

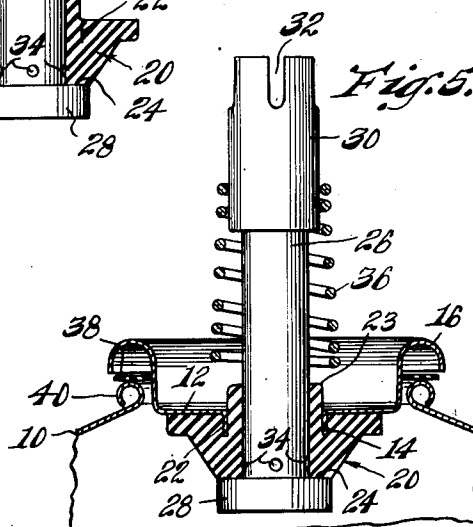
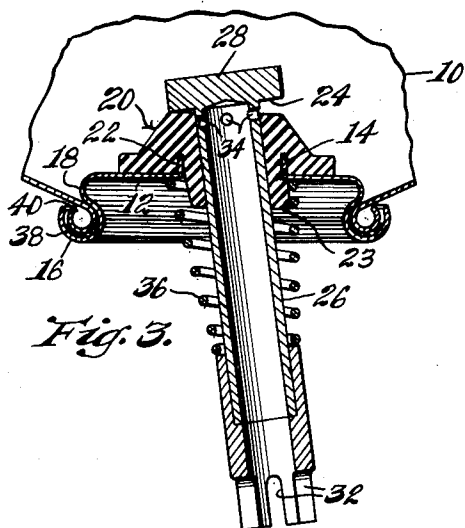
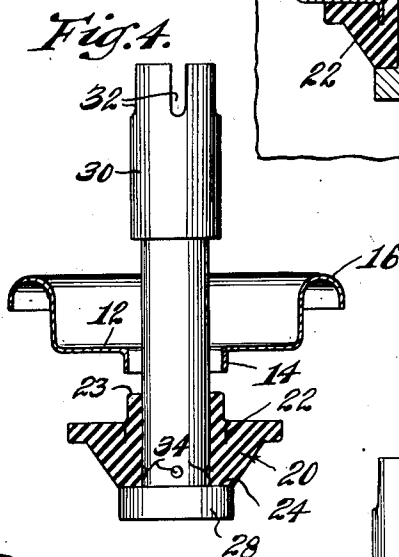
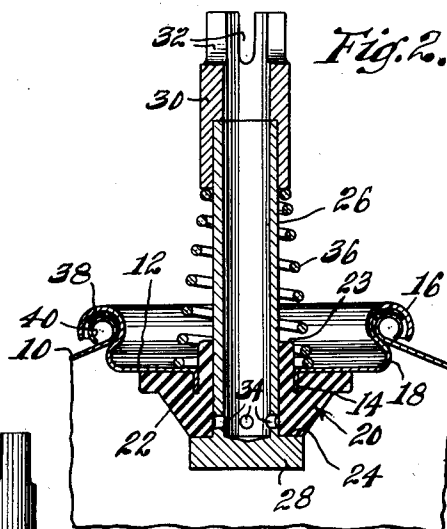
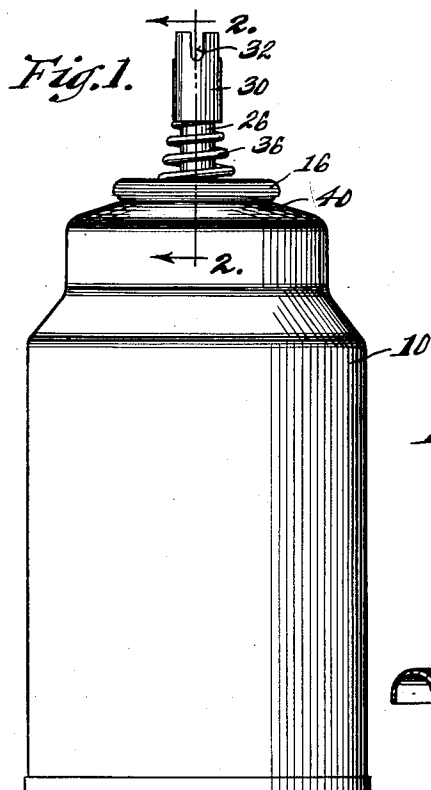
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H. F. TOMASEK ET AL

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DISPENSING VALVE FOR LIQUID AND GAS CONTAINERS

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Inventors.
Herbert F. Tomasek,
and Frank Zimmer,
By Bain & Freeman
Attys.

