Dec. 6, 1955 E. BURDEN 2,726,017

AERATED DISPLAY AND DISPENSING DEVICE

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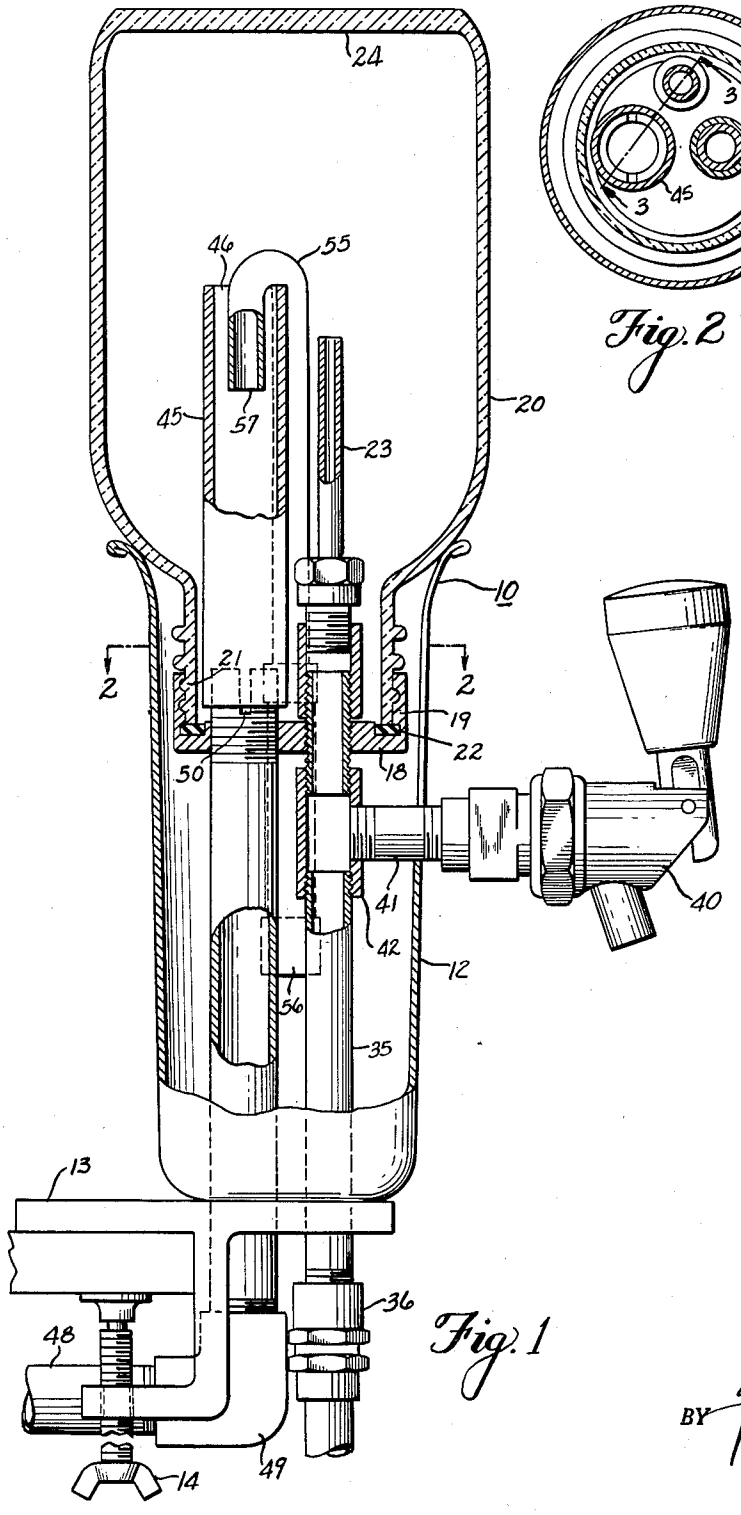


