Feb. 5, 1935. G. EISEMANN ET AL 1,990,226

DISPENSING DEVICE

Filed Jan. 29, 1934

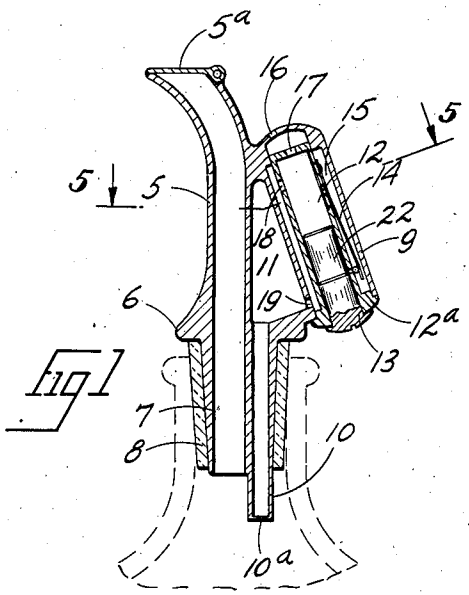


Fig 1

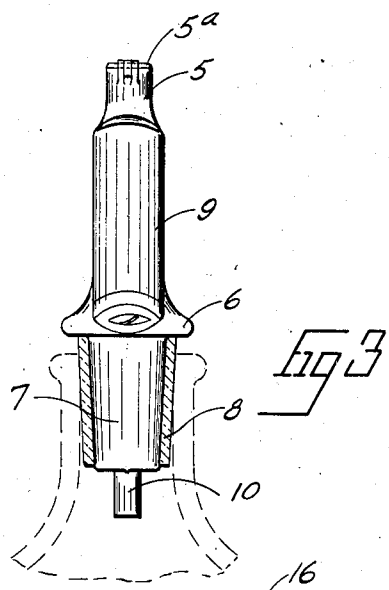


Fig 3

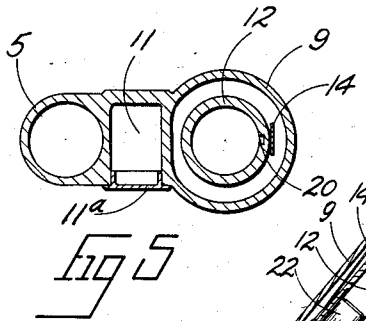


Fig 5

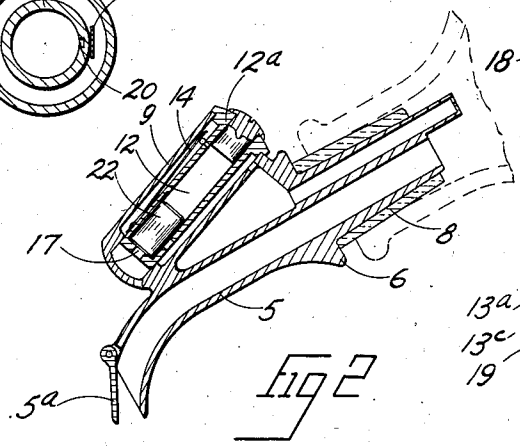


Fig 2

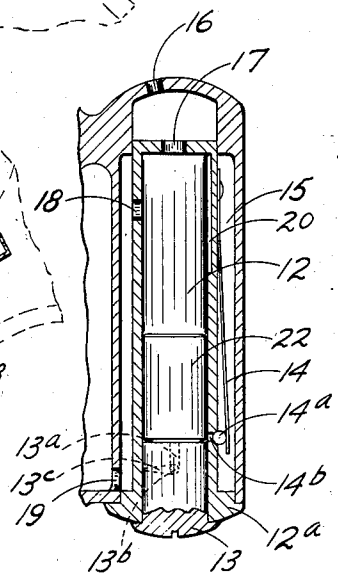


Fig 4

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DISPENSING DEVICE

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9 Claims. (Cl. 221—98)

This invention relates to an automatic dispensing device for containers, and the primary object of the same is to provide an attachment in the nature of a stopper or cap for bottles and the like which will measure a predetermined quantity of liquid when the container is inverted to pour and which is reliable in operation, relatively small and neat in appearance and so simple in design and construction as to be capable of manufacture at a relatively low cost.

