March 12, 1968 J. W. SMITH ET AL 3,372,838

CARBONATED BEVERAGE DISPENSER

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FIG. 1.

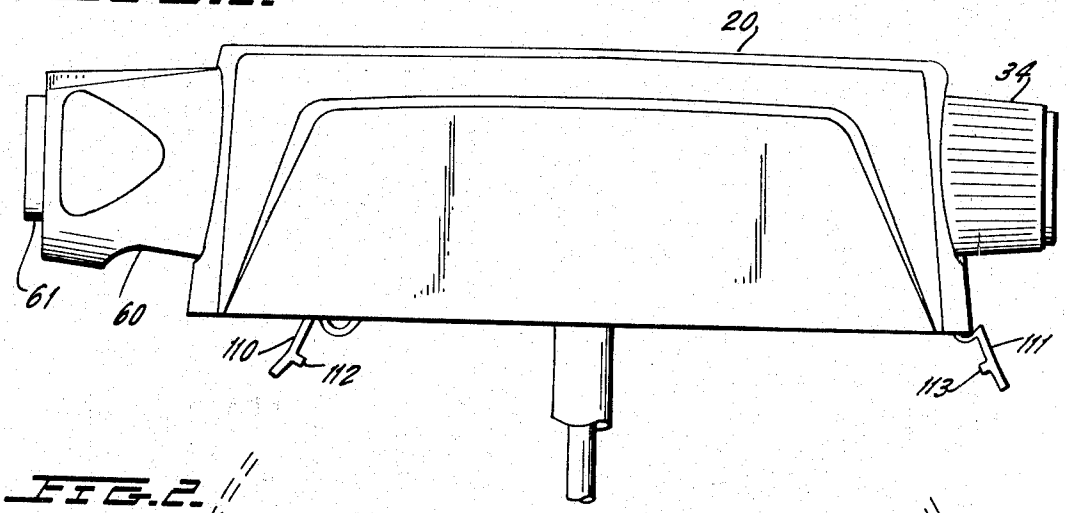


FIG. 2.

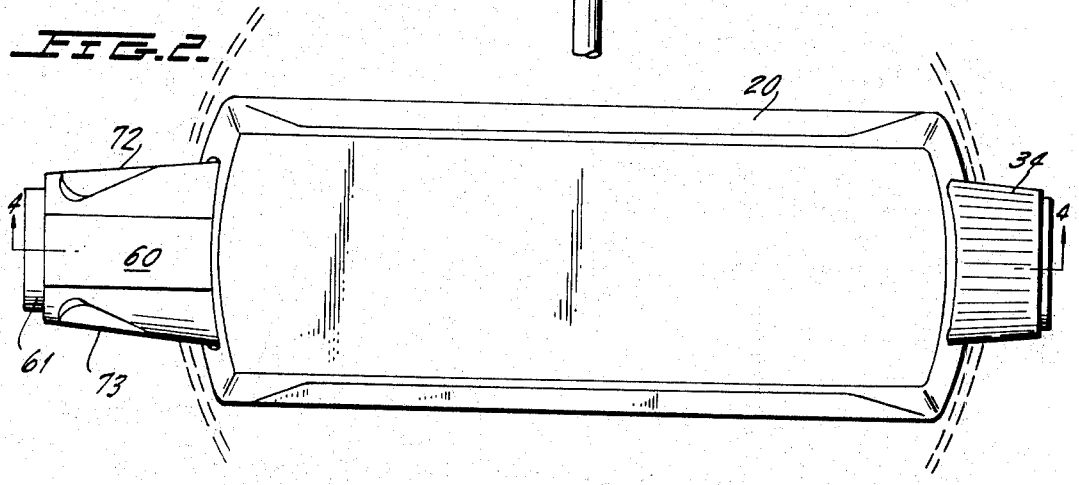


FIG. 3.

