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OUTLET DEVICE FOR LIQUIDS WHICH FOAM WHEN DISCHARGED

Filed Aug. 19, 1955

2 Sheets-Sheet 1

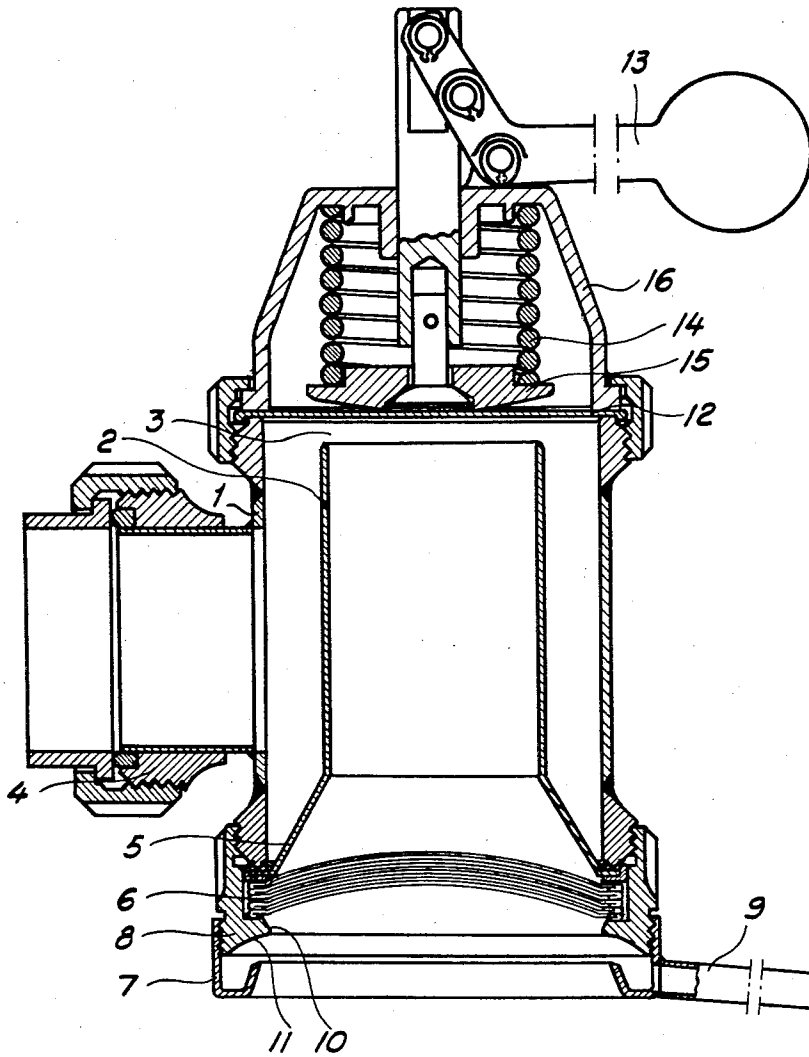


Fig. I

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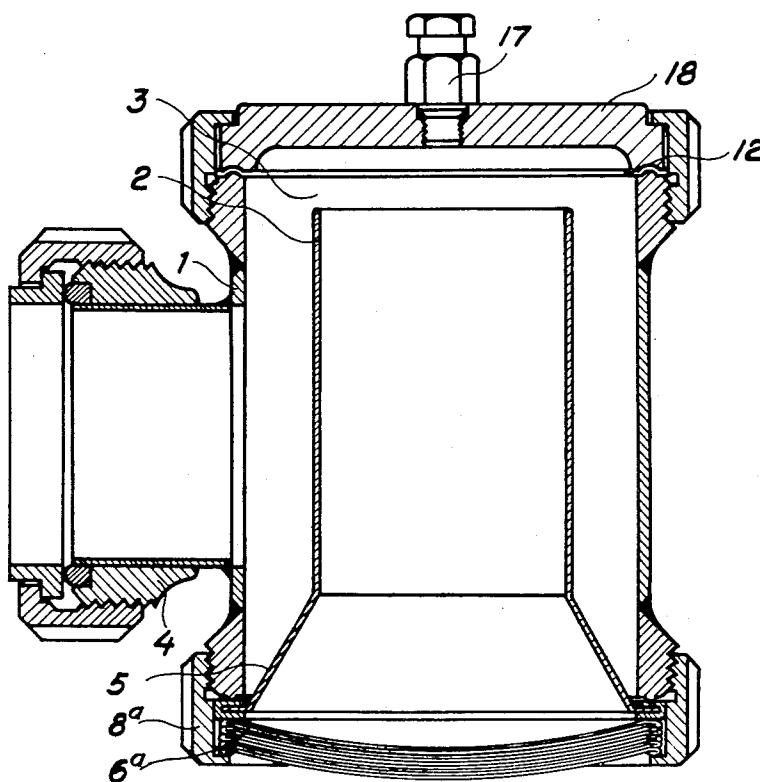


Fig. II

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OUTLET DEVICE FOR LIQUIDS WHICH FOAM
WHEN DISCHARGED

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1 Claim. (Cl. 137—170.1)

This invention relates to the discharging of liquids which have a tendency to foam, and has particular reference to an improved outlet device for this purpose.

