Feb. 8, 1955 C. L. DAY ET AL 2,701,676

FILLING NOZZLE FOR APPARATUS FOR FILLING CONTAINERS WITH LIQUID

Filed June 8, 1951 4 Sheets-Sheet 1

Fig. 1.

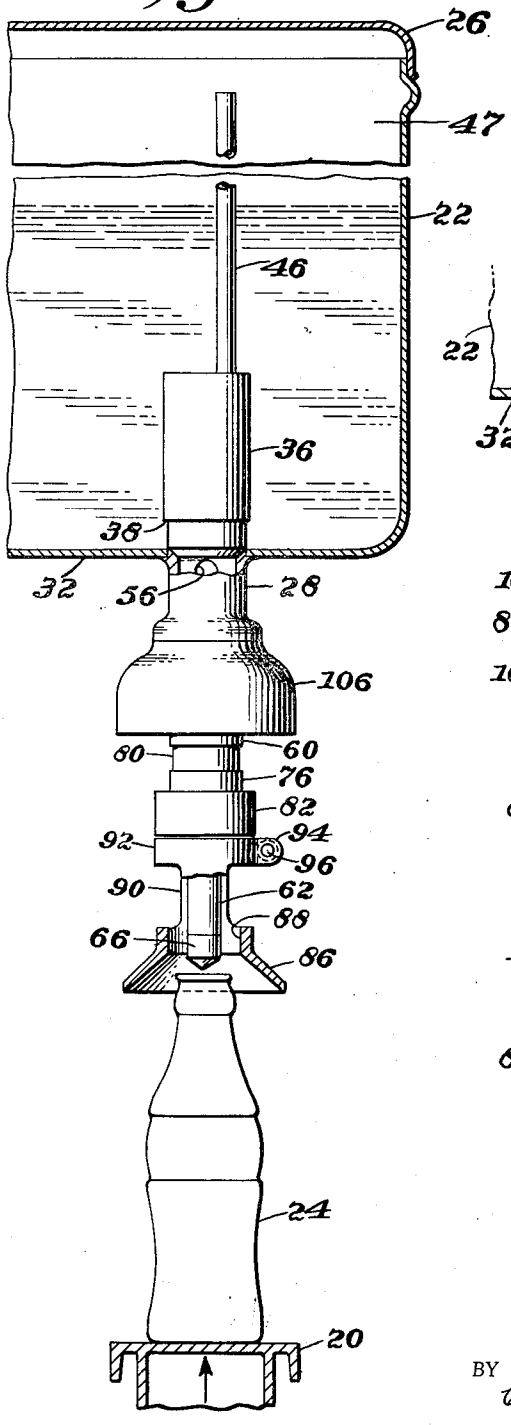
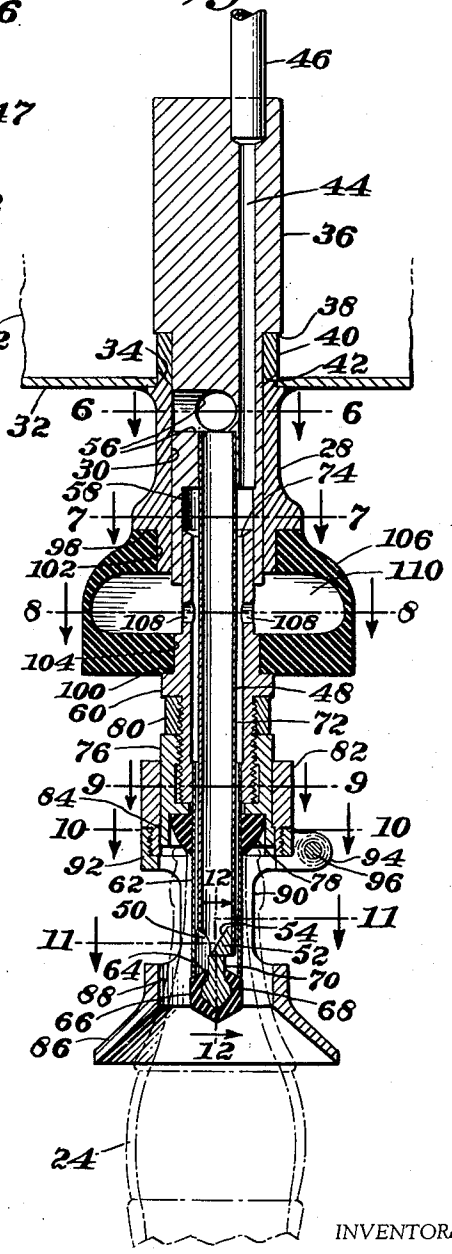


Fig. 2.



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Fig. 3.

