June 11, 1963 I. H. RISSER 3,093,165

ROTARY FILLING MACHINE AND FILLING TUBES THEREFOR

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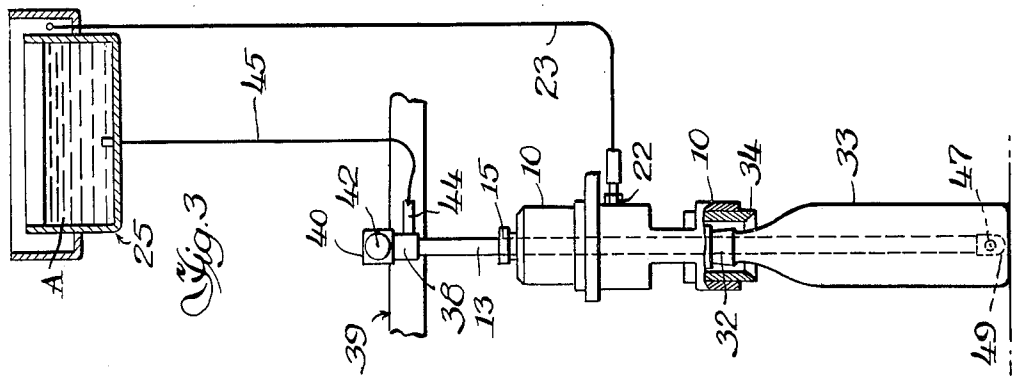


