United States Patent [19]

Hartness et al.

[11] **3,856,059**

[45] **Dec. 24, 1974**

[54] **CONTAINER CENTERING DEVICE**

[76] Inventors: **Thomas P. Hartness,** 305 Bridgewater Dr.; **Robert G. Hartness,** 203 Wilmington Rd., both of Greenville, S.C. 29607; **Thomas S. Hartness,** 1101 86th St., Marathon, Fla. 33052

[22] Filed: **Mar. 7, 1973**

[21] Appl. No.: **338,990**

[52] **U.S. Cl.** **141/165**

[51] **Int. Cl.** **B65b 43/42**

[58] **Field of Search** 53/367; 141/62, 165, 166, 141/168, 171, 172, 177, 269, 311, 312, 369–374

[56] **References Cited**

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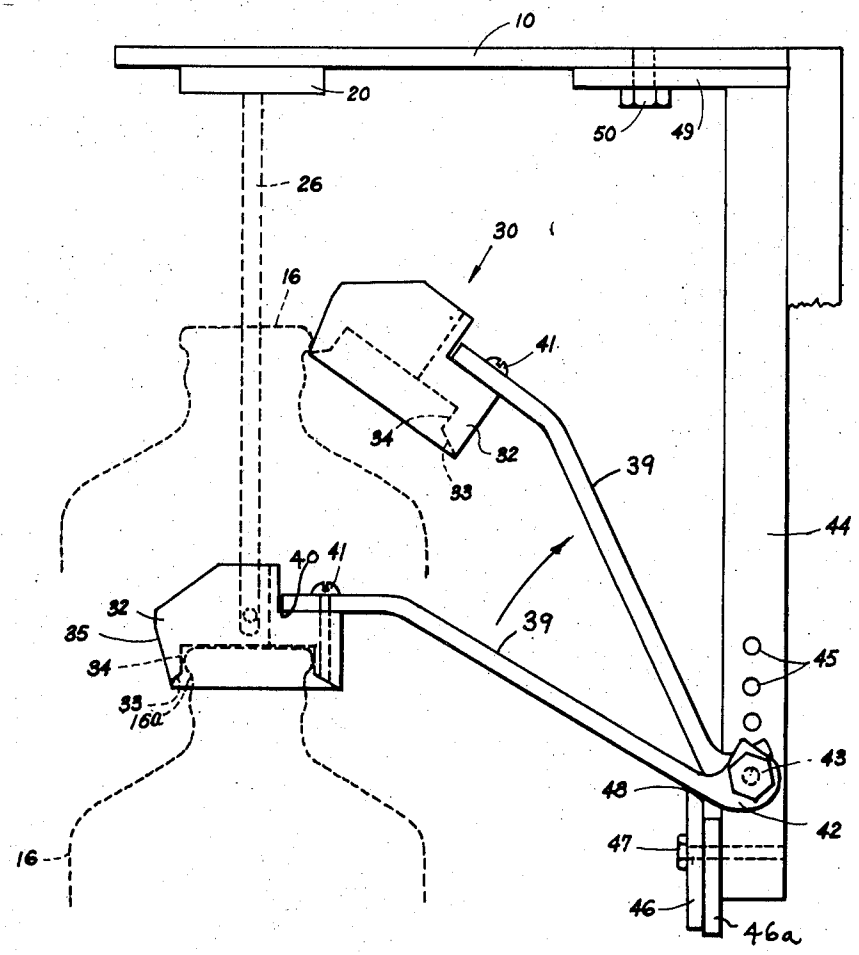
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Primary Examiner—Houston S. Bell, Jr.
Assistant Examiner—Frederick R. Schmidt
Attorney, Agent, or Firm—Bailey & Dority

[57] **ABSTRACT**

An apparatus for centering open top containers, such as bottles, relative to elongated tubes so that when the container is raised to filling position the tube will be properly aligned with the opening in the container. The apparatus includes a positioning member having surrounding walls adjacent a bottom portion defining a recess with an inner camming surface of said surrounding wall being inclined upwardly towards the center of the positioning member. The positioning member is supported on a pivotal arm which permits the positioning member to be retracted as the article is raised to the filling position. An elongated camming surface is provided closely adjacent the container loading and unloading stations for raising the positioning member in order that the containers may be loaded and unloaded from stirrups utilized in the filling operation. A resilient member is used for forcing the positioning member downward on the top of the container for insuring proper alignment therewith.