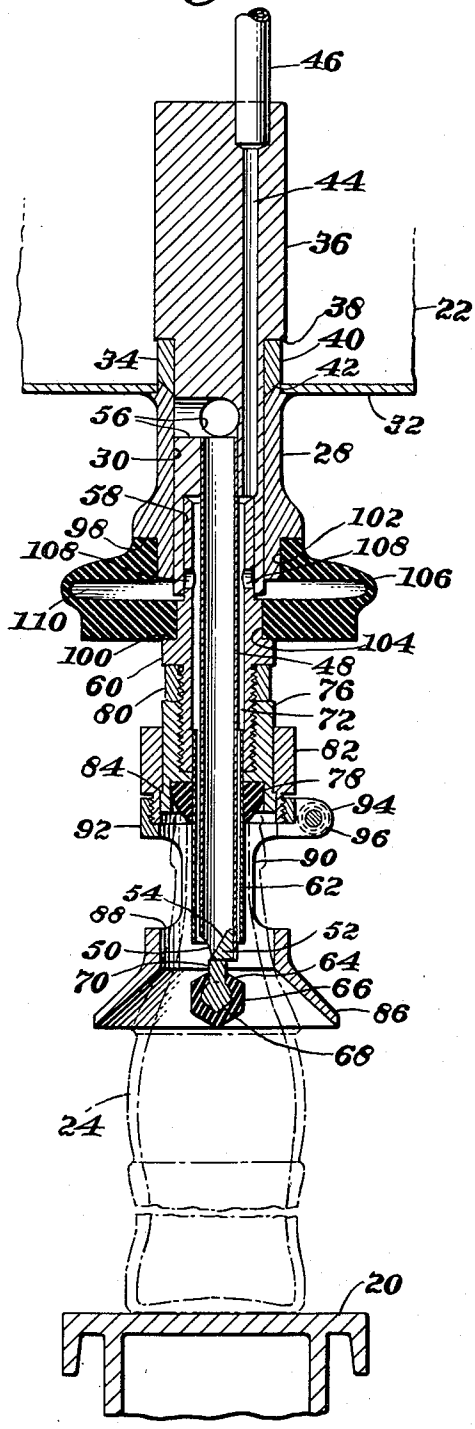
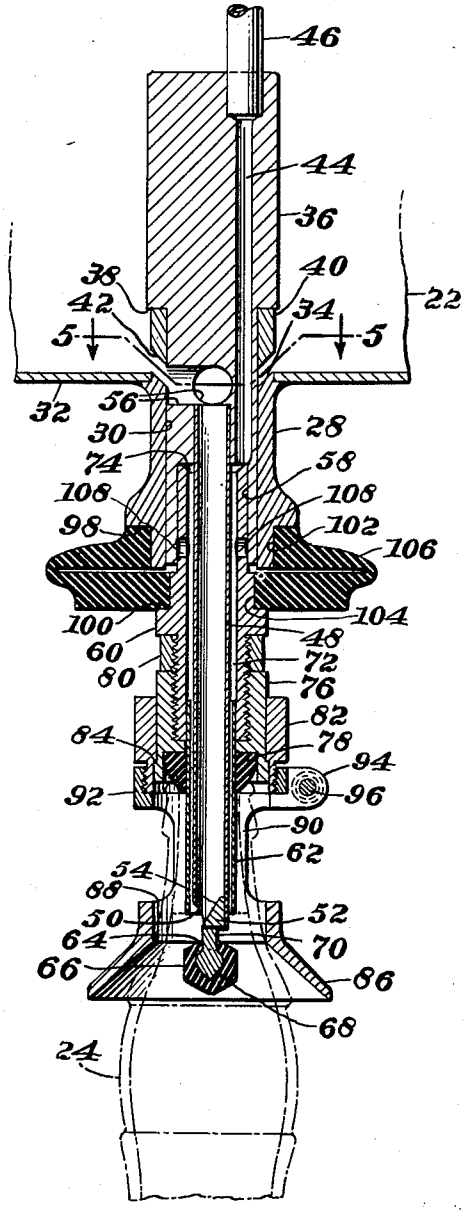


Fig. 4.



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Fig. 5.

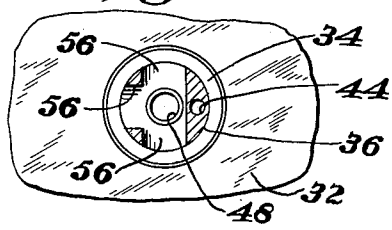


Fig. 6.

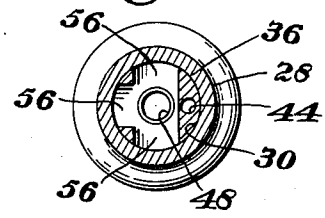


Fig. 7.

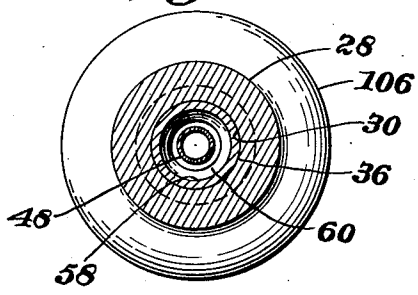


Fig. 8.

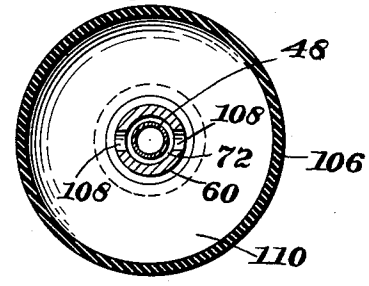


Fig. 9.

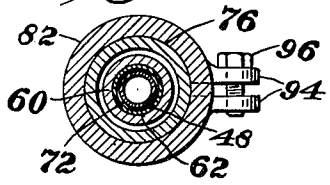


Fig. 10.

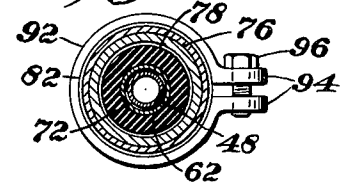


Fig. 11.

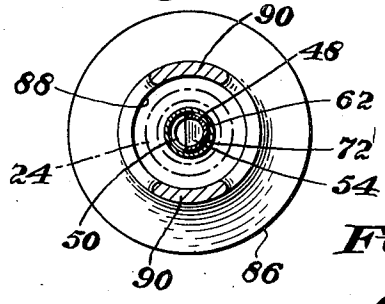


Fig. 12.