Fig. 3

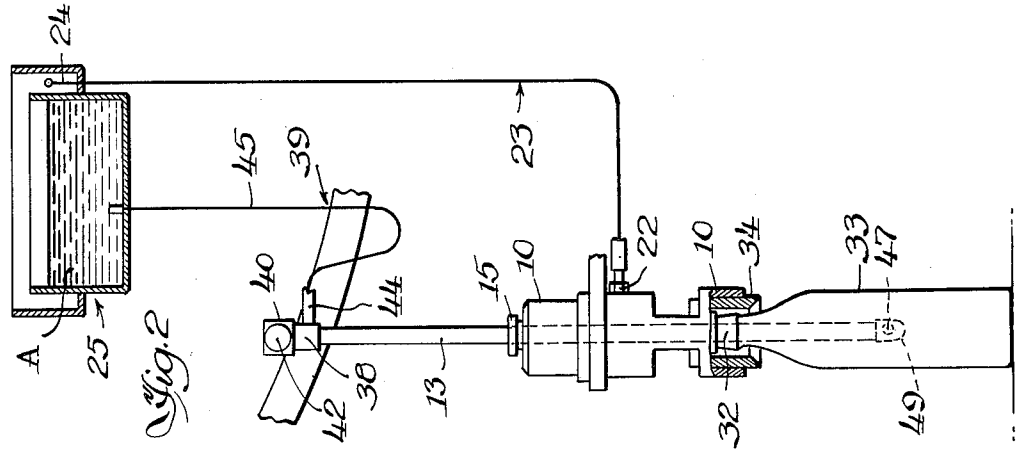


Fig. 2

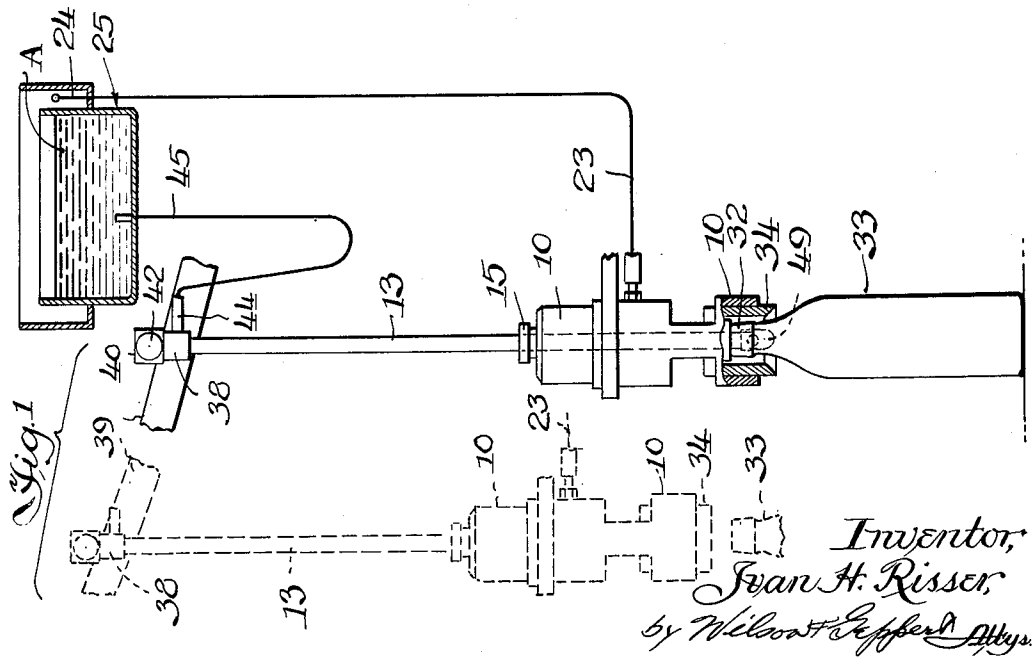


Fig. 1

Inventor,
Ivan H. Risser,
by Wilson & Leffert Attys.

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ROTARY FILLING MACHINE AND FILLING TUBES THEREFOR

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Fig. 4

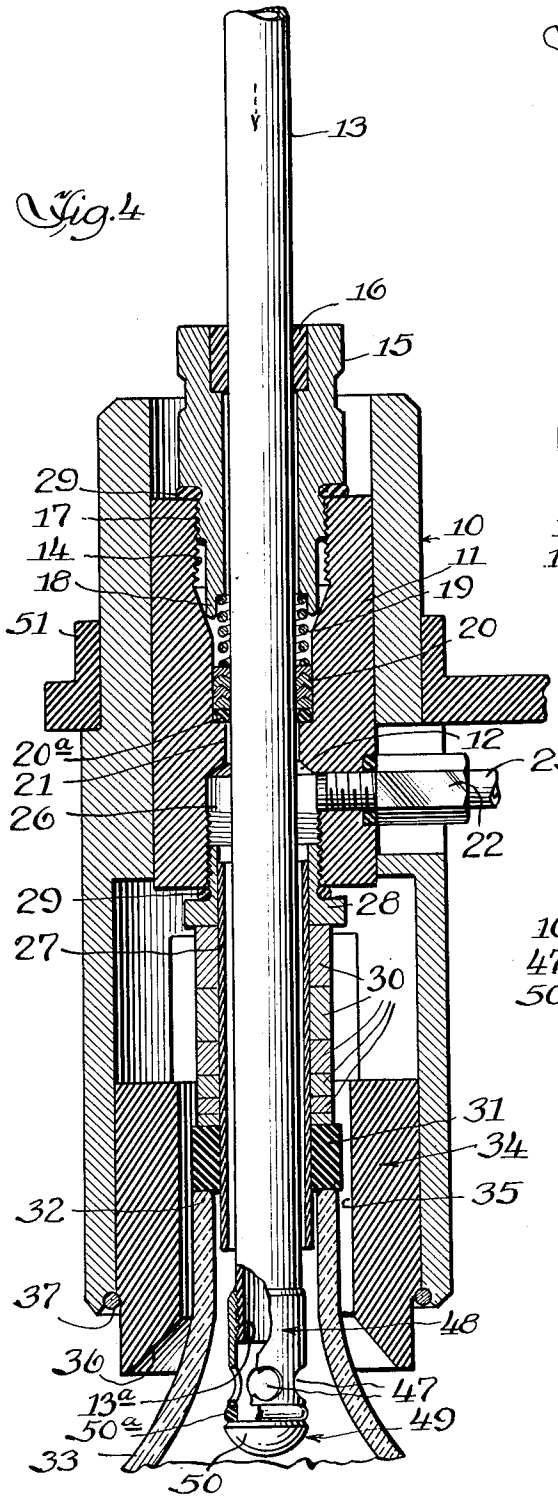
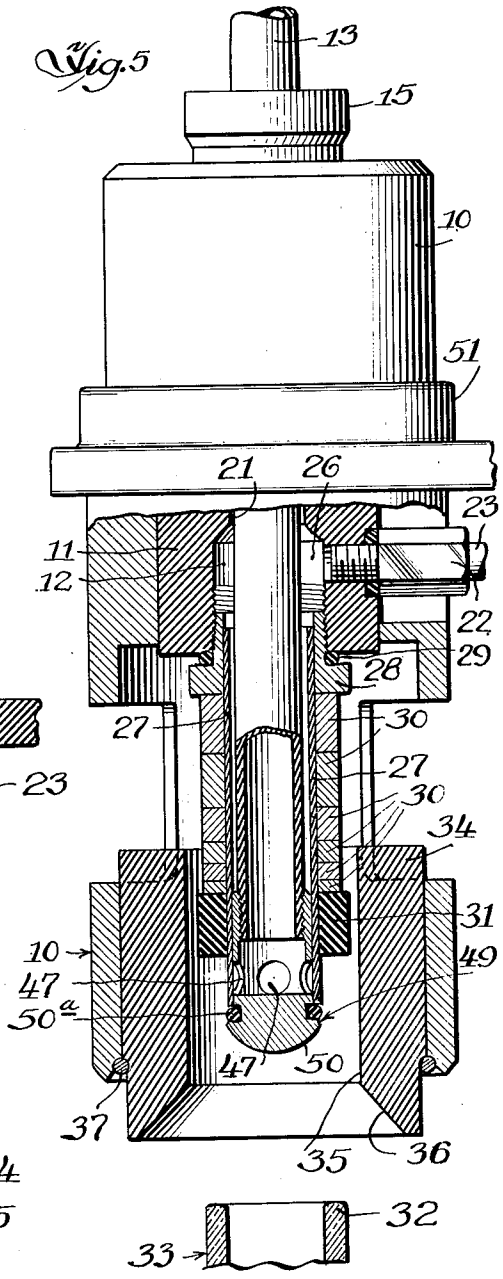


