July 10, 1956 C. L. GONZALES ET AL 2,754,034

METERING DISPENSER AND CUT-OFF DEVICE FOR LIQUIDS

Filed May 17, 1955

FIG. 1

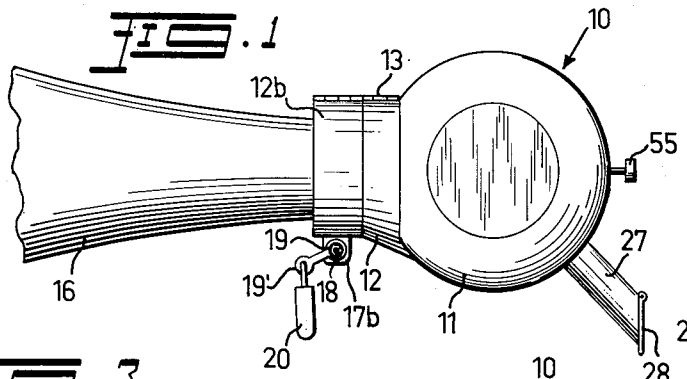


FIG. 2

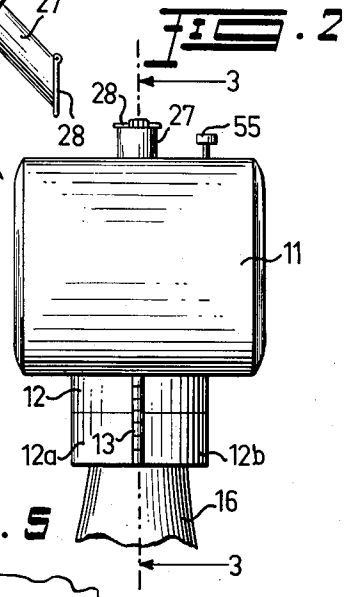
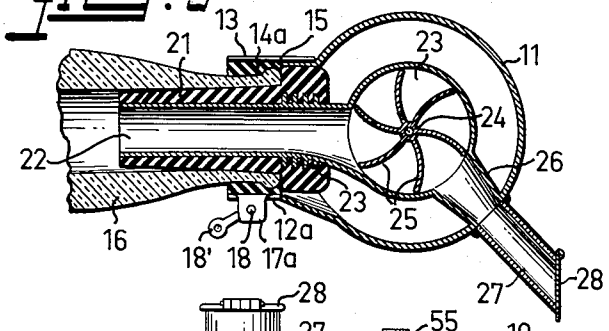


FIG. 3



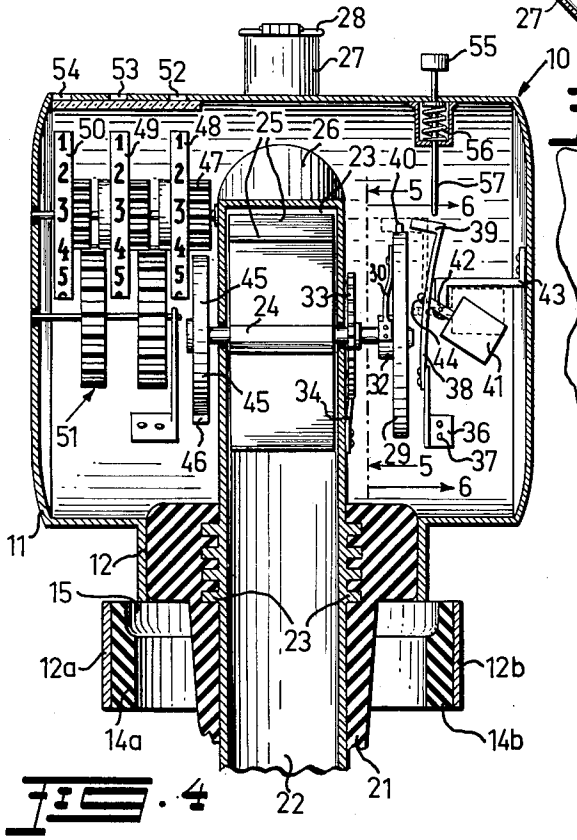


FIG. 4

FIG. 5

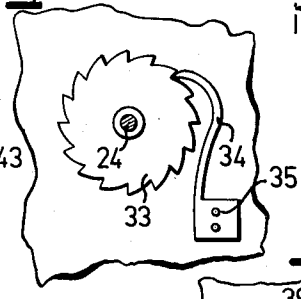
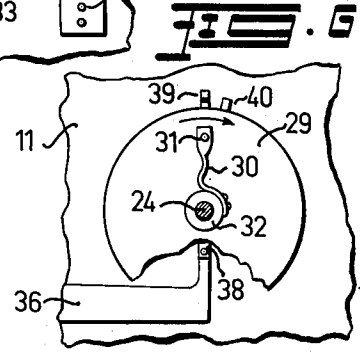


FIG. 6



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METERING DISPENSER AND CUT-OFF DEVICE FOR LIQUIDS

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5 Claims. (Cl. 222—335)

Our present invention relates to a device adapted to meter the volume of liquid dispensed from a container, e. g. a bottle, and to cut off the flow of the liquid after a predetermined volume thereof has passed through an outlet.