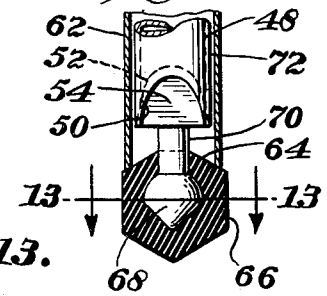
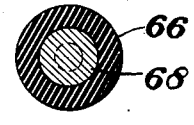


Fig. 13.



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Filed June 8, 1951 4 Sheets-Sheet 4

Fig.14.

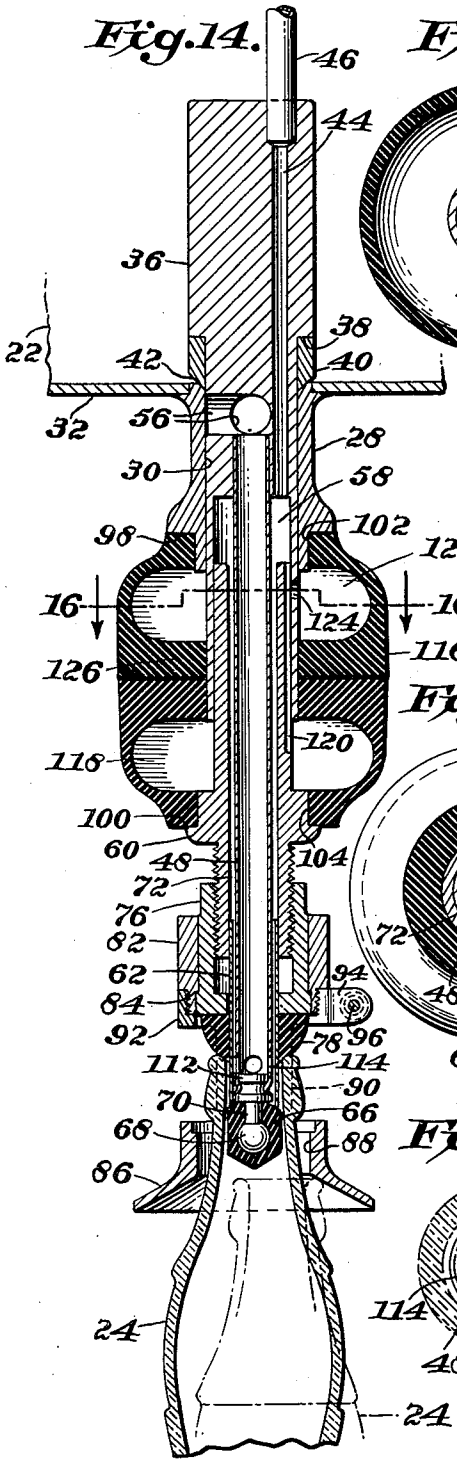


Fig.16.

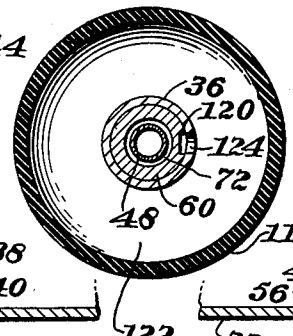


Fig.15.

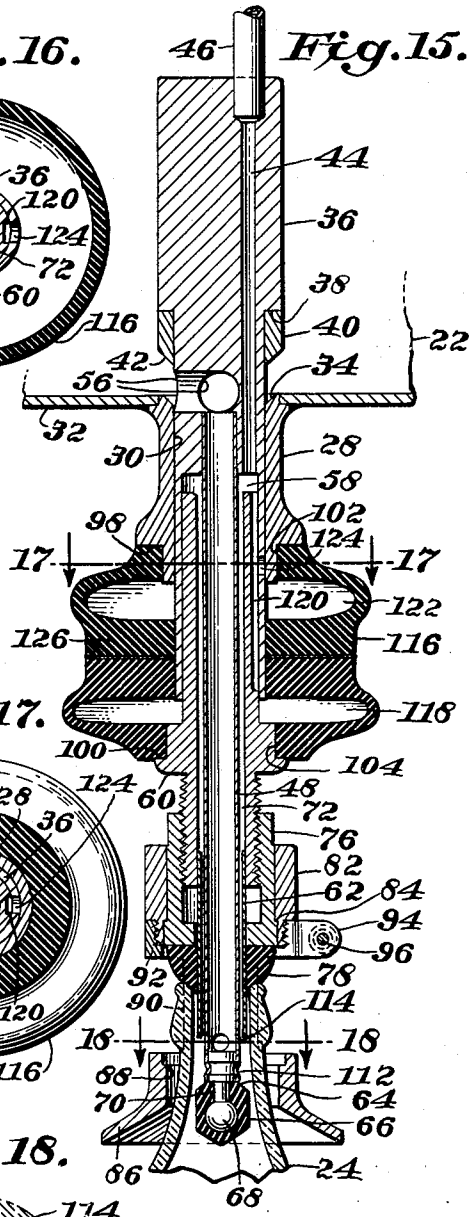


Fig.17.

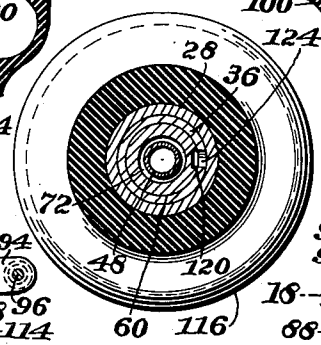
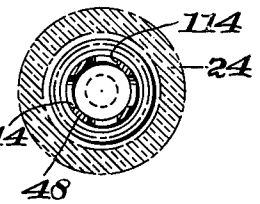


Fig.18.