The measurement of liquids of this type passing through an outlet device presents a problem due to the production of foam in the discharging liquid. The foam has a tendency to accumulate below the outlet device and drop to an objectionable extent. Moreover, the flow meter usually connected to the outlet device is sensitive to those shocks of the liquid which occur in the outlet devices as made heretofore, these shocks being obtained when the closing member or valve for the outlet device is operated.

These disadvantages have been overcome by the present invention and further advantages have been attained, as compared with the outlet devices previously known. The invention is especially applicable to draw-off valves for skim-milk, but is not limited thereto.

An outlet device made according to the invention comprises an outer tube into which the liquid to be discharged is fed, for instance through a pipe fitting arranged in the side wall of the tube. This outer tube surrounds concentrically an inner tube into which the liquid is fed from the outer tube by way of a slot, whereby the liquid is prevented from undergoing foam-producing turbulent motion.

For a better understanding of the invention reference may be had to the accompanying drawings, in which Fig. I is a vertical sectional view of one form of the outlet device provided with a manually operated lever, and Fig. II is a vertical sectional view of another form of the outlet device provided with a connection nipple for compressed-air operation.

The outlet device as illustrated comprises an outer tubular casing 1 into which liquid is fed through a pipe fitting 4 secured in the side wall of the tube 1. Inside the tube 1 is a tube 2 which is somewhat shorter than the outer tube 1, the latter concentrically surrounding the inner tube 2. The open upper end of tube 2 communicates with the surrounding part of tube 1 through an annular slot 3 forming an inlet for the inner tube 2. The liquid is prevented from undergoing foam-producing turbulent motion in passing from tube 1 to tube 2, by reason of the narrow slot 3. Subsequent turbulent motion of the liquid is prevented by providing the inner tube 2 with a conically flared outlet part 5 at the bottom and by providing beyond the outlet end of the inner tube 2 a number of perforated straining discs 6, for instance five of these discs. The straining discs 6 may be either planar or dished convexly against the discharge direction of the liquid, as shown in Fig. I, or they may be inclined at a fixed angle to the plane of the outlet opening of the outlet part 5. In this way, any drops remaining after interruption of the liquid flow are prevented from leaving the lowermost straining disc 6 from its middle. An annular draining groove 7 provided with a discharge pipe or spout 9 may be arranged below the

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straining discs 6. The pipe 9 may, if desired, form a connection nipple for an elastic tube or hose (not shown). The straining discs 6 are secured in position by a threaded ring 8 having an internal constricting surface 10 in the form of a funnel which terminates abruptly at its lower end in a surface 11 which slopes downward and outward. This causes the liquid to discharge as a compact jet. Any residual drops, however, follow the inclined surface 11 and go to the draining groove 7.

Alternatively, the straining discs may be dished concavely against the discharge direction of the liquid, as shown at 6a in Fig. II, in which case the draining groove 7 may be omitted and the attaching ring 8a does not have the special flow surfaces 10 and 11. In this case, any residual drops discharge from the middle part of the bottom straining disc 6a.

The outlet device is also provided with a throttle or valve for the liquid flowing through the slot 3. For this purpose the upper limit of slot 3 is defined by a flexible diaphragm 12 closing the upper end of outer tube 1. This diaphragm can narrow or close the slot 3 by being displaced toward the adjacent end portion of the inner tube 2. Such displacement is obtained by manual operation of a lever 13 which is articulately connected with a valve disc 15 (Fig. I). The latter, which is loaded by a compression spring 14, actuates the diaphragm 12 and is arranged in a housing 16 at that end of the outer tube 1 which is provided with the diaphragm 12, the spring 14 bearing against one end of the housing 16.

As shown in Fig. II, the diaphragm actuation is obtained by compressed air acting directly upon the diaphragm 12. A connection nipple element 17 for the compressed air is arranged in a cover 18 which is closely fitted at that end of the outer tube 1 which is provided with the diaphragm 12.

The advantage of a throttling device comprising the flexible diaphragm 12 lies primarily in the fact that, when closing the valve slot 3, the liquid shocks usually occurring in conventional throttling devices are avoided.

We claim:

An outlet device for liquids which foam when discharged, comprising an outer tube having an inlet for the liquid to be discharged, an inner tube surrounded concentrically by the outer tube and forming at one end an outlet for discharge of the liquid, said inner tube having an inlet end at least partly defining a slot for passage of the liquid from the outer tube into the inner tube, whereby the liquid is prevented from undergoing foam-producing turbulent motion, a plurality of perforated straining discs nested together in superimposed relation at the outlet end of the inner tube and through which the discharging liquid passes, said discs being dished toward said inlet end of the inner tube, said inner tube being provided at its outlet end with an outwardly extending part located between the lower end of the outer tube and the peripheral portion of the uppermost disc, and a ring threaded on the outer tube and clamping the discs and said inner tube part against the lower end of the outer tube.

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