The foregoing and other objects and advantages will become apparent in view of the following description taken in conjunction with the drawing, wherein:

Figure 1 is a central sectional view of the improved dispensing device shown adapted for use with a bottle, the latter being illustrated in dotted outline in upright position;

Fig. 2 is a view similar to Fig. 1, showing the position of certain parts when the bottle is in pouring position;

Fig. 3 is a view in elevation of the device;

Fig. 4 is an enlarged view in central transverse section of the air-controlling cylinder and housing therefor; and,

Fig. 5 is an enlarged section taken on the line 5—5, Fig. 1.

In its preferred form, the device comprises a delivery or pouring nozzle or spout 5 which, when adapted for a bottle stopper, is formed with an annular shoulder or boss 6 and sleeve portion 7 over which is inserted a bottle stopper 8, the latter being formed of cork, rubber composition or like material. A hinged lid 5*a* is provided at the end of the nozzle 5.

Adjacent the delivery nozzle 5 is a cylindrical housing 9. The pouring nozzle and housing are so designed that they may be die-cast in one piece, and accordingly the parts 5, 6, 7 and 9 are shown as one integral casting. The portion 7 has formed therein a passageway 10 which communicates with the interior of the bottle or like container through a restricted air-inlet opening 10*a*. At its upper end, the passageway 10 opens into a chamber or trap 11, adapted to receive any liquid that may pass through the opening 10*a* during the pouring operation. To facilitate the casting operation, the one side of the chamber 11 is initially cast open and subsequently closed by a plate 11*a*, note Fig. 5, having inwardly projecting flanges which fit into the walls of the said chamber.

The housing 9 is preferably cast at an incline with respect to the nozzle or spout 5, and in the open end of this housing is inserted an air-controlling valve cylinder 12 having an open end portion formed with an annular recessed shoulder 12*a* adapted to engage the adjacent wall of the housing. In the open end of the cylinder 12 is inserted an adjustable air-inlet or vent plug 13 having a longitudinal port 13*a* in the side wall thereof, as shown in dotted outline in Fig. 4, the one end of this port communicating with a hole or port 13*b* formed in the side wall of the housing and open to the atmosphere. A tapering adjusting groove 13*c* is formed in the side wall of the plug 13 and is arranged to override the port 13*b*. Thus by turning the plug 13 anti-clockwise, the port 13*b* may be gradually closed, and by turning it clockwise, gradually opened, the adjustment being capable of accurate control.

The cylinder 12 is provided with a relatively sensitive escapement valve assembly in the form of a leaf spring 14 and ball valve 14*a* adapted to close an exhaust port or vent 14*b*. The housing 9 defines a chamber 15 around the cylinder 12. Air inlet ports 16, 17, 18 and 19 are formed in the one end and side wall of the housing 9, and in the end and side wall of the cylinder 12. A longitudinal accelerating by-pass vent 20 is formed in the side wall of the cylinder 12.

A floating valve piston 22 is mounted in the cylinder 12 and acts to close the ports 16 and 17 when the bottle is held in a pouring position for a predetermined length of time.

The device operates as follows: When the bottle is inverted or tilted to pouring position, air will pass from the atmosphere into the bottle through ports 16, 17, 18, 19 and 10*a*, permitting liquid to flow from the spout or nozzle 5 until the piston 22 reaches the end of cylinder 12 and closes the ports 16 and 17 (the position shown in Fig. 2), whereupon air will be shut off from the bottle and the liquid will cease to flow. The rate of travel of the piston 22 is governed by the volume of air admitted through the ports 13*b* and 13*a* in the housing 9 and plug 13.

When the piston 22 passes the longitudinal vent 20, its speed is accelerated, due to the fact that the vacuum is abruptly broken, so that the piston in effect drops into the end of the cylinder. This results in an abrupt closing of the air-inlet ports 17 and 18 and a back-action on the fluid in the bottle which reduces dripping to a minimum.

When the bottle is turned to its normal upright position, the piston 22 slides by gravity back to the position shown in Fig. 1, the weight of the piston 22 being sufficient to cause the air entrapped within the cylinder to lift the valve 14*a* and permit escapement thereof through the port

14b. By adjusting the size of the opening 13a, the quantity of liquid dispensed at one pouring from the nozzle 5 may be varied as desired. While some of the liquid in the container or bottle may pass into the chamber or trap 11 when the bottle is tilted to pouring position, yet the amount is negligible and does not interfere with the operation of the dispensing device, the liquid returning to the bottle when the latter is set in upright position.

