

United States Patent

Ianelli

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[54] **LIQUID DISPENSER PLASTIC BOTTLE AND RECEPTACLE WITH PIERCING UNITS**

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[58] Field of Search.....222/81-91, 394, 222/400.7, 325, 181, 185; 215/100

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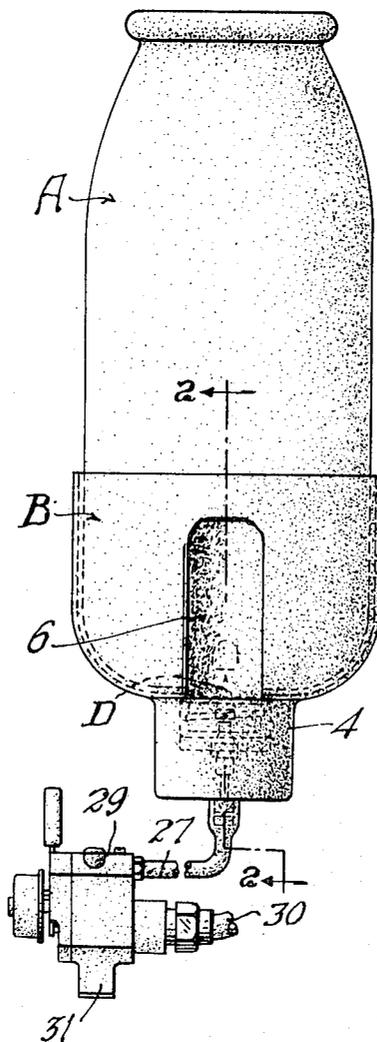
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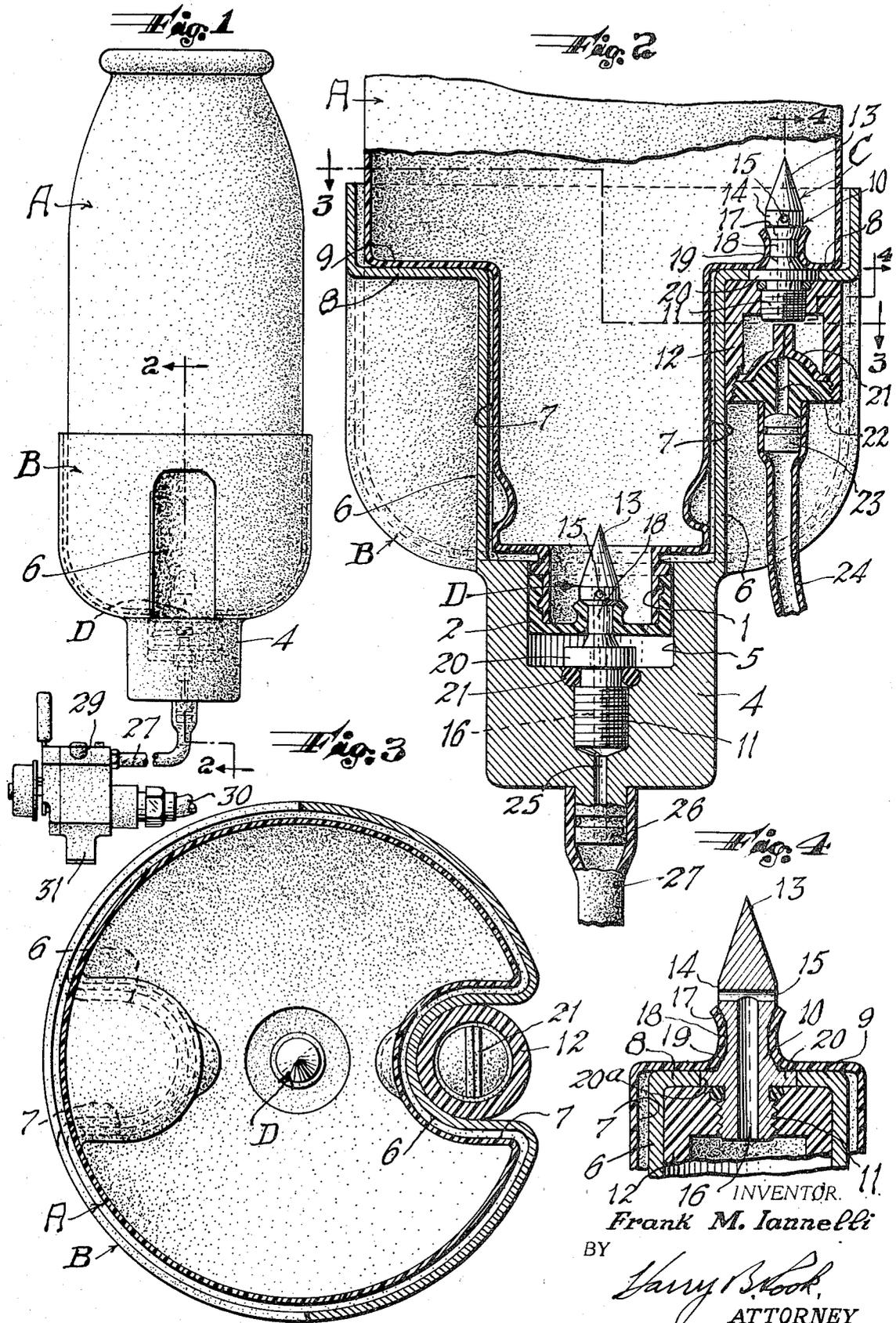
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[57] **ABSTRACT**

