United States Patent

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[54] BULK CONTAINERS

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[21] Appl. No.: **845,588**

Related U.S. Application Data

[63] Continuation of Ser. No. 595,252, Nov. 17, 1966, abandoned.

[52] **U.S. Cl.**.....**222/90,** 222/183, 222/541, 222/554

[51] **Int. Cl.**.....**B67b 7/26**

[58] **Field of Search**.....222/81, 89, 90, 183, 541, 554

[56] **References Cited**

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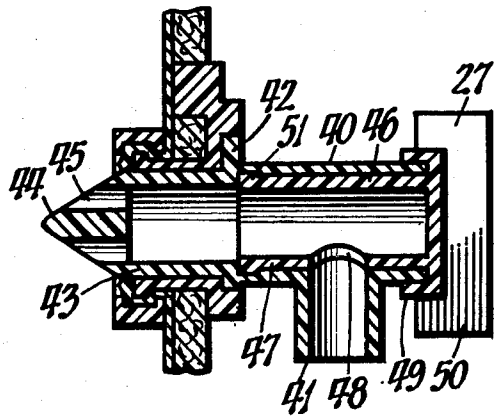
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Assistant Examiner—Frederick R. Handren
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[57] **ABSTRACT**

A bulk container for liquids which become contaminated or otherwise deteriorate when exposed to air, comprising an outer container having fitted to it a socket member for receiving a tap in such manner that the tap will engage therein in substantially leak-free manner, and a sealed inner container for the storage of liquid in the outer container. The socket member is so constructed and so mounted in the outer container that when the tap is engaged it will project into the sealed inner container between the tap, the socket member and the inner container.

