

July 21, 1959

H. M. GIEPEN

2,895,653

MEASURING AND DISPENSING VALVE

Filed June 27, 1957

Fig. 1.

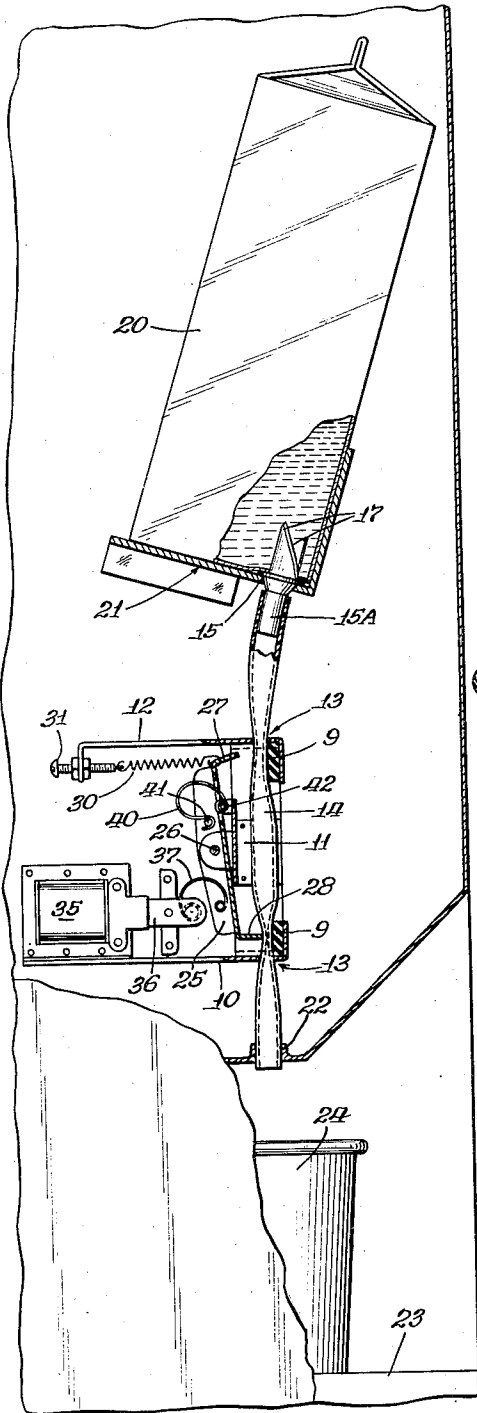


Fig. 2.

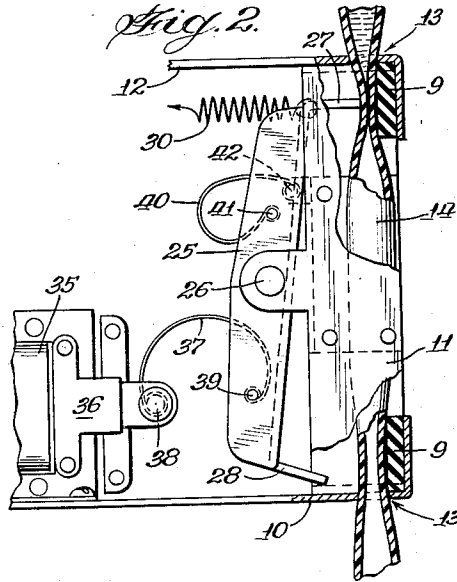


Fig. 3.

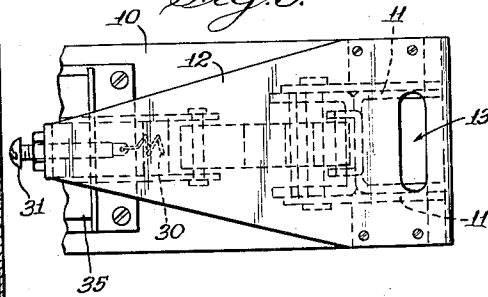


Fig. 4.

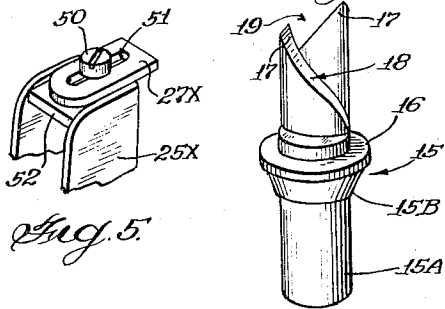


Fig. 5.

