United States Patent

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[54] **VALVE FOR BEVERAGE DISPENSERS**
8 Claims, 7 Drawing Figs.

[52] U.S. Cl. **222/185,** 222/517, 251/9
[51] **Int. Cl.** **B67d 5/06**
[50] **Field of Search** 222/185up, 181up, 183up, 517up, 129.1; 251/4up, 6, 7, 8, 9, 10up

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ABSTRACT: A valve assembly having a support and a pinch tube controlled by a lever that pinches and releases the tube against an anvil in the support to close and open the valve.

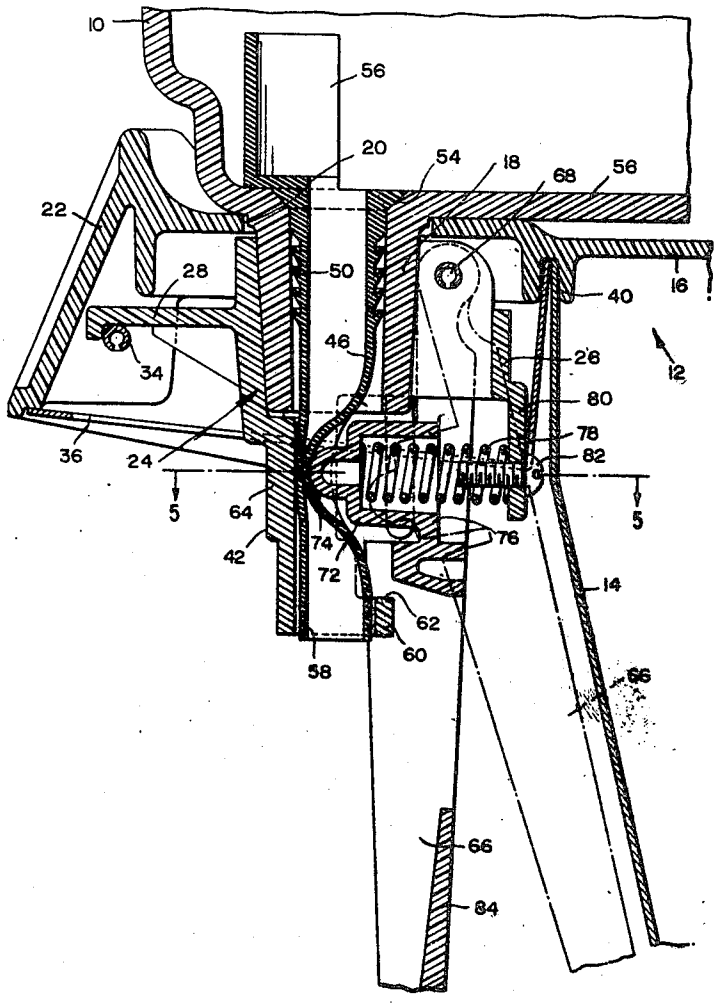


FIG. 1