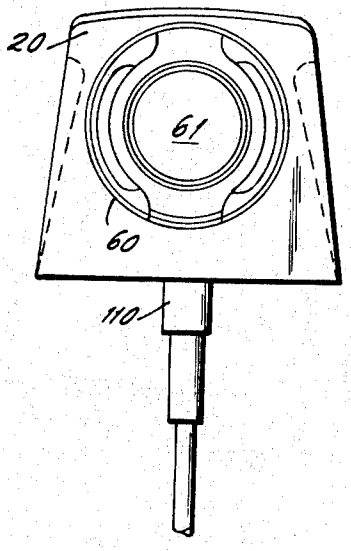


FIG. 7.

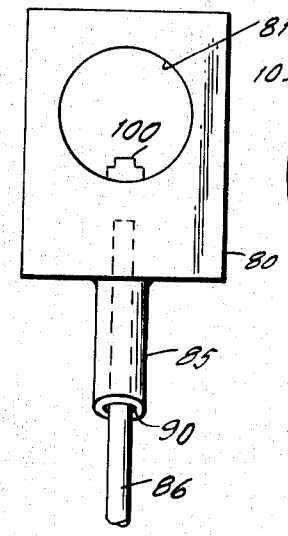
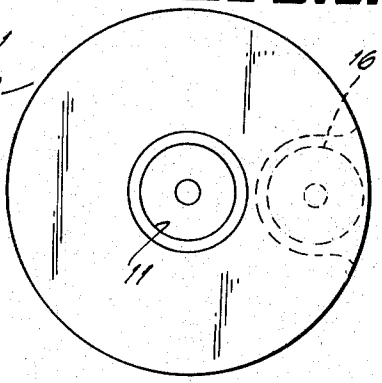


FIG. 5.



INVENTOR.
JOSEPH W. SMITH
CHARLES P. MOTTRAM
BY Allen A. Meyer, Jr.

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FIG. 4.

