

1

3,093,165

**ROTARY FILLING MACHINE AND FILLING TUBES THEREFOR**

Ivan H. Risser, Glenview, Ill., assignor to U.S. Bottlers Machinery Company, Chicago, Ill., a corporation of Illinois

Filed Aug. 20, 1957, Ser. No. 679,162  
6 Claims. (Cl. 141-140)

The present invention relates to rotary filling machines and especially to a novel means and mechanism for the rapid filling of bottles or containers with dry wines accomplished with a minimum of turbulence and aeration of such wines.

It is, therefore, an important object of the present invention to provide a novel filling tube assembly for a high speed, rotary filling machine employing a plurality of said units and in which each container is filled to a predetermined height by a vertically movable filling tube and in such manner that the filling operation is carried out most effectively for the bottling of dry wines.

A further object of the present invention is the provision of a novel filling tube assembly for a rotary filler in which the containers to be filled travel in spaced relation and continuously in a horizontal plane on a rotary filler bed and the registering filling tubes are moved vertically into and out of the containers with the lower, ported end of each filling tube being projected to adjacent the bottom of the container from which position the main flow of wine or liquid to be bottled enters the container below the surface of the collected wine without undue turbulence and aeration of the contents during the filling operation.

In the disclosed embodiment and novel manner of filling containers, the vertically movable filling tube remains sealed against flow until its discharge end or tip is lowered into the bottle and its sealing collar seats upon the neck and seals the interior of the bottle to the atmosphere. Thereupon the filling tube continues its travel downwardly in the bottle with its outlet ports in the tip remaining uncovered until the tip is located adjacent the bottom of the bottle. In this downward travel with the outlet ports uncovered a small quantity of wine, sufficient to cover these ports when the tip is in its lowered position, is initially discharged and collects in the bottom of the bottle, after which the filling tube continues its downward travel until the tip reaches adjacent the bottom whereupon full flow is established from this lowered position.

The tip of the filling tube remains in this lowered position until the bottle is substantially filled whereupon the filling tube is elevated and the outlet ports are sealed against further flow, after which the filling tube assembly is withdrawn from the bottle. This entire filling operation is effected with a minimum of turbulence and aeration of the wine after which the filled bottle is capped or sealed.

The present invention further relates to a novel filling unit and to a novel means and manner of supplying dry wines to and filling containers therewith whereby aeration of the contents is reduced to a minimum.

Another important object of the present invention is the provision of a novel reservoir or tank for supplying wine in a quiescent state to a plurality of the novel filling tubes, the reservoir being so constructed and arranged whereby the velocity of the entering wine is most effectively reduced and must pass in a tortuous path to dis-

2

pate entrapped air before it is collected in a quiescent body from which it is supplied to the filling tubes.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

In the drawings:

FIGURE 1 is a diagrammatic view, part in side elevation and part in vertical cross section, of the novel filling unit of the present invention located upon a bottle to be filled and also showing in dotted outline the manner in which the filling unit with its centering bell is moved into position for filling a bottle.

FIG. 2 is a view similar to FIG. 1 but showing the filling tube partially lowered into a bottle.

FIG. 3 is a view similar to FIGS. 2 and 3 but with the filling tube lowered into the bottle in position for filling.

FIG. 4 is a fragmentary enlarged view in vertical cross section through the centering bell housing and associated parts positioned above a bottle to be filled and with the filling tube tip being lowered into the bottle.

FIG. 5 is an enlarged view, part in elevation and part in vertical cross section, through the centering bell unit and showing it elevated above the bottle to be filled with the filling tube retracted and the centering bell housing rotated through an arc of approximately 90° from the position shown in FIG. 4.

FIG. 6 is a view, part in elevation and part in vertical cross section, showing the novel reservoir or tank for supplying wine in a quiescent state to the novel filling units of a rotary filling machine.

Referring more particularly to the disclosure in the drawings in which an illustrative embodiment of the novel filling unit is shown, the unit disclosed in greater detail in FIGS. 4 and 5 comprises a centering bell housing 10 in which is embodied a filling tube body 11 having a central, stepped bore 12 through which projects an elongated filling tube 13. The bore 12 in the upper end of the body 11 is enlarged and threaded at 14 to detachably receive a tube body guide 15 provided with a flexible or resilient guide bushing 16 press-fitted into the upper recessed end of the body guide 15 for the filling tube 13, with the guide bushing 16 encompassing the filling tube but permitting the latter to move vertically therein.

The tube body guide 15 for the filling tube 13 encompasses this tube in spaced relation and is provided with external stepped reductions and externally threaded at 17 for detachably mounting it in the threaded bore 14 of the filling tube body 11 with the lower depending end 18 of the guide 15 provided with an annular recess to receive one end of a coiled packing ring spring 19. The other end of this spring seats upon the upper end of a packing gland consisting of a plurality of chevron-type packing rings 20 with the lower or male member of these rings bearing against an O-ring 20<sup>a</sup> seated upon a shoulder of an annular reduction 21, the spring and rings all encompassing the filling tube 13 above said annular reduction in the central bore 12 of the encompassing filling tube body 11.

Below this annular reduced portion 21 is a nipple 22 threaded into the lower end of the filling tube body 11 connected through a flexible discharge or return hose 23 of relatively small internal diameter to a vertical dis-