8 Claims, 7 Drawing Figures



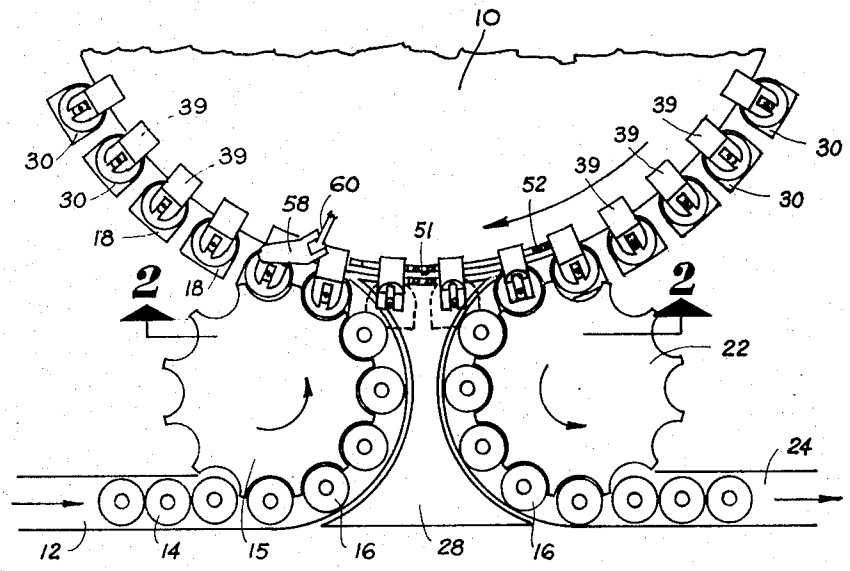

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Fig. 1.

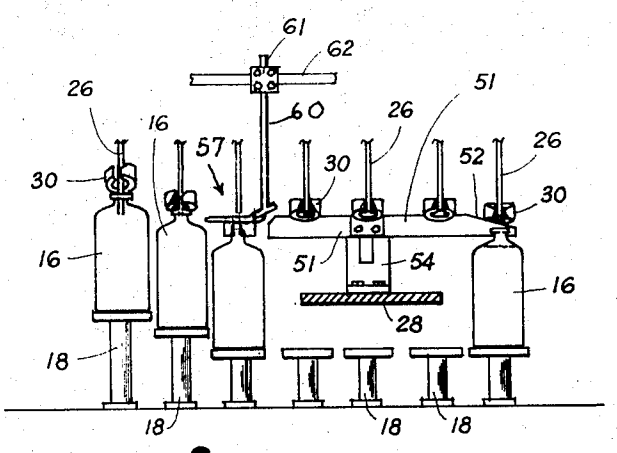

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Fig. 2.