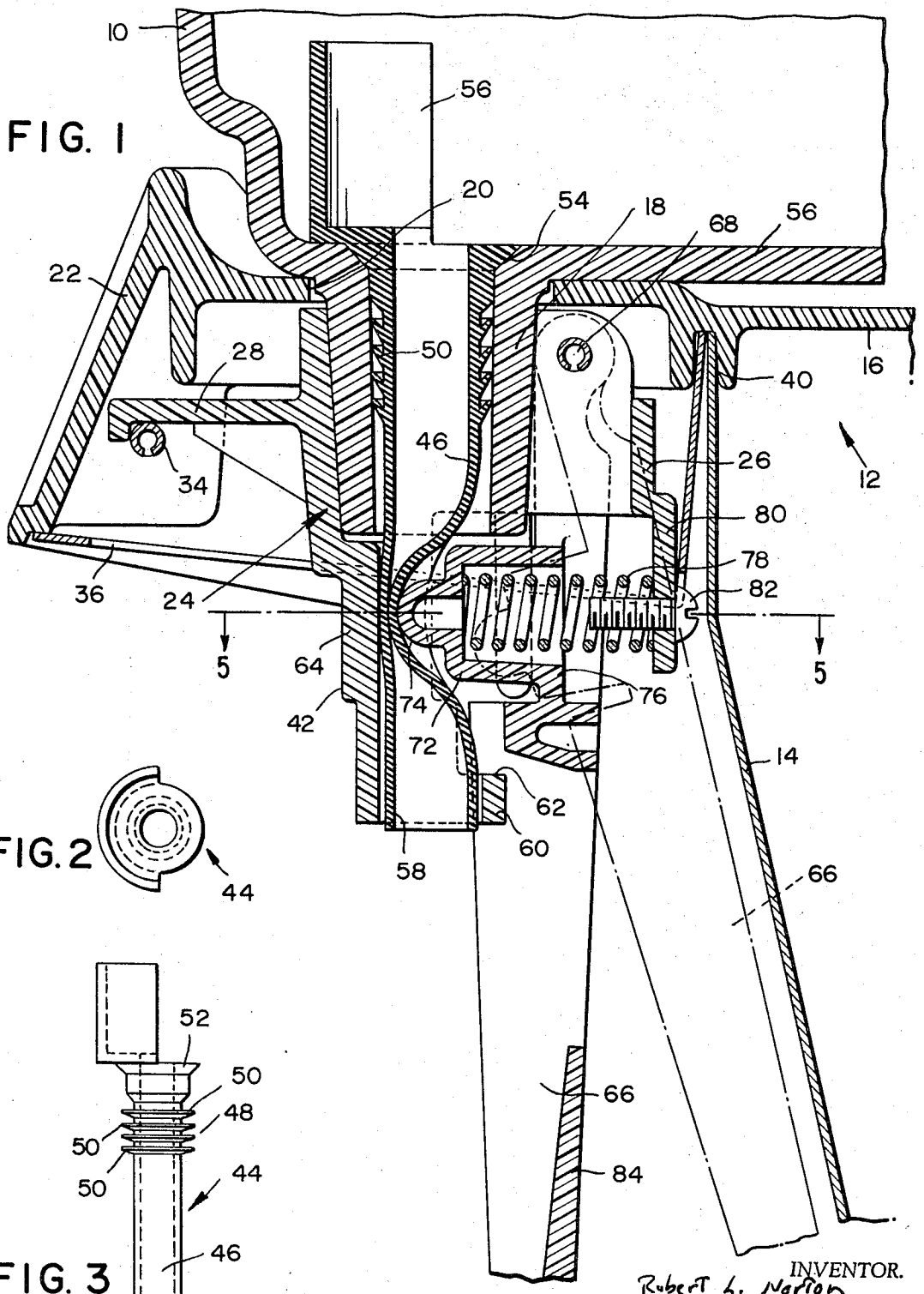


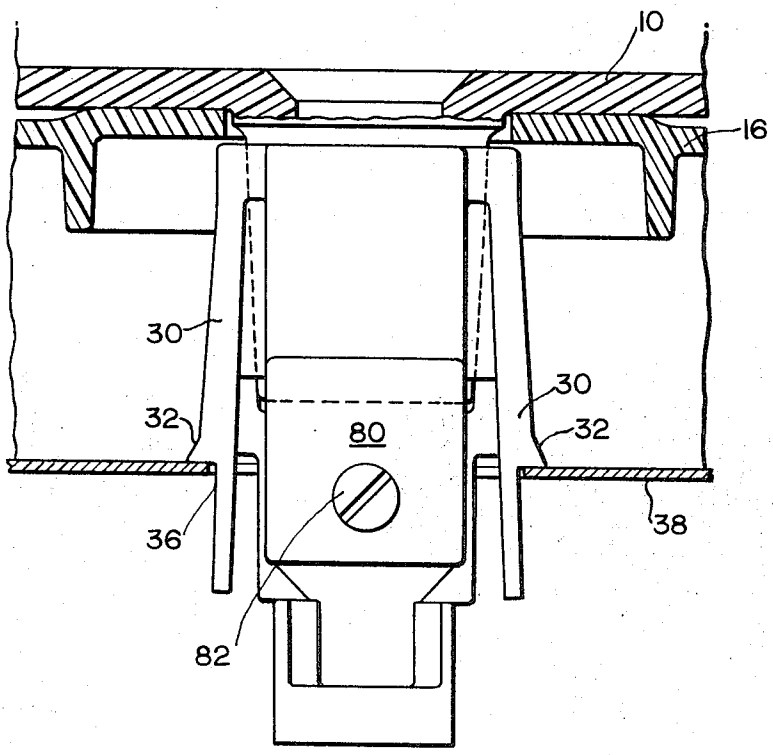
FIG. 2

FIG. 3

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FIG. 4



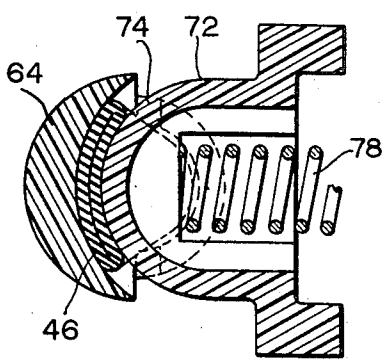


FIG. 5

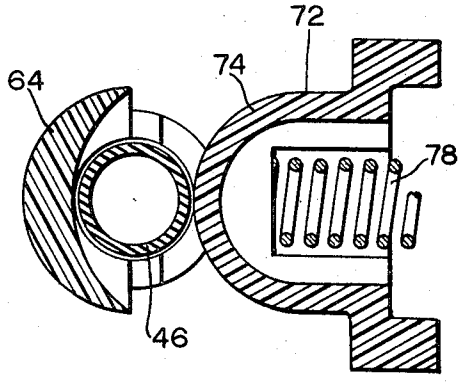


FIG. 6

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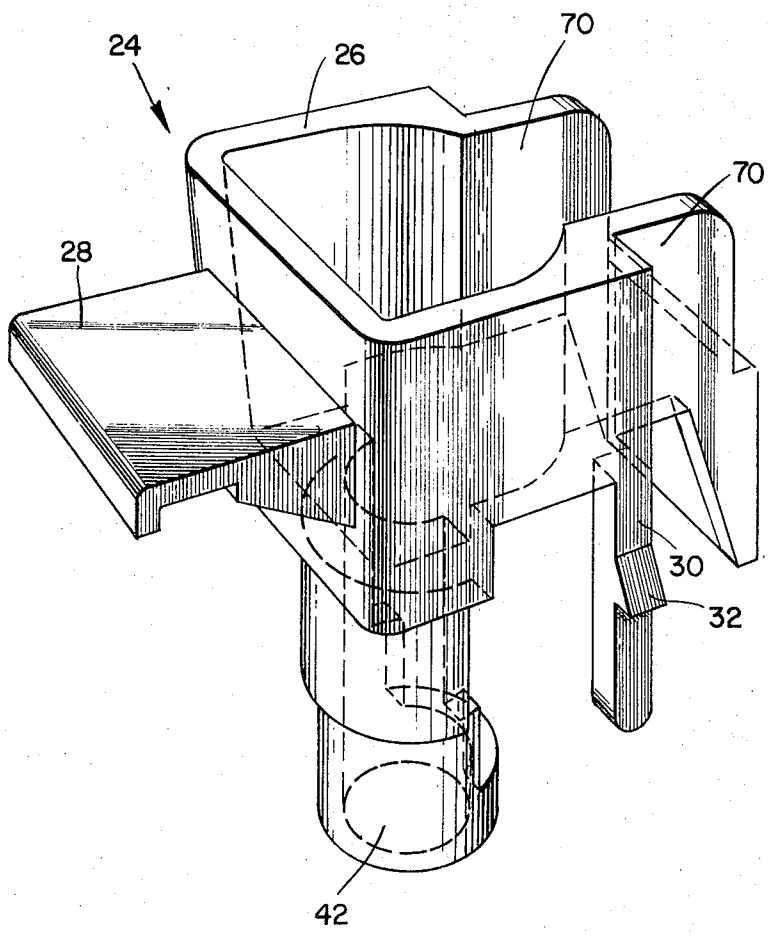


FIG. 7

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VALVE FOR BEVERAGE DISPENSERS

This invention relates to beverage dispensers and more particularly comprises a new and improved pinch valve assembly for beverage dispensers.

The pinch valve assembly of this invention typically is suitable for use in any one of the beverage dispensers shown in U.S. Pat. Nos. 3,272,380 and 3,385,413 owned by Jet Spray Cooler, Inc. These dispensers are characterized as having a large transparent bowl housing some form of refrigeration system. A circulation system in the bowl improves the heat exchange relationship between the beverage and the refrigeration system and also provides a visual display so as to make the beverages most appealing. The dispenser may or may not include means for carbonating the beverage in the bowl.