9 Claims, 7 Drawing Figures



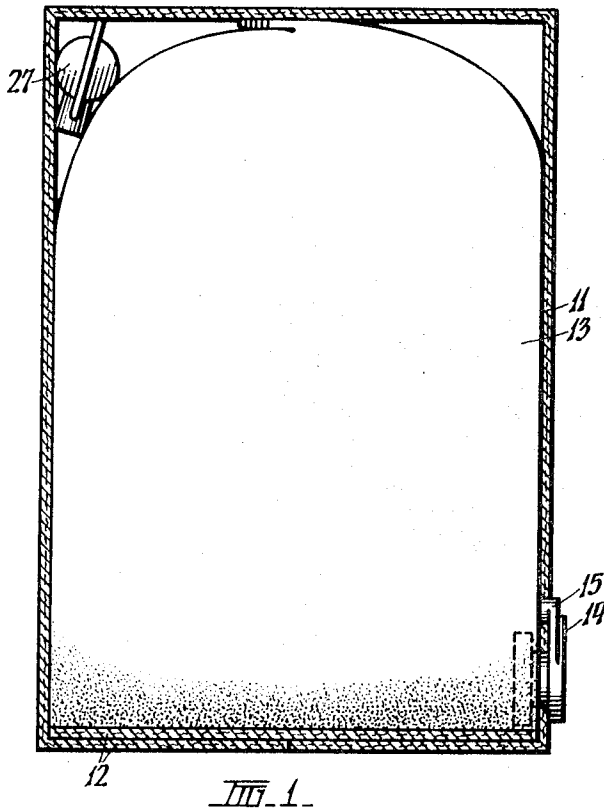


Fig. 1

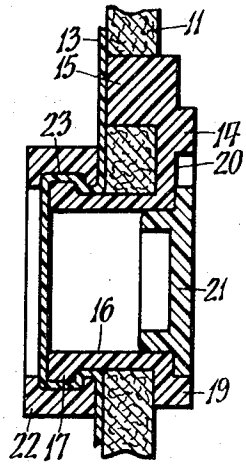


Fig. 2

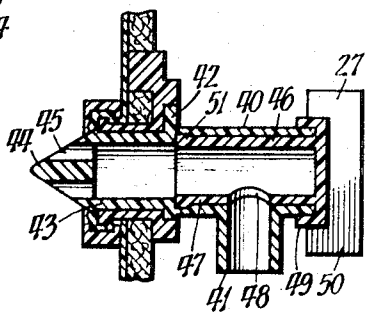


Fig. 4

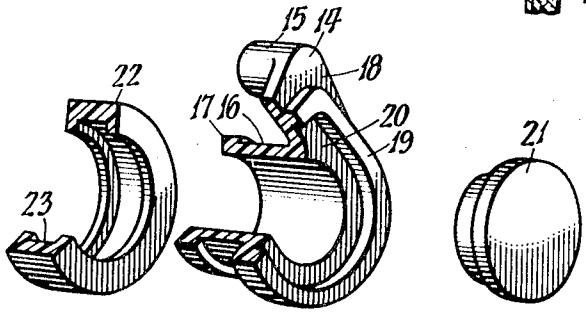


Fig. 3

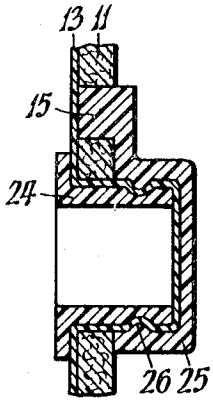


Fig. 7

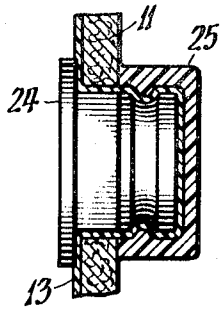


Fig. 6

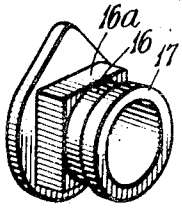


Fig. 5

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BULK CONTAINERS

This application is a continuation of application Ser. No. 595,252, filed Nov. 17, 1966, and now abandoned.

This invention relates to improvements in bulk containers and it relates particularly, but not exclusively, to containers for liquids such as unfortified wines, milk or other liquids which become contaminated or otherwise deteriorate when exposed to air.

It is an object of the invention to provide a bulk container having an inner container for the liquid to be stored in the bulk container, an outer container, and means for securing the inner container relative to the outer container at a location whereat a tap is to be fitted.

Another object of the invention is to provide a bulk container having an inner container within an outer container and means fitted to the outer container for holding a tap in correct position to engage in the inner and outer containers so that the contents of the inner container may be readily dispensed without real likelihood of leakage.

It has been proposed to provide a container having in it a flexible bag or lining of a material such as polyethylene, and means at or near the base of the container for tapping the container and flexible lining. Also, the container has a vent so that when liquid is withdrawn from within the flexible lining air will flow into the container, outside the flexible lining, to cause the lining to collapse around the liquid remaining in it. In this form of container the air does not directly contact the liquid within the flexible lining so that a liquid subject to deterioration may be stored for an appreciable period of time.

There are several disadvantages with this construction, one of which is that the tap does not always effectively engage through the flexible bag or lining to make a liquidtight seal therewith and as a result liquid tends to seep into the space between the flexible bag and the outer container.

A further object is to provide a bulk container of the type mentioned which will not be subject to the disadvantages associated with such containers in the past.

According to this invention there is provided a bulk container having an outer container, an inner container in the form of a flexible bag for holding the liquid to be stored, and means for securing the inner container to the outer container at the location whereat a tap is to be fitted so that when the tap is engaged in the outer container it will also engage in the inner container so as to permit flow of liquid therefrom through the tap, the connection between the parts being sealed so that there is no real likelihood of leakage of liquid from the inner container to the interior of the outer container.