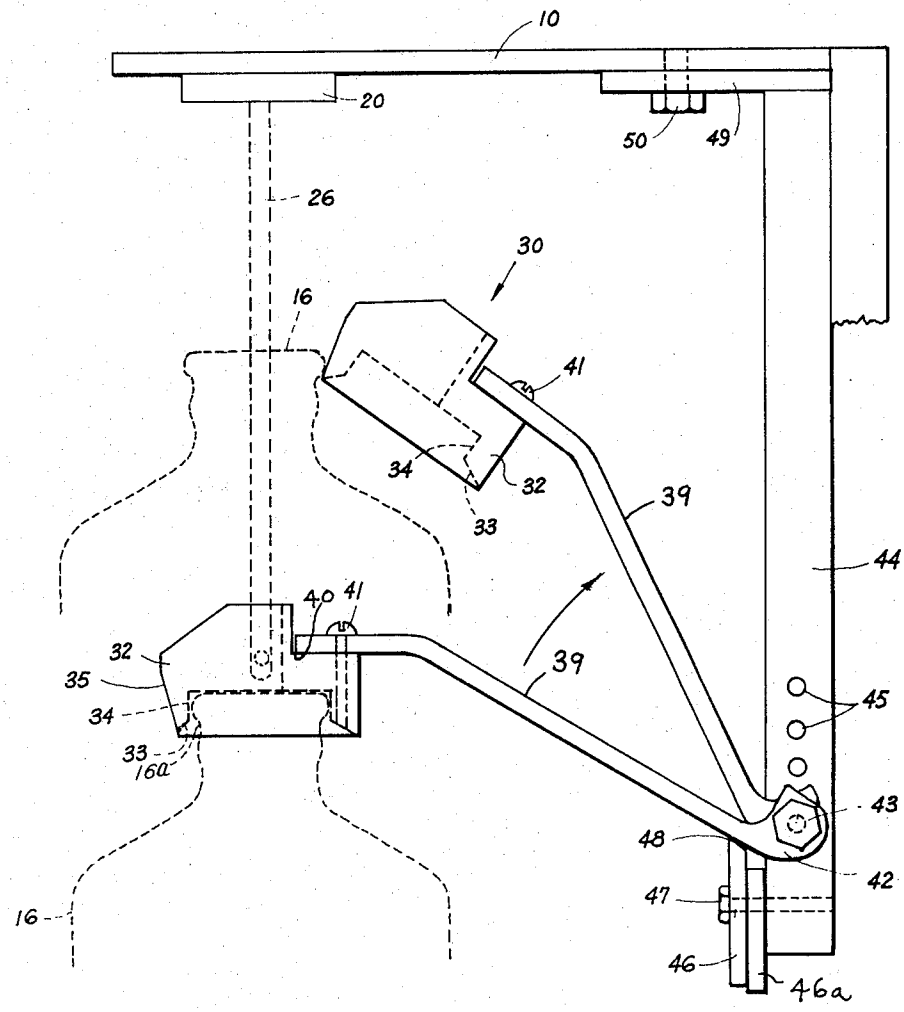

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Fig. 3.

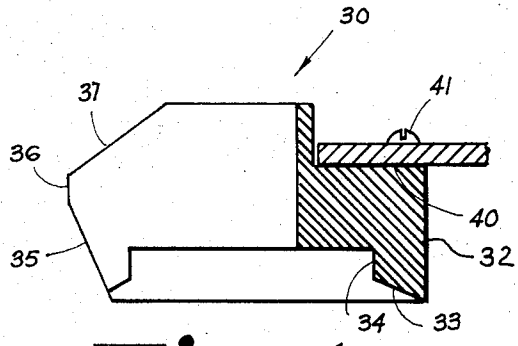

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Fig. 4.

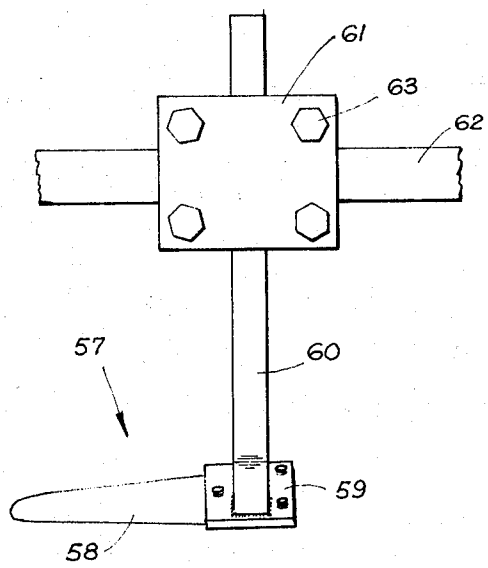


Fig. 5.

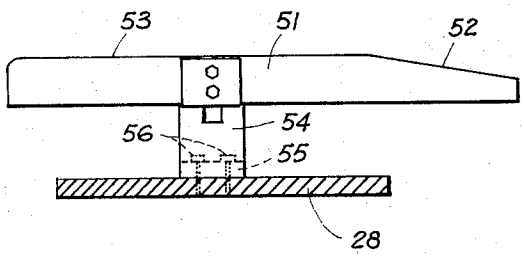


Fig. 6.

