

Dec. 28, 1943.

F. D. CHAPMAN

2,337,869

CONTAINER

Original Filed April 11, 1940

Fig. 2.

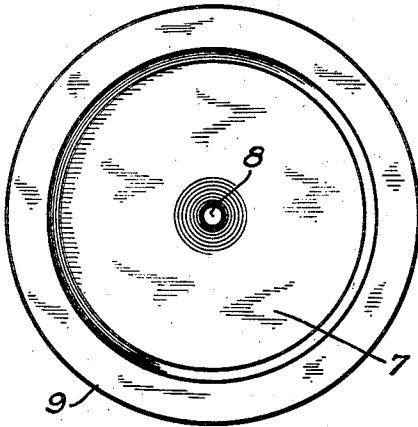


Fig. 3.

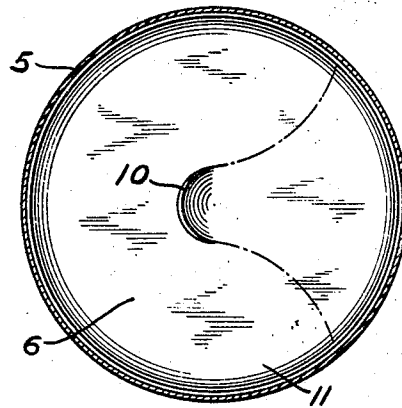
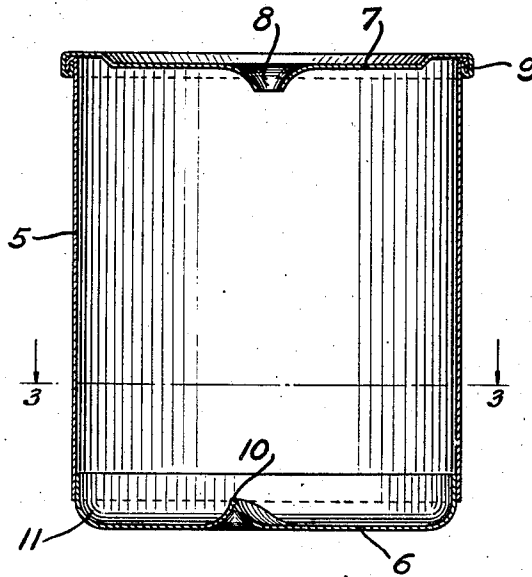


Fig. 1.

INVENTOR.
F. D. Chapman
BY *Lieber & Lieber*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,337,869

CONTAINER

Frank D. Chapman, Berlin, Wis.

Original application April 11, 1940, Serial No. 329,021. Divided and this application July 20, 1942, Serial No. 451,552

4 Claims. (Cl. 220—86)

The present invention relates generally to improvements in the construction of containers especially adapted for use in packing fluent commodities, and this application is a division of my co-pending application, Serial No. 329,021, filed April 11, 1940, entitled Art of canning.

An object of this invention is to provide an improved container or receptacle for fluent commodity such as milk, which is formed to facilitate admission of the material to the container interior.

It is present rather common commercial practice to fill containers with liquid commodities by injecting the liquid through a tube or nozzle adapted for disposition within a central upper opening or vent hole in each receptacle. While this mode of admitting ordinary liquids to most containers is quite satisfactory, certain fluent commodities or materials such as milk, tend to froth and foam and to entrap air when delivered in jet form and at high velocity against the flat bottoms of the receptacles. This objectionable condition is especially pronounced when heated fatty liquid such as milk is being packed, and in cases where the injection nozzle orifices are considerable distance away from the container bottom when the liquid is being delivered against the latter. I have discovered that the undesirable foaming and frothing and the resultant entrapment of air within such receptacles, can be substantially eliminated by properly forming or constructing the receptacles so as to cause the entering material to be deposited upon the container bottom and to be promptly but gradually dispersed or converted from a high velocity jet into a relatively thin and gently spreading layer or film, and that the speed of filling such special receptacles can also be greatly enhanced.

It is therefore a more specific object of my present invention to provide an improved receptacle for packing liquid such as milk, and which is adapted to be filled at high speed and while the milk is hot, without causing objectionable turbulence or foaming and without entrapping undesirable free air.

Another specific object of my invention is to provide improvements in the construction of metal cans of the vent hole type, whereby such containers may be more rapidly and effectively filled with fluent commodities while exposed to atmospheric conditions.

A further specific object of this invention is to provide a new and useful can structure which can be manufactured at moderate cost, and which obviates many of the objectionable fea-

tures of prior receptacles of this kind when used for packing batches of certain commodities.

Still another specific object of the invention is to provide a strong and durable receptacle for milk or similar relatively delicate products, which will facilitate the filling operation while aiding in the subsequent treatment and preservation of the commodity.

These and other objects and advantages will be apparent from the following detailed description.

A clear conception of an embodiment of the invention and of the specific construction of my improved container, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same parts in the several views.

Fig. 1 is a somewhat distorted central vertical section through one of my improved containers;

Fig. 2 is a top view of the container shown in Fig. 1; and

Fig. 3 is a transverse section through the container taken along the line 3—3 of Fig. 1, looking downwardly.

