Jan. 26, 1954 J. E. McPHEE 2,667,290

LIQUID DISPENSER FOR BOTTLES

Filed July 30, 1951

Fig. 1

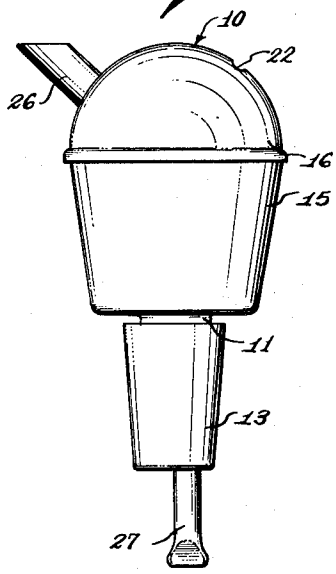


Fig. 2

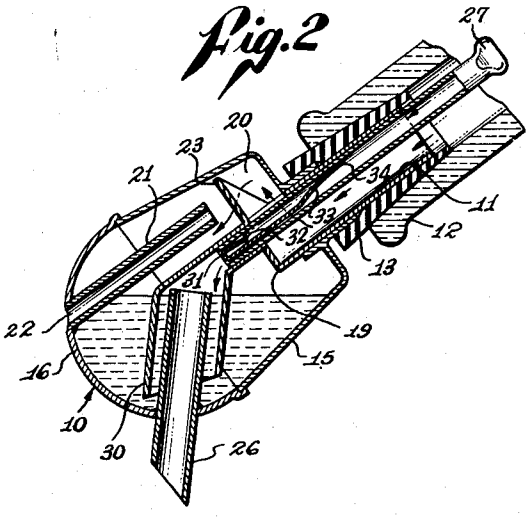


Fig. 3

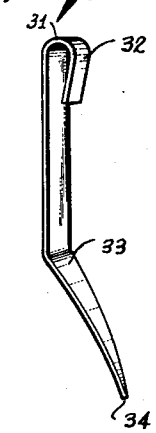


Fig. 4

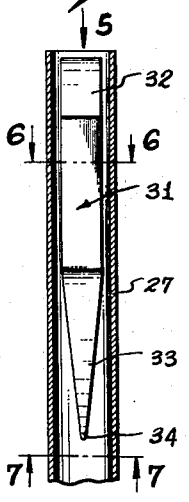


Fig. 5

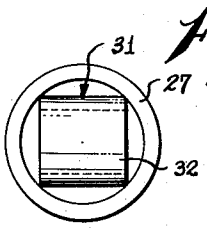
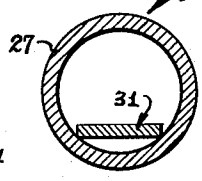


Fig. 6



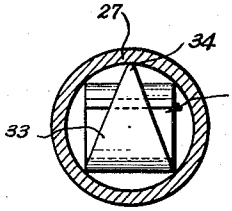


Fig. 7

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Patented Jan. 26, 1954

2,667,290

UNITED STATES PATENT OFFICE

2,667,290

LIQUID DISPENSER FOR BOTTLES

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Application July 30, 1951, Serial No. 239,275

6 Claims. (Cl. 222—416)

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This invention relates to measuring devices for dispensing liquids and is directed to an improved device for use on a bottle to pour measured servings of a liquid and particularly alcoholic beverages.

The object of the invention is to provide a self-contained dispensing unit of this type that is efficient and reliable in operation but at the same time is relatively simple in structure for economy in manufacture on a mass production basis.

In the drawings, which are to be regarded as merely illustrative,

Fig. 1 is a side elevation of a preferred embodiment of the invention;

Fig. 2 is a longitudinal sectional view of the device as mounted on a bottle in pouring position;

Fig. 3 is an enlarged perspective view of what may be termed a meniscus baffle that is mounted in an air tube of the device;

Fig. 4 is a longitudinal sectional view of a portion of the air tube showing the meniscus baffle in place;

Fig. 5 is an end view of the air tube with the meniscus baffle therein, the view being taken as indicated by the arrow 5 in Fig. 4;

Fig. 6 is a transverse section taken as indicated by the line 6—6 in Fig. 4; and

Fig. 7 is a similar cross-sectional view taken as indicated by the line 7—7 in Fig. 4.

The device shown in the drawings includes a dispenser body generally designated 10 which has the character of a sealed container and is mounted on what may be termed a neck tube 11. The neck tube 11 is adapted to be mounted on a bottle 12 and for this purpose is embraced by a tapered rubber sleeve 13 that is dimensioned to wedge into the mouth of the bottle in the manner of the usual tapered stopper.