Valves commonly used today in such dispensers are generally made of rigid materials and include a plunger that is lifted when the valve is opened. These valves sometimes stick when in use, and invariably this occurs when the plunger is in the elevated position leaving the valve open. Because the valves are rigid, they are not always able to accommodate pulpy materials, and as a result, such materials sometimes prevent the valves from closing completely.

One important object of this invention is to provide a valve for beverage dispensers which does not have a tendency to stick in the open position.

Another important object of this invention is to provide a valve better able to handle pulpy, semisolid media in suspension found in certain beverages.

Another important object of this invention is to provide a pinch tube valve assembly suitable for use in a variety of beverage dispensers.

Another important object of this invention is to provide a pinch tube valve assembly which is very economical to manufacture, easy to install, and capable of giving long trouble free performance.

Yet another important object of this invention is to provide a pinch tube valve assembly which may be very quickly dismantled from the dispenser so that it may be cleaned and replaced without difficulty.

To accomplish these and other objects, the pinch tube valve assembly of this invention includes a pinch tube support which is adapted to be secured either to the bowl or to the stand which supports the bowl and which has a generally cylindrical vertical stem which registers with the discharge passage in the bowl. A flexible pinch tube is disposed in the support and extends to the lower end of the stem. An opening in the stem above its lower end provides access to the tube, and an anvil is formed in the support adjacent the opening. An actuating lever mounted on the support is pivotable about a horizontal axis and has a pinch finger extending into the opening and movable in and out of the opening so as to pinch the tube against the anvil. A spring is provided in the assembly for biasing the lever to a position wherein the pinch tube is closed by action of the finger against it.

These and other objects and features of this invention along with its advantages will be better understood and appreciated from the following detailed description of one embodiment thereof, selected for purposes of illustration and shown in the accompanying drawing, in which;

FIG. 1 is a fragmentary cross-sectional view of a dispenser employing a pinch tube valve assembly constructed in accordance with this invention;

FIG. 2 is a top view of the pinch tube of the valve shown in FIG. 1;

FIG. 3 is a side view of the pinch tube;

FIG. 4 is a rear view of the assembly shown in FIG. 1;

FIG. 5 is a cross-sectional view taken along the corresponding section line in FIG. 1 and showing the pinch tube closed;

FIG. 6 is a view similar to FIG. 5 but showing the pinch tube released or open; and

FIG. 7 is a perspective view of a support forming part of the valve assembly.

In FIG. 1 portions of a beverage dispenser are shown including the bowl 10 and its stand 12. The stand 12 includes a front panel 14 that covers the interior of the dispenser mechanism including a portion of the refrigeration system, the motor, etc. (not shown) and a condensation tray 16. The tray 16 forms a base for the bowl 10 when the dispenser is assembled. It is to be understood that the particular configuration of the bowl as well as the stand are not limiting features of this invention.

The bowl 10 has a discharge passage 18 for its contents in the form of a depending generally cylindrical spout. The spout 18 extends through an opening 20 provided in the tray 16, and in the embodiment shown the spout is partially hidden from the front of the dispenser by the panel 22. In this embodiment the panel 22 is an integral part of the condensation tray 16.

The pinch valve assembly in the embodiment shown is mounted on the stand 12 as opposed to the bowl 10, and the assembly is organized about a main pinch tube support member 24. The support member 24 is shown in FIG. 7 to include a frame 26 from which extends a forwardly extending lip 28 and a pair of downwardly extending posts 30. The posts 30 in turn carry outwardly extending ears 32 beveled at their top to cooperate with the lip 28 to secure the support in place. In FIGS. 1 and 4 it will be noted that the lip 28 rests on a pin 34 attached to the condensation tray 16, while the ears 32 rest on the margins of opening 36 in the plate 38 which forms part of the stand. The plate 38 is disposed generally parallel to the tray 16 and extends from the bottom of the panel 22 rearwardly to the vicinity of the panel 14 where it bends upwardly and engages a slot 40 in the condensation tray. In FIG. 1 it will be noted that the opening 36 is large enough so as to provide access for the support 24. To install the support in place the lip 28 is positioned above the pin 34, and then the support is pivoted upwardly on the pin until the ears 32 on the posts 30 pass through the opening 36 and snap in place in the position shown in FIG. 4.