Fig. 5



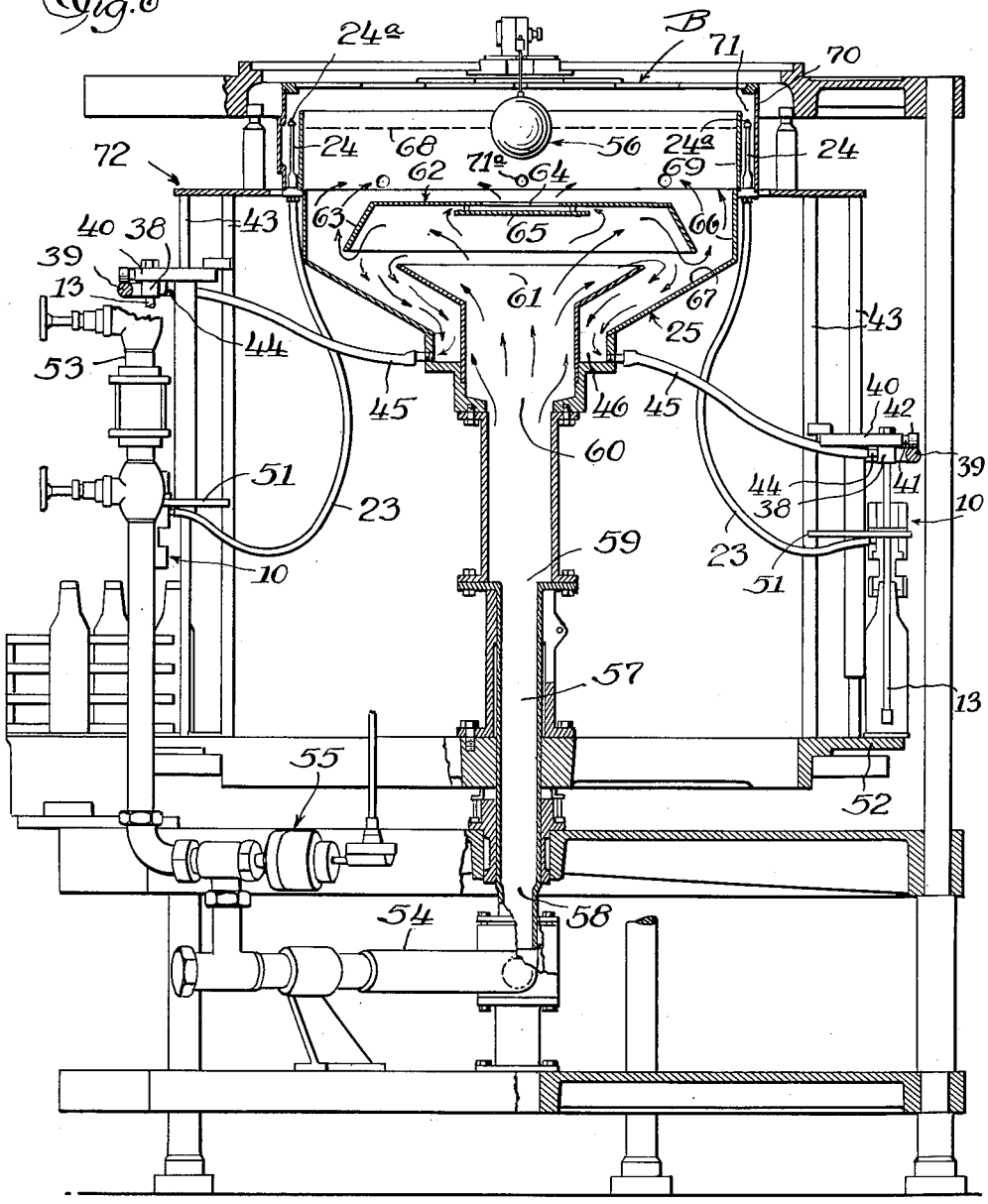
Inventor,
Ivan H. Risser,
by Wilson & Geppert
Attys.

