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DISCHARGE VALVE FOR BOTTLE FILLING MACHINES

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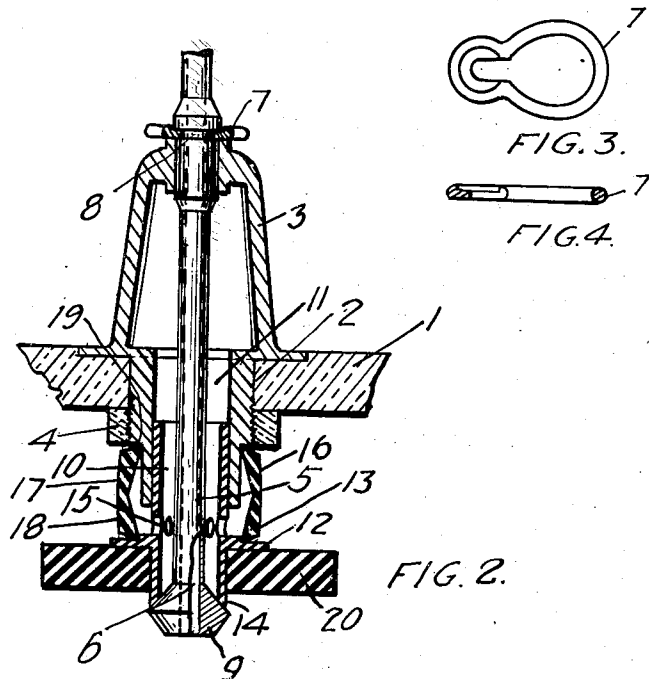
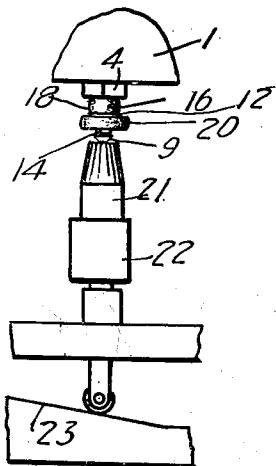


FIG. 1.

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DISCHARGE VALVE FOR BOTTLE FILLING MACHINES

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2 Claims. (Cl. 226—124)

My invention relates to improvements in discharge valves for bottle filling machines, and more particularly to that class of valves used for filling bottles of fragile or non-rigid material, such as paper, which would sustain damage from excessive pressures exerted by valve closures, and the outside surfaces of which would absorb any waste liquid leaking through the outside of the valve.

The object of the invention is to provide a valve with a valve closure member of relatively light resistance to pressure exerted by the bottle in opening the valve and which will prevent leakage around the outside of the valve.

It is well known to those skilled in the art, that filling machines for liquid food products, and particularly milk, must be constructed in a thoroughly sanitary manner and that gland packings are not approved. Also that seals or cushions must be plain and easily cleaned.

To those ends, my invention consists of a cylindrical valve casing, slidable vertically in a discharge orifice of the liquid reservoir and having an annular flange extending therefrom, immediately of its length, perforations extending through the wall of the casing just above the flange, an annular valve seat at its lower end, contacting a vented valve, and a sleeve of impervious resilient material surrounding the casing, spaced therefrom and extending between the flange and the reservoir bottom as hereinafter more particularly described.

In the drawing showing one form of my device:—

Fig. 1 is a side elevation of a fragmentary portion of a bottle filling machine showing my device applied thereto.

Fig. 2 is an enlarged sectional detail through the filling valve and adjacent parts.

Fig. 3 is a plan view of valve securing ring.

Fig. 4 is an elevation of valve securing ring.

Referring to the drawing in which like characters of reference indicate corresponding parts in each view.

1 is a fragmentary portion of a liquid reservoir, having an opening 2 in which a valve guide 3 is secured by nut 4. A valve stem 5 having a vent hole 6 through its entire length is supported in the valve guide 3 by a valve securing ring 7 engaging a groove 8 in an enlarged portion of valve stem 5 and holding the valve head 9 to resist the downward pressure of the cylindrical valve casing 10 slidably fitted, at its upper end, in the discharge orifice 11 of the valve guide 3.