When the support is mounted in place, the frame 26 surrounds the spout 18 of the bowl, and a generally cylindrical stem 42 which forms a part of the support 24 defines an extension of the spout. This is particularly evident in FIG. 1.

A pinch tube 44 shown in detail in FIGS. 2 and 3 is mounted in the spout 18 of the bowl and the stem 42 of the support 24. The pinch tube 44 includes an elongated generally cylindrical body 46 and an upper sealing portion 48 that includes a plurality of radially extending fins 50. The fins 50 as shown in FIG. 1 are of a diameter to engage the inner surface of the spout 18 so as to form a seal with the spout when the tube is mounted in place. The upper portion of the body 46 is also provided with an outwardly flared lip 52 of tapered thickness which is sized to sit within the tapered seat 54 formed on the inner surface of the bottom wall 56 of the bowl about the spout 18. Thus when the tube is positioned as shown in FIG. 1, the upper surface of the tube body is flush with the surface of the bottom wall 56 about approximately half its circumference. A handle 56, which is molded as an integral part of the pinch tube 44, is semicylindrical in shape and is large enough to be grasped by the fingers so as to enable the tube to be withdrawn. The handle is so oriented with respect to the tube so as not to interfere with the discharge of the pump (not shown) which may be located in the bowl and direct beverage toward the spout 18.

When the pinch tube 44 is mounted in place, the lower end 58 of the body extends to or below the bottom of the stem 42. The lower end 60 of the stem holds the body 46 of the pinch tube in place so that it will always discharge downwardly. That is, the end of the body 46 cannot be deflected because it is captured within the lower end 60 of the stem 42.

An opening 62 is provided in the rear portion of the cylindrical stem 42 and faces the front panel 14 of the stand. The opening 62 is generally aligned with an anvil 64 formed in the stem against which the pinch tube may be pressed to shut it. An actuating lever 66 is shown in FIG. 1 in full lines in its biased position and in broken lines in the position in which it may be pushed, and the lever is shown to be pivotally sup-

ported on a horizontal pin 68 extending between the sides of the frame 26. In FIG. 7 holes 70 are shown in the sides of the frame, which support the pin 68 that in turn pivotally supports the actuating lever 66. The lever 66 includes as an integral part thereof a forwardly extending finger 72 that is adapted to move in and out of the opening 62 in the stem 42 and pinch the tube body 46 against the anvil 64. The finger 72 has an arcuate flange 74 at its tip having a curvature which is the same as the inner curvature of the anvil 64 so that it can completely pinch the tube body 46 closed in the manner shown in FIG. 5. The finger 72 includes a recess 76 that houses a spring 78 which acts against the finger 72 and the stationary foot 82 forming part of the support 24 to bias the actuating lever 66 to the position shown in full lines in FIG. 1. A screw 82 is disposed inside the end of the spring 78 bearing against the foot 80 so as to retain the spring in place. It will be evident from an inspection of FIG. 1 that the spring 78 acts in compression to urge the finger and the lever 66 in a forward direction (the direction of panel 22) so as to pinch the tube body 46 between the anvil 64 and the flange 74. The pinch tube 44 may be readily opened by pressing the actuating lever rearwardly against the spring 78 and relieve the flange 74 against the tube. The relative positions of the anvil 64, finger 72 and its flange 74 with the tube open are shown in FIG. 6.

From the foregoing description it is evident that the very simple assembly shown forms a complete valve assembly for the dispenser. With the actuating lever 66 left to the influence of the spring 78 the pinch tube 44 is closed and the beverage in the bowl 10 cannot flow out. However, when a drink is to be drawn from the bowl, the lever 66 may be moved rearwardly, typically by pressing the glass against the plate 84 of the lever until the lever moves to the position shown in broken line in FIG. 1. When this is done, the cup is aligned with the lower end 58 of the pinch tube 44 so that the beverage in the bowl will flow directly into the cup.