For dispensing liquids, a disposable bottle having inherently resilient, easily penetrable plastic walls and a capped mouth that is separably inserted into a rigid receptacle in which are mounted fixed bottle piercing devices that also serve respectively as an outlet for the liquid contents of the bottle and as an inlet for propellant gas under low pressure of the order of 3 pounds, said receptacle having key guide ribs to mate with corresponding recesses in the bottle to permit insertion of bottles of only one and the same design into the receptacle, and preferably, the second-mentioned piercing device being located in one of said ribs to penetrate the bottle wall during such insertion of the bottle.

3 Claims, 4 Drawing Figures





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LIQUID DISPENSER PLASTIC BOTTLE AND RECEPTACLE WITH PIERCING UNITS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to apparatus of the type wherein liquid for example, a flavoring syrup is dispensed from a container under pressure of a propellant gas, for example, for use in the preparation of beverages and confections.

2. The Prior Art

Dispensing apparatus comprising a puncturable metallic container which is pressed into a holder against a piercing and outlet element is known for example, in U.S. Pat. No. 2,655,286. The liquid is discharged by gravity, a special leak-preventing sealing disk is required around said element and there is a manually operable piercing element on the holder to form a vent opening in the container.

In U.S. Pat. No. 3,159,311, a puncturable can for granular material is placed in a holder that has a chamber into which compressed air is admitted and in which are a plurality of manually reciprocable can-piercing air jet nozzles to admit air into the container, and the holder has a cover which carries a can-piercing outlet conduit which punctures the can as the cover is applied to the holder.

These prior art devices require separate operations for connecting the liquid outlet and forming a vent, or separate and different operations for forming inlets for air and outlets for the containers; and the devices are costly and cannot be relied upon to perform satisfactorily.

SUMMARY

One object of the present invention is to provide a combination of a novel puncturable liquid container and a novel receptacle or holder therefor and two container piercing devices that also serve respectively as an outlet for the container and as an inlet for a gas under low pressure, for example, 2 or 3 pounds, for propelling the liquid from the container, both piercing devices being preferably but not necessarily mounted on said receptacle providing for penetration of the container by both of said piercing devices approximately simultaneously when the container is pressed into the receptacle or holder.

The invention also contemplates the holder having at least one key guide rib with which must be mated a recess in the container to allow the container to be pressed into the receptacle and whereby only containers of one and the same type can be inserted into the receptacle.

Also, in accordance with the invention the gas inlet-piercing device is mounted on one of said guides and the portion of the container wall desired to be pierced is guided into the proper relation to said piercing device.

Other objects of the invention are to provide a dispensing apparatus of which the liquid container shall be relatively inexpensive and disposable and not reusable; and provide a holder for the container which includes a novel and improved relatively inexpensive construction and arrangement of a piercing-gas inlet device and a piercing-liquid outlet device.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the invention, reference should be had to the following description in conjunction with the accompanying drawings in which:

FIG. 1 is a side elevational view of a liquid dispenser embodying the invention, showing the container seated in the receptacle or holder and illustrating a valve for controlling the discharge of the liquid.