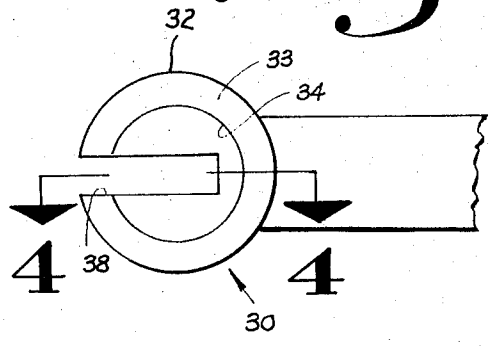


Fig. 7.

CONTAINER CENTERING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to an apparatus for centering open top containers, and more particularly to an apparatus for aligning the open top of a container with a tube provided on a liquid dispensing apparatus. The tube on most apparatus is used as a vent tube, however, on some apparatus it is used to fill the container with liquid.

When filling containers, such as narrow neck bottles, a tube which is connected to a filling valve is provided for entering the neck of the bottle. One of the problems encountered is that often the top of the bottle will not be aligned properly with the elongated tube. When the bottles are raised on stirrups to engage the filling valve, if the tube is not properly aligned it will strike the edge of the bottle, possibly damaging the bottle and the tube.

One attempt to eliminate this problem is disclosed in U.S. Pat. No. 3,580,299, which discloses a container filling device wherein, bottles are fed onto an annular platform which is adapted to rotate with the conventional filler bowl. As the platform is rotated a centering head is lowered down on top of the bottle for aiding in aligning the bottle. After the centering head has been placed on the bottle a tube is inserted therein for filling the bottle with liquid. While such apparatus may operate satisfactorily, the normal or conventional filling device is provided with stirrups rather than the annular platform which are raised as the filler bowl is rotated to insert a sniff tube into the throat of the bottle. Considerable modification of these apparatus would be necessary to incorporate the device shown in the Alkalay U.S. Pat. No. 3,580,299.

Another attempt for centering bottles relative to a sniff tube of a bottle filling machine is disclosed in U.S. Pat. No. 3,502,120 granted to Lars G. Rydstrom. This device includes a rotating disc similar to a star wheel which engages the upper neck portion of the bottle for positively positioning the upper portion of the bottle relative to the discharge tube.

SUMMARY OF THE INVENTION

The invention includes an apparatus for centering an open top container so that an elongated sniff tube of a liquid filling device can be inserted therein for filling the container with liquid. The liquid filling device may be any suitable conventional filling apparatus, such as presently being used for filling soft drink bottles having elongated necks. Normally, the liquid filling device includes a plurality of movable stirrups which support the bottles and are shifted vertically from a loading position to a filling position while being rotated in a circular path. The elongated sniff tubes are inserted in the bottles when the stirrups rais the bottles to a filling position. The apparatus forming the subject invention includes a plurality of positioning members having a surrounding wall adjacent a bottom portion defining a recess. An inner camming surface of the surrounding wall is inclined upwardly towards the center of the positioning member. Pivotal means support the positioning members above the containers so that the top of the containers engage the inclined camming surfaces of the positioning members as the container is shifted vertically to the filling position. When the top of a container engages the inclined camming surface such causes the container to be aligned with the sniff tube. A support member is provided for carrying the pivotal means adjacent the container for permitting the positioning member to be pivoted out of the path of the container as the container is shifted vertically beyond a predetermined point to the filling position. The positioning member has an elongated slot extending from an outer periphery adjacent the center thereof so as to permit the discharge tube to pass therethrough into the container. As the containers are raised to the filling position the slot permits the positioning members to be pivoted out of the path of the container.

Another elongated camming surface is carried between the stations where the containers are loaded and unloaded onto the stirrups. This elongated camming surface engages the pivotal means as the centering apparatus passes thereby for raising such so as to permit the containers to be inserted on and removed from the stirrups.

Accordingly, it is an important object of the present invention to provide an apparatus which aids in aligning containers relative to sniff tubes of a conventional filling apparatus.

Another important object of the present invention is to provide an apparatus for use on a liquid filling machine which positively positions the top portion of a container, such as a bottle, so that an elongated tube can be inserted therein.