The invention also provides an outer container having fitted to it a socket member for receiving a tap in such manner that the tap will engage therein in substantially leak-free manner, and a sealed inner container for the storage of liquid in the outer container, said socket member being so constructed and so mounted in the outer container that when the tap is engaged therein so as to project into the sealed inner container there will be a substantially leakage-free connection between the tap, the socket member, and said inner container. For that purpose the inner end part of the socket member may be formed as a pointed 'nose'—of substantially conical shape—with a recess or annular groove behind the outer end of that 'nose' so that when the tap is engaged in the socket member the material of the inner container, above the perforation made by the inner end of the tap, will be engaged in that annular groove so as to effect a relatively tight seal about the socket member.

Preferably, the socket member engages with the inner container and clamps it in substantially leakage-free fashion against the inside wall of the outer container, and in so doing forms a frangible diaphragm across the inner end of the socket member.

It is also preferred that the tap have a body part with a substantially cylindrical chamber within it, an outlet nozzle leading from that chamber, a noncircular external flange at the inner end of the body part adapted to engage with the socket member to hold the tap against rotation, a neck extending inwardly of that flange, and a pointed nose or probe—which may be conical in shape—at the inner end of the neck there being a suitable number of openings—preferably longitudinal in direction—through the nose or probe. A spigot or turncock is mounted within the chamber of the tap and it has an outlet opening to permit the flow of liquid through the neck part of the tap into the spigot and out through that opening when it is in register with the outlet nozzle. It is preferred that the spigot or turncock, and the outer end of the tap body, are so shaped as to limit the turning movements of the spigot. Also, it is preferred that the spigot and inner surface of the body are so formed that the spigot will be held against linear movement once it is fitted in the tap body, and that the inner end of the tap is so formed that it will be held against linear movement once fitted in the socket member.

In order that the invention may be clearly understood and readily put into practical form I shall now describe, with reference to the accompanying drawings, several exemplary forms of the invention. In these drawings:

FIG. 1 shows a vertical cross section through a container incorporating this invention:

FIG. 2 is a vertical cross section through the socket member, showing it fitted into the container and engaged with the collapsible bag;

FIG. 3 is an exploded perspective view of the several parts constituting the socket;

FIG. 4 shows in vertical cross section, the tap fitted into the socket;

FIG. 5 illustrates a modified construction; and

FIGS. 6 and 7 are views depicting a further modified construction, FIG. 6 being a partial cross section in one direction and FIG. 7 being a cross section in a direction at right angles.

Reference is made initially to FIGS. 1, 2, 3, and 4.

The outer casing is in the form of a carton 11 which is conveniently made of rectangular shape and composed of corrugated board. The bottom flaps 12 of the carton are sealed in closed position so as to be adapted to support a flexible bag 13 and the contents thereof, and close to the bottom of the carton 11 there is, in one sidewall, an opening to receive a socket member 14 and a second (upper) opening to receive a locating pin 15 integral with said socket member 14.

The flexible bag 13 is sealed at its lower end but, prior to use, is initially open at its upper end, as is the carton 11.

The socket member 14 is adapted to be fitted securely to a sidewall of the carton 11 and it has a tubular neck part 16 of an external size such that it will fit tightly in the lower opening in said sidewall, with a bulbous enlargement or bead 17 at its inner end. At the outer end of the neck part 16 there is a flange 18 which carries the locating pin 15 and it has a rim portion 19 which provides a seating 20 at the outer end of the socket member 14.

A plug 21 is provided to fit neatly within the socket member 14 with its top located within the rim portion 19 and on the seating 20. This plug is used to seal the outer end of the socket member 14 during the transport and storage of the carton 11.

There is also provided a ring member 22 having in its inner surface a groove 23 adapted to accommodate the bulbous enlargement 17 at the inner end of the socket member, and the ring member 22 is made to be a tight fit on the inner end of said socket member when engaged therewith as hereinafter described.

In the assembly of the socket member 14 and the flexible bag 13 into the carton 11 said socket member is fitted into position in the relative wall of the carton 11, and a lower end part of the bag 13 is spread over the inner end of said socket member. Then the ring member 22 is forced onto the inner end part of the socket member 14, drawing with it part of the material of the flexible bag 13 and stretching such material tightly over the inner end of the socket member 14—see FIG. 2. It will be apparent that the socket member will be held securely in position by reason of the engagement of the ring member on its inner end, and that the bag 13 will be locked on said inner end of said socket member.