FIG. 2 is an enlarged fragmentary vertical sectional view approximately on the plane of the line 2-2 of FIG. 1;

FIG. 3 is a horizontal sectional view approximately on the plane of the line 3-3 of FIG. 2; and

FIG. 4 is a further enlarged fragmentary central vertical sectional view approximately on the plane of the line 4-4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention contemplates in general a disposable container or bottle A having self-sustaining inherently resilient easily penetrable walls, preferably formed of plastic material such as polyethylene, and a receptacle B for the container which may be mounted in any suitable support such as a stand or a counter.

Desirably the container has a capped mouth through which desired liquid, for example, a flavoring syrup may be inserted into and discharged from the container. As shown the container has a neck 1 that provides the filling and discharging opening and preferably is exteriorly screw threaded to receive a correspondingly threaded cap 2 which is also formed of inherently resilient easily penetrable material.

The invention also contemplates a pair of container piercing devices to serve respectively as an outlet for the container contents and as an inlet for a propellant gas under pressure, for example, carbon dioxide. At least one of these piercing devices is fixedly mounted in the receptacle so to puncture the container as the container is pressed into the receptacle against the piercing device, and the piercing devices are connected respectively to a liquid outlet tube and to a source of propellant gas under low pressure for example, of the order of 3 p.s.i. In the drawings the piercing device to serve as an inlet for the propellant fluid is designated C, while the other piercing device which serves as an outlet for the container contents is designated D.

In accordance with the invention the container and the receptacle are so formed that only containers of one and the same type can be inserted into the receptacle, and the container, and receptacle also are constructed to insure that the container shall be inserted into the receptacle in proper relation to the piercing devices.

As shown the bottom of the receptacle has an extension 4 in which is formed a recess 5 to loosely slidably receive the cap 2 of the container, and the piercing device D is mounted in said extension at the bottom of said recess so as to puncture the cap as the cap is pressed against said device during insertion of the container into the receptacle. The receptacle has one or more key guide ribs 6 extending inwardly of the receptacle, each to mate with a correspondingly shaped recess 7 opening outwardly of the container wall and

through one end of the container. As shown, the receptacle has an annular side wall providing an opening at its upper end through which the container is inserted, and said guide rib extends inwardly from said side wall and has an end portion 8 facing said open end; and the recess 7 in the container has an inner end wall portion 9 adapted to be disposed of in contact with end portion 8 when the container is inserted into the receptacle; and the piercing device C is mounted on said end portion 8 of the rib 6 to pierce said end wall portion 9 of the recess in the container when the container is pressed into the receptacle.

The piercing devices C and D are in general similar to each other but the device C has associated therewith a check valve to prevent backward flow of the propellant gas and to prevent escape of the liquid contents of the container through the device. As shown each piercing device includes a body 10 provided at one end with screw threads or other suitable means for connecting the body to supporting structure, which in the case of the device C is the casing 12 of the check valve and in the case of the device D is the extension 4 of the receptacle. One end of the body 10 is formed to pierce the wall of the container or the cap and has shown as a conical point 13 which merges into a cylindrical portion 14 transversely through which extends a hole 15 which intersects a longitudinal passage 16 in the body. Inwardly of the cylindrical portion 14 the body has a frusto-conical portion 17 which merges into a cylindrical shank portion 18 of smaller diameter than the portion 14; and extending from the portion 18 is another frusto-conical portion 19 that merges into a circumferential base flange 20 which abuts either the end of the valve casing 12 or the bottom of the recess 5 as the case may be. A packing ring 21a is provided to prevent leakage between the body and either the valve casing 12 or the extension 4 as the case may be.

The check valve may be of any suitable form but preferably comprises a normally closed slit rubber valve 21 secured in the valve casing 12 to control the passage of fluid between a duct 22 in the casing and the passage 16 in the piercing device.

For connecting the piercing device C to a source of propellant gas, the valve casing 12 may have a nipple 23 at its end through which the duct 22 extends and to which is attached a rubber hose 24. For connecting the piercing device D to a receiving unit for the liquid contents, the extension 4 of the receptacle has a duct 25 extending through a nipple 26 to which is connected a rubber hose 27. In the present instance, the hose 27 is shown as connected to the flavoring syrup inlet of a mixing dispensing valve 29 shown in my U.S. Pat. No. 3,414,540 for mixing the syrup with a mixing liquid such as carbonated water which is supplied to the valve through a hose 30 so that the syrup and carbonated water are mixed and the mixture is discharged through an outlet nozzle 31. It is desirable that the liquid dispensing apparatus of the invention be operable under low propellant gas pressure for example 2 to 3 pounds per square inch because of the relatively weak nature of the disposable plastic container. Therefore, a low pressure outlet valve for the contents of the container is necessary and the valve shown in my U.S. Pat. No. 3,111,540 is especially designed for operating with low pressure.