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DISPENSING VALVE FOR LIQUID AND GAS CONTAINERS

Herbert F. Tomasek and Frank Zimmer, St. Louis, Mo., assignors, by mesne assignments, to Reddi-Wip, Inc., St. Louis, Mo., a corporation of Missouri

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8 Claims. (Cl. 222—394)

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This invention relates to a dispensing valve which is inexpensive to manufacture, the parts being few and readily assembled with a minimum of special tools, the valve being part of a lid structure for a container adapted to contain liquid such as cream and gas under pressure such as nitrous oxide, whereby opening of the valve will result in expulsion of the cream in the form of "whipped" cream.

One object of the invention is to provide a valve structure which is formed of a resilient insert in the opening of a wall of a liquid and gas container and a valve stem extending through the insert in such manner that when the valve is operated by the simple expedient of tipping the stem from its normal position in relation to the insert, the contents of the container will find their way into the stem for discharge therefrom.

Another object is to provide a valve structure assembled on a lid for a container so that when the lid is connected to the container the valve is thereby mounted and sealed in relation to the container.

Still another object is to provide a valve construction that can be quickly assembled by thrusting the stem through a resilient insert, positioning the insert through an opening in a lid or the like, and slipping a spring over the head to a position thereunder for normally tending to close the valve.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our dispensing valve whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of our valve structure mounted on a container.

Figure 2 is an enlarged sectional view through the valve structure and the top of the container as taken on the line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 2 showing the container turned over and the valve being operated for discharging the contents of the container, and

Figures 4 and 5 are sectional views showing steps in the assembly of the parts of our valve structure.

On the accompanying drawing we have used the reference numeral 10 to indicate a container such as one made of steel or tin plate and of about the same thickness as an ordinary "tin can." We have found that containers of this

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kind have sufficient strength to sustain an internal pressure of up to 100 pounds per square inch which is sufficient for the purpose of containing liquid, and a gas under pressure for discharging the liquid.

A lid 12 is provided for the container 10 and this lid has a central opening defined by a downturned annular flange 14. The lid also has an upwardly offset annular flange 16 and this flange and the flat portion of the lid are connected together by a vertical annular wall 15 as shown in Figure 4. The vertical wall 15 however is adapted to be bulged outwardly as at 18 in Figure 2 for connecting the lid to the container as will hereinafter be described in detail.

A resilient insert 20 of rubber, neoprene or the like is provided having an annular groove 22 therein (see Figure 4) which groove is adapted to receive the flange 14 as in Figures 2 and 5. The insert 20 also has a lower seating face 24.

A valve stem 26 extends through a central opening of the insert 20, which opening is surrounded by a hub 23 positioned inside the flange 14. The stem 26 has a valve head 28 normally seated against the face 24 of the insert 20 by a spring 36 and is provided with port openings 34 adapted to be opened as in Figure 3 for permitting discharge of liquid from the container 10. The spring is interposed between the lid 12 and a sleeve 30 on the valve stem 26. The sleeve 30 is provided with slots 32 for the purpose of improving the foaming action of the liquid as it discharges from the container 10.

Before describing the operation of our dispensing valve we will briefly describe the steps in the assembly of the parts thereof. Referring to Figure 2, the stem 26 and the sleeve 30 are connected together by slipping the stem into the sleeve and soldering the two together. Referring to Figure 4 the stem may then be associated with the insert 20 by pushing the sleeve 30 upwardly through the central opening of the insert.

The insert may then be positioned in relation to the lids 10 as in Figure 4 following which it is pushed upwardly to the position of Figure 5 so that the flange 14 of the lid enters the annular groove 22. This provides a seal at this point in a simple yet effective manner.

The spring 36 is then readily associated with the valve structure by pushing it down over the head 30 as shown in Figure 5, the upper coils of the spring of course expanding as illustrated and when they are pushed sufficiently far the upper end of the spring will snap under a shoulder surrounding the stem 26 which should

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der is formed by the lower end of the sleeve 30. The parts are then in the assembled position of Figure 2.

