June 27, 1939. W. DALTON 2,164,172

LIQUID-DISPENSING APPARATUS

Filed April 30, 1938

Fig. 1.

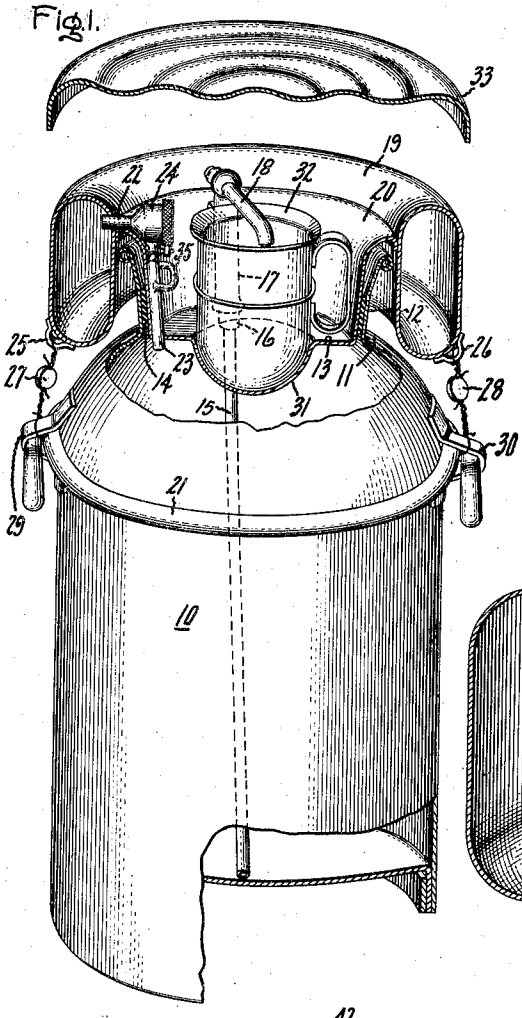


Fig. 2.

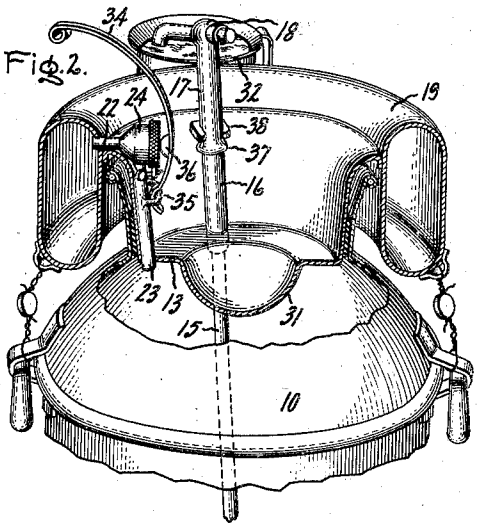


Fig. 4.

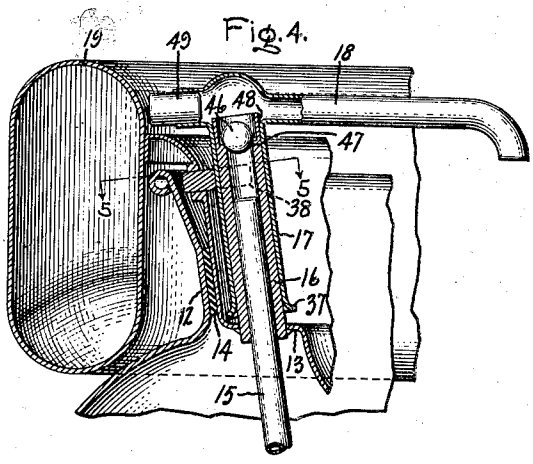


Fig. 3.

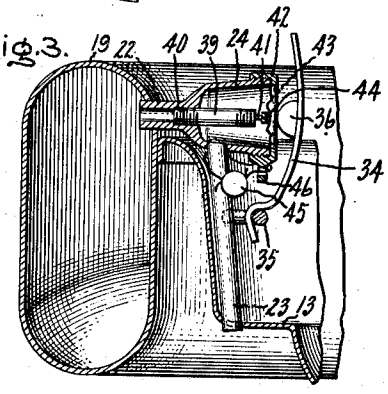
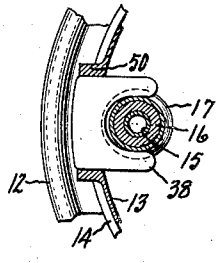


Fig. 5.



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William Dalton,
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Patented June 27, 1939

2,164,172

UNITED STATES PATENT OFFICE

2,164,172

LIQUID-DISPENSING APPARATUS

William Dalton, Schenectady, N. Y., assignor to General Electric Company, a corporation of New York

Application April 30, 1938, Serial No. 205,296

6 Claims. (Cl. 221—67)

My invention relates to liquid dispensing apparatus, and particularly to apparatus for the dispensing of beverages such as milk.