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United States Patent Office 2,701,676 Patented Feb. 8, 1955

2,701,676

FILLING NOZZLE FOR APPARATUS FOR FILLING CONTAINERS WITH LIQUID

Carl L. Day and Leo F. Pahl, Baltimore, Md., assignors to Crown Cork & Seal Company, Inc., Baltimore, Md., a corporation of New York

Application June 8, 1951, Serial No. 230,586

17 Claims. (Cl. 226—124)

This invention relates to a filling valve or nozzle for machines for filling containers with non-carbonated liquid. More particularly, this invention relates to an improved filling nozzle for conventional automatic bottle filling machines of the type which have a filling platform, on which the bottle to be filled is located, and a superposed liquid reservoir. In such machines the filling platform either lifts to raise the bottle into engagement with a filling nozzle which depends from the liquid reservoir, or the liquid reservoir is lowered to accomplish such engagement.

The filling nozzle of such machine incorporates a valve which is opened by the engagement and movement of a portion of the nozzle by the container to be filled, to thus automatically permit liquid to flow from the reservoir through the nozzle and into the container. In order to prevent overflow of the container being filled, the nozzle is provided with an annular gasket or pad that is engageable with the mouth of the container to seal the same from the atmosphere. This seal creates the problem of properly venting the air from the container during filling thereof with liquid. Accordingly, the filling nozzle must also be constructed to incorporate such a vent. The vent usually leads to the air space above the liquid in the reservoir, which space may be under a pressure less than atmospheric in some types of machines, i. e., so-called vacuum machines. After the container has been filled, it is lowered from engagement with the nozzle to automatically close the valve and stop the flow of liquid.

Nozzles of the aforementioned type present numerous problems which must be overcome to provide satisfactory operation without undue complexity. Among these problems may be mentioned those of providing a nozzle structure which may be easily taken apart and cleaned for sanitary reasons, as when filling containers with various types of beverages, of providing a nozzle which is dripless to avoid a messy and unsanitary condition of the filling machine, and of preventing blocking of the vent passage with the liquid.

Accordingly, it is an object of this invention to provide an improved filling nozzle for vacuum or non-vacuum apparatus for filling containers with non-carbonated or still liquids.

It is another object of this invention to provide a filling nozzle which is absolutely dripless.

It is another object of this invention to provide a filling nozzle with means for preventing the vent passage therethrough from becoming blocked with the liquid with which the container is being filled.

It is another object of this invention to provide a filling nozzle of the type described with suction and pressure creating means, operable by the filling movements of the nozzle, for withdrawing residual liquid from the lower end of the vent passage and the filling passage at the end of the filling operation, and for forcing such residual liquid into the container at the beginning of the next filling operation.

It is still another object of this invention to provide a nozzle of the type described that can easily and quickly be disassembled for cleaning purposes and can be reassembled in an extremely short time, such nozzle being of such simplified construction that all parts thereof, when disassembled, may be reached and readily cleaned with a brush to thereby provide an extremely sanitary construction.

It is still another object of this invention to provide a filling nozzle of the type described having no threads exposed for contact with the liquid passing therethrough for obvious sanitary reasons.

It is still another object of this invention to provide a filling nozzle of the type described of simplified construction, having no soldered or welded joints.

It is still another object of this invention to provide a filling nozzle of the type described with means by which the filling level, that is, the height to which the container is filled with liquid, may be readily adjusted and accurately maintained.

Other objects and advantages of this invention will be readily apparent from the following description and accompanying drawings, in which:

Figure 1 is a fragmentary elevational view of a portion of a container filling machine illustrating a filling nozzle embodying this invention in operative position over a container to be filled.

Figure 2 is an enlarged vertical sectional view of the filling nozzle illustrated in Figure 1 showing the container engaged therewith in position to start a filling operation.

Figure 3 is a view corresponding to Figure 2 showing the position of the nozzle parts at the end of their initial upward movement during the filling operation.

Figure 4 is a view corresponding to Figure 2 illustrating the position of the nozzle parts at the terminus of their upward movement during the filling operation.

Figure 5 is a fragmentary sectional view taken on line 5—5 of Figure 4.

Figures 6, 7, 8, 9, 10, 11, and 12 are sectional views taken on the correspondingly numbered lines of Figure 2.

Figure 13 is a sectional view taken on line 13—13 of Figure 12.

Figure 14 is a view corresponding to Figure 2 illustrating a modified form of the invention.

Figure 15 is a view corresponding to Figure 14 illustrating the position of the nozzle parts at the terminus of their upward movement during the filling operation.

Figure 16 is a cross-sectional view taken on line 16—16 of Figure 14.

Figures 17 and 18 are sectional views taken on the correspondingly numbered lines of Figure 15.

Referring now to the drawings, there are shown in Figure 1 the filling platform 20 and superposed, preferably constant level, liquid reservoir 22 that are conventional in automatic bottle filling machines of the type with which this invention is concerned. A small mouthed beverage bottle 24 is shown on the platform in position to be filled, but it will be realized that the filling nozzle is adapted for use to fill all types of liquid containers, whether of glass or other material. The reservoir is provided with a removable cover 26 and a depending downspout 28 positioned directly over the filling platform 20. The downspout 28 has a smooth cylindrical bore 30 therethrough and is provided, adjacent the bottom wall 32 of the reservoir, with an upwardly-facing frusto-conical valve seat 34.