INVENTOR.
Hubert M. Giepen
BY
Hubert M. Giepen

1

2,895,653

MEASURING AND DISPENSING VALVE

Hubert M. Giepen, Des Plaines, Ill., assignor to Raymond T. Moloney; American National Bank and Trust Company of Chicago, executor of said Raymond T. Moloney, deceased

Application June 27, 1957, Serial No. 668,362

2 Claims. (Cl. 222-452)

The principal object of this invention is the provision of a simple measuring valve structure which is of general application and which also has operating and hygienic features especially useful in conjunction with beverage dispensing machines.

Another important object is the provision of a measuring valve which has no parts contacting with the liquid measured and controlled thereby, but which acts in alternation directly at spaced points upon a compressible tube carrying said liquid from the source of supply to the point of utilization or discharge.

Additional aspects of novelty and utility characterizing the invention relate to details of the construction and operation of the embodiment described hereinafter in view of the accompanying drawing, in which:

Fig. 1 is a fragmentary elevational view of a coffee dispensing machine employing the new valve to dispense cream;

Fig. 2 is an enlarged fragmentary side elevation of the measuring valve with parts shown in section;

Fig. 3 is a fragmentary top plan view of the parts seen in Fig. 2;

Fig. 4 is a perspective detail of the spike coupling;

Fig. 5 is a fragmentary perspective detail of a modified valve presser finger.

As viewed in Fig. 1, the new measuring and dispensing valve consists of a somewhat U-shaped frame having a base portion 10, an upright limb 11, and an overhead arm 12.

Aligned, oblong tube passages 13 (see Figs. 2 and 3 also) are provided in the arm 12 and base portion 10 adjacent the conjunction with the latter of the respective ends of an upright channel section or limb 11, at which positions are provided resilient back stops 9 of rubber or like material, secured in position by an adhesive.

A pliable delivery or feed tube 14 passes through the tube passages or guide openings 13 so that the tube is somewhat flattened in the region adjoining said passages and the appertaining back stops 9.

At its upper end the feed tube removably engages the nipple 15A of a spike coupling shown to larger scale in Fig. 4, and comprising a head portion 15 on which is a seating gasket 16, and above which extends a hollow spike structure including spaced piercing points 17, angularly cut away and sharpened as at 18, 19, to enter the bottom of a carton 20 (Fig. 1) containing a dispensible liquid such as cream, and adapted to seat on a bracket means 21 fixed above the measuring valve.

The head portion 15 of the spike is provided with a gasket 16 aiding to seal the spike puncture in the carton; also the periphery of the spike head 15 may be provided with screw threading 15B for removable seating in bracket 21, although for most installations it is sufficient simply to drop the spike into the seating hole in the bracket and omit the threading.

2

At its lower end the tube 14 fits into a discharge outlet 22 above a shelf 23 adapted to support a cup 24.

Referring to Figs. 1 and 2, the valve mechanism includes a rockable member 25 carried on a pin 26 supported between the channel uprights 11, and each of the ends of said member includes a somewhat lateral presser extension or finger 27, 28 disposed opposite one of the tube back stops 9, each finger being adapted to press against the intervening and pre-flattened portion of the feed tube opposite the corresponding stop member 9 when the rockable member is pivoted in the appropriate direction, as depicted in alternation in Figs. 1 and 2.

A normal spring 30 is attached at one end to the upper end of the rockable member and (Fig. 1) at its other end to an adjusting screw 31 carried on arm 12, so that the lowermost finger 28 is normally pressed against the lower tube flat and compresses the same against the corresponding backstop 9 to close off the tube and block escape of the contained dispensible liquid.

Means for rocking the arm 25 from the normal position of Fig. 1 into the discharge position of Fig. 2, includes a solenoid 35 having a plunger 36 connected by a bow spring 37 (Fig. 2) to a pin 39 on the rocking arm, the other end of said spring connecting through a pin 38 to the solenoid plunger.

A snap-action is afforded by providing another bow spring 40 to the upper region of the rockable lever member 25 on the opposite side of its pivot 26 from the first-mentioned bow spring 37, the second bow spring having one end engaged with a cross pin 41 on the rockable member and the opposite end pivoted on a cross pin 42 carried between the channel uprights 11.

The solenoid 35 may be equipped with the usual internal restoring spring (not shown) in which case the normal spring 30 has merely the work of returning the member 25 and the over-center bow spring 40 to the point whereby the latter assists in the return action when the solenoid is deenergized.