Still another important object of the present invention is to provide an apparatus which can be readily mounted on conventional container filling devices for aligning the containers relative to the filling mechanism.

These and other objects and advantages of the invention will become more apparent upon reference to the following specification, attendant claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view, with parts removed for purposes of clarity, illustrating a portion of a conventional bottle filling apparatus modified in accordance with the subject invention,

FIG. 2 is an enlarged elevational view illustrating various positions of the bottle aligning device and the bottles while loading and unloading the bottles from the stirrups,

FIG. 3 is an enlarged side elevational view illustrating a container aligning device constructed in accordance with the present invention,

FIG. 4 is an enlarged side cross-sectional view taken along line 4—4 of FIG. 7,

FIG. 5 is an elevational view illustrating a resilient member used for applying pressure to the top of the container positioning member,

FIG. 6 is an enlarged elevational view of a camming surface used for raising and lowering the container positioning members for loading and unloading containers from the moving stirrups, and

FIG. 7 is a plan view taken from the bottom illustrating a positioning member constructed in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring in more detail to FIG. 1 of the drawings, there is illustrated a portion of a conventional bottle

filling device, such as used for filling soft drink bottles and the like. The device includes a cylindrical filler bowl **10** which is rotated in a clockwise direction during the filling operation. Bottles are fed to the liquid filling machine by means of a conveyor bed **12** which feeds the bottles **16** into a rotating star wheel **15.** The star wheel rotates in a counterclockwise direction delivering the bottles onto stirrups **18** which are rotated with the filler bowl **10.** The stirrups are capable of being shifted from a lower loading and unloading position to an upper position wherein the top or throat of the bottle engages a filling valve **20** forming part of the liquid filling device. The filling valve **20,** of course, is also rotated with the filler bowl. Another star wheel **22** which also rotates in a counterclockwise direction is positioned laterally of the input star wheel **15** for removing the bottles from the stirrups after they have been filled by liquid. The filled bottles **16** are then fed away from the liquid filling machine by means of a conveyor **24.**

The filler valve **20,** shown in more detail in FIG. **3** is circular in shape and is provided to be activated when the top of the bottle **16** comes in physical contact therewith. Centrally located relative to the filler valve **20** and extending downwardly therefrom is a vertical sniff tube **26.** When the top of the bottle **16** engages the filler valve **20** liquid is caused to flow through the sniff tube **26** to fill the bottle. The entire apparatus is suitably supported on a structure, not shown, with flat frame members **28** being interposed between the star wheels **15** and **22** with an inner end of the frame member **28** terminating closely adjacent the filler bowl. The structure described to this point in the detailed portion of the specification forms a part of the standard or conventional container filling device, such as is presently being used for filling soft drink bottles.

One of the problems encountered in filling containers, such as narrow neck bottles, is that when the stirrups raise the bottles to the filling position, if the neck of the bottle is not aligned properly with the sniff tube **26** the tube engages the bottle damaging the sniff tube **26** or possibly chipping the bottle. Heretofore, in order to minimize this problem U-shaped clamps have been carried on the filler bowl so that as the bottles are fed from the input star wheel **15** such are held in position by these U-shaped resilient clamp means. These clamp means, however, have not proven to be completely satisfactory.

In order to minimize the problem of aligning the bottles with the sniff tube **26** a positioning member, generally designated by the reference character **30,** is provided for engaging the top portion of the bottle as it moves vertically upwardly on the stirrups **18** to insure that the top of the bottle is in proper alignment with the sniff tube **26.** The positioning member **30** is constructed of any suitable material, such as nylon, and includes a surrounding wall **32** which has an inner circular camming surface **33,** which inclines upwardly towards the center of the positioning member **30.**

The inclined camming sufrace **33** terminates in a vertical surface **34** which is parallel to the center axis of the positioning member **30.** The inclined camming surface **33** with the vertical surface **34** define a circular recess which is slightly larger than the top of a bottle so that when the bottle is inserted therein, such directs the top of the bottle to the desired aligned position for receiving the sniff tube **26.** The positioning member **30** has a forward wall **35** which extends upwardly from the bottom of the side wall **32** at an angle of approximately **25** degrees from the vertical, then extends straight up as at **36** and rearwardly as at **37.** The purpose of the inclined surface **35** is to prevent the lip **16a** of the bottle from hanging up on the positioning member **30** when the bottle is lowered after filling. As can be seen in FIG. **7,** the overall configuration is substantially circular.