June 11, 1963 I. H. RISSER 3,093,165

ROTARY FILLING MACHINE AND FILLING TUBES THEREFOR

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Fig. 6



Inventor,
Ivan H. Risser,
by Wilson & Leffert Attys.

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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

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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 dissipate 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 **20a** 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-

charge pipe 24 provided with a laterally opening orifice 24a having its outlet flattened to provide a relatively wide discharge orifice (FIGS. 1, 2, 3 and 6). The nipple 22 opens into an annular space 26 about the filling tube and communicates with the upper end of an outer tube 27 disposed about and spaced from the filling tube 13. The outer tube 27 is press-fitted into or anchored at its upper end in a bushing 28 threadedly connected to the lower end of the filling tube body 11. A sealing gasket 29 is provided at the upper and lower ends of the filling tube body 11 where it is threadedly connected to the tube body guide 15 and the bushing 28.

About this outer tube 27 below the bushing 28 is provided a plurality of spacers of suitable or different thickness and designated generally by the reference character 30. Beneath these spacers is a rubber sealing collar or resilient sealer 31 press-fittted onto the tube 27, the lower end of which collar is adapted to seat upon the upper end of the neck 32 of a bottle 33 to be filled, with the lower end of the outer tube 27 projecting below and beyond the lower end of the collar.

The centering bell housing 10 carries at its lower end a centering bell 34 having a bore 35 for receiving the upper open end and neck 32 of a bottle 33 and is provided with a tapered lip 36 at its lower end for facilitating centering over the bottle to be filled. When filling some bottles this tapered lip 36 may contact the neck of the bottle, the centering bell 34 being vertically slidable in the bell housing 10 but retained against dropping out of the housing by a spring retainer 37.

The upper end of the filling tube 13 (FIGS. 1, 2, 3 and 6) is detachably mounted on and depends from a filling tube head 38 movably mounted on an inclined stationary cam track 39 by means of a guide rod head 40, guide roller 41 and a roller bearing 42. The guide rod head 40 is slidably mounted upon spaced vertical guide rods 43. The filling tube head 38 is hollow and connected to a nipple 44 and flexible tube 45 connected to an annular sump or collecting chamber 46 in the filling tank or reservoir 25 whereby the liquid contents A flow by gravity and without turbulence into and through the filling tube 13 to the lower end 13a thereof and outwardly through a plurality of circumferentially spaced openings or outlet ports 47 in the cylindrical wall 48 of a tip 49 threaded onto the externally threaded lower end 13a of the filling tube 13.

This tip 49 is closed at its lower end 50 and thereabove is provided with an O-ring 50a adapted to have sealing contact with the lower end of the tube 27 which encompasses the filling tube 13, the cylindrical wall of the tip being adapted to form a sliding fit with the interior of the encompassing outer tube 27 when the filling tube 13 is in elevated, inoperative position as shown in FIG. 5.

The entire filling tube unit including the centering bell housing 10 and its contained assembly is provided with a guide arm 51 having a part encompassing and connected to the bell housing and with the laterally projecting arm slidably mounted upon and guided by the spaced vertical guide rods 43.