For the purpose of fabrication the dispenser body 10 is made in two sections 15 and 16, the lower section 15 being unitary with the upper end of the neck tube 11. The upper end of the neck tube 11 is closed by an end wall 19 but the neck tube extends an appreciable distance into the interior of the body 10 and has a side opening generally designated 20 through which liquid may flow from the neck tube into the interior of the dispenser body.

The dispenser body 10 is provided with a small vent tube 21 that communicates with a small vent hole 22 in the wall of the dispenser body and the vent tube 21 is extended to a point near the opening 20 from the neck tube 11, this point

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being above the maximum liquid level in the dispenser body when the bottle 12 is tipped into pouring position. Since it is desirable that liquid flowing from the neck tube 11 into the body 10 through the opening 20 be prevented from entering the small vent tube 21, a suitable hood or guard 23 is provided at the side opening 20 from the neck tube 11 to serve as a baffle to divert the flowing liquid from the inner end of the vent tube 21.

The dispenser body 10 is provided with a pouring spout or pouring tube 26 that extends a substantial distance into the interior of the dispenser body. As shown in Fig. 2 the pouring tube 26 is approximately vertical when the device is tipped into pouring position. To permit liquid to flow from the tipped bottle through the neck tube 11 into the dispenser body 10, it is necessary to provide for counterflow of air from the atmosphere into the bottle. For this purpose a suitable air tube 27 extends from the interior of the bottle 12 through the neck tube 11 and through the end wall 19 of the neck tube to communicate with the interior of the dispenser body 10 independently of the neck tube. The outer end of the air tube 27 which extends into the interior of the bottle 12 is suitably restricted to minimize leakage of liquid into the air tube when the bottle is in tipped position. For this purpose the outer end of the air tube 27 may be pinched or flattened as shown at 28 to restrict the intake of liquid from the bottle.

Inside the dispenser body 10 what may be termed a siphon tube 30 surrounds the inner portion of the pouring tube 26. The siphon tube 30 is carried by the inner end of the air tube 27 and may be regarded as an enlarged extension of the air tube. When the device is in pouring position, as shown in Fig. 2, the siphon tube 30 cooperates with the pouring tube 26 to provide an automatic siphon in which the down-leg is the pouring tube and the up-leg is the annular space between the pouring tube and the surrounding siphon tube.

A feature of the invention is the employment of what may be termed a meniscus baffle 31 inside the air tube 27 to prevent whatever liquid that leaks into the air tube from interferring with the free inward flow of air through the air tube. In the absence of such a baffle 31 inside the air tube 27, liquid leaking into the tube from the bottle tends to form a meniscus effective to cut off air flow therethrough into the interior of the bottle. I have found that such blockage by liquid inside the air tube occurs in the end

of the tube adjacent to the dispenser body 10 and I have discovered that such blockage may be prevented merely by mounting a suitable longitudinal baffle means inside the air tube at the end of the tube adjacent the enlarged siphon tube 30. I have further discovered that such a baffle need not be physically joined to the surrounding air tube 27 and therefore may comprise simply a strip of metal held in place solely by frictional contact with the surrounding air tube.

In the preferred practice of my invention the meniscus baffle 31 is cut from thin sheet brass which preferably has a certain degree of resiliency or spring-like character. As may be seen in Figs. 4, 5 and 6, the present baffle structure comprises a strip or ribbon of metal somewhat smaller in width than the inside diameter of the air tube 27. One end of the strip is formed into a hook or loop 32 that tends to spread against the surrounding wall of the tube 27 and thereby frictionally anchors the baffle strip in the tube. As may be seen in Fig. 5 the loop 32 makes contact with the surrounding air tube at four points and, as may be seen in Fig. 6, the intermediate portion of the strip of metal forming the baffle 31 tends to lie against one side of the tube making two point contact therewith. Preferably the inner end portion 33 of the baffle strip 31 is cut to tapered configuration as may be seen in Fig. 4 and this end portion is bent towards the opposite side of the surrounding tube with the point 34 of the tapered end portion flexed into pressure contact with the tube wall. Thus the loop 32 at one end and the flexed tapered portion 33 at the other end tend to position the intermediate portion of the baffle strip 31 towards and along one side of the tube.