An object of our invention is to provide a device of this character having means for blocking the outflow of liquid from a bottle, after a predetermined amount of liquid has been decanted therefrom, until the bottle is placed in upright position, after which another, similar amount of liquid may be poured from it.

Another object of our invention is to provide means for cumulatively counting the amount of liquid dispensed in successive decanting, either in number of drinks or in units of fluid volume, in such manner as to enable convenient ascertainment of the total.

Still another object of our invention is to provide means for selectively adjusting such device for either the intermittent or the continuous outflow of metered liquid.

A further object of our invention is to provide means for securely attaching a device of the type set forth to the neck of a bottle in a manner preventing unauthorized removal therefrom.

A feature of the present invention is the provision of an annular metering chamber having a set of vanes rotatably disposed therein, the shaft carrying the vanes being provided with detent means for periodically arresting it, e. g. once per revolution, in a predetermined angular position, whereby the vanes are immobilized within the chamber and the flow of liquid is substantially completely cut off. The shaft, according to another feature of the invention, is coupled with a digital counter disposed in a common housing with the metering chamber, the housing having one or more windows through which the counter may be viewed. A further feature of the invention resides in providing, as part of the aforementioned detent means, a weighted spring member so positioned as to be operative only when the housing containing the metering chamber is inverted or inclined, this spring member being rendered inoperative when the housing is in a normal position indicating an upright stance of the bottle or the like to which it is attached.

The above and other objects and features of our invention will become more fully apparent from the following detailed description of a specific embodiment, reference being had to the accompanying drawing in which:

Fig. 1 is a side view of a device embodying the invention, attachable to the neck of a bottle;

Fig. 2 is another side view, taken at right angles to that of Fig. 1;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is an axial section, on a larger scale, taken at right angles to that of Fig. 3;

Fig. 5 is a section taken on the line 5—5 of Fig. 4; and

Fig. 6 is a section taken on the line 6—6 of Fig. 4.

The device shown in the drawing comprises a housing 11 having a neck 12 whose lower portion is split into two wings 12*a*, 12*b* swingable about a hinge 13. Wings 12*a*, 12*b* have rubber linings 14*a*, 14*b* recessed at 15 (Fig. 4) to engage the lip of a bottle 16. These wings are further formed with ears 17*a* (Fig. 1), 17*b* (Fig. 3) adapted to be held together by a bolt 18 and a nut 19, an apertured lug 18′ projecting from the head of bolt 18 and a similar lug 19′ projecting from nut 19 being shown locked together in Fig. 1 by a padlock 20 so as to maintain the device 10 clamped to the neck of bottle 16.

Lodged within neck 12 of device 10 is a rubber plug 21 insertable in the neck of bottle 16 in place of the usual cork (not shown). An inlet tube 22, having ribs 23 imbedded in plug 21, leads into the annular metering chamber 23 traversed by a shaft 24 which carries a number of vanes 25 (here five). Chamber 23 has an outlet 26 leading to a spout 27, the latter being closable by a lid 28. It will be noted that the vanes 25 are so positioned that at least one of them will block the passage between inlet 22 and outlet 26 in any position of shaft 24.

Mounted loosely on shaft 24 on one side of the metering chamber 23 (to the right thereof as viewed in Fig. 4) is a follower disk 29 connected with shaft 24 via a resilient link 30, the latter being attached to disk 29 at 31 and having its other extremity secured to a collar 32 rigid with shaft 24. This coupling permits a relative rotation between disk 29 and shaft 24 by a few degrees but tends, owing to the resiliency of link 30, to maintain the disk and the shaft in a predetermined relative position. Also fixed to the same projecting end of shaft 24 is a ratchet 33 co-operating with a pawl 34 anchored at 35 to the outer wall of chamber 23, this arrangement preventing clockwise rotation of the vanes 25 as viewed in Fig. 3.