Referring again to Figure 5, a gasket is shown at 38. This may be made of resilient material such as rubber or neoprene and the lid 12 with its assembled valve structure is placed on the container 10 after the gasket 38 is placed on an annular rim 40 at the upper end of the can.

The lid is then pressed downwardly to the position of Figure 2 and a suitable roller-type expanding tool used to expand the vertical wall 15 of the lid 12 in Figure 4 to the position illustrated at 18 in Figure 2. This tool would have a hole at its center to clear the sleeve 30.

The operation just described compresses the gasket 38 and thereby effects a seal between the container and the lid. This seal of course is effected after the desired quantity of liquid such as cream is placed in the container 10.

The container 10 with its liquid contents and the valve assembly are now gas tight for the introduction of the proper gas. Nitrous oxide for instance may be used in connection with cream and is introduced by forcing the stem 26 downwardly from the position of Figure 2 which opens the ports 34 to the interior of the container 10 below the face 24 of the insert 20.

The container is then charged with the gas, for instance at a regulated pressure of 90 pounds per square inch, the container being shaken during the process after which the gas line is disconnected and the valve head 28 permitted to seat at 24 under the action of the spring 36. The container is again shaken to cause the cream to absorb more of the gas which causes a pressure drop to about 60 to 70 pounds per square inch and conditions the cream for subsequent dispensing.

When it is desired to dispense the cream the container 10 is inverted as in Figure 3 so that the valve points downwardly and the cream then surrounds the valve head 28 to prevent the discharge of gas instead of cream. It is now merely necessary to push the valve stem 26 sidewise as in Figure 3 by applying thumb pressure against the sleeve 30 as indicated by the arrow.

This results in distortion of the resilient insert 20 with one side of the head 28 unseating in respect to the face 24 of the insert, thereby opening one or more of the ports 34 to the interior of the container so that the cream may pass outwardly through the hollow stem and sleeve and be discharged downwardly from the sleeve. The cream, having absorbed a considerable proportion of the nitrous oxide gas, tends to expand as its pressure drops to atmospheric, and this results in the cream having a consistency comparable to ordinary whipped cream.

While we have described the valve structure in connection with the dispensing of cream it of course can be used for other liquids and of course other gases under pressure can be used for providing the dispensing pressure. Our valve structurally is comparatively simple to manufacture, involving but a few parts and simple assembly operations that consist merely of putting together the parts with the exception of the final operation of connecting the lid and its valve to the container. A special tool or machine is used for that purpose and the parts are thereupon assembled in a gas-tight manner so that the entire assembly is then ready for being charged with gas.

A dispensing valve and container combination

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of the character disclosed is particularly adaptable to be filled and merchandised by dairies and the like, the entire container and valve being sufficiently simple that the units can be provided as an expendible item, that is they can be made economically enough to permit a single "throw-away" use. At the same time they provide attractive units for sale as compact whipped cream containers and dispensers capable of producing a quantity of whipped cream having much more volume than the original container itself.

Some changes may be made in the construction and arrangement of the parts of our invention without departing from the real spirit and purpose thereof, and it is our intention to cover by our claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

We claim as our invention:

1. A dispensing container comprising a container portion having a substantially flat wall penetrated by a hole, a generally tubular elastic member having a tubular sleeve extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the container around the hole and with its outer edge unsecured, a hollow-stem valve member extending through and movable in the elastic member with its valve portion closing against the elastic member on the inside of the container and its discharge portion extending outside the container, the hollow stem being rockable laterally to angularly displace the valve portion, and a compression spring around the extending discharge portion resiliently urging the valve to a closed position and urging the flange-like enlarged portion of the elastic member into flatwise contact with the flat container wall around the hole.

2. A dispensing container comprising a container wall portion penetrated by a hole, a generally tubular elastic member having a tubular sleeve fitted and extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing against the inner face of the wall of the container around the hole, a hollow-stem valve member extending outwardly through and movable in the elastic member having a discharge opening at its outer end and being provided with a valve head on its inner end closing axially against the elastic member on the inside of the container, the discharge portion of the hollow stem having an inwardly faced shoulder, and a tapered coiled spring fitted around the extending discharge portion with its large end adjacent to the wall of the container and its smaller end engaging against the shoulder whereby said spring resiliently urges the valve to a closed position against the elastic member and urges the elastic member into contact with the inner side of the container wall around the hole.

