

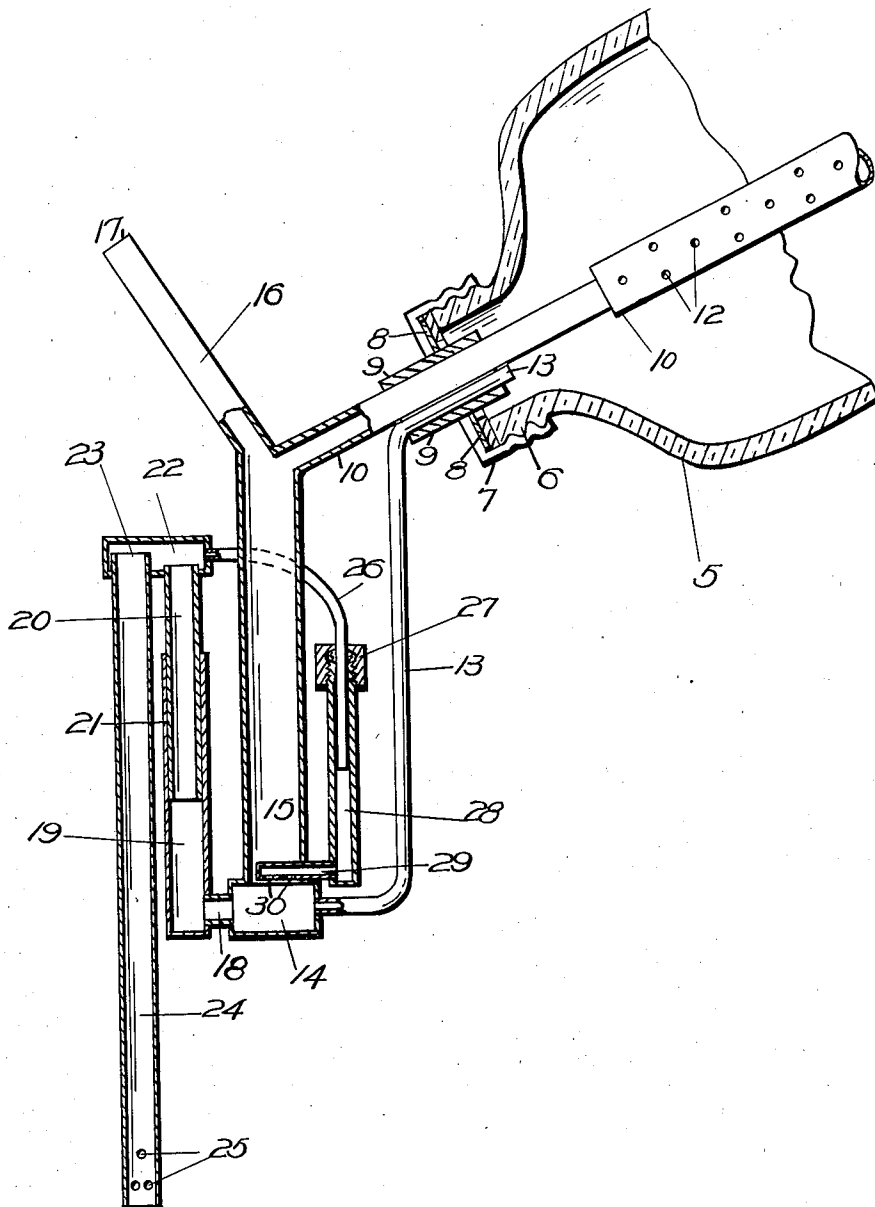
Jan. 21, 1941.

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2,229,122

METERING SPOUT

Filed Dec. 6, 1938



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UNITED STATES PATENT OFFICE

2,229,122

METERING SPOUT

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Application December 6, 1938, Serial No. 244,162

4 Claims. (Cl. 221-147)

This invention relates to metering spouts.

The principal object of the invention is to provide a pouring spout that may be readily attached to a bottle or other container of liquid, and which will dispense accurately measured volumes of liquid from the bottle when it is tipped to a pouring position.

Another object is to provide a metering spout of this character that will continue to deliver such measured units of liquid as long as it is held in its pouring position or until the supply of the liquid has been exhausted.

Still another object is to provide a metering spout of this character, which may be varied to alter the volume of the measured dispensed units.

Other objects and advantages reside in details of design and construction which will be more fully disclosed in the following description and in the drawing wherein like parts have been similarly designated and in which the figure is a view partially in section, illustrating the improved metering spout in its pouring position.

In the drawing, reference character 5 denotes a bottle or the like, having a neck portion 6 to which is attached a metering spout made according to this disclosure. The spout is attached to the bottle by means of a screwed cap or the like, 7, that engages the flange 8 that is attached to a plug 9 through which passes a breather tube 10, which is provided with a series of apertures 12 that are open to the interior of the bottle. The breather tube 10 extends into the bottle to a position adjacent the bottom thereof.

A feed tube 13 connects through the plug 9 with the interior of the bottle adjacent its top or neck. The opposite end of the feed tube 13 is conductively connected with a chamber 14 which is in open communication with accumulating chamber 15, the upper end of which opens into the breather tube 10 and also into an air tube 16 which is open to the atmosphere at its outer extremity 17.