It is frequently desirable to provide beverage dispensing apparatus which may be sealed completely when it is filled and of a construction such that it need not be opened to the atmosphere in order to remove the contents. It is also desirable that the apparatus can be provided with indicating seals of the type which must be broken before access may be gained to the interior thereof. Furthermore, it is necessary that apparatus utilized for dispensing beverages, and particularly milk can be cleaned and sterilized easily and thoroughly. Accordingly, it is an object of my invention to provide a liquid dispensing apparatus of simple construction and with a minimum number of moving parts which may be completely sealed against access from the outside and which may readily be cleaned and sterilized.

Another object of my invention is to provide an improved liquid dispensing apparatus utilizing a compressed fluid such as air for effecting the dispensing of liquid and which is compact and requires no external connections for supplying compressed air or other fluid during the dispensing operation.

A further object of my invention is to provide an apparatus for dispensing beverages such as milk in which all the parts of the dispensing apparatus are arranged on a cover adapted for use with liquid containers such as milk cans, of conventional construction.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention, reference may be had to the accompanying drawing, in which Fig. 1 is a perspective view partly in section of a liquid dispensing apparatus embodying my invention; Fig. 2 is a perspective view of the upper portion of the apparatus shown in Fig. 1 with the apparatus in position for dispensing liquid therefrom; Fig. 3 is an enlarged sectional view of the control valve of the apparatus shown in Fig. 1; Fig. 4 is an enlarged sectional view showing the dispensing spout and discharge conduit of the apparatus shown in Fig. 1; and Fig. 5 is a sectional view on the line 5—5 of Fig. 4.

Referring now to the drawing, in Fig. 1 I have shown a can or container 10 of the conventional type commonly employed for shipping milk, the can being provided with an opening 11 at the top thereof for gaining access to the interior thereof. The opening 11 is surrounded by a flange 12 and a dish-shaped cover 13 is provided for sealing the opening, a gasket 14 of rubber or other suitable material being arranged between the cover 13 and the flange 12. A conduit 15 is provided in order to remove liquid from the container 10. The conduit 15 is provided with a large sleeve 16 extending through the cover 13, and over the sleeve 16 is fitted a slidable sleeve 17 formed as an integral part of an outlet spout 18. In order to provide a supply of air or other gas suitable for forcing liquid from the container, I provide an annular tank 19 secured to an upper flange 20 of the cover 13 and arranged on the exterior side of the flange 12. The tank 19 arranged in this manner lies within the boundary defined by the exterior cylindrical walls of the container 10 and is protected from striking against similar containers or other objects placed adjacent thereto by a heavy guard ring 21 surrounding the upper end of the cylindrical portion of the container 10. The tank 19 is designed to be of sufficient size that it will contain a charge of compressed fluid at a suitable pressure and which will be sufficient to force one entire filling of liquid out of the container. In order to provide communication between the tank 19 and the container 10 to discharge compressed air into the container, I provide connections 22 and 23 entering the tank and container respectively, and which may be placed in communication through a check-valve housing 24. The tank 19 is provided with sealing loops 25 and 26 so that seals 27 and 28 respectively, may be secured thereof and to handle loops 29 and 30 respectively, to seal the cover 13 to the container 10 in order that tampering may be detected. The cover 13 is provided with a depression 31 so that a measuring vessel 32 may be placed therein and supported in an upright position and a lid 33 is provided to be secured over the top of the tank 19 so that it encloses a space within the cover 13 within which are contained the measuring vessel 32, the spout 18 in its retracted position, and the valve housing 24. It is, therefore, evident that after the filling of the container the lid 33 may be secured in place so that all parts within the space enclosed will be kept clean during shipment.

In Fig. 2, I have shown the apparatus with the cover 33 removed and the spout 18 moved

upwardly from its retracted position within the cover to a position overhanging the cover for dispensing milk or other fluid, the spout being turned toward the outer edge of the container so that the measuring vessel 32 may be held at the edge of the container when it is filled. The sleeve 17 of the spout 18 is provided with a flange 37 which engages a U-shaped retaining bracket 38 mounted in the cover 13 and prevents the removal of the spout from the sleeve 16. An operating handle 34 is provided to unseat the check-valve within the casing 24 and thereby discharge compressed fluid from the tank 19 into the container 10 and effect a flow of fluid out of the container through the conduit 15 and the spout 18. The handle 34 engages a metal loop 35 secured to the connection 23 and is provided with a knob 36 for engaging a diaphragm in the check-valve casing in a manner to be described below. When it is desired to remove liquid from the container 10, the handle 34 is pushed downwardly and outwardly and compressed air or other fluid is admitted to the casing 10 through the connection 23 so that liquid is forced out of the casing through the spout 18.