An elongated rectangular slot **38** extends from the outer edge of the positioning member **30** slightly beyond the center thereof. The sniff tube extends through this elongated slot **38** when being inserted into the bottle **16.** The elongated slot **38** also permits the positioning head **30** to be pivoted out of the path of the bottle, such as is shown in FIG. **3,** when the bottle is being raised to the filling position where the top is in engagement with the filler valve **20.**

A pivotal means **39** taking the form of an elongated arm is secured to a flat portion **40** of the positioning head by means of a screw **41.** The arm extends downwardly and has a bifurcated lower end **42.** The lower end **42** has a hole extending therethrough through which a pin **43** passes to pivotally secure the bifurcated end **42** to a support member **44.** The support member **44** has holes **45** vertically spaced therein so that the height of the pivotal connection of the arm **39** may be adjusted to accommodate different size bottles. A slotted insert **46** is bolted to the bottom portion of the support **44** by a bolt **47** and has an inclined upper surface **48** which engages the bottom of the arm **39** for limiting the downward pivotal movement of the positioning member **30.** Since the bolt **47** extends through a slotted portion of the insert **46,** the insert can be adjusted vertically so as to adjust the downward height that the pivotal means **39** is allowed to drop. A retaining band **46***a* extends around the filler bowl **10** and is bolted by bolt **47** to the support member **44** for adding strength thereto. The support member **44** has an outwardly extending flange **49** welded to the top thereof, through which a bolt **50** passes for securing the support **44** to the filler bowl **10.**

In order to insure that the positioning members **30** are raised high enough not to interfere with the loading and unloading of the bottles **16** from the stirrups **18** an elongated camming means **51** is carried between the loading and unloading star wheels **15** and **22.** The elongated camming surface **51,** which is best seen in FIGS. **1, 2** and **6,** is circular, and has a radius substantially equal to the radius of the filler tank **10.** Adjacent a leading end is an inclined surface **52** which engages the pivotal arms **39** causing the positioning member **30** to be raised as it reaches the unloading star wheel **22.** The cammming surface **52** terminates in a horizontal portion **53** which holds the positioning head in the slightly raised position, such as shown in FIG. **2,** until after the particular positioning head **30** is rotated beyond the position where the in-feed star wheel **15** places another bottle **16** on the stirrup **18.** The camming member **51** is supported on a vertical bracket **54** which has a horizontal flange **55** adjacent the bottom thereof. Bolts **56** extend through the horizontal flange for attaching the bracket **54** to the horizontal frame portion **28.**

In order to insure that the positioning member **30** is pushed tightly down on the top of a bottle as the bottle **16** is loaded on the stirrups **18** from the infeed star wheel **15** a spring bias member, generally designated by the reference character **57** engages the top of the posi-

tioning member **30** forcing such down onto the top of the bottle.

The spring bias member **57** includes an elongated tongue-shaped spring steel member **58** which is bolted to a support bracket **59.** The support bracket **59** is welded to a vertical square-shaped bar member **60.** The bar member **60** is sandwiched between a pair of plates **61** (FIG. **5**) which are carried on opposite sides of the conventional sniff ring **62.** The sniff ring **62** extends circumferentially around the filler bowl **10.** By loosening the bolts **63** extending through the plates **61** the height of the member **60** can be adjusted for varying the pressure applied by the spring member **58** on the top of the positioning members **30** and for accommodating different size bottles.

Summarizing the operation of the device, bottles or any other suitable containers are fed by an infeed star wheel **15** onto the sitrrups **18** while in a lower loading position. After the bottles **16** are placed on the stirrups the positioning member **30** drops down over the top of the bottle and the spring member **58** forces the positioning member **30** downwardly over the top. The inclined camming surface **33** of the positioning member **30** directs the top of the bottle to the center of the positioning member **30.** Thus, if the bottle is slightly out of alignment, it causes the bottle to shift into proper alignment.