Fig. 1

Fig. 2

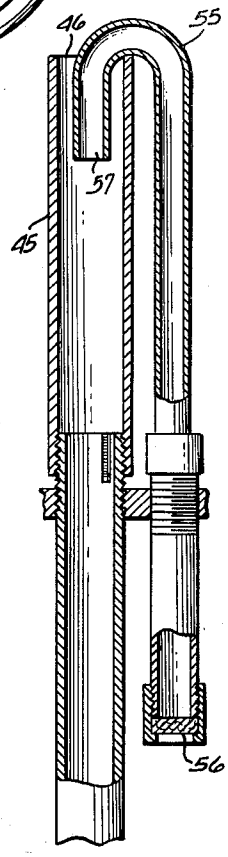


Fig. 3

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AERATED DISPLAY AND DISPENSING DEVICE

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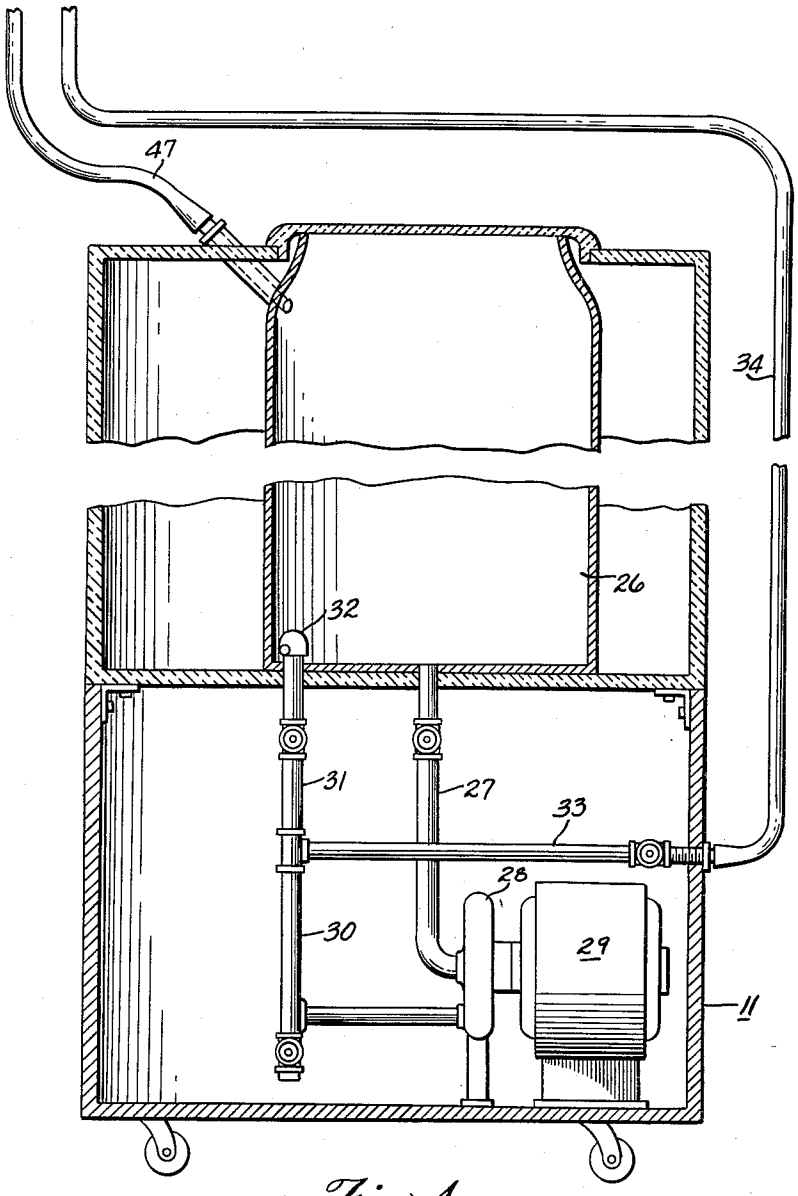


Fig. 4

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AERATED DISPLAY AND DISPENSING DEVICE

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5 Claims. (Cl. 222—154)

This invention relates to beverage dispensing equipment in general, and relates more specifically to a system including a beverage display for sales appeal, aeration for taste improvement, and rapid dispensing with a minimum of equipment and piping.