In a rotary filler of the type disclosed in which a plurality of my novel filling units are employed, the bottles or containers 33 to be filled are carried by a feed conveyor and are timed to a feed star by a feed worm (not disclosed). This feed star supplies the containers in sequence and in timed and spaced relation onto a filler bed 52 where each bottle registers with one of the novel filling tubes. For example, in one embodiment there are provided approximately forty-five of these filling tube units with the bottles to be filled thereby moving with the rotatable filler bed 52 about a vertical axis but in a horizontal plane with each filling tube being vertically movable into and out of filling relation with its bottle or container. This vertical movement of the filling tube units is controlled by a stationary cam track 39 upon which the filling tube heads 38 are supported and over which these heads move and from which they depend. When the containers are properly filled, a discharge star removes the filled bottles from the filler bed 52 and onto a conveyor that carries them away to be capped.

The wine or liquid to be bottled is pumped in a controlled manner from a vat or source of supply to the lower end of an upwardly opening conduit or inlet and upwardly through stepped enlargements in this conduit whereby the wine or liquid entering the reservoir is maintained in a quiescent state. This reservoir is provided with multiple baffles whereby the entering wine passes in a tortuous path and is relieved of entrapped air and collected and maintained in a quiescent state in which condition it is supplied by gravity to the multiple filling tubes.

As shown in FIG. 6, the wine from a vat or suitable source of supply enters the valved supply line 53 and its passage into the inlet pipe 54 where its passage is automatically controlled through suitable valve means 55 actuated or under control of a float valve 56 in the top of the reservoir or filling tank 25. The wine from the inlet pipe 54 passes upwardly through a centrally arranged and vertically disposed passage or conduit 57 provided with stepped enlargements at 58, 59 and 60 whereby the velocity of the liquid entering the tank or reservoir is substantially reduced. As shown by the arrows, the entering liquid supply entering from the upper enlargement 60 and outwardly flared or funnel-shaped discharge 61 cannot enter directly into the upper portion of the tank by reason of a horizontally arranged baffle 62 provided with a peripheral, downwardly and outwardly directed flange or skirt 63. Although this baffle has a centrally arranged opening 64 for the escape of entrapped air, direct access through this opening is prevented by a depending, spaced and horizontally arranged baffle 65 of greater dimensions than the opening 64 so that liquid entering and passing through this opening must first take a tortuous path about the baffle 65.

The annular side wall 66 of the tank or reservoir 25 is stepped downwardly and inwardly toward the inwardly inclined base 67 directing the liquid into the annular sump or collecting chamber 46 of the reservoir 25 from which the liquid enters each of the flexible tubes 45 and flows into its connected filling tube 13. The normal liquid level in the reservoir or tank is shown by the dotted line 68 adjacent the top of the tank. Encompassing but spaced from the upper portion 69 of the side wall 66 of the tank or reservoir 25 is an annular wall 70 forming an annular collecting space 71 in the base of which are mounted the vertical discharge pipes 24, there being one of these pipes for each return hose 23. Into this annular space is withdrawn through each flexible return hose 23 air from the bottle to be filled and any liquid that may be withdrawn with this air through the annular space between the filling tube 13 and the encompassing or outer tube 27. The flattened discharge orifices 24a discharge this air and contained liquid over the top of the liquid collected in the annular collecting space 71 with the collected liquid flowing back into the tank or reservoir 25 through restricted ports 71a and air escaping through suitable vents in the cover B.

In the operation of the present rotary filling machine, liquid such as dry wine to be bottled flows into and is collected in a quiescent state in the tank or reservoir 25 with the wine flowing by gravity from the annular collecting chamber or sump 46 in the base of the reservoir into the plural flexible tubes 45 each connected to a filling tube 13 for passage to a bottle or container 33 to be filled to a predetermined height and specified quantity of the liquid. The filling tube units are of substantial weight for vertical movement and carried in spaced relation with

the rotary filling machine designated generally by the reference numeral **72**.

The bottles or containers **33** to be filled are fed to the filling machine **72** by a conventional conveyor and directed by a conventional feed star (not disclosed) in spaced relation onto the filler bed **52** of the rotating machine. On this filler bed each container is disposed beneath and aligned with an elevated filling tube unit and filling tube head **38** (see dotted outline in FIG. 1) both carried by the rotary filling machine, and these containers of a predetermined capacity filled by its filling tube **13** during each revolution of the machine. To raise and lower the filling tube units and filling tube heads **38** and direct the filling tube of each unit into a container **33** to be filled, its filling tube head **38** is carried over the stationary elevated cam track **39** and in following the contour of the stationary cam track each filling tube head and its depending filling tube and filling tube unit is lowered for filling and elevated when filling has been accomplished, and when lowered the filling tube **13** enters the neck of a container and fills it to a predetermined depth, then is elevated and withdrawn from the filled container which continues in its travel upon the filler bed **52** until it is directed from the filler bed by a discharge star onto a discharge conveyor for delivery to sealing apparatus (not shown). Each filling tube head and filling tube unit is of substantial weight and thus closely follows the contour of the cam track which is sufficiently steep to effectively seal each bottle as the filling tube **13** is lowered into the bottle.