The stirrups **18** are then raised vertically towards a filling position, wherein, the sniff tube **26** passes through the elongated slot **38** in the positioning head **30.** As the bottle **16** is raised further such causes the positioning head to be pivoted rearwardly. The bottle **16** is then shifted up until it comes in contact with the filling valve **20** which causes the liquid to be inserted into the bottle while the sniff tube **26** vents the bottle.

While the filler tank **18** and the bottles are rotated the liquid is placed in the bottles. After the bottles are filled with liquid the stirrups **18** are lowered and the positioning members **30** drop by gravity. When the filled bottles **16** reach adjacent the discharge star wheel **22** the pivotal arms **39** engage the inclined surface **52** of a camming member **51** raising the positioning head off of the bottles **16.** Star wheel **22** then removes the filled bottles from the stirrups **18** and feeds such out on a conveyor **24.**

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. An apparatus for centering an open top container so that an elongated tube of a liquid filling device can be inserted therein when filling said container with liquid, said liquid filling device including a movable stirrup which supports said container and is capable of being shifted vertically from a loading position to a filling position wherein said elongated tube is inserted in said container, said apparatus comprising: a positioning member having a surrounding wall adjacent a bottom portion defining a recess, an inner camming surface of said surrounding wall being inclined upwardly towards the center of said positioning member, pivotal means supporting said positioning member above said container so that the top of said container engages said inclined inner surface of said positioning member for aligning said top of said container with said tube, and a cam means for engaging said positioning member for forcing said positioning member down on top of said container for insuring proper alignment of said container, whereby said positioning member aligns said container with said tube and is then retracted out of the path of said vertical movement of said container so as to not interfere with filling of said container.

2. The apparatus as set forth in claim **1** wherein said cam means is a spring biased member.

3. The apparatus as set forth in claim **1** wherein said cam means includes an elongated tongue shaped spring steel member which engages a top portion of said positioning member.

4. An apparatus for use on a bottle filling machine for aiding in positioning narrow neck bottles in alignment with elongated tubes forming part of a liquid filling apparatus as said bottles are shifted in a circular path on stirrups, said bottles being fed onto said stirrups at a loading station, filled with liquid as they are shifted in said circular path and then removed from said stirrups when said stirrups reach an unloading station, after said bottles are loaded on said stirrups, said stirrups are raised vertically from a loading position to a liquid filling position wherein said tubes are inserted in said narrow neck bottles, said apparatus comprising: positioning members having a recess in the bottom thereof defined by an inclined wall terminating in a vertical wall of a diameter greater than the diameter of the tops of said bottles being filled, pivotal means supporting said positioning members above said bottles in alignment with said tubes so that when said bottles are raised vertically on said stirrups the tops of said bottles engage said inclined walls of said positioning members which direct the top into the portions of the recesses defined by said vertical walls insuring proper alignment with said tubes, and slots extending laterally from the outer periphery of said positioning members to adjacent the center thereof for allowing said elongated tubes to extend into said bottles, and a support carrying said pivotal means adjacent said bottles for permitting said positioning member to be pivoted out of the path of said bottles as said bottles are shifted vertically beyond a predetermined point, whereby said positioning members aid in aligning said bottles with said tubes and are then retracted out of the path of said bottles so as not to interfere with filling said bottles.

5. The apparatus as set forth in calim **4,** wherein said positioning member has an outer wall on an opposite side from said support which is inclined outwardly and upwardly from the bottom thereof so as to prevent the tops of said bottles from hanging on said support means after filling.

6. The apparatus as set forth in claim **4,** further comprising: resilient means carried adjacent said loading station engaging said positioning members for forcing said positioning members down on top of said bottles for insuring proper alignment of said bottles.

7. The apparatus as set forth in claim **6,** wherein said resilient means includes an elongated tongue shaped spring steel member which engages a top portion of said positioning members as they pass thereunder.

8. The apparatus as set forth in claim **7** wherein said positioning member has an inclined upper surface which said tongue shaped spring steel member engages when aligning said bottles.

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