG. 2, thus providing for air pressure in the interior of container 10. This valve however when in the upright condition of the container as shown in FIG. 3 aids in preventing the entrance of material in the container into the tube 20.

There is another seal provided which acts by gravity. This is a cylindrical valve body member generally indicated by the reference numeral 38 and preferably metallic. This member is provided with an extending conical member 40 which fits a valve seat or the like 42 surrounding an opening in a fixed member 44 extending across the tube 20. The valve body 38 rests in the FIG. 2 position by gravity and opens the opening. It also however rests in the position of FIG. 3 by gravity, closing the opening, the FIG. 3 position showing the situation when the container is upright and the FIG. 2 position when it is as shown in FIG. 1, inverted for dispensing purposes. The conical surface on the member 40 will fill the opening at 42 as shown in FIG. 3 and if any material from the container should enter into the space between the partition 44 and that at 32, the gravity actuated valve body 38 will prevent any further progress of this material upwards in tube 20.

The valve body 38 is provided with a passage generally indicated at 46 and this communicates with an opening at 48 in a rest member 50 fixedly mounted in the tube 20 so that when the parts are in the FIG. 2 position, the air will rise through opening 48 and passages 46 through the valve member seat at 42 and thence through opening 34 into the container 10. However in the FIG. 3 position the passages 46 are completely blocked off by member 44.

There is another tube 52 adjacent to the lower end of tube 20 in FIG. 1 and this provides the dispensing opening of the device. A nozzle of any description 54 can be utilized and this can be detachably mounted with respect to a fixture 56 or in any other way to the tube 52. A spring 58 normally maintains a ball valve 60 upwardly in FIG. 1 in closed position against a valve seat 62 so that the drip is completely cut off at any time except when air pressure is applied to the contents of the container when in the inverted position of FIG. 1.

Whenever the air pressure is applied by any means desired such as an air pump, foot pedal, etc., to tube 28, the air goes up the tube and into the container 10, the steel ball 26 acting as a cut-off valve to prevent the pressure from falling back. Air pressure going up the tube proceeds through the valve body 38 and the flutter valve

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as described and is applied to the contents of the container at the now top of the container, the container being inverted as in FIG. 1. As the shot of air pressure pushes the steel ball 60 downwardly, a charge of the contents of the container 10 is expressed through the nozzle 54 but as soon as this air pressure is expended, spring 58 causes ball 60 to close, the valve at 62 thus cutting off any possible drip.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A dispensing apparatus comprising a container for holding material to be dispensed with the container inverted but stored normally in upright condition, said container having an opening at the top thereof through which the container may be filled, a cap for closing said opening, an elongated air-pressure supplying tube mounted on said cap and extending from the exterior of the container interiorly thereof to a point near the bottom of the container, gravity operated sealing means adjacent the end of the tube near the bottom of the container preventing entry of material in the container into said tube when the container is upright, said container being inverted for the dispensing action, a separate dispensing nozzle on the container adjacent the opening, said nozzle being open to the container adjacent the cap, an exterior source of air pressure for said tube for applying pressure through the gravity operated sealing means to the container at the top thereof when inverted, said air pressure forcing the container contents downwards through said dispensing nozzle.

2. A dispenser as recited in claim 1 including a normally closed valve associated with said dispensing nozzle and normally maintaining the same closed, said normally closed means yielding under conditions of pressure on the contents of the container to open and allow the expression of a charge of material in the container through the nozzle.

3. The dispenser as recited in claim 1 wherein the sealing means comprises a normally closed one-way valve, said normally closed valve yielding under conditions of pressure in the tube to allow the pressure in the tube to escape past the sealing means into the container.

4. The dispenser as recited in claim 1 wherein the sealing means comprises a normally closed one-way valve, said normally closed valve yielding under conditions of pressure in the tube to allow the pressure in the tube to escape past the sealing means into the container, said valve comprising a flexible flat valve member, a partition in the tube upon which the flat valve member rests, said partition having an opening therein for the passage of air therethrough to impinge upon the flat valve member and flex it to open position.

5. The dispenser as recited in claim 1 wherein said sealing means comprises a fixed partition having an opening therein and gravity actuated means for closing the opening in the partition when the container is upright and retreating from the partition when the container is inverted.

6. The dispenser as recited in claim 1 wherein said sealing means comprises a fixed partition having an opening therein and gravity actuated means for closing the opening in the partition when the container is upright and retreating from the partition when the container is in-

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verted, said gravity actuated means comprising a movable body, a projecting member thereon for closing said partition opening in one position of the container but falling away from the fixed partition by gravity in the inverted position of the container.

7. The dispenser as recited in claim 1 wherein said sealing means comprises a fixed partition having an opening therein and gravity actuated means for closing the opening in the partition when the container is upright and retreating from the partition when the container is inverted, said gravity actuated means comprising a movable body, a projecting member thereon for closing said partition opening in one position of the container but falling away from the fixed partition by gravity in the inverted position of the container, said projection and partition opening being complementary in shape and being beveled to interfit.

8. A dispenser for fluids comprising a storage container for the fluids normally in upright position, said container having a top opening, said container being inverted for the dispensing operation, a cap for the container opening, an elongated tube mounted on said cap and extending through the container close to the bottom thereof, means at the end of the tube close to the bottom of the container providing a seal guarding against entrance of the contents of the upright container into the tube, means providing for passage of air through said sealing means from the tube into the container, means providing air under pressure for the tube from a point exterior of the container, and a dispensing nozzle for the container, said nozzle being separate from the tube and including a normally closed valve yielding to open to dispense a charge of the contents of the container upon the application of air pressure through the tube and into the container, the tube serving to apply the pressure to a point at the bottom of the container which is at the top when the container is inverted.

9. A dispenser for fluids comprising an open-top container normally in upright position but being inverted for the dispensing operation, a cap for the container, an elongated tube mounted on said cap and extending into the container, means at the inner end of the tube providing a seal guarding against entrance of the contents of the container into the tube, means providing for passage of air through said sealing means from the tube into the container, means providing air pressure for the tube, a dispensing nozzle on the cap, said nozzle being separate from the tube and including a valve yielding to dispense the contents of the container upon the application of air pressure through said tube, and a normally closed valve for the air pressure means, said valve being opened by the air pressure and said valve being located at the exterior end of said tube as respects said container.

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