Feb. 26, 1963 C. WOLFSON ETAL 3,079,048

NON-DRIP VALVES FOR PRESSURIZED CONTAINERS

Filed Sept. 7, 1960

FIG. 1

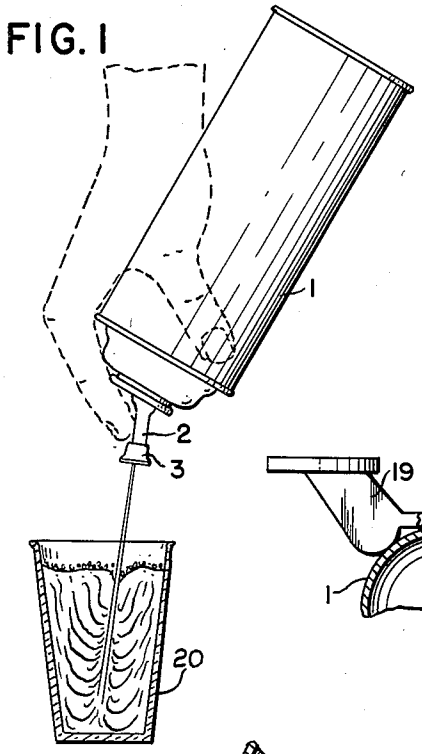


FIG. 2

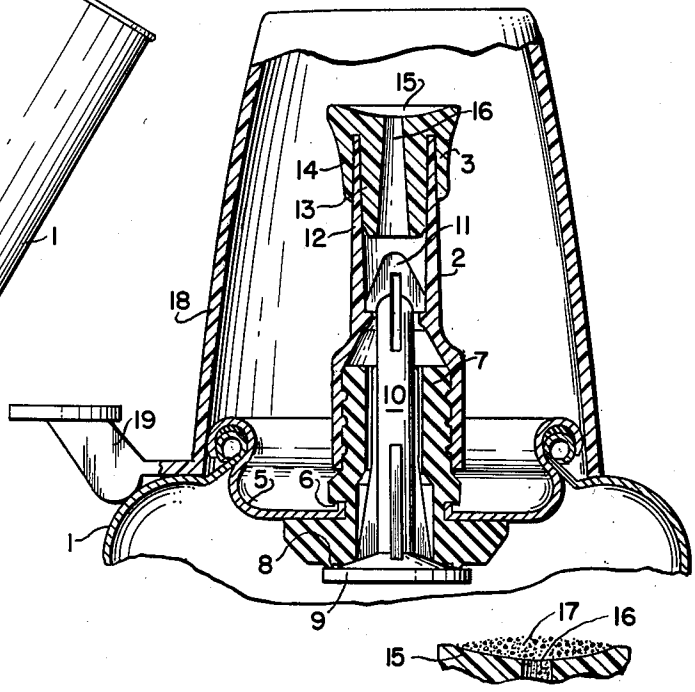


FIG. 4

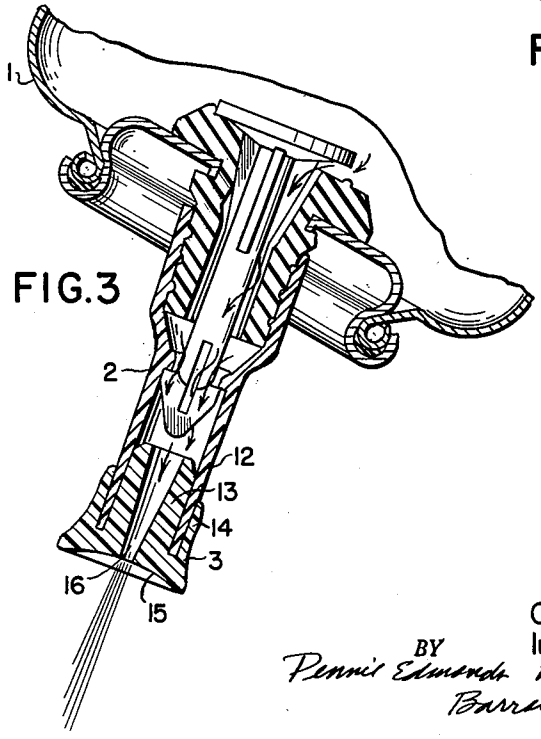


FIG. 3

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NON-DRIP VALVES FOR PRESSURIZED CONTAINERS

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2 Claims. (Cl. 222—108)

This invention relates to improvements in valves of the tilting or "nozzle down" type for use with pressurized containers, and to containers having such valves combined therewith.

The invention relates more particularly to non-drip valves, for use in pressurized containers for dispensing syrups, etc. into an aqueous liquid such as milk or water to produce a self-mixed beverage or other product, in which a tilting or "nozzle down" type of valve is provided with a discharge orifice of small size for discharging a small high-velocity jet downwardly with an aqueous liquid for self-agitation of the liquid, and to pressurized containers with such valves. Such pressurized containers and valves are described in the application of Fox and Palley Serial No. 9,839, filed February 19, 1960, now Patent No. 2,977,231.