When the bottle 12 with the dispensing device thereon is tipped to pouring position as shown in Fig. 2, liquid from the bottle passes through the neck tube 11 and the opening 20 into the dispenser body 10 and the liquid accumulated in the dispenser body rises towards the inner end of the pouring tube 26. Air to replace the liquid pouring out of the bottle into the dispenser body 10 enters the dispenser body through the vent tube 21 and the pouring tube 26. When the liquid level rises to the edge of the siphon tube 30 surrounding the pouring tube, communication between vent tube 21 and the air space in the tipped bottle is cut off and thereafter air enters the dispenser body 10 through the pouring tube 26 alone. When the liquid pouring into the dispenser body 10 rises above the level of the inner end of the pouring tube 26 the two legs of a siphon are completed for automatic siphon flow, the liquid flowing upward through the siphon tube 30 around the pouring tube 26 and then downward through the pouring tube. This dispensing flow through the pouring tube 26 continues until the liquid level drops below the rim of the downwardly presented siphon tube 30 whereupon siphon flow ceases and the liquid level rises to repeat the siphon cycle. The various parts of the dispenser device are so proportioned that this siphon cycle releases the desired measured quantity of liquid during each pouring period.

The presence of the meniscus baffle 31 inside the air tube 27 avoids any blockage of the air tube that would prevent one pouring cycle from following the previous pouring cycle without prolonged time delay. There is reason to believe that any liquid entering the restricted end of the air tube 27 that would tend to block air flow therethrough is diverted to one side of the tube by capillary action so that the liquid meniscus forms between the baffle strip 31 and one side of the air tube, the other side of the air tube being clear for the free flow of air. The drawings show that the baffle strip 31 is turned or positioned in the air tube 27 to partition the tube into an upper portion and a smaller lower portion, these terms being used with reference to the position of the air tube when the device is tipped to pour as shown in Fig. 2. There is reason to believe that the pointed end portion 33 of the baffle strip is desirable.

My description herein of the presently preferred form of the invention will suggest to those skilled in the art possible changes and substitutions that may be made within the scope and spirit of my appended claims.

Having described my invention, I claim:

1. A liquid dispenser of the character described for use on a bottle, said dispenser having: a hollow dispenser body; a tube connected with said body and adapted to seat in a sealed manner in the mouth of the bottle both to support said body and to provide a passage for flow of liquid from the bottle into the body when the bottle is tipped; a pouring tube mounted in said body for discharging flow therefrom, the inner end of said tube extending inward to the interior of the body; a vent tube mounted in said body for communication with the atmosphere, the inner end of said tube extending to a point above the inner end of said pouring tube when the body is tipped into pouring position; an air tube extending through said neck tube for the passage of air from said body into the bottle when the bottle is tipped, the outer end of said air tube having a restricted opening to minimize the entrance of liquid from the bottle; a continuous wall inside said body forming an extension of the inner end of said air tube, said wall enclosing the inner portion of said pouring tube to cooperate therewith to form a pouring siphon; and a strip of material mounted in said air tube longitudinally thereof near said continuous wall to divert any liquid meniscus in the air to one side of the air tube to avoid blocking airflow therethrough.

2. A liquid dispenser as set forth in claim 1 in which said strip is substantially shorter than the air tube and is frictionally mounted in said air tube at the inner end thereof.

3. A liquid dispenser of the character described for use on a bottle, said dispenser having: a hollow dispenser body; a tube connected with said body and adapted to seat in a sealed manner in the mouth of the bottle both to support said body and to provide a passage for flow of liquid from the bottle into the body when the bottle is tipped; a pouring tube mounted in said body for discharge flow therefrom, the inner end of said tube extending inward to the interior of the body, a vent tube mounted in said body for communication with the atmosphere, the inner end of said tube extending to a point above the inner end of said pouring tube when the body is tipped into pouring position; an air tube extending through said neck tube for the passage of air from said body into the bottle when the bottle is tipped, the outer end of said air tube having a restricted opening to minimize the entrance of liquid from the bottle; a continuous wall inside said body forming an extension of the inner end of said air tube, said wall enclosing the inner portion of said pouring tube to cooperate therewith to form a pouring siphon;

and a strip of material mounted in said air tube longitudinally thereof near said continuous wall to divert any liquid meniscus in the air to one side of the air tube to avoid blocking airflow therethrough, said strip being substantially narrower than the inner diameter of the air tube and being bent at one end to make four-point contact with the air tube.

4. A liquid dispenser as set forth in claim 3 in which an intermediate portion of the strip lies close to one side of the air tube.

5. A liquid dispenser as set forth in claim 4 in which the other end of said strip is tapered and flexed towards the other side of the air tube.

6. A liquid dispenser as set forth in claim 1 in which said strip extends in a generally horizontal direction across said passage when said body is tipped into pouring position.

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