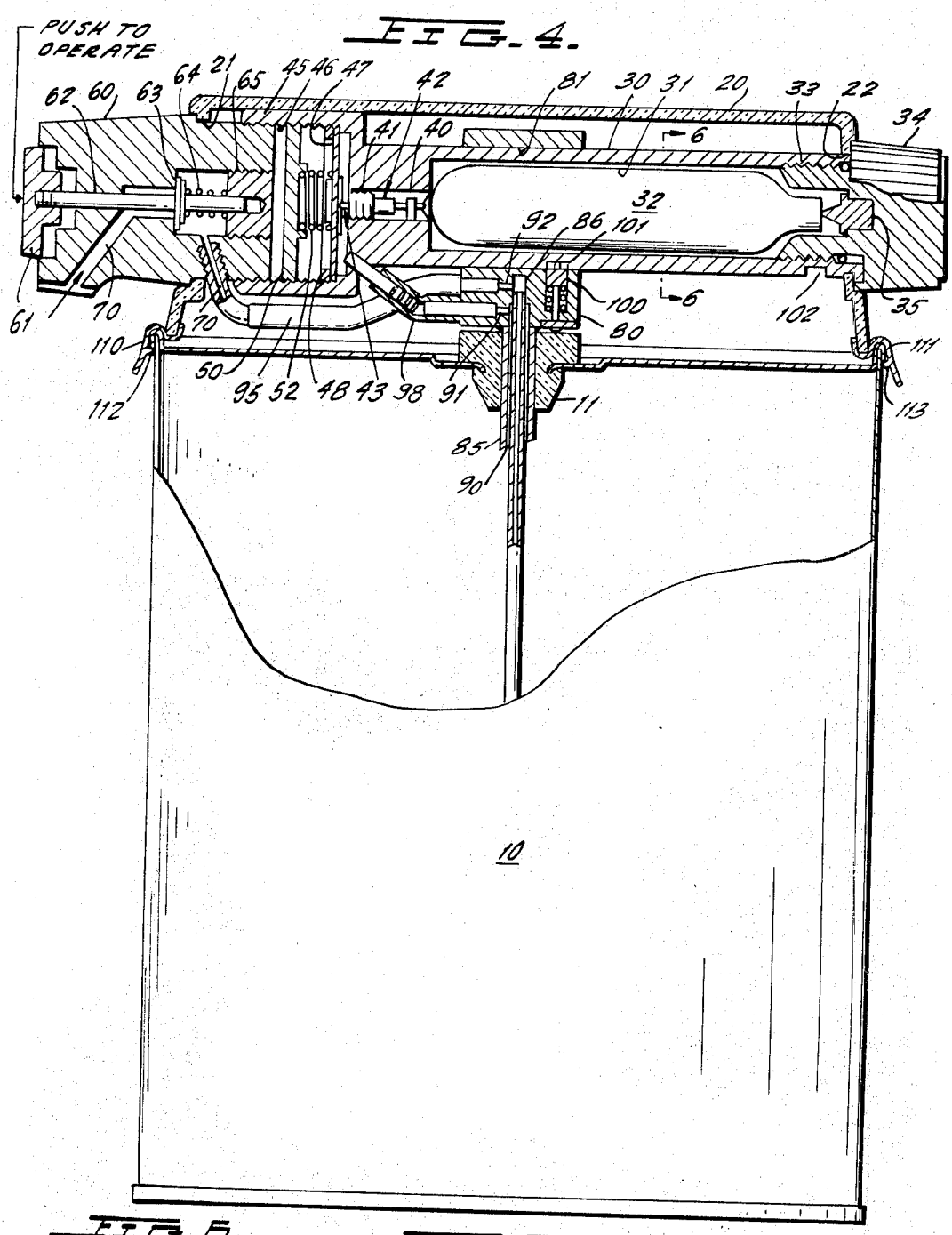


FIG. 5.

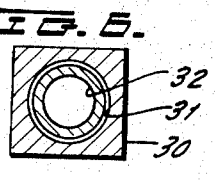
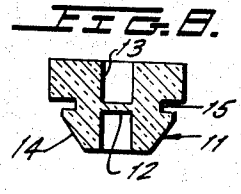


FIG. 8.



INVENTOR.
JOSEPH W. SMITH
CHARLES P. MOTTRAM
BY Allen A. Meyer, Jr.

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CARBONATED BEVERAGE DISPENSER

Joseph W. Smith, Trumbull, and Charles P. Mottram, Stratford, Conn., assignors to National Distillers and Chemicals Corporation, New York, N.Y., a corporation of Virginia

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3 Claims. (Cl. 222—52)

ABSTRACT OF THE DISCLOSURE

A carbonated beverage dispenser has an elongated regulator body containing a cylindrical chamber which completely receives a carbon-dioxide cartridge. The open end of the chamber is closed by a threaded plug containing a piercing member which pierces the cartridge. The opposite end of the regulator body receives a threaded spigot with the threaded spigot and regulator plug passing through openings in a plastic housing including the regulator body. A concentric pair of tubes extend from the regulator body and can puncture a can so that the central and long tube extends into the can content and is connected to the spigot to be dispensed therefrom. The volume between the two concentric tubes is connected through a regulating valve to the gas of the carbon-dioxide cartridge. The concentric tubes can be adjustably located on the cartridge body to pierce either centrally located bungs or off-center located bungs in the can.

This invention relates to a fluid dispensing apparatus, and more particularly relates to a novel dispenser device which can be removably connected to a beer can, or the like, which is normally kept refrigerated, for dispensing the contents of the can from a spigot-type mechanism, and for maintaining the can pressurized with carbon-dioxide.

It is well known that draft beer and other beverages should be refrigerated until served. It is further well known that it is desirable to use carbon-dioxide as a propellant for such carbonated beverages.

The present invention is directed to a novel portable dispensing apparatus which may be connected to cans having bung openings located at various portions of the top of the can, and which can be easily cleaned and stored when not in use.

In addition, the novel dispenser of the invention can be connected to a can and placed in a refrigerated compartment with the can until the can contents are completely empty.

It is a primary object of this invention to provide a novel dispenser for carbonated beverages which is attractive in appearance, efficient in operation, and inexpensive to manufacture.