The arrangement of the check-valve so that it may be used to control the dispensing of liquid from the container 10 is clearly shown in Fig. 3. Within the valve housing 24 is arranged a short tube 39 secured to the connection 22 by a threaded fitting 40 and in the tube is mounted a check-valve of the type commonly employed in the inner tubes for automobile tires, the stem of the valve being indicated at 41 where it extends from the end of the tube. The valve casing 24 is provided with a cap 42 to which is secured a flexible metal diaphragm 43 having a small block 44 at the center thereof for contacting the end of the stem 41 of the check-valve. When the diaphragm 43 is depressed by the knob 36 of the handle 34, the stem 41 is pushed into the tube 39 and unseats the check-valve thereby permitting compressed fluid to escape from the tank 19 and to flow through the valve housing and the connection 23 to the container 10. In order to charge the container 19 with compressed fluid, the cap 42 is removed from the housing 24 and a suitable source of compresserd fluid is connected to the outer end of the tube 39. After the tank has been charged to the desired pressure, the cap 42 is replaced and the wire of a seal 45 may be wound around the connection 23 and threaded through an eye 46 formed on the cap 42 so that any removal of the cap after filling may be detected.

The construction of the discharge spout 18 and its associated parts is clearly shown in Fig. 4. The sleeve 17 is slidable longitudinally of the sleeve 16 so that the spout 18 may be raised from its retracted position to the position shown in Fig. 2, the limit of its movement being determined by the abutting of the flange 37 against the U-shaped bracket 38. In order to prevent the admission of fluid to the container 10 through the spout 18, a ball 46 is provided to seat on a shoulder 47 formed by an enlarged bore 48 in the upper end of the sleeve 16. The spout 18 is provided with a plug 49 in the end opposite its open end and this plug may be removed for cleaning purposes. Furthermore the sleeve 17 may be removed from the sleeve 16 for cleaning by removing the retaining bracket 38 when the cover 13 has been removed from the container. As shown in Fig. 5, bracket 38 fits within a slot formed in a boss 50 in the side wall of the cover 13 and is freely slidable therein. When the cover is removed from the container, the bracket 38 may be pushed out and removed. When the cover is in place on the container, the bracket is held in position between the sleeve 17 and the upper portion of the flange 12 of the container.

When it is desired to fill the container 10 with a liquid to be dispensed, the container, the cover, and the dispensing control devices are thoroughly sterilized and a charge of thoroughly cleaned or sterilized air or other suitable gas is forced into the tank 19. The valve housing 24 is then closed by the cap 42 and sealed. The spout 18 and bracket 38 are secured in place, and after the container 10 has been filled with liquid, the cover 13 is placed in the opening 11 and pressed down so that the gasket 14 constitutes an effective seal. Thereafter, the seals 27 and 28 are secured in place in order that any subsequent tampering with the cover may be detected. The measuring vessel 32, cleaned and sterilized, is then placed in position in the support 31 and the spout 18 is placed in its retracted position as shown in Fig. 1. The cover 33 may then be secured over the tank 19 so that it encloses the spout and measuring vessel within the cover and prevents any accumulation of dust or other foreign matter on the top of the dispensing apparatus. The handle 34 may also be placed within the cover around the vessel 32 since it is arcuate in form and can be accommodated within the circular space surrounding the vessel. In this manner, all the parts necessary for the operation of the dispensing apparatus may be shipped with the container filled with milk or other beverage and may be kept clean until required for use. The several parts preferably are constructed of corrosion resistant materials such as stainless steel or chromium plated steel.

When the container has been received from the dairy or milk factory filled with homogenized milk, for example, and is ready for dispensing, the lid 33 is removed and the handle 34 hooked over the loop 35 in position for operation. In order to fill the measuring vessel 32, the handle 34 may be operated with the vessel and spout 18 in the positions shown in Fig. 1 without removing them from the top of the cover. However, it is preferable to move the spout 18 to its position as shown in Fig. 2 so that it overhangs the tank 19 and any milk dripping from the spout will fall outside the cover. When the handle 34 is operated, compressed air is admitted to the top of the casing 10 and forces milk out through the conduit 15 past the ball check-valve 46 and through the spout 18. When a sufficient quantity of milk has been dispensed the handle 34 is released and the flow of milk stops, the check ball 46 returning to its position on the shoulder 47. When the container is empty, the measuring vessel 32 and spout 18 may be returned to their original positions as shown in Fig. 1 and the cover 23 replaced so that the entire dispensing apparatus may be returned to the dairy for refilling.