A valve body 36 is mounted for vertical slidable movement within the bore 30 of the downspout 28 and has an enlarged upper portion forming a shoulder 38 against which an annular detachable valve head 40, preferably of rubber, is seated. The lower end of the valve head 40 has a frusto-conical valve surface 42 complementary to and seating on the valve seat 34. The valve body 36 preferably is weighted, for reasons later described. The reduced lower portion of the valve body 36 fits snugly within the bore 30 of the downspout and extends downwardly therethrough to a point adjacent the bottom thereof. Extending vertically through the valve body 36 is a vent passage 44 which is continued upwardly above the level of the liquid in the reservoir 22 by a vent pipe 46 mounted in a counterbore in the upper end of the vent passage, as shown best in Figure 1. Although a nozzle embodying this invention is principally intended for use with non-vacuum machines, it may be used satisfactorily with vacuum machines. In the latter event, the air space 47 in the reservoir would be under reduced pressure.

Mounted in a central counterbore in the lower end of the valve body and depending therefrom is a relatively

long filling tube 48 having an inclined discharge port 50 at one side of the lower end thereof. A deflector block 52 is positioned in the lower end of the tube 48 opposite the discharge port 50 and has an inclined surface 54 facing the latter. Several lateral ports 56, three as illustrated in the drawing, are provided in the reduced lower portion of the valve body, immediately beneath the sealing surface 42 of the valve head 40, for communication with the upper end of the tube 48. These ports 56, when the valve body 36 is seated on the valve seat 34, are disposed completely within the bore 30 of the downspout 28. The lower end of the valve body is provided with a central circular recess 58 concentric with the filling tube 48 and into which the lower end of the vent passage 44 opens.

A sleeve 60 concentrically encloses the filling tube 48 and has a reduced upper portion which is telescopically slidable within the recess 58 in the lower end of the valve body. Secured to and depending from the lower end of the sleeve 60 is a concentric vent tube 62 having its open end normally supported by and seating upon the upwardly facing frusto-conical surface 64 of a valve element 66, preferably of rubber or other appropriate resilient material, that is secured to the lower end of the liquid tube 48. This rubber valve element 66 has a diameter only slightly greater than that of the vent tube 62 and is hollow to enable it to be stretched over and supported on a bulbous metallic core 68 having a stem 70 that is secured to and depends from the lower end of the liquid tube 48. The core 68 is of smaller diameter than the interior of the vent tube 62 for assembly and disassembly purposes. The interior diameters of both the sleeve 60 and the vent tube 62 are greater than the exterior diameter of the liquid tube 48 to provide an annular vent passageway 72 therebetween that communicates, at its upper end, with the circular recess 58 and thereby with the lower end of the vent passage 44 through the valve body 36.

From the construction thus far described, it will be seen that the valve element 66 and the lower ends of the vent and filling tubes are adapted to be inserted into the container 24 and that when the sleeve 60 is raised relative to the liquid tube 48, the lower end of the vent passageway 72 will be opened to permit free communication between the interior of the container and the air space 47 in the reservoir 22. Continued upward movement of the sleeve 60 engages its reduced upper end with the bottom of the recess 58 in the valve body 36, as shown in Figure 3, and then raises the valve body 36 off its seat 34, as illustrated in Figure 4. In this position of the movable parts of the nozzle, liquid may flow through the gap between the valve head 40 and the seat 34, through the lateral ports 56, and down through the liquid tube 48 for discharge through the inclined port 50 into the container 24. At the same time the air displaced from the container by the inflowing liquid is vented upwardly through the vent passageway 72 and vent passage 44 to the air space 47 above the liquid in the reservoir 22. It will be noted that the upper end of the sleeve 60 is internally beveled, as at 74, so that in the position of the parts shown in Figure 4 lifting engagement of the sleeve with the valve body will not block off the lower end of the vent passage 44 through the valve body.

The mechanism for effecting such operating movements of the nozzle parts by means of the upward movement of the container 24 on the filling platform 20 consists of a collar 76 which is threadedly supported on a reduced lower portion of the sleeve 60 and has an annular recess in the lower end thereof in which is positioned an annular sealing gasket or pad 78 that snugly embraces the vent tube 62. This pad 78 engages and seals the mouth of the container 24 from the surrounding atmosphere upon upward movement of the latter. A lock nut 80 is threaded on the sleeve 60 above the collar 76. The threaded engagement of the collar 76 with the sleeve 60 provides a method by which the pad 78 may be adjusted vertically relatively to the sleeve 60 to thereby afford a convenient method of adjusting the filling height or headspace of the container 24. Slidably mounted for vertical movement on the collar 76 is another sleeve 82 having an externally threaded lower end. Engageable shoulders 84 on the lower ends of the collar 76 and the sleeve 82 serve to limit the downward movement of the sleeve 82 relative to, and to support the sleeve 82 from, the collar 76.

A bell-shaped guide 86 having a central circular opening 88 depends from and is supported by the sleeve 82 by means of a pair of upright legs 90 secured to an internally threaded split collar 92 threaded onto the lower end of the sleeve 82 and having a pair of radially extending opposed ears 94 through which a bolt 96 may be inserted for clamping the collar 92 securely to the sleeve 82. The purpose of the guide 86 is to correctly center the mouth of a container to be filled directly beneath the vent tube 62 and the liquid tube 48, in case the container is improperly positioned upon the filling platform 20. In the latter event, as best shown by dotted lines in Figure 14, the guide 86 serves to move the container 24 into correctly centered position with respect to the vent and liquid tubes 62 and 48. In this connection it will be noted that the lower end of the valve member 66 is of pointed conical configuration for cooperation with the guide 86 in the centering operation.