Yet another object of this invention is to provide a novel dispenser for carbonated beverages which includes a self-contained carbon-dioxide cartridge, and which includes an adjustable connector structure which can be connected to variously located bung openings in cans.

Yet another object of this invention is to provide a novel dispenser for canned carbonated beverages which has substantially no drip after a dispensing spigot is closed.

These and other objects of this invention will become apparent from the following description when taken in connection with the drawings, in which:

FIGURE 1 is a side plan view of the dispensing head of the invention.

FIGURE 2 is a top view of FIGURE 1.

FIGURE 3 is a side view of FIGURE 1 as seen from the left-hand side of FIGURE 1.

FIGURE 4 is a cross-sectional view of FIGURE 2 taken across the line 4—4 in FIGURE 2 to illustrate the internal construction of the dispenser, with the dispenser connected to a can having a centrally located bung.

FIGURE 5 is a top view of a typical can adapted to be stored in a refrigerated compartment with a centrally located bung, and illustrates in dotted lines an alternative position for the bung.

FIGURE 6 is a cross-sectional view taken across the line 6—6 in FIGURE 4 to illustrate the cross-section configuration of the dispenser body.

FIGURE 7 is a side view of the sliding member which carries the bung piercer and tube of the dispensing apparatus.

FIGURE 8 is a cross-sectional view of an unpierced bung constructed in accordance with the present invention.

Referring first to FIGURES 4 and 5, there is illustrated therein a can 10 which is commercially available and could be of the one gallon size containing draft beer, or some other carbonated beverage. In some commercially available cans, there is provided a centrally located bung 11 which is a solid, flexible member serving as a closure for a can.

In accordance with one aspect of the invention, the bung 11 is constructed, as illustrated in FIGURE 8, with a central membrane 12 extending across a channel 13 which will receive a bung piercer carried by the dispensing apparatus to gain access to the interior of the can. The bung 11 of FIGURES 4, 5 and 8 is connected to the can opening by forcing the tapered bottom portion 14 of bung 11 through the opening in the can until the edges of the opening enter the annular groove 15 of bung 11, causing an effective seal around the can opening.

As illustrated in dotted lines in FIGURE 5, a can may also be provided with a bung 16 which is located at the side of the can. As will be apparent from the foregoing, the novel dispenser of the invention is adjustable for connection to either type of bung 11 or 16 in FIGURE 5.

The novel dispenser of the invention is comprised of a suitable housing such as a plastic housing 20 which has openings 21 and 22 (FIGURE 4) at its opposite ends for receiving the dispensing apparatus. The dispensing apparatus is best shown in FIGURE 4, and includes a regulator body 30 that has an opening 31 in its right-hand side (FIGURES 4 and 6).

It will be noted from FIGURE 6 that body portion 30 may be square in configuration, although it will be apparent that any suitable configuration could have been used.

FIGURE 6 illustrates that opening 31 is circular to conform to the exterior shape of a standard commercially available carbon-dioxide cartridge 32 which is inserted into opening 31 in body 30. The right-hand end of body 30 is provided with internal threads 33 which threadably receive a piercer 34 which extends through opening 22 in plastic housing 20. The piercer 34 carries a pointed member 35 internally thereof so that when the piercer 34 is threaded into thread 33, the piercing body 35 will pierce the diaphragm in the right-hand end of the carbon-dioxide cartridge 32 to release high pressure carbon-dioxide gas into the chamber enclosed by opening 31.

The left-hand end of opening 31 in body 30 is provided with a through-opening 40 which has a threaded end 41 which threadably receives a valve core member 42. The valve core member 42 may be of any desired type and has a projecting stem 43 which will open the valve when stem 43 is sufficiently depressed.

The extreme left-hand end of body 30 is then provided with an outwardly flaring flange 45 which is internally threaded with threads 46. A pressure diaphragm 47 is in-

serted into the bottom of circular flange 45 against a shoulder stop at the bottom of flange 45. A lock nut 48 then retains diaphragm 47 in position, as shown.