In order that the contents of the flexible bag may be withdrawn when and as desired there is provided a tap of the construction illustrated in FIG. 4. The tap **27** has a barrel or body part **40** with a substantially cylindrical chamber in it and an outlet nozzle **41** extending therefrom, a shaped external flange **42** at the inner end of the body part **40**, a neck part **43** of reduced diameter as an inward longitudinal continuation of the body part and a pointed probe **44** at the inner end of the neck **43**. There are several openings **45** through the probe leading to the interior of the tap. Fitted rotatably to the outer end portion of the tap is a turncock **46** having a hollow cylindrical part **47** closed at its outer end, an opening **48** through the wall of that cylindrical part **47** at a location to register with the outlet nozzle **41** when the turncock **46** is moved to the 'on' position, a cap part **49** fitting above the outer end of the barrel **40** and a finger piece **50**. Near the inner end of the part **47** is a small external enlargement **51** which engages in a recess in the wall of the barrel **40** to hold the turncock **46** against linear movement.

The flange **42** is substantially the same shape as the seating **20** at the outer end of the socket member **14** and of such a size as to engage neatly within the rim portion **19** when the tap is fitted into the socket member **14**. Also, the inner end part of the neck part **43** is enlarged a small amount externally so as to be adapted to hold the tap in the socket member. Further, the outer end edge of the barrel **40** and the inner surface of the cap part **49** are made so that the turncock **46** has limited movement from the 'on' to the 'off' position.

As the socket member **14** is held in position in the carton **11** so that it cannot turn relative thereto, and as the tap **27**—by engagement of its flange **42** in the rim portion **19**—is held nonrotatable relative to the socket member **14**, it will be apparent that the tap will be held securely against rotation relative to the carton **11**.

When the tap **27** is forced into the socket member **14** its probe **44** will pierce the portion of the flexible bag **13** stretched across the inner end of said socket member **14** and thereby enable liquid to flow from within said bag **13** to the interior of the tap.

After the socket member **14** and flexible bag **13** have been assembled into the carton **11** the liquid to be stored in the carton is fed into the bag **13**, and after the bag has been filled to a desired extent its upper end is sealed, that sealed end is then tucked into the upper end of the carton **11**, the tap **27** is then placed within the carton—see FIG. **1**—and the top of the carton is sealed. When it is desired to dispense liquid from within the bag **13** the top of the carton is opened, the tap **27** is removed therefrom, the plug **21** is removed from the socket member and the tap is pressed into the socket member **14** so as to penetrate into the bag **13**. Then the tap may be turned 'on' and 'off' as desired.

As the contents of the flexible bag **13** are drawn off the bag will collapse, but (provided the bag **13** is made of a material impervious to air) air will not come into contact with the contents of the bag **13**.

In some cases it may be found necessary to provide one bag, of a material not subject to attack of the liquid contents, within another bag impervious to air so that the liquid is protected both from attack by air and from contact with a plastic material which may cause deterioration of the liquid contents.

FIG. **5** illustrates a modified construction of the socket member, wherein the neck part **16***a* is made of noncircular shape (so as to hold the member **14** against rotation) and the locating pin **15** is dispensed with.

FIGS. **6** and **7** illustrate a further modification wherein a male member **24** having a passageway through it is fitted from inside the flexible bag **13** and there is an external female member **25** having a locating pin **15** thereon, to fit as a cap over the end of the member **24** and seal the outer end thereof, the two parts **24**, **25** having cooperating groove and embossment means **26** to lock them together.