An object of this invention is to provide a unique fountain display of a beverage within a sealed transparent container.

Another object of this invention is to provide the container sealed for sanitary purposes and yet maintain an air space in the container in order not to destroy the fountain display.

Another object of this invention is to provide means to cause all beverage in the container to drain back into the refrigerated reservoir of the system when the system is shut down, thereby avoiding the isolation of any portion of beverage away from refrigeration to stagnate or spoil.

Still another object of this invention is to improve the taste of a beverage by aeration of the beverage.

Yet another object of this invention is to provide such display system in a form suitable for easy, proper cleaning.

And another object of this invention is to provide a beverage system which will keep the beverage properly stirred and will fully incorporate air into the beverage.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a vertical sectional view through a display container and dispensing apparatus embodying the principle of this invention;

Figure 2 is a sectional view taken along line 2—2 of Figure 1 to show the spaced relationship of the input nozzle, the return outlet pipe, and the aerator tube;

Figure 3 is a vertical section taken along line 3—3 of Figure 2 and illustrates the relationship of the return pipe and the aerator tube; and

Figure 4 is a sectional view through a cabinet housing a reservoir tank, pump, and related apparatus for stirring fluid in the reservoir and conducting a beverage.

This application is an improvement upon applicant's prior Patent No. 2,700,575. In the drawings there is illustrated a dispensing and display head indicated generally by the reference character **10**, and in Figure 4 there is illustrated a reservoir and service equipment cabinet indicated generally by the reference character **11**. The beverage is displayed and dispensed from the head **10**, and is stored and refrigerated in the cabinet **11**. The refrigeration equipment is conventional and, therefore, has been omitted from the drawings for clarity in illustrating the balance of the apparatus.

In the Figure 1, the preferred embodiment of the invention comprises a cup standard **12** with a vice grip base **13** for attachment of the cup **12** to the edge of a suitable display counter. Vice-grip base **13** employs a

thumb screw **14** for readily attaching the base **13** to any desired counter.

The structural portion of the dispensing and display head **10** comprises a base member **18** having a threaded side wall **19**. A display container, in the form of a small bottle **20**, provides transparent walls enclosing an airtight space. It is essential, for the maintenance of a sanitary condition, that the display container be an airtight structure which cannot be opened by curious persons, and which will not allow the beverage to escape and putrify on the exterior surface of the container, or draw air unfiltered into the container. Thus, the bottle **20** is an ideal container for such purpose. Bottle **20** is provided with a threaded neck portion **21**. A gasket **22** is employed to seal the mouth of the bottle **20** with respect to the base member **18**.

A nozzle **23** extends through the base member **18** and projects upwardly towards the dome of the display container which is the portion of the bottle **20** normally considered to be the bottom of the bottle. This dome bottom is referred to in the drawing by the reference character **24**.

In the cabinet **11** there is provided a reservoir tank **26** having a fluid main **27** opening from the bottom thereof and extending to a suitable sanitary fluid pump **28**. Pump **28** is driven by a prime mover which is illustrated in the drawing as an electric motor **29**. A pressure line **30** carries the beverage under pressure from the pump **28**. Pressure line **30** is divided into two branch lines **31** and **33**. Branch line **31** extends to a stirring nozzle **32** located in a bottom of the reservoir tank **26** and thus injects a strong stream of the beverage back into the reservoir for the purpose of rapidly stirring the beverage in the reservoir at all times during the operation of the dispensing apparatus.

The branch supply line **33** extend to a flexible supply hose **34** to carry beverage under pressure to the dispensing and display head **10**. Hose **34** is flexible in order to permit movement of the head **10** with respect to cabinet **11** to thereby provide flexibility of arrangement to suit particular conditions.

In the display head **10**, there is provided a supply conduit **35** extending through the cup **12** and connected to the nozzle **23** in a fluid conducting relationship. A fitting **36** is provided to attach the supply hose **34** to the supply conduit **35** in fluid-tight relationship.

A dispensing valve **40** is inter-connected by means of a supply branch line **41** and T-fitting **42** into the supply conduit **35**.