In such tilting valves the valve and valve seat are located inside the container, and have an outwardly extending hollow member for tilting the valve to open it and for discharge of liquid through the hollow member. When such valves are provided with a restricted discharge orifice at the end of the hollow tilting member, and when the valve is open to discharge the liquid downwardly and the valve then closed, flow of liquid into the hollow member is shut off by the closing of the valve but the expansion of the gas contained in the liquid between the valve and the discharge orifice results in the formation of a few drops of liquid which overflow the end of the valve and drop back down over the outside of the tilting member, when it is turned into its upright position.

In the improved tilting valves of the present invention, the valves are provided at the discharge end of the tubular member, and around the restricted discharge orifice, with a small cup-like receptacle which will hold the few drops of expanded liquid and keep it from dripping back over the tubular member. The liquid so collected in the receptacle can readily be rinsed off under a faucet, making the valve ready for reuse when needed.

The invention will be further described in connection with the accompanying drawings which illustrate one form of tilting valve, and one form of container, embodying the invention.

In the drawings:

FIG. 1 illustrates, somewhat conventionally and diagrammatically, the use of a pressurized container having the improved valve combined therewith, and the discharge of a high velocity stream therefrom into a glass of water or milk to effect agitation thereof;

FIG. 2 shows in section the upper end of the container and one form of valve construction embodying the invention;

FIG. 3 shows a similar portion of the container and valve in section and in operating position; and

FIG. 4 is an enlarged sectional view of the discharge end of the valve tilting device and receptacle, with the liquid held thereby.

In the drawing, a pressurized container 1, such as a standard 16 ounce container, has a tilting discharge valve the outer tilting portion of which is indicated at 2, this valve being mounted in the closure 5 at the top of the container. A flexible rubber member 7 is mounted in an opening 6 in this closure and has a valve seat 8 against

which the valve member 9 is normally held by the pressure in the container. This valve has a valve stem 10 extending up through the member 7 and terminating in a portion 11 located in the upper portion 12 of the tubular member 2, the lower member of which tubular member surrounds the flexible rubber member 7.

The upper portion 12 of the tubular member 2 has mounted thereon a member with an insert 13 extending inside the tubular member 12 and a portion 14 extending on the outside of this tubular member. This member has a restricted discharge orifice 16 through which the liquid is discharged when the valve is open, and it has a depression or cup-shaped portion 15 at the end of the member and surrounding the discharge opening which serves as a receptacle for the few drops of liquid forced out of the restricted orifice by the expansion of the liquid contained in the tubular member when the valve is closed.

In the operation of the valve and pressurized container, the tilting of the tubular member, as illustrated in FIGS. 1 and 3, results in the opening of the valve 9 and the forcing of the pressurized liquid out through this valve and through the tubular tilting member and through the small orifice 16 in the form of a high velocity jet, as illustrated in FIGS. 1 and 3.

When the valve is closed, the liquid contained in the tubular member, between the valve and the discharge orifice, will continue to expand to a limited extent until pressure is equalized, and this causes a few drops of liquid to continue to flow out through the small orifice. The provision of the recess or cup-like portion surrounding the discharge orifice holds these few drops and prevents them from running down over the tubular member when the container and its valve are turned from the downwardly discharging position of FIGS. 1 and 2 to the vertical position of FIG. 2.

After expansion of the liquid in the tubular tilting member has ceased, the few drops of liquid contained in the recess 15 can readily be washed off under a faucet, leaving the valve where it is again ready for reuse. The size of the restricted opening in this discharge valve can be somewhat varied, with variation in the viscosity of the liquid in the container, but in general, for self-agitating jets, it is of the order of magnitude of 0.05 to 0.09 inch in diameter.

A protective and removable cover or cap 18 is shown for covering and protecting the discharge valve during shipping and storage and between periods of use. This cap is readily made of flexible plastic material with an integral side extension or handle 19 for loosening and removing the cover when desired.

We claim:

1. A tilting valve structure of the "nozzle down" type having a valve and valve seat to be located within and directly connected to the upper gas containing portion of a pressurized container and for discharging the liquid contents of the container downwardly therethrough when the container is inverted, and a tubular tilting member for tilting the valve to open it when the container is inverted, said tilting member having a restricted orifice at its discharge end, a shallow cup-shaped receptacle contiguous to and flaring outwardly from the discharge orifice for holding liquid which expands beyond the discharge orifice in the tubular member when the valve is closed and when the container is in its upright position with the tubular tilting member extending upwardly from the container.

2. A pressurized container having a tilting valve structure of the "nozzle down" type, said pressurized container having a liquid and a propellant gas therein and having a tilting discharge valve with a regulated small discharge

orifice, the valve and valve seat being located in the container and directly connected to the upper gas-containing portion of the container and being directly connected when the container is inverted with the liquid in the container and the tilting operating member for the valve being tubular and having a passage therethrough from the valve to the discharge orifice for discharging liquid downwardly therethrough and through the discharge orifice, and said tubular member having a shallow cup-shaped receptacle at the end of the tubular member contiguous to and flaring outwardly from the discharge orifice and arranged to hold liquid which expands in the tubular member when the valve is closed and when the tubular member extends upwardly from the container.

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