While the invention has been shown and described herein as having been specifically embodied in a vent hole type of metal can especially adapted to confine a batch of hot milk injected therein through the central vent hole, it is not my desire or intention to thereby unnecessarily restrict the scope or utility of the improvement which is also advantageously applicable to non-metallic receptacles used for the confinement of materials other than milk. The term "metal" is therefore intended to include any substitute sheet material and the term "milk" is also intended to include any similar liquid.

Referring to the drawing, the improved container shown therein, comprises in general a sheet metal tubular or annular wall 5 having a bottom closure 6 and a cover or top closure 7, firmly secured to its opposite ends. The bottom and top closures 6, 7 are also preferably formed of sheet metal, and while the cover closure 7 is of relatively standard construction the bottom closure 6 is of special formation and has special cooperation with the top closure 7. The cover closure 7 is provided with a tapered central vent hole 8 and is secured to the upper end of the annular wall 5 by a crimped or spun joint 9 produced with an ordinary closing machine; and the bottom closure 6 is provided with a central crescent shaped projection or mound 10, and with a concavely curved annular peripheral por-

tion 11 surrounding the mound 10 and rigidly secured to the lower end of the wall 5 in any suitable manner. The upper surface of the bottom closure 6 between the mound 10 and the concave annular surrounding surface 11 may be relatively flat so as to permit the container to stand erect without danger of tipping over, but the upwardly exposed surfaces of the container bottom should preferably be devoid of abrupt projections or depressions which will tend to undesirably obstruct the flow of liquid thereacross.

When the improved containers are being filled with liquid such as hot milk, a filler such as shown and described in the parent application above referred to, may be utilized in order to effect filling of the successive receptacles at high speed. A liquid injection nozzle will then be lowered loosely through the central vent hole 8 of each receptacle, sufficiently to position the nozzle discharge orifice directly above and within the crescent shaped mound 10, whereupon the liquid will be delivered in the form of a high velocity jet against the concave surface of the crescent. The concavity of the mound 10 will gently but quickly convert the jet of liquid into a continuous laterally advancing relatively thin layer or gradually spreading film, flowing across the flat upper surface of the bottom closure 6, as shown in dot-and-dash lines in Fig. 3. As this spreading layer of liquid encounters the concavely curved bottom portion 11, it is directed upwardly along the interior of the annular wall 5, and the liquid gradually rises and eventually fills the receptacle. During this rising period, vapor is formed above the top of the liquid, and this vapor expels the free air through the vent hole 8 around the exterior of the filling nozzle, and finally accumulates in the slight space beneath the top closure 7 and above the measured batch of admitted liquid. The liquid injection nozzle should thereafter be promptly withdrawn, and the vent hole 8 must be sealed by soldering or otherwise, before the entrapped vapor has escaped; and the confined commodity may subsequently be further treated as desired. When the sealed commodity laden receptacles are finally cooled, the confined vapors will be condensed to thereby create a vacuous condition in each can.

From the foregoing detailed description it will be apparent that my present invention provides an improved receptacle for fluent commodity such as hot milk, which is formed to facilitate rapid and effective admission of the material to the receptacle interior. The improved containers can be filled in rapid succession without causing objectionable turbulence or foaming of the hot liquid, and without entrapping undesirable free air; and may also be filled with ordinary high

speed fillers of the vent hole injection type. The new metal cans constructed in accordance with the invention are also strong and durable in structure, and may be manufactured at moderate cost. While these receptacles are preferably formed of sheet metal, they may also be formed of other materials, and the improved structures are especially adapted for packing and preserving milk for an indefinite period of time.

It should be understood that it is not desired to limit the invention to the exact details of construction or to the precise mode of use herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. As an article of manufacture, a liquid container having a small central tapered vent hole in its top, and having a bottom provided with a crescent shaped mound offset with respect to the central axis of the container and concavely curved at said axis to uniformly distribute liquid admitted to the container through said vent hole.

2. A liquid container comprising, a tubular wall provided at its opposite ends with top and bottom closures permanently sealed to the wall ends, said top closure having a small central vent hole for admitting liquid axially into the container, and said bottom closure having a central crescent shaped projection and a concavely curved peripheral portion for dispersing the admitted liquid laterally across the container bottom and upwardly along said tubular wall in spreading film formation.

3. A liquid container comprising, an annular wall provided with transverse permanently attached top and bottom closures, said top closure having a small vent hole for admitting liquid into the container toward said bottom closure, and said bottom closure having a crescent shaped mound concentric with the vertical axis of said hole and a peripheral concavely curved portion at said axis merging gradually into the base of said mound and upwardly into the lower part of said wall.

4. A liquid container comprising, a thin cylindrical tubular wall having parallel top and bottom closures permanently attached to and sealing its opposite ends against escape of liquid, said top closure having a small central air vent hole for introducing liquid centrally into the container, and said bottom having a central crescent shaped mound merging into an extensive annular plane portion and an upwardly curved annular peripheral portion connecting the outer edge of the plane portion with the lower interior of said cylindrical wall.

FRANK D. CHAPMAN.