In the operation of the filler tube assembly the wine or liquid to be bottled is sealed against flow as shown in FIG. 5 until the filling tube unit is lowered over the empty container and the resilient sealer or sealing collar **31** seats upon the open upper end of the neck **32** of the bottle **33**. As the filling tube **13** is movable vertically and relative to the encompassing parts in the centering bell housing **10**, it continues its downward movement whereupon the cylindrical portion **48** of the tip **49** on the lower end **13a** of this filling tube is withdrawn from the lower end of the encompassing tube **27**, thereby breaking the seal effected by the O-ring and uncovering the outlet ports **47** (FIG. 4). Wine or liquid in a relatively small quantity but sufficient to cover these ports **47** when the tip **49** and filling tube **13** are lowered to adjacent the bottom of the bottle flows from the outlet ports **47**.

This initial flow is caused by the static head which tends to gently force the liquid outwardly through the ports **47** against the inner wall of the bottle from where the wine flows downwardly and collects in the bottom. This static head which results in initial flow is dissipated as the air in the bottle sealed to the atmosphere is being forced upwardly through the annular space between the filling tube **13** and encompassing outer tube **27**, into the space **26** and out through the nipple **22** and the relatively small internal diameter flexible return hose **23**, through the discharge pipe **24** and out through the orifice **24a** into the annular collecting space **71** in the tank or reservoir **25**.

The restricted return hose **23** is raised and lowered with the filling unit and this hose and the larger tube **13** function as a U-tube, with the level of the liquid collected in the smaller or restricted hose dropping as one end of this hose is lowered with the filler assembly, its other end being retained above the liquid level in the tank.

The initial flow from the filling tube **13** begins when this tube and the filling tube unit have been lowered upon a bottle, as shown in FIG. 4, and the lower end of the depending filling tube is forced downwardly by the filling tube head **38** out of the lower end of the encompassing tube **27** to expose the discharge ports **47**. At such time the lower end of the tube **27** is also open for the discharge of the entrapped air. As the entrapped air in the bottle is relieved before the main flow of the gravity fed liquid commences and this air with any entrained liquid can only be relieved through the restricted annular passage between the concentric tubes **13** and **27** and through the restricted opening in the return hose **23**, there is a time lag between the initial flow and the main flow while the entrapped air is relieved.

Before the main flow through the filling tube **13** and the outlet ports **47** of the tip **49** begins, the air in the bottle must be removed. In such removal the static head through the filling tube **13** forces some wine upwardly through the reduced annular column in the outer tube **27** through which escapes collected air. In the filling operation this time lag in which the collected air is dissipated through this reduced annular column or space in the outer tube **27** and through the small internal diameter of the flexible return hose **23** requires approximately one second which is sufficient to permit the tip **49** to reach approximately the bottom of the bottle **33** whereupon the main flow from the filling tube **13** commences.

This bottom flow of the wine in the filling operation is highly important to prevent turbulence and the entrainment of air in dry wines.

In one commercial embodiment of the present invention, two hundred and twenty-five bottles are filled per minute with the rotary filling machine provided with forty-five filling tubes so that the rotary filler bed **52**, the filling tube heads **38** and filler tube units with the filler tubes **13** make five revolutions each minute. In this embodiment, the filling operation for forty-five bottles requires a maximum of twelve seconds to complete, including approximately one second required to move each bottle to filling position, approximately one second to lower the filling tube, the filling tube is maintained lowered for approximately four seconds, approximately four seconds is required to slowly raise the filling tube into the encompassing outer tube **27** and complete the filling operation, approximately one second to completely withdraw the filling tube from the bottle and approximately one second to withdraw or remove the filled bottle. The lag period between the initial flow and before the main flow commences is between one and two seconds.