A return line **45** has an entrance end **46** within the space enclosed by the bottle **20**. The entrance end **46** is about half-way between the neck **21** and the bottom **24** of the bottle **20** in order to provide a sump of fluid within the bottle **20** at all times. Return line **45** extends to a return flexible hose **47** which leads into the top area of the reservoir tank **26**. A nipple **48** at the end of the return line **45** will receive the hose **47** with a slip fit. A frictional connection is sufficient because the returning fluid from the display head **10** is under practically no pressure. An elbow **49** may be employed to extend the nipple **48** at an angle when desired.

Conduit **27**, pump **28**, fluid lines **30** and **33**, the supply hose **34**, supply conduit **35**, and nozzle **23** together constitute a conduit system from the reservoir to the display container. The dispensing valve **40** opens from this conduit system. The valve **40** is large for fast dispensing but pump **28** has a pumping capacity so much greater than the small amount that can be dispensed into a beverage cup that the pump will force a far greater volume of beverage through the conduit system than the maximum possible dispensing capacity of the valve **40**. Therefore

the display effect of a spray from nozzle **23** is unaffected by full dispensing from the valve **40**.

Paddle devices are eliminated for stirring the beverage in the reservoir by the use of the jet stream from branch line **31** and the stirring nozzle **32**.

The line **47**, returning the beverage from the dispensing and display head **10** to the reservoir tank **26** enters near the top of tank **26** above the normal liquid level in the tank. The flavor of beverages dispensed by this apparatus had a noticeably superior taste over a beverage made of the identical components of syrup and water when mixed in a container and ladled out into cups, for example, as from a punch bowl. It was discovered that the returning beverage cascading from return hose **47** into the reservoir liquid carried a considerable amount of atmospheric air down into the body of liquid in storage, and that the rapid stirring by the jet of fluid from nozzle **32** intimately mixed the air and beverage together and caused a considerable proportion of the entrained air to be absorbed by the body of the liquid in storage. It was the aeration that made the beverage "alive" and better tasting than the identical beverage in a dead state. Accordingly, the very circulation of the beverage to the dispensing and display head and return to the reservoir in a cascading manner, coupled with the rapid stirring in the reservoir by a liquid jet, has been found to materially enhance the taste of the beverage. The jet type of stirring causes a superior incorporation of the entrained air over mechanical stirring.

Air incorporation in this manner did not saturate the beverage, but did have a marked effect upon the taste. Another discovery was then found to further enhance the taste of the beverage and to eliminate a problem of the display of the beverage. The further discovery was that complete aeration of the beverage made an unusually pronounced beneficial effect upon the taste. The problem overcome was that of destroying the display in a sealed container.

In the operation of a beverage display employing a spray of the beverage into a sealed air space, the beverage soon absorbs the air and eliminates the air space. The eye appeal is thereby destroyed. Prior devices for this reason provided loose fitting covers or vent piping. However, loosely fitting covers are unsanitary and vent pipes produce an unsatisfactory appearance.

It was then discovered that the air space could be maintained by saturation of the beverage with properly cleaned air aspirated into the beverage as it circulates through the system. Accordingly, air line **55** was provided and in the preferred embodiment it extends from a free end in atmosphere through the base member **18** upwardly into the display container and down into entrance end **46** to return line **45**. The end of line **55** within return line **45**, indicated by the reference character **57**, then serves as an aspirator to bubble a fine stream of air into the stream of beverage flowing through return line **45**. Of course, venturi type aspirators may be employed, if desired, but the open end **57** of line **55**, as illustrated, will satisfactorily aspirate plenty of air into the stream.

Although the primary purpose of introducing the air into the beverage was to eliminate the loss of the air space in the upper portion of bottle **20** by saturation of liquid and by actual replacement of the air, it was discovered that the air was being thoroughly absorbed into the beverage because of the rapid stirring of the beverage in the reservoir tank by nozzle **32**. This absorption of the air had a remarkable effect upon the enhancement of the taste and quality of the beverage. The aspirator introduces the air in fine bubbles, but the rapid stirring of the beverage and the fine bubbles together in the reservoir cause a more thorough absorption of the air into the beverage.