In operation, the solenoid 35 will be pulsed from some control circuit (not shown) which will cause the rockable presser means 25, 27, 28 to change from the normal position of Fig. 1 to the discharge position of Fig. 2, at which time the contents of the tube 14 situated in the region between the fingers 27, 28, will be released to flow into the receptacle 24, the upper finger 27 blocking flow from the source or carton 20 until such time as the solenoid is deenergized and the upper finger 27 disengages the tube.

The measured quantity of dispensed liquid is that quantity entrapped in the span of the tube between the upper and lower fingers 27 and 28 in each complete oscillation of the valve lever or rockable member 25.

The accuracy of the measuring action is partly dependent on deliberate full-stroke movements, in both directions, of the member 25, and on the proper location and length of the fingers 27, 28. For ordinary adjustment these fingers may be bent up or down to change to a limited extent the moment of contact and disengagement thereof with the feed tube, but further adjustment is possible with the adjustable fingers such as finger 27X shown in Fig. 5 which is slidably held by screw and slot means 50, 51, on a return bend 52 of the stock from which the modified rockable member 25X is formed.

The valve is so constructed that the feed and measuring tube 14 may be easily removed from the passages 13 which guide and maintain the measuring portions thereof relative to the rocking presser or valve fingers 27, 28.

Moreover, the tube 14 and carton spike 15, etc., are easily removed from bracket means 21, and the tube in turn is easily detached from the spike.

For hygienic purposes the foregoing features are of great importance in a beverage dispensing machine, as

no-moving valve parts touch the liquid inside the feed tube, and the latter and its coupling spike may be replaced by a fresh tube and spike upon each installation of a fresh carton of cream, the tubes either being sterilized and returned, or discarded.

I claim:

1. In a measuring liquid dispensing valve of the type having a compressible feed tube adapted to be connected to a supply of liquid to be dispensed, valve mechanism comprising: a frame; an elongated valve lever mounted to rock on pivot means situated between the first and second opposite ends of the lever and carried by part of said frame; means positioning a length of said tube in said frame to pass in a direction at right angles to the axis of said pivot and past said opposite ends of the lever; tube-engaging means at said first and second opposite lever ends respectively adapted to be pressed in alternation against the tube to compress the same in valve action responsive to opposite rocking motions of the lever; and snap-action actuating means for rocking the lever as aforesaid comprising a traction spring connecting with the first one of said lever ends to rock the same into a normal position with the tube-engaging means of the second end lever compressing the tube to normally close the same; a bow spring having one end rockably anchored to the frame and an opposite end rockably engaging said lever at a point between said first lever end and said pivot; together with a second bow spring having one end rockably connecting with said lever at a point thereon on the opposite side of the pivot from the first bow spring; and electromagnetic means including a reciprocable driving member movable back and forth opposite said lever in a direction in parallelism to the action of the traction spring approximately normal to the length of the lever and having a pivotal driving connection with the remaining end of said second bow spring such that

predetermined movement of the reciprocable member away from the lever causes a snap-action rocking of the lever out of said normal position to open the normally closed portion of the tube and close the portion thereof juxtaposed to the first lever end.

2. A liquid measuring valve comprising a compressible feed tube and frame means for mounting said tube in a substantially upright position, means carried by said frame means providing a backstop at spaced points constituting upper and lower levels along said tube, a long lever mounted between its ends at one side of the tube to rock about an axis normal to the length of the tube so that the opposite ends of the lever can be rocked toward and away from engagement with the tube; a tube-engaging projection at each end of the lever respectively opposite one of said backstop means to pinch the corresponding portion of the tube at the corresponding level against the appertaining backstop means when the lever is rocked in the appropriate direction; a first spring means yieldingly urging said lever into a normal position to press the lowermost one of said tube-engaging projections against the tube to close the latter at the lower level, a second spring means connecting with said lever on one side of the rocking axis thereof, and a third spring means connecting with the lever on the opposite side of said axis from the second spring means to cause the opposite rocking movements thereof to occur with a snap action, and means connecting with said lever and operable to rock the same in opposite directions.

References Cited in the file of this patent

UNITED STATES PATENTS

350,503	Richards	Oct. 12, 1886
2,667,288	Mach	Jan. 26, 1954
2,673,011	Rood	Mar. 23, 1954
2,726,019	Moran	Dec. 6, 1955