In this commercial embodiment the filling tube **13** has an internal diameter of approximately $^{25}/_{64}$ inch and an external diameter of approximately ½ inch. Due to the enlarged internal diameter of the cylindrical portion **48** of the tip **49** over that of the internal diameter of the filling tube **13**, the velocity of the liquid flow into the bottle being filled is maintained low. The inner diameter of the flexible return hose **23** which connects with the annular space between the filling tube **13** and the encompassing outer tube **27** is approximately $^{3}/_{16}$ inch and thus substantially smaller than the filling tube **13**.

Having thus disclosed the invention, I claim:

1. In a rotary filling machine for bottling liquids such as dry wines with a minimum of entrained air, a resevoir for receiving and supplying the liquid to be bottled in said machine, an inlet, a conduit rising from said inlet and connected to the base of said reservoir for vertical flow upwardly into said reservoir, said conduit having stepped enlargements to decrease the velocity and turbulence of the liquid entering said reservoir, a collecting chamber encompassing but separated from said conduit the liquid flowing by gravity from said collecting chamber for bottling, and baffles provided in said reservoir for directing the entering liquid in a tortuous path to said collecting chamber whereby the liquid in said collecting chamber is in a quiescent state and substantially free of entrapped air.

2. In a rotary filling machine for bottling liquids such as dry wines with a minimum of entrained air, a reservoir for receiving and supplying the liquid to be bottled in said machine, an inlet, a conduit rising from said inlet and provided with stepped enlargements connected to the bottom of the reservoir for decreasing the velocity and turbulence of the entering liquid, a collecting chamber in the base of said reservoir but separated from said inlet for receiving the liquid in a quiescent state, and baffles in

said reservoir for directing the upward flow of the entering liquid in a tortuous path, said conduit and baffles being so constructed and arranged that the velocity and turbulence of the entering liquid is reduced, entrapped air is liberated and the liquid entering the collecting chamber from which the liquid is withdrawn for bottling is in a quiescent state.

3. In a rotary filling machine for bottling liquids such as dry wines with a minimum of entrained air, a reservoir for receiving and supplying the liquid to be bottled in said machine, an inlet for the liquid, a conduit rising from said inlet and connected to the base of said reservoir for vertical flow upwardly into said reservoir, said conduit having stepped enlargements to decrease the velocity and turbulence of the liquid entering said reservoir, a collecting chamber in the base of but separated from the conduit for said reservoir, the liquid flowing by gravity from said collecting chamber for bottling, baffles provided in said reservoir for directing the entering liquid in a tortuous path to said collecting chamber whereby the liquid in said collecting chamber is in a quiescent state, a filling assembly comprising a filling head communicating with and withdrawing liquid from the bottom of said collecting chamber by gravity, a stationary cam track over which the head is moved and by which the head is lowered during filling of a bottle and elevated when the bottle has been filled, a filling tube unit including a filling tube depending from and carried by said head with its lower end movable vertically in said unit and into and out of a bottle to be filled, a centering bell housing slidably mounted in said unit and in which said filling tube is slidably mounted, a tube mounted in said centering bell and encompassing and spaced from the filling tube to provide an annular restricted passage therebetween, a flexible sealing collar carried on the lower end of said encompassing tube for sealing contact with the neck of the bottle, a filling tip on the lower end of said filling tube, said tip being provided with a sealing ring and one or more outlet ports above said ring, said tip being telescopically received in the encompassing tube with the lower end of the encompassing tube engaging the sealing ring to cover the ports and seal the annular restricted passage, a return hose communicating with said restricted annular space and of a smaller internal diameter than the internal diameter of the filling tube for the escape through said restricted passage and return hose of air and entrained liquid from the bottle during the initial part of the filling operation when a limited quantity of liquid enters the bottle through the uncovered outlet ports after which the tip is lowered to adjacent the bottom of the bottle and liquid issues through said ports beneath the collected liquid until the bottle is filled, said cam track and filling head lowering and raising said tip in a predetermined timed sequence.