While I have described an embodiment of my invention in connection with a milk can of conventional type, other applications will readily be apparent to those skilled in the art. I do not, therefore, desire my invention to be limited to the particular construction shown and described, and I intend in the appended claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A liquid dispensing apparatus comprising a container having an opening therein, a flange arranged about said opening, means including a removable dish-shaped cover arranged to fit within said flange for sealing said opening, means for supporting a measuring vessel within said cover, means including an annular tank secured to said cover and arranged about the exterior side of said flange for containing a fluid under pressure, a conduit extending through said cover and opening into said container adjacent the bottom thereof and having a discharge spout within said cover, means providing communication between the interior of said tank and the interior of said container for conveying fluid under pressure from said tank to effect a flow of liquid from said container through said conduit, means including a valve in said conveying means for controlling the discharge of fluid under pressure from said tank to said container to control the flow of liquid from said container, and a removable lid for enclosing said discharge spout and said valve and a measuring vessel within said cover.

2. A liquid dispensing apparatus comprising a container having an opening therein, a flange arranged about said opening, means including a removable dish-shaped cover arranged to fit within said flange for sealing said opening, means including a tank secured to said cover and arranged about the exterior side of said flange for containing a fluid under pressure, a lid for enclosing a space within said cover, a conduit extending through said cover and opening into said container adjacent the bottom thereof, said conduit terminating within the space enclosed by said lid, an outlet spout mounted on the upper end of said conduit and arranged to be movable from a retracted position within the space enclosed by said lid to a position above said cover when said lid is removed, means providing communication between the interior of said tank and the interior of said container for conveying fluid under pressure from said tank to said container to effect a flow of liquid from said container through said conduit, and means including a valve in said conveying means for controlling the discharge of fluid under pressure from said tank to said container to control the flow of liquid from said container.

3. A liquid dispensing apparatus comprising a container having an opening therein, a flange arranged about said opening, means including a removable dish-shaped cover arranged to fit within said flange for sealing said opening, means including a tank secured to said cover and arranged about the exterior side of said flange for containing a fluid under pressure, a lid for enclosing a space within said cover, a conduit extending through said cover and opening into said container adjacent the lower end thereof, the upper end of said conduit terminating within the space enclosed by said lid, an outlet spout mounted on the upper end of said conduit and arranged to be movable from a retracted position within the space encloser by said lid to a position above said cover when said lid is removed, means providing communication between the interior of said tank and the interior of said container for conveying fluid under pressure from said tank to said container to effect a flow of liquid from said container through said conduit, and means including a valve in said conveying means for controlling the discharge of fluid under pressure from said tank to said container to control the flow of liquid from said container, said valve being arranged within the space enclosed by said lid.

4. A liquid dispensing apparatus comprising a container having an opening therein, a removable cover for sealing said opening, an outlet conduit extending through said cover and into said container, a tank secured to said cover for containing a fluid under pressure, means providing communication between said tank and said container for conveying fluid under pressure from said tank to effect a flow of liquid from said container through said conduit, a check-valve in said conveying means for preventing the discharge therethrough of fluid from said tank, a removable cap arranged to afford access to said check-valve for charging said tank with fluid under pressure, and means arranged to unseat said check-valve for controlling the discharge of fluid from said tank to control the flow of liquid from said container.

5. A liquid dispensing apparatus comprising a container having an opening therein, a removable dish-shaped cover for sealing said opening, means including a tank secured to said cover and arranged about the exterior side of said flange for containing a fluid under pressure, a lid for enclosing a space within said cover, an outlet conduit extending through said cover and opening into said container adjacent the lower end thereof, the upper end of said conduit terminating within the space enclosed by said lid, an outlet spout mounted on the upper end of said conduit and arranged to be movable from a retracted position within the space enclosed by said lid to a position above said cover when said lid is removed, means providing communication between said tank and said container for conveying fluid under pressure from said tank to effect a flow of liquid from said container through said conduit, a check-valve in said conveying means for preventing the discharge through said conveying means of fluid from said tank, means including a removable diaphragm arranged to afford access to said check-valve for charging said tank with fluid under pressure, said diaphragm being located within said cover in the space enclosed by said lid, and means arranged to apply force to said diaphragm to unseat said check-valve for controlling the discharge of fluid from said tank to control the flow of liquid from said container.

6. A liquid dispensing apparatus comprising a container having an opening therein, means including a removable cover for sealing said opening, an outlet conduit extending through said cover and into said container, a removable discharge spout arranged on said outlet conduit on the outer side of said cover and movable from a retracted position on said cover to a position overhanging said cover, means utilizing a portion of said container for preventing the removal of said spout from said conduit when said cover is in place on said container, a connection for admitting a fluid under pressure to said container to effect a flow of liquid from said container through said conduit, and a valve for controlling the passage of fluid through said connection to determine the amount of liquid discharged from said container.

WILLIAM DALTON.