The lower end of the downspout 28 is formed with a downwardly facing annular shoulder 98, while the intermediate portion of the sleeve 60 is formed with an upwardly facing shoulder 100. Seated against these shoulders 98 and 100 and snugly embracing the downspout 28 and the sleeve 60 are the upper and lower rims 102 and 104, respectively, of an annular resilient bellows-like element 106, preferably made of rubber or other appropriate material. This element provides a seal for the telescoping joint between the lower end of the valve body 36 and the upper portion of the slidable sleeve 60. The reduced upper portion of the sleeve has lateral ports 108 to provide communication between the interior chamber 110 of the bellows-like element 106 and the vent passageway 72. These ports 108 are so located that in the normally extended position of the parts, shown in Figure 2, open communication is provided between the chamber 110 and the vent passageway 72, but when the sleeve 60 is raised into lifting engagement with the valve body 36, as shown in Figure 3, the side wall of the recess 58 covers the ports 108 to shut off such communication.

The operation of the filling nozzle is as follows: With a container 24 positioned on the filling platform, as illustrated in Figure 1, the filling machine operates to raise such platform and lift the container over the filling and vent tubes 48 and 62 and into sealing engagement with the gasket 78, as shown in Figure 2. In the event that the container is improperly centered on the filling platform 20, the guide 86 serves to correctly center the mouth of the container, as illustrated in Figure 14, for reception of the valve element 66 and the lower ends of the vent tube 62 and liquid tube 48. Continued upward movement of the filling platform serves to raise the sleeve 60, thereby contracting and reducing the volume of the chamber 110 within the bellow-like element 106. Simultaneously, such lifting of the sleeve 60 serves to raise it from engagement with the valve element 66 supported on the end of the liquid tube 48 to provide free communication between the interior of the container and the vent passageway 72. Any residual liquid within the vent passageway 72 and/or the chamber 110 within the bellows-like element drains or is forced downwardly into the container 24 by reason of the pressure developed on such liquid by the contraction of the bellows-like element 106. While it is true that such pressure may also escape upwardly through the vent pipe 46, it has been observed in actual operation that enough of the residual liquid drains or is forced downwardly into the container to clear the vent passageway 72 sufficiently to permit unobstructed venting of the container during the filling operation.

When the container 24 has been raised sufficiently to cause the sleeve 60 to engage with the valve body 36, as shown in Figure 3, continued movement will lift the latter to the position shown in Figure 4 to thereby separate the valve head 40 from its seat 34 and permit liquid to flow from the reservoir 22 through the lateral ports 56 and down the filling tube 48 into the container. In this position of the parts it will be noted that the lower end of the vent tube 62 is spaced above the lower portion of the discharge port 50 in the filling tube 48. Hence, there is no interference between the inflowing liquid and the air being vented upwardly, through the annular inlet to the vent passageway 72, that might cause blocking of such inlet with liquid. The container will continue to be filled until the level of the liquid therein reaches the lower end of the vent tube 62 at which time the filling operation will cease, as shown in Figure 4, except

for such liquid as continues to rise through the vent passageway 72.

After the container has been filled, the filling platform 20 lowers, thereby permitting the weighted valve body 36 to lower into engagement with its seat 34 and shut off further flow of liquid through the filling tube 48. Thereafter, liquid drains from the filling tube 48 into the container until continued lowering movement of the container uncovers the lateral ports 108 in the sleeve 60 and sufficient suction is developed by expansion of the chamber 110 to withdraw residual liquid from the lower end of the vent tube 62 and, in the final seating movement of the sleeve 60 from the lower end of the filling tube 48 up through the vent passageway 72, through the lateral ports 108, and into the chamber 110. Continued lowering of the container permits the vent tube 62, aided by the spring-like action of the bellows element 106, to seat on the valve element 66, and thereby positively prevent any drip of liquid from the lower end of the filling tube 48 after disengagement of the mouth of the container from the sealing gasket 78 and withdrawal of the nozzle from the container interior. Thereafter another container is positioned on the lifting platform and the above described filling cycle is repeated.

In the event it is desired to fill a container to a higher level than that illustrated in Figure 4, i. e., decrease the headspace, the lock nut 80 is loosened and the sleeve 76 is rotated in a direction to move it, together with the gasket 78, downwardly on the sliding sleeve 60 to thereby lessen the distance to which the vent tube 62 and filling tube 48 are inserted within the container.

In the event that the container mouth is too large to pass through the central circular opening 88 in the guide 86, the vertically slidable mounting of the sleeve 82 permits the guide to raise until the mouth of the container is engaged with the sealing gasket 78.

The construction of the parts of the nozzle facilitates the ease of disassembly for cleaning and reassembly into operating position in the reservoir downspout 28. When it is desired to disassemble the nozzle, the rubber valve element 66 is pulled off the bulbous core 68 and the sleeve 60, together with the vent tube 62, gasket 78, collar 76, sleeve 82, and guide 86, is pulled downwardly as a unit from the assembly. Such downward movement disengages the lower rim 104 of the bellows-like element 106 from its seat on the sleeve 60, thereby permitting the sleeve assembly unit to be completely removed and disassembled separately for cleaning and/or sterilizing. Upon the removal of the rubber valve element 66, the valve body 36, together with the depending filling tube 48 and upstanding vent pipe 46, may be removed in an upward direction out of the downspout 28. The annular valve head 40 may be slipped off of the valve body for replacement and/or cleaning of both the valve head and the valve body and the parts supported thereon. After the sleeve assembly unit has been removed, the bellows-like element 106 may be pulled downwardly to detach its upper rim 102 from the seat at the lower end of the downspout 28, thus permitting the bellows-like element to be cleaned separately.

In order to reassemble the nozzle, the valve head 40 is replaced upon the valve body 36 and the latter dropped downwardly into operating position within the downspout 28. The bellows element 106 is thereupon seated on the lower end of the downspout 28 and the sleeve assembly unit slipped up over the filling tube 48 and seated against and within the lower rim 104 of the bellows-like element. The sleeve assembly unit is then held in raised position while the rubber valve element 66 is stretched and pushed over its supporting core 68.