In the embodiment shown it is evident that for cleaning, the bowl 10 need only be emptied and the pinch tube 44 may then be pulled from the spout 18 and the stem 42 by grasping the handle 56. The tube is literally lifted into the interior of the bowl 10 and may be removed from it through the open cover (not shown). In the embodiment shown, the bowl itself may be removed from the stand with its pinch tube 44 merely by moving the lever 66 rearwardly and then lifting the bowl 10 off the stand. When the bowl is removed, the pinch tube 44 will be removed with it. And the support 24 with the lever 66 may readily be removed from the stand merely by pinching the lower ends of the posts 30 together so as to enable the ears 32 to pass down within the margins of the opening 36.

While in the embodiment shown the support 24 is mounted on the stand rather than on the bowl, it is to be understood that with certain dispensers it may be more desirable or convenient to mount the support directly on the spout. This is within the contemplated use of the present invention. It is of course, desirable that the support be such that it can be readily dismounted from the bowl or the stand for cleaning without difficulty, but the particular manner in which it is connected to the bowl or the stand is not to limit the inventive scope. The particular type of attachments provided on the support will of course, be determined by the particular dispenser with which it is to be used. Obviously little latitude is provided if the particular pinch tube assembly is to be used for converting an existing dispenser. On the other hand if the pinch tube assembly is to be designed for use on a new dispenser, the most simple fastening arrangement can be employed.

It will be appreciated that the pinch tube assembling of this invention will fulfill the many objects of this invention. If the valve has any tendency to stick it will stick in the closed position rather than in the open position, and the contents of the bowl is not lost. The flexible tube can conform to the shape of semisolids that lodge in it, so that it can close about it. The assembly costs about one quarter as much as the stainless steel valves which they replace. And the support allows the assembly to be mounted on a variety of different dispensers.

Having described this invention in detail, those skilled in the art will appreciate the numerous modifications that may be made of this invention without departing from its spirit. Therefore, it is not intended that the scope of this invention be limited to the specific embodiment illustrated and described.

We claim:

1. A beverage dispenser comprising:
- a bowl having a discharge passage including a downwardly extending discharge spout, and a stand for supporting the bowl;
- a pinch tube support surrounding the spout and having a generally cylindrical vertical stem registering with the passage;
- a flexible pinch tube disposed in the support and spout and extending to the lower end of the stem, and including means forming a seal against the inside of the spout and permitting upward withdrawal of said tube through said bowl;
- an opening in the stem above its lower end providing access to the tube;
- an anvil formed in the support adjacent the opening;
- an actuating lever mounted on the support pivotable about a horizontal axis and having a pinch finger extending therefrom and movable in and out of the opening in the support to pinch and release the tube against the anvil; and
- a spring means engaging the lever biasing it to a position wherein the finger engages the tube through the opening and pinches it closed against the anvil.

2. A beverage dispenser as defined in claim 1 and further characterized by said means forming a seal between the periphery of the pinch tube at a top portion and the inner surface of the spout for preventing the contents of the bowl from leaking out between the spout and the tube.

3. A beverage dispenser as defined in claim 2 further characterized by:
- said spout forming an integral part of the bowl;
- said means forming a seal comprising a plurality of radial fins on the tube and forming a seal against the inside of the spout; and
- a handle attached to and forming part of the tube for withdrawing the tube from the spout and stem into the interior of the bowl.

4. A beverage dispenser as defined in claim 1 further characterized by said spout forming an integral part of the bowl, said support having a frame which surrounds the spout with the support exterior of the bowl and with the stem of the support forming an extension of the spout.

5. A beverage dispenser as defined in claim 4 further characterized by said finger having a recess; a foot forming part of the support and aligned with the recess; and said spring means comprising a helical spring disposed in the recess and bearing against the foot.

6. A beverage dispenser as defined in claim 1 further characterized by said opening in the stem facing rearwardly of the dispenser and with the lever mounted behind the stem and with the finger projecting forwarding and into the opening, whereby the pinch tube is released to allow the contents of the bowl to discharge through it when the lever is pushed rearwardly away from the stem.

7. A beverage dispenser as defined in claim 1 further characterized by said support being secured to the stand and enabling the bowl to be removed from the stand without removing the support and lever.

8. A beverage dispenser as defined in claim 3 further characterized by said support being secured to the stand enabling the bowl to be removed from the stand without removing the support and lever.