The valve casing 10 is provided, intermediately

of its length, with an annular flange 12 having an annular shoulder 13, and at its lower end with a valve seat 14. Perforations 15 extend through the wall of the valve casing just above the flange 12 and a sleeve 16 of resilient and impervious material having a double cone shape 17 on the interior of its wall with the larger diameter in the centre of its length and a slightly barrel shaped exterior surface 18, surrounds the shoulder 13 at its lower end so as to be spaced from the casing 10 and bearing at its upper end against a shoulder 19 on the valve guide 3 to exert an initial pressure between the valve 9 and valve seat 14. A cushion 20 of soft resilient and impervious material, such as to conform under a light pressure, to ordinary irregularities in the lip surface of bottle, surrounds the lower end of the valve casing 10 bearing against the lower surface of the flange 12.

The bottle 21 to be filled is carried on a vertically movable support 22 in a circular path concentrically beneath the valve 9 in a manner common to filling machines. The bottle and support are raised by a stationary cam 23 until the bottle mouth is vertically brought into contact with the cushion 20. A continued upward movement of the bottle lifts the valve casing 10, lifting the valve seat 14 from contact with the valve 9, allowing the milk or other liquid to flow into the bottle. The compression of the sleeve 16 while the valve is open maintains an air seal between the mouth of the bottle and the cushion 20, preventing the over-flow of the liquid when bottle is filled.

Air displaced by the liquid flowing into the bottle escapes through the vent hole 6 in the valve stem 5.

As the valve casing 10 has a free sliding fit in the discharge orifice 11, milk or other liquid will leak between the valve casing 10 and the wall of the orifice 11. By my device, this leakage passes into the space between the valve casing 10 and the sleeve 16, thence through perforations 15 into the main flow passage, through the valve and into the bottle, preventing an unsightly and unsanitary condition which would be caused by wetting the outside of the bottle.

Normally the valve casing 10 is seated at 14 on the valve head 9, the liquid pressure being equalized within the casing 10 and sleeve 16 by means of the perforations. There is, therefore, no tendency for any liquid to pass downward from between the valve guide 3 and casing 10.

As the bottle 21 is raised vertically its mouth is brought into contact with the cushion 20 so as to raise the casing 10 vertically a short distance

to lift the seat 14 clear of the valve head 9. Any increased pressure produced on the liquid between the casing 10 and sleeve 16 by the lifting of the casing 10 forces such contained liquid through the perforations into the liquid flow passing be-
 5 the perforations into the liquid flow passing beneath the lifted seat 14.

It will thus be seen that a pressure above the normal pressure will not be exerted tending to force the liquid outward at the ends of the compressible sleeve 16 and thus wasting the liquid and producing the unsanitary condition above referred to.

What I claim as my invention is:—

1. In a bottle filling machine, a liquid reservoir
 15 having a depending outlet, a tubular valve slidably fitting the outlet and having perforations in the wall thereof beneath the outlet, a stationary valve stem extending through the outlet and valve and having a valve head at its lower end, an
 20 annular flange extending from the valve beneath the perforations, and a sleeve of resilient mate-

rial surrounding the perforated portion of the valve and extending between the flange and receptacle to resiliently hold the valve seated on the valve head.

2. In a bottle filling machine, a liquid reservoir
 5 having a depending outlet, a tubular valve slidably fitting the outlet and having perforations in the wall thereof beneath the outlet, a stationary valve stem extending through the outlet and
 10 valve and having a valve head at its lower end, an annular flange extending from the valve beneath the perforations, and a sleeve of resilient material surrounding the perforated portion of the valve
 15 and extending between the flange and receptacle to resiliently hold the valve seated on the valve head, such sleeve having its ends bevelled outward, its exterior slightly convexed from end to end and its interior flared outward from its ends to a medial line.

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