The chamber 14 is conductively connected by passage 18, with an ascending siphon tube 19, the upper portion 20 of which is telescoped with the lower portion as shown at 21. The uppermost end of tube 20 is open into a chamber 22 into which projects the open upper end 23 of a descending siphon tube 24, which is provided adjacent its lower or discharge end with a plurality of apertures 25.

A siphon-breaking air tube 26 is connected into the chamber 22, and at its other end, slidably projects through an adjustable packing nut

27 into a lower siphon-breaking air tube 28, which in turn, is conductively connected into the accumulating chamber 15 by means of a passage 29 that is provided along its lowermost surface with a plurality of apertures 30.

Operation

In use, the improved metering spout is installed on the neck of a bottle or the like in sealed engagement therewith, and when it is desired to dispense one or more measured units of liquid from the bottle, the latter is tipped to the position illustrated whereupon liquid from the bottle will flow down feed tube 13 into chamber 14, from where it will rise in ascending siphon tube 19-20 and in accumulating chamber 15. When the liquid has raised into chamber 22 above the upper end 23 of descending siphon tube 24, it will begin to run down through said tube 24 and be discharged through the lower open end thereof. This will start a siphon action to withdraw accumulated liquid from the chamber 15 down to a level slightly below the apertures 30 that are in communication with the siphon-breaking air tube 26-28. At this point, air will be taken in to the siphon-breaking tube connections to effect a sharp break in the siphon action.

If the bottle is still held in its pouring position, the cycle hereinabove described will be repeated and it will be continually repeated until the liquid supply is exhausted.

By carefully determining the cubic volume of the liquid holding portions of the improved spout, a predetermined volume of liquid will be dispensed at each siphon operation. By loosening the packing nut 27, the upper siphon-breaking air tube 26 and the descending siphon tube 24 can be raised or lowered with reference to the accumulating chamber 15 so that the volume of discharge at each siphon operation may be varied to suit requirements. Upon turning the bottle upright to its normal position of repose, substantially all liquid contained in the spout assembly will return by gravity to the interior of the bottle.

The breather tube 10 is effective for maintaining atmospheric pressure within the bottle through apertures 12, under all circumstances, since it is in constant communication with the atmosphere through air tube 16. By arranging the apertures 12 in spaced positions through substantially the entire length of the bottle, the forming of a liquid column in breather tube 10 is avoided. When the bottle and the spout are

tipped to their pouring position, liquid will not run down through breather tube 10 because it will naturally follow the lower tube 13, whereupon air will enter breather tube 10 and be admitted to the interior of the bottle or other container through the apertures 12. The apertures 25 in the lower discharge end of descending siphon tube 24 prevent the air that is forced down through tube 24 ahead of each liquid unit, from forcing adhering drops of liquid remaining from the previous discharge, out of the lower end of tube 24.

The enlarged portion 14 of the accumulating chamber 15, provides for a longer time period during which air can be admitted into the siphon through siphon-breaking air tube 26—28, because it requires a longer time for liquid to refill 14 up to the apertures 30. The feed tube 13 is, of course, of less conductive capacity than the siphon, and it is preferably connected with the accumulating chamber 14—15, at a location below the connection of the air tube 26—28 with said accumulating chamber.

While this specification discloses preferred means for reducing the present invention to practice and a preferred embodiment of the invention, changes may occur to those skilled in the art and may be made within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A metering spout comprising an accumulating chamber for liquid, a siphon conductively connected with said accumulating chamber adjacent the lower portion thereof, a siphon-breaking air passage connecting the interior of the chamber with the interior of the siphon adjacent the top of said siphon, the accumulating chamber being open to the atmosphere whereby at-

mospheric pressure is maintained therein, and means for selectively raising or lowering the top of the siphon inclusive of its connection with said siphon-breaking air passage to predetermine selectively the quantity of liquid discharged by each siphoning action.

2. A metering spout comprising an accumulating chamber for liquid, a siphon having an extensible ascending tube connected with said accumulating chamber adjacent the lower portion thereof, and a correspondingly extensible siphon-breaking air passage connecting the interior of the chamber with the interior of the siphon adjacent the top of said siphon, the accumulating chamber being open to the atmosphere.

3. A metering spout comprising an accumulating chamber for liquid, a siphon having an extensible ascending tube connected with said accumulating chamber adjacent the lower portion thereof, a correspondingly extensible siphon-breaking air passage connecting the interior of the chamber with the interior of the siphon adjacent the top of said siphon, the accumulating chamber being open to the atmosphere, and means for holding said extensible siphon tube in selected predetermined positions whereby the volume of liquid discharged during each siphoning cycle may be selectively predetermined.

4. A metering spout comprising an accumulating chamber for liquid open to the atmosphere, means for connecting said chamber adjacent its bottom with a source of liquid to be metered, an extensible siphon conductively connected with said accumulating chamber adjacent its lower portion, and an extensible siphon-breaking air passage connecting the interior of the chamber with the interior of the siphon adjacent the top of said siphon.

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