4. Filling mechanism for a rotary filling machine having a liquid reservoir from which the liquid flows by gravity for filling bottles or other containers with a liquid while maintaining said liquid with a minimum of turbulence and aeration and a rotary filler bed upon which the containers to be filled are carried in a horizontal plane during filling, comprising a filling tube assembly for filling said containers with a liquid with a minimum of turbulence and entrained air, a cam track carrying said filling tube assembly and lowering said assembly to fill a container and elevating said assembly when the container has been filled, said assembly including a supporting head mounted on said track, a filling tube unit having a filling tube carried at one end by said head and connected with the reservoir with the other end depending and vertically slidable in said unit with its depending end adapted to enter the fill opening of a container, a tube in said unit encompassing the filling tube and providing a restricted passage therebetween, a return hose having a substantially smaller internal diameter than said filling tube and communicating with the restricted passage, the lower end of said filling tube being closed but adjacent to this closed end provided with one or more outlet ports for the passage of the liquid during filling, said lower end adapted to be telescopically received in the encompassing tube and provided with sealing means for sealing the telescoped ends of the filling tube and the encompassing tube except during the filling operation, and a sealing ring on said encompassing tube for sealing contact with the container about its fill opening preparatory to the filling operation, whereby when the lower end of the filling tube enters the container and the sealing ring on the encompassing tube seals the fill opening to the outside atmosphere, the encompassing tube remains stationary with the weight of said unit maintaining said sealing means in sealing contact with the container while the filling tube continues to move downwardly in the container to break the seal between the adjacent ends of said tubes and uncover the ports whereupon a limited quantity of the liquid flows into the container while the air entrapped in the container together with entrained liquid escapes through the restricted annular space and the return hose to the reservoir, and delays full flow through the outlet ports until the filling tube is fully lowered and these ports are disposed adjacent the bottom of the container, said reservoir having a separate chamber and said return hose having an outlet for discharging the entrapped air and entrained liquid exhausted from the container laterally into the upper portion of said separate chamber, in which the entrained liquid is separated from the entrapped air, and ports in the bottom of said separate chamber for returning the liquid collected therein to the reservoir.

5. In beverage bottle filling apparatus provided with an upright, generally cylindrical filler tank having a horizontal bottom wall and a vertical side wall connected thereto, said bottom wall being provided with an inlet opening in the central portion thereof and a liquid supply line connected to said inlet for directing liquid into the tank and with sufficient force that the liquid normally has a large number of gas bubbles therein, said side wall being provided with a series of outlet openings in the lower portion thereof adjacent said bottom wall and thereby spaced from and surrounding said inlet opening and communicating with corresponding outlet conduits, the combination with said tank, of structure for forcing the liquid to rise in the tank to a sufficient level to cause the bubbles to pass upwardly from the liquid prior to passage of the later into said outlet openings, said structure including an annular baffle disposed within the tank and having a lower annular edge substantially complementally engaging the upper face of said bottom wall of the tank and disposed in completely surrounding relationship to said inlet opening and between the latter and said outlet openings, said baffle extending upwardly in the tank and provided with an upper annular edge lying in a horizontal plane at a height to cause the liquid entering the tank from the supply line through said inlet opening, to travel upwardly a sufficient distance that when the liquid passes over the upper edge of the baffle and descends downwardly toward said outlet openings in the side wall of the tank, substantially all of the gas bubbles in the liquid continue upward movement thereof whereby the liquid drained from the tank through said outlet conduits is substantially free of gas bubbles.

6. In beverage bottle filling apparatus provided with an upright, generally cylindrical filler tank having a horizontal bottom wall and a vertical side wall connected thereto, said bottom wall being provided with a circular boss presenting an annular flange spaced from said side wall, said boss having an inlet opening in the central portion thereof and a liquid supply line connected to said inlet for directing liquid into the tank and with sufficient force that the liquid normally has a large number of gas bubbles therein, said side wall being provided with a series of outlet openings in the lower portion thereof adjacent said bottom wall and thereby spaced from and surrounding said inlet opening and communicating

with corresponding outlet conduits, the combination with said tank, of structure for forcing the liquid to rise in the tank to a sufficient level to cause the bubbles to pass upwardly from the liquid prior to passage of the latter into said outlet openings, said structure including an annular baffle disposed within the tank and having a lower annular edge substantially complementally engaging the flange of said boss and the upper face of said bottom wall of the tank and disposed in completely surrounding relationship to said inlet opening and between the latter and said outlet openings, said baffle extending upwardly in the tank and provided with an upper annular edge lying in a horizontal plane at a height to cause the liquid entering the tank from the supply line through said inlet opening, to travel upwardly a sufficient distance that when the liquid passes over the upper edge of the baffle and descends downwardly toward said outlet openings in the

side wall of the tank, substantially all of the gas bubbles in the liquid continue upward movement thereof whereby the liquid drained from the tank through said outlet conduits is substantially free of gas bubbles.

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