A threaded washer 50 is then threaded into thread 46 and compresses spring 52 between washer 50 and diaphragm 47, the spring 52 serving as a reference in the pressure regulator to be described. Thereafter, a spigot body 60 is threaded through opening 21 and into threads 46. The spigot body 60 carries a pushbutton 61 which is connected to a shaft 62 which operates valve 63 against spring 64 captured between valve 63 and threaded insert 65.

The valve 63 permits communication between channel 70 which leads to the interior of the can 10, as will be described, and the outlet channel 71 through which liquid is dispensed when the pushbutton 61 is depressed. Note in FIGURE 2 that the spigot 60 is provided with finger depressions 72 and 73 so that the spigot can be conveniently gripped between the index and third finger and the pushbutton 61 depressed with the thumb.

A slider 80 (FIGURES 4 and 7) has an internal opening 81 which has a shape conforming to the external shape of body 30 and slides along the elongated portion of body 30. Slider 80 has a bung piercer 85 connected to the bottom thereof as by welding, and has a lower elongated opening which receives the upper end of tube 86, again as by welding.

The tube 86 is coaxial with bung piercing tube 85, and has an outer diameter smaller than the inner diameter of bung piercer 85 to define an annular channel 90. The channel 90 then extends to a channel 91 which passes laterally through body 80, as shown in FIGURE 5, while the interior of tube 86 is connected to a second lateral channel 92 extending through slider 80. Channel 90 is preferably a close tolerance passage to control the rate at which gas can enter can 10 and to prevent a sudden outrush of gas if, for any reason, the dispenser is removed from the can before its contents, or the cartridge is consumed.

A flexible conduit 98 is then suitably connected to channel 91 and connects channel 91 to the volume contained between pressure diaphragm 47 and the bottom of circular flange 45. Channel 92 in slider 80 is similarly connected by a suitable conduit 95 to the volume between spigot valve 63 and insert 65. Thus, this volume is connected through shaft 86 to the interior of the can, while the pressure at the top of the can is connected to the volume behind pressure diaphragm 47. This same volume is connected to the interior of opening 31 containing cartridge 32 through the valve core 42. Note that a suitable check valve, not shown, can be contained in channel 91.

The slider 80 is then held in position on the regulator body 30 by means of a spring biased plunger 100 which engages detent 101 in body 30. Note in FIGURE 7 that plunger 100 is pressed upwardly when the slider is removed from body 30. The plunger 100 is received in detent 101 when the slider 80 is to be positioned for a centrally located bung 11.

Where, however, the can has an offset center-located bung 16, as shown in FIGURE 5, the slider 80 is moved to the right with the plunger 100 entering detent 102 in the surface of body 30. Thus, the slider, along with spout 86, are automatically properly located for the particular can to which the dispensing apparatus is to be connected.

In order to now connect the dispensing apparatus to the can, the tube 86 and bung piercer 85 are inserted through the top of the bung 11 where they will pierce diaphragm 12, shown in FIGURE 8, to gain access to the interior of the can.

Once the piercer 85 enters the bung 11, it has been found that relatively good mechanical connection is obtained between the dispenser and the can. However, in order to improve this mechanical connection, it has been found further desirable to provide spring latches such as spring latches 110 and 111, as shown in FIGURES 1, 3 and 4, which are secured to the base of the molded body 20. The spring latches 110 and 111 each have protruding tongues 112 and 113, respectively, which catch over the lip of the can, thereby to insure a positive mechanical engagement between the dispenser and the can.

In operation, the dispenser is connected to a can by insertion of tubes 86 and 95 through the can bung. A carbon-dioxide cartridge 23 is then placed into opening 31 and the piercer 34 is threaded into position on threads 33 until the piercing device 35 breaks the diaphragm at the end of the cartridge. This permits the cartridge pressure to fill the chamber defined by opening 31. The pressure from the interior of the can is then applied to channel 90 and into the chamber defined to the right of pressure diaphragm 47.