It will be appreciated that the outer container may be a can provided with suitable air inlet means at a satisfactory location, that there may be provided other means for locking the flexible bag on to the socket member, that said socket member may have a frangible diaphragm to protect the film across its inner end—as by being formed with a pointed nose at its inner end, the nose part being relatively thin to be readily fractured—and that it may be held against rotation relative to the outer container by other suitable means. Also, there may be means to indicate if the contents of the container have been tampered with—such as disclosed in the copending application Ser. No. 595,253 filed concurrently herewith.

All such modifications are to be deemed to be included in the ambit of the invention as defined by the appended claims.

I claim:

1. A bulk container having an outer container, a flexible baglike inner container for holding liquid to be stored, a socket member having at least on opening therethrough, said socket member being fastened securely to the inner container in such manner that a portion of the inner container extends across the inner end of the opening through the socket member so as to constitute a frangible diaphragm, wherein said socket member has a neck portion of noncircular shape which engages a corresponding noncircular aperture in the wall of said outer container for securing said socket member against rotational and linear movement relative to said outer container; said opening through said socket member being adapted to receive in leakage-free manner a tap for dispensing the contents of the inner container after the frangible diaphragm has been broken.

2. A bulk container having an outer container, a flexible baglike inner container for holding liquid to be stored, a socket member having at least one opening therethrough, said socket member being fastened securely to the inner container in such manner that a portion of the inner container extends across the inner end of the opening through the socket member so as to constitute a frangible diaphragm, wherein said socket member has in its outer surface a noncircular seating to accommodate a noncircular flange on the tap whereby the tap, when fully engaged with the socket member, is held against turning; said opening through said socket member being adapted to receive in leakage-free manner a tap for dispensing the contents of the inner container after the frangible diaphragm has been broken, and securing means for securing said socket member against rotational and linear movement relative to said outer container.

3. A bulk container having an outer container, an inner container in the form of a flexible bag for holding liquid to be stored, a socket member fitted to the outer container and engaged with the inner container at a location at which a tap can be fitted so that the tap will engage in the socket member and penetrate into the inner container to permit the flow of liquid therefrom through the tap, the socket member having an inner end which engages with the inner container in a substantially leakproof manner to prevent leakage of liquid therefrom to the interior of the outer container, and an integral locating pin on said socket member engaging in a hole in the wall of the outer container to prevent rotation of said socket member relative thereto.

4. A bulk container according to claim **3** wherein said socket member has a circumferential bead near said inner end which tightly engages with a ring member which is within said inner container, whereby a part of said inner container is clamped therebetween across said inner end to form a frangible diaphragm.

5. A bulk container having an outer container, an inner container in the form of a flexible bag for holding liquid to be stored, a socket member fitted in the outer container and engaged with the inner container at a location whereat a tap is to be fitted so that the tap will engage in the socket member and penetrate into the inner container, the tap having at its inner end a probe of somewhat conical shape with a least one opening therethrough, at an intermediate position in its length a flange to engage nonrotatably in said socket member, and at its outer end a turncock to control the flow of liquid from the

inner container through the tap, and said socket member engaging with the inner container in a substantially leakproof manner to prevent leakage of liquid therefrom to the interior of the outer container.

6. A bulk container according to claim 5 wherein said opening in said probe extends substantially longitudinally of said tap.

7. A tap for use with a bulk container for liquids comprising a body portion having an outlet therefrom, a neck part at the inner end of said body portion for engagement in a support, an external flange of noncircular shape at the inner end of said body portion for engagement in a seating, a probe of tapered shape at the inner end of the neck part, said probe having at least one opening therethrough to permit the flow of liquid into the interior of the neck part and body portion, and a turncock engaged in said body portion, said turncock having an opening to register with the outlet from the body portion when said turncock is turned to the 'on' position.

8. A tap according to claim 2 wherein there are a plurality of openings through the probe and said openings extend substantially longitudinally of the tap.

9. A tap according to claim 7 wherein the turncock has adjacent its inner end an external embossment engaged in a groove in the inner wall of the body portion, said embossment being effective to hole the turncock against linear movement.

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