From the above it will be seen that no tools are required for assembling or disassembling the nozzle structure and that all parts may be quickly and easily separated for individual cleaning.

In the modified form of the invention shown in Figure 14, the lower end of the filling tube 48 is completely closed by a plug-like element 112 from which the stem 70 of the valve core 68 depends and a plurality of radial discharge ports 114 are formed in the lower end of the vent tube 62 immediately above the plug-like element 112. The single bellows element 106 shown in Figure 2 is replaced by the multiple-chamber compound bellows 116 shown in Figure 14. For this purpose the telescopically engageable portions of the lower end of the valve body 36 and the upper end of the sleeve 60 are considerably elongated and the lateral ports 108 which afford communication between the bellows chamber 110 and the vent passageway 72, in the construction shown in Figure 2, must, of necessity, be rearranged somewhat. As shown in Figure 14, communication between the lower bellows chamber 118 and the vent passageway 72 is afforded by a longitudinal groove 120 extending along the exterior of the reduced upper portion of the sleeve 60 to the upper end thereof. Communication between the upper bellows chamber 122 and the vent passageway 72 is provided by means of a lateral port 124 through the depending annular portion of the lower end of the valve body 36 and in circumferential alignment with the longitudinal groove 120.

The compound bellows 116 consists essentially of two bellows elements, corresponding to the elements 106 shown in Figure 2, vulcanized together to provide the two chambers 118 and 122 separated by an intermediate partition 126. The walls of the central opening through this partition 126 snugly embrace the lower end of the valve body 36. Hence, the upper chamber 122 contracts only upon upward movement of the valve body. As best illustrated in Figure 15, the mounting of the compound bellows 116 eliminates the necessity for actual lifting engagement between the sleeve 60 and the valve body 36 since the intermediate partition 126 of the bellows grips the lower end of the depending annular portion of the valve body, and starts to lift the latter after a predetermined raising movement of the sleeve 60. It will be noted, however, that in the position of the parts shown in Figure 15, that is, when the valve head 40 has been lifted from its seat 34, communication between the chambers 118 and 122 and the vent passageway 72 is interrupted.

It will thus be seen that the objects of this invention have been effectively and efficiently accomplished. It will be realized, however, that the specific embodiments shown and described are for the purpose of illustrating the principles of the invention and that various changes will occur to one skilled in the art. Therefore, this invention embraces all modifications encompassed by the spirit and scope of the following claims.

We claim:

1. A filling nozzle for container filling apparatus having a filling platform and a superposed liquid reservoir, at least one of which is vertically movable, said nozzle being adapted to depend from the reservoir into a container to be filled and comprising: a vertically movable assembly having a vent passage and a liquid passage extending therethrough; means on said assembly engageable by the container for raising said assembly; normally closed valve means controlling said liquid passage; means for opening said valve means by the terminal upward movement of said assembly; normally closed valve means controlling said vent passage; means for opening said last-mentioned valve means by the initial upward movement of said assembly; and means forming a normally-expanded contractible chamber in communication with said vent passage above said vent passage valve means, said chamber being mounted at least in part on said assembly for contraction and expansion upon upward and downward movements, respectively, of said assembly.

2. The structure defined in claim 1 including normally open valve means controlling the communication between the chamber and the vent passage, and means for closing said valve means during terminal upward movement of the assembly.

3. The structure defined in claim 1 in which the contractible chamber comprises a bellows having one end thereof secured to the assembly and the other end adapted to be secured to the reservoir.

4. A filling nozzle for container filling apparatus having a filling platform and a superposed liquid reservoir, at least one of which is vertically movable, said nozzle being adapted to depend from the reservoir and comprising: a vertically movable valve body having a vent passage therethrough; an upwardly facing valve seat for said body; a filling tube depending from said body for insertion into a container to be filled, upward movement of said body being effective to permit liquid to flow from the reservoir through said tube; a vent tube concentrically mounted over said filling tube for lost motion lifting engagement with said valve body, said vent tube terminating adjacent the lower end of said filling tube to define therewith a vent passageway in com-

munication with said valve body vent passage; a valve controlling said vent passageway and opening upon upward movement of said vent tube; means on said vent tube engageable by the container for raising said vent tube and subsequently said valve body; and means forming a normally-expanded contractible chamber in communication with said vent passageway between the ends thereof, said chamber being mounted at least in part for contraction and expansion upon upward and downward movements, respectively, of said vent tube.

5. The structure defined in claim 4 in which the vent passageway valve comprises a valve element on the lower end of the filling tube normally in sealing engagement with the lower end of said vent tube, and including a discharge port in the filling tube above said valve element.

6. A filling nozzle for container filling apparatus having a liquid reservoir and a filling platform therebelow, at least one of which is vertically movable, said nozzle being adapted to depend from the reservoir and comprising: upper and lower vertically and relatively movable sections having a vent passage and a liquid passage extending therethrough; means on said lower section having lost motion lifting engagement with said upper section, relative advancing movement between the container and the reservoir being effective to engage a container to be filled with said lower section, initially raise said lower section into lifting engagement with said upper section, and thereafter to raise both said sections, and withdrawing relative movement between the container and the reservoir effecting lowering movement of said sections in the reverse order; normally closed valves controlling said vent passage and said liquid passage and being opened in succession by the initial upward movement of asid lower section and the upward movement of said upper section, respectively, said valves being closed in reverse order by the lowering movements of said sections; and means forming at least one normally-expanded contractible chamber in communication with said vent passage above said vent passage valve, said chamber being mounted at least in part on said lower section for contraction by the initial upward movement thereof in order to expel residual liquid in said vent passage into the container prior to the opening of said liquid passage valve, and for expansion by the final lowering movement of said lower section in order to withdraw liquid from said vent passage into said chamber.