If this pressure to the right of diaphragm 47 is lower than some predetermined value, the spring 52 will press diaphragm 47 to the right to engage and depress pin 43 in valve core 42. This will open the channel from the opening 31 to permit pressurized carbon-dioxide gas to enter the chamber to the right of diaphragm 47 and to flow from there through conduit 93 into the can. Once the pressure at the top of the can reaches the predetermined desired value, pressure diaphragm 47 will be pressed to the left against the force of spring 52 and the valve core 42 will close.

Assuming now that there is sufficient pressure in the can, in order to operate the dispenser, button 61 in spigot 60 is depressed to open spigot valve 63. The pressurized can contents will then flow up tube 86 through conduit 95 through valve 63 and out channel 71. In order to cut off this flow, the spigot button 61 is released and valve 63 is closed.

Note that the system will operate in such a manner that the can pressure will always be that desired value which is set by the force of spring 52 with the can automatically receiving high pressure carbon-dioxide gas when the can pressure falls below some predetermined value.

Although this invention has been described with respect to its preferred embodiments, it should be understood that many variations and modifications will now be obvious to those skilled in the art, and it is preferred, therefore, that the scope of the invention be limited not by the specific disclosure herein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A carbonated beverage dispenser apparatus comprising an elongated regulator body, an elongated cylindrical chamber extending into one end of said elongated regulator body; a high pressure carbon-dioxide cartridge fixed within said cylindrical chamber; said cylindrical chamber having a length greater than the length of said cartridge; a threaded plug member threaded into the end of said cylindrical chamber and sealing said end of said cylindrical chamber; a piercing member centrally located on the surface of said plug member facing said cylindrical chamber; said carbon-dioxide cartridge having a piercible diaphragm adjacent said piercing member; a conduit support structure mechanically connected to said elongated regulator body; first and second elongated hollow tubes extending from said conduit support structure; said second tube having a short length with respect to said first tube and defining a bung piercer; said second tube externally concentric with said first tube and defining an annular channel between said first and second tubes; said conduit support structure having first and second channels therethrough; said first channel communicating with the interior of said first tube; said second channel communicating with said annular channel; said cylindrical chamber having a third channel extending therefrom through said elongated regulator body; a pressure regulator; said third channel connected to said second channel through said pressure regulator; a spigot outlet and a manually operable valve in said spigot outlet for manually opening and closing said valve; said first channel con-

nected to said spigot outlet; said spigot outlet connected to the other end of said regulator body; a housing extending over the top and sides of said regulator body; said threaded plug member and said spigot extending through openings in the opposite end sides of said housing; said first and second tubes extending from the unclosed bottom of said regulator body.

2. The device as set forth in claim 1 which includes can lip latch means connected to the bottom of said opposite end sides of said housing.

3. A carbonated beverage dispenser apparatus comprising an elongated regulator body, a cylindrical chamber extending into one end of said elongated regulator body; a high pressure carbon-dioxide cartridge fixed within said cylindrical chamber; a threaded plug member threaded into the end of said cylindrical chamber and sealing said end of said cylindrical chamber; a piercing member centrally located on the surface of said plug member facing said cylindrical chamber; said carbon-dioxide cartridge having a piercible diaphragm adjacent said piercing member; a conduit support structure mechanically connected to said elongated regulator body; first and second elongated hollow tubes extending from said conduit support structure; said second tube having a short length with respect to said first tube and defining a bung piercer; said second tube externally concentric with said first tube and defining an annular channel between said first and

second tubes; said conduit support structure having first and second channels therethrough; said first channel communicating with the interior of said first tube; said second channel communicating with said annular channel; said cylindrical chamber having a third channel extending therefrom through said elongated regulator body; a pressure regulator; said third channel connected to said second channel through said pressure regulator; a spigot outlet and a manually operable valve in said spigot outlet for manually opening and closing said valve; said first channel connected to said spigot outlet; said conduit support structure being slidable with respect to the axis of said regulator body and latchable into a predetermined position along said regulator body whereby said dispenser apparatus can be connected to cans having different bung locations.

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SAMUEL F. COLEMAN, *Primary Examiner.*