3. A dispensing container comprising a container portion having a substantially flat wall penetrated by a hole, a generally tubular elastic member having a tubular sleeve extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the container around the hole and with its outer edge unsecured, a hollow-stem valve member extending through and movable in the elastic member with a solid valve portion at one end closing against the elastic member on the inside of the container and a discharge portion extending outside of the container, said stem being rockable laterally to angularly dis-

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place the valve portion and having a fluid outlet passage through said stem adjacent to the valve portion, and a compression spring around the extending discharge portion resiliently urging the valve to a closed position and urging the flange-like enlarged portion of the elastic member into flatwise contact with the flat container wall around the hole.

4. A dispensing container comprising a container portion having a substantially flat wall penetrated by a hole, a generally tubular elastic member having a tubular sleeve extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the container around the hole and with its outer edge unsecured, a hollow-stem valve member having a stem extending through and movable in the elastic member with an enlarged valve portion closing against the inner side of the elastic member on the inside of the container and a discharge portion extending outside of the container, said stem being rockable laterally to angularly displace the valve portion and having an outlet through the side of said stem uncovered when the valve is moved from a closed position, and a compression spring around the extending discharge portion resiliently urging the valve to a closed position and urging the flange-like enlarged portion of the elastic member into flatwise contact with the flat container wall around the hole.

5. A dispensing container comprising a container portion having a substantially flat wall penetrated by a hole, a generally tubular elastic member having a tubular sleeve extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the container around the hole and with its outer edge unsecured, a hollow-stem valve member extending through and movable in the elastic member with its valve portion closing against the elastic member on the inside of the container, the hollow stem being rockable laterally to angularly displace the valve portion, and its discharge portion extending outside of the container, said discharge portion having an inwardly faced shoulder, and a coiled spring around the extending discharge portion exerting yieldable force between the container and shoulder resiliently urging the valve to a closed position and urging the flange-like enlarged portion of the elastic member into flatwise contact with the flat container wall around the hole.

6. A dispensing container comprising a container portion having a substantially flat wall penetrated by a hole, a generally tubular elastic member having a tubular sleeve extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the container around the hole and with its outer edge unsecured, said elastic member being recessed in that portion contacting the container at the hole, a hollow-stem valve member extending through and movable in the elastic member with its valve portion closing against the elastic member on the inside of the container and its discharge portion extending outside the container, said stem being rockable laterally to angularly displace the valve por-

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tion, and a compression spring around the extending discharge portion resiliently urging the valve to a closed position and urging the flange-like enlarged portion of the elastic member into flatwise contact with the flat container wall around the hole.

7. A dispensing container for liquid under high pressure comprising a container portion having a substantially flat wall portion penetrated by a hole, an elastic member having a tubular sleeve fitted and extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the flat wall of the container around the hole, a hollow-stem valve member extending through and movable in the elastic member having a valve head portion on its inner end and a discharge portion extending outside of the container, the elastic member being unsecured to the container and having on its inner face a valve seat engageable with the valve portion, the hollow stem being rockable laterally and angularly within the elastic member to angularly displace the valve portion from its seat, and a compression spring around the extending discharge portion of the hollow-stem valve member urging the valve portion against the seat and urging the flange-like enlarged portion axially into flatwise bearing against the container wall.

8. A dispensing container comprising a container portion having a substantially flat wall penetrated by a hole, an elastic member having a tubular sleeve portion fitted and extending outwardly through said hole and having a flange-like enlarged portion on the inner side bearing axially flatwise against the inner wall of the container around the hole, a hollow-stem valve member fitted and extending outwardly through and movable in the elastic member and having a valve portion on its inner end closing against the elastic member on the inside of the container, said hollow-stem valve member having a discharge end outside of the container and having a lateral outlet passage adjacent to the valve portion, the hollow stem being angularly rockable laterally to angularly displace the valve from closure on the valve seat of the elastic member and thus uncover the outlet passage, and a coiled spring interposed and exerting yieldable force between the container and the outer portion of the hollow stem thus closing the valve against the valve seat and the elastic member and urging the flange-like enlarged portion into flatwise contact with the flat container wall around the hole.

HERBERT F. TOMASEK.
FRANK ZIMMER.

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