7. The structure defined in claim 6 including a normally open valve controlling the communication between the chamber and the vent passage, said valve being closed during vertical movement of the upper section.

8. The structure defined in claim 6 in which the vent passage includes a vent tube depending from the lower section, the liquid passage includes a filling tube depending from the upper section concentrically within said vent tube, the vent passage valve includes a tip secured to the lower end of said filling tube and providing an enlarged annular surface on which the end of said vent tube normally seats, and including a discharge port in said filling tube above said annular valve surface.

9. The structure defined in claim 6 in which the contractible chamber comprises a bellows having one end thereof secured to the lower section and the other end adapted to be secured to the reservoir.

10. The structure defined in claim 6 in which the contractible chamber comprises a compound multi-chamber bellows having one end thereof secured to the lower section, an intermediate portion thereof secured to the upper section, and the other end thereof adapted to be secured to the reservoir, each of the chambers of said bellows normally being in communication with said vent passage.

11. The structure defined in claim 6 in which the upper section comprises a valve body slidably mounted in a reservoir downspout and having an annular valve surface thereon for seating engagement with a complementary seat about the downspout, and the liquid passage extends through said body and includes a lateral inlet port below said valve surface.

12. In a filling nozzle for container filling apparatus having a filling platform and a superposed liquid reservoir, at least one of which is vertically movable, the combination of an inner liquid tube, and an outer concentric vent tube mounted for relative vertical movement, the lower ends of said tubes being adapted for insertion into a container to be filled, a projection having an enlarged head depending from the lower end of said liquid tube, and a resilient element detachably mounted on said projection over said head and forming an annular valve surface normally closing the lower end of said vent tube, said liquid tube having a discharge port above said valve surface.

13. A filling nozzle for container filling apparatus having a filling platform and a superposed liquid reservoir, at least one of which is vertically movable, said nozzle being adapted to depend from the liquid reservoir and comprising: normally-extended vertically and relatively movable telescoping sections the lower of which is adapted to be engaged and raised, by a container to be filled, into lifting engagement with the next higher section; a vent tube depending from said lower section for insertion into the container and a filling tube depending from said next higher section into, and extending to a point adjacent the end of, said vent tube; a valve on the lower end of said filling tube for normally closing the lower end of said vent tube; valve means controlling said filling tube and opening upon upward movement of said next higher section; and resilient chamber means in communication with said vent tube above said valve, said chamber means being mounted at least in part on said lower section for contraction by the raising movement thereof in order to expel residual liquid from said vent tube prior to the opening of said filling tube valve means.

14. A nozzle for filling containers with liquid from a superposed reservoir comprising: a pair of vertically and relatively movable tubes, one for supplying liquid to the container and the other for venting the same; a valve on the liquid tube normally closing the lower end of the vent tube; means on said vent tube engageable by a container to be filled, relative advancing movement between the container and the nozzle being effective to raise said vent tube and open said valve; a valve controlling said liquid tube and opening upon upward movement thereof; means on said vent tube having lost motion lifting engagement with said liquid tube upon upward movement of said vent tube; and a contractible chamber in communication with said vent tube above said lower end theerof and mounted in part on said vent tube for contraction by its upward movement.

15. In a filling nozzle for container filling apparatus having a filling platform and a superposed liquid reservoir, at least one of which is vertically movable, the combination of a vertically movable depending liquid tube having a discharge port adjacent the lower end thereof; a vent tube movable vertically and relative to said liquid tube, said vent tube being concentrically disposed over said liquid tube and forming a vent passage therebetween; stop means on said liquid tube engageable by said vent tube to limit the upward movement of the latter relative to said liquid tube; an annular member on said vent tube for sealing engagement with the mouth of a container to be filled and for raising said vent tube thereby; a collar mounting said member and vertically adjustable on said vent tube for varying the filling height of the container; a bell-shaped member depending from said collar for guiding the mouth of the container over said vent and liquid tubes; and means mounting said bell-shaped member for vertical slidable movement on said collar.

16. A filling nozzle for apparatus for filling containers with liquid from a reservoir, said nozzle comprising: a downspout depending from the bottom of the reservoir and having an upwardly facing valve seat; a weighted valve body slidably mounted in said downspout for seating on said seat and having a vent passage extending vertically therethrough and a lateral port normally spaced below said seat; a vent pipe mounted on said body and extending upwardly from said vent passage above the level of the liquid in the reservoir; a filling tube in communication with said lateral port and depending from said valve body for insertion into a container to be filled, said tube having a discharge port adjacent the lower end thereof; a tip on the lower end of said tube presenting an enlarged upwardly facing annular surface below said discharge port; a sleeve member having telescoping engagement with the lower end of said valve body and surrounding said filling tube in spaced relation thereto, said sleeve having a lateral port normally positioned below said

valve body; a vent tube depending from said sleeve about and in spaced relation to said filling tube and normally seating on said annular surface of said tip, said sleeve and vent tube defining with said filling tube a vent passageway communicating with said valve body vent passage; a resilient annular bellows secured to and between said downspout and said sleeve and having the interior thereof in communication with said sleeve port; and an annular pad on said vent tube above the lower end thereof for sealing engagement with the mouth of the container.

17. The structure defined in claim 16 including engageable stops on said sleeve and said valve body to limit the amount of relative collapsing telescoping movement therebetween.

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