A bracket 36, secured to the inner housing wall at 37, carries a spring member 38 having a hook 39 positioned for engagement with a tooth 40 projecting radially from disk 29. A weight 41, pivoted at 42 to a bracket 43 secured to housing 11, carries a projection 44 which draws the member 38 away from disk 29 when the device 10 is in a normal, upright position as shown in Fig. 4; when the bottle 16 carrying the device is tilted or inverted, weight 41 is urged (either by gravity or by the prevailing force of spring 38) into its dotted-line position in which it abuts the bracket 43 and its projection 44 allows the hook 39 to extend into the path of tooth 40.

The members 38–41 form part of an escapement mechanism whose function will be described hereinafter.

The opposite end of shaft 24, projecting from chamber 23 on the left side as viewed in Fig. 4, carries a wheel 45 with a single tooth 46 adapted to mesh with the teeth of a pinion 47, the latter carrying one of three indicator disks 48, 49, 50 forming part of a conventional decimal counter 51. The numerical indications displayed by disks 48, 49, 50 are visible through windows 52, 53, 54 provided in the housing 11. As shown, counter 51 is arranged to advance by one unit whenever shaft 24 makes a full revolution; it will be understood that with the use of more than one tooth 46 on wheel 45 the counter may register not single drinks but units of fluid measure, such as ounces or cubic centimeters.

A knob 55, urged upwardly by a spring 56 (Fig. 4), has a stem 57 projecting into the path of detent 38 when the knob is manually depressed, thereby preventing engagement of hook 39 with tooth 40. This knob may be used to decant the entire contents of the bottle, if desired, in a manner more fully described hereinafter. In operation, after the device 10 has been fastened to the bottle 16 by the mechanism described, any passage of liquid through chamber 23 will rotate the vanes 25 counterclockwise (as viewed in Fig. 3) until shaft 24 is arrested by the engagement of detent hook 39 with tooth 40 on disk 29. It will be apparent that this engagement does not stop the shaft 24 immediately since the coupling 30, 32 between the disk and the shaft enables the latter to move

on by a few degrees. Once the shaft has come to rest, one of the vanes **25** blocks the outflow of liquid through spout **27** and the user is obliged to restore the bottle **16** to its upright position before any further liquid can be drawn from it. When this occurs, weight **41** causes projection **44** to cam the detent hook **39** away from tooth **40**; resilient link **30** thereupon turns disk **29** through a few degrees to place it in an angular position which is normal relative to the position in which shaft **24** is then held by the backstop comprising ratchet **33** and retaining pawl **34**. When the bottle is subsequently tilted again, tooth **40** has already moved past the hook **39** (see Fig. 6) so that disk **29** will be allowed to turn through almost a complete revolution before shaft **24** is again arrested.

Should the user depress knob **55** while the bottle **16** is upright, disk **29** will not be arrested in its rotation and the entire contents of the bottle can be decanted without interruption while being metered by the counter **51**.

It will thus be seen that we have provided a device in which a predetermined amount of liquid, here substantially equal to the volume of metering chamber **23** (exclusive of the volume of inlet port **21** and of outlet port **26**), can be decanted from a bottle and will be registered on a counter **51**, the flow of liquid being thereupon discontinued until the bottle has been righted to inactivate the detent mechanism **39**, **40**.

The invention is, of course, not limited to the specific embodiment described and illustrated but may be modified in various ways without departing from the spirit and scope of the appended claims.

We claim:

1. In a device for dispensing a liquid, in combination, a conduit adapted to be traversed by the liquid, vane means positioned in said conduit for displacement by said liquid, a support for said vane means, a follower member, resilient link means between said follower member and said support tending to maintain same in a normal relative position while enabling a limited relative displacement therebetween, detent means positioned for engagement with said follower member in a position of relative alignment, said link means arresting said support after said limited relative displacement following such engagement, thereby causing said vane means substantially to block further passage of said liquid through said conduit, an escapement mechanism for withdrawing said detent means from said follower member, and backstop means preventing reversal of the movement of said support, thereby causing said resilient link means to move said follower member to said normal position relative to said support and out of alignment with said detent means.

2. The combination according to claim 1, wherein said mechanism comprises weight means operative to withdraw said detent means from said follower member in a predetermined spatial position of the device.

3. The combination according to claim 1, wherein said support comprises a rotatable shaft, said follower member being mounted on said shaft and being provided with an eccentric projection aligned with said detent means once during each revolution of the shaft.

4. The combination according to claim 3, wherein said backstop means comprises a ratchet fixed to said shaft and a pawl engageable with said ratchet.

5. The combination according to claim 1, further comprising manually operable check means adapted to block return of said detent means to an operative position following withdrawal thereof by said escapement mechanism, thereby enabling continued movement of said vane means.

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