In accordance with the invention, the piercing devices are self-sealing in the walls of the container, that is, the material that is displaced during the piercing operation hugs or tightly grips the body 10 of the piercing device and is pressed against the frusto-conical surfaces 17 and 19; and the frusto-conical surfaces 17 engaging the material at the edge of the punctures prevent the container from being forced off or away from the piercing devices by the pressure in the container; in other words, the container is releasably locked on the piercing devices.

It will be understood by one skilled in the art that the piercing devices preferably will be made of stainless steel and are preferably replaceable. For relatively inexpensive and one time sterile use for example with blood plasma containers, the piercing devices might be formed of hard plastic material such as "Celco" made by the Celanese Corporation. Also the piercing devices could be arranged to pierce the container at other positions depending upon the place and manner and use of the container; for example a piercing device could pierce the upper end or the side wall of the container.

The check valve casing 12 may be secured to the receptacle in any suitable manner, for example, by adhesive or by plastic welding, as shown in the drawings with the flange 20 of the piercing device seated in an opening 20a in the end portion 8 of the rib 6.

I claim:

1. A liquid dispensing apparatus comprising a liquid container having inherently resilient easily penetrable wall portions, a receptacle to removably receive said container, a pair of container piercing devices fixedly mounted in said receptacle and formed to serve respectively as an outlet for the container contents and as an inlet for propellant gas under pressure, at least one piercing device being located in said receptacle to provide for penetration of the container wall portion by said piercing device when one end portion of the container is pressed into the receptacle against said piercing device, said container having a longitudinal guide recess opening outwardly at the side and one end of said end portion of the container, and said receptacle having an inwardly projecting key guide rib with which said recess is required to mate to permit insertion of the container into the receptacle, and wherein said one piercing device is located on said guide rib.

2. A liquid dispensing apparatus comprising a plastic liquid container having easily penetrable resilient wall portions, a rigid receptacle to removably receive said container, a pair of container piercing devices fixedly mounted in said receptacle and formed to serve respectively as an outlet for the container contents and as an inlet for propellant gas under pressure, said piercing devices being located in said receptacle to provide for penetration of said penetrable wall portions by said piercing devices simultaneously, when the container is pressed into the receptacle against said piercing devices, each piercing device having a base rigidly associated with the receptacle, a stud having a hole therethrough and one end separably connected to said base and its other end provided with a conical piercing point, a cylindrical portion of reduced diameter and a frusto-conical portion between said piercing point and said reduced cylindrical portion providing for sealing engagement of said cylindrical and frusto-conical por-

tions with the resilient edge portions of the punctures in the container walls formed by said piercing devices, the inherent resiliency of said edge portions of the punctures and the pressure in the container pressing said edge portions into tight sealing engagement with said frusto-conical portions and said cylindrical portions, and wherein said container has a longitudinal recess opening outwardly at the side and one end of the container, and said receptacle has a key guide rib with which said recess is required to mate to permit insertion of the container into the receptacle and wherein the second-mentioned piercing device is mounted on said guide rib.

3. A liquid dispensing apparatus comprising a liquid container having inherently resilient easily penetrable wall portions, a receptacle to removably receive said container, a pair of container piercing devices fixedly mounted in said receptacle and formed to serve respectively as an outlet for the container contents and as an inlet for propellant gas under pressure, at least one piercing device being located in said receptacle to pro-

vide for penetration of the container wall portion by said piercing device when one end portion of the container is pressed into the receptacle against said piercing device, said container having a longitudinal guide recess opening outwardly at the side and one end of said end portion of the container, and said receptacle having an inwardly projecting key guide rib with which said recess is required to mate to permit insertion of the container into the receptacle, and wherein said receptacle has a bottom wall and an annular side wall providing an opening at its upper end to receive said container, said guide rib extends inwardly from said side wall and has an end portion facing said open upper end, said recess in the container has an inner end wall adapted to be disposed opposite said end portion of the rib when the container is inserted into the receptacle, and said one piercing device is mounted on said end portion of the rib to pierce said end wall of said recess when the container is pressed into the receptacle.

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