The air introduced through the line **55** does not require a force pump. The natural flow of liquid into the return line **45** will draw air through the line **55**. A filter **56** on the atmospheric end of line **55** assures a dust free air intake.

Beverages are water based drinks, and water will absorb very little air, especially when cold. Therefore, unless purposely restricted, the air drawn through line **55** will provide all that can be absorbed and much more. The excess will be carried along as find beads in this system wherein the air and beverage mixture is kept in rapid motion.

By the use of the aspirator air line as described, the air space in the bottle **20** is maintained without any diminution, and the quality of taste in the beverage is markedly enhanced.

Sweetened beverages generally will deteriorate and spoil rapidly if left unrefrigerated. Display and dispensing systems such as the one illustrated in the drawings are usually shut down for considerable periods of time, especially overnight. In warm weather, the beverage would quickly spoil if allowed to remain in the bottle **20** away from refrigeration. This spoilage of a portion of beverage has long been a problem with this type of display and dispensing apparatus. According to this invention, a plurality of openings **50** enter into the return line **45** at a position near the base member **18**. Because of the venting of the system through the air line **55**, the liquid in the bottle **20** may then seep through the openings **50** and run through the return line **45** into the reservoir **26**. Openings **50** are not large enough to prevent the normal accumulation of a beverage in bottle **20** to the height of the opening in return line **45**.

In addition to the foregoing improvements, the illustrated embodiment of the invention employs straight fluid conduits in both the supply conduit **35** and the return line **45** in order to permit brushes to be extended completely through the system for sanitary cleaning. In order to permit such straight-through construction, the vice grip base **13** has been constructed as best illustrated in Figure 1 to position the cup **12** beyond the edge of the supporting counter. The elimination of turns in the system is considerably more acceptable to sanitary departments of the government.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What I claim is:

1. A beverage dispensing and aeration system, comprising, a display container enclosing an air tight space, defined by walls through which a liquid content therein may be visually observed, an inlet to said space, means to inject a liquid beverage through said inlet into said space, an outlet line from said space, said outlet line having an entrance opening in said space, an air line extending from atmosphere through said space into said entrance opening, and means to stir said beverage and entranced air together after leaving said display container.

2. A beverage dispensing and aeration system, comprising, a display container enclosing an air tight space, defined by walls through which a liquid content therein may be visually observed, an inlet to said space, means to inject a liquid beverage through said inlet into said space, and outlet line from said space, said outlet line having an entrance opening in said space, an air line extending from atmosphere into said outlet line, and means to stir said beverage and entrained air together after leaving said display container.

3. A beverage dispensing and aeration system as set forth in claim 2 with the further provision of faucet

means located in said system to dispense the beverage after the beverage has been stirred with the air.

4. The method of dispensing and improving the flavor of a beverage, comprising, providing a dispensing system in which the beverage is continuously circulating in a conduit from which a dispensing valve opens to atmosphere, circulating a greater volume of beverage through said conduit than can be dispensed through said valve under the maximum valve dispensing conditions, continuously introducing a greater volume of air as a bubble stream into the beverage bypassing said dispensing valve through said conduit than can be absorbed by the beverage, and rapidly stirring said air and beverage together to incorporate the maximum possible quantity of such air into the beverage.

5. A beverage dispensing apparatus comprising, a beverage reservoir from which air may escape, a display container, a conduit system from said reservoir to said display container, said conduit system including a pump, a dispensing valve means opening from said conduit system to atmosphere, said pump having a pumping capacity greater than the maximum possible dispensing capacity

of said dispensing valve means, a return line from said display container to said reservoir, said return line leading from an intermediate point of said display container to maintain a body of fluid beverage therein at all times for display, means continuously introducing a volume of air from atmosphere into said beverage in the form of a bubble stream in a moving body of said beverage passing through said return line, and means to stir said air and beverage together to incorporate the maximum possible quantity of such air into the beverage as absorbed air and small air beads.

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