The parts of the assembly are, in general, die castings which may be manufactured at relatively low cost and which require relatively little machining work. In assembling, the cylinder 12 is pressed into the housing 9, and the cap 20 likewise pressed upon its seat in the housing. The piston 22 is preferably formed from a brass rod machined for a light sliding fit within its cylinder. Experience has shown that the device is remarkably accurate in measuring a desired quantity of liquid.

It will be understood that certain modifications and variations in structure may be adopted within the scope of the invention as defined by the appended claims.

We claim:

1. A dispensing attachment for bottles and like containers comprising a housing having a main pouring opening, a separate opening leading to the atmosphere, a sliding valve member for closing said second-named opening when the bottle is tilted to pouring position, and means for regulating the speed of travel of said member to thereby regulate the quantity of liquid dispensed at one pouring operation.

2. A dispensing device for bottles and like containers comprising a housing having a pouring opening, a valve cylinder, a separate opening leading to the atmosphere through said cylinder, a sliding valve member in said cylinder adapted to close said atmospheric openings when the bottle is tilted to pouring position, and means for adjusting the amount of air admitted into said cylinder to thereby control the speed of travel of said valve member.

3. A dispensing device for bottles and like containers comprising a housing having a pouring opening, a valve cylinder, a separate opening leading to the atmosphere through said cylinder, a sliding valve member in said cylinder adapted to close said atmospheric opening when the bottle is tilted to pouring position, and means for adjusting the amount of air admitted into said cylinder to thereby control the speed of travel of said valve member, said means consisting of an adjustable port-regulating member located in the end of said cylinder.

4. A dispensing device for bottles and like containers comprising a housing having a pouring opening, a valve cylinder, a separate opening leading to the atmosphere through said cylinder, a sliding valve member in said cylinder adapted to close said atmospheric opening when the bottle is tilted to pouring position, and means for adjusting the amount of air admitted into said cylinder to thereby control the speed of travel of said valve member, said means consisting of an adjustable valve plug located in the end of said cylinder.

5. A dispensing device for bottles and like containers comprising a housing having a main pouring opening, a ported valve cylinder, a separate opening leading to the atmosphere through said cylinder, a sliding valve piston in said cylinder, an adjustable means for controlling the amount of air admitted into said cylinder when the valve piston slides to port closing position, and a one-way exhaust valve for permitting a free return movement of said valve piston.

6. A dispensing device for bottles and like containers comprising a housing having a main pouring opening, a valve cylinder, a passageway for admitting atmospheric air into the bottle, said cylinder being formed with ports for controlling the flow of air through said passageway, a sliding valve piston mounted in said cylinder and adapted to slide by gravity into port closing position when the bottle is tilted to a pouring position, an air inlet valve at one end of said cylinder for regulating the speed of travel of said piston, and a one-way exhaust valve for permitting a free return of said piston.

7. A dispensing attachment for bottles and like containers comprising a housing having a main pouring opening, a passageway for admitting air into the bottle, said passageway at one end communicating with the bottle through a restricted opening and at its opposite end opening into a trap chamber, a valve cylinder, ports communicating said trap chamber with the atmosphere through said valve cylinder, a slidable valve plug mounted in said cylinder and adapted to move to port closing position when the bottle is tilted to pouring position, and means for regulating the speed of travel of said piston.

8. A dispensing attachment for bottles and like containers comprising a housing having a main pouring opening, a passageway for admitting air into the bottle, a sliding valve piston for closing off air from the bottle when the latter is tilted to a pouring position, and means for accelerating the final speed of travel of the piston.

9. A dispensing attachment for bottles and like containers comprising a housing having a main pouring nozzle, a separate passageway leading to the atmosphere, a valve cylinder interposed in said passageway, a sliding valve in said cylinder for closing off said passageway when the bottle is tilted to pouring position, said cylinder being formed with a longitudinal by-pass vent for accelerating the final speed of travel of the piston and reduce dripping of liquid from the nozzle.

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