

[54] **ROTARY FILLING MACHINE**

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[51] Int. Cl. **B65g 47/00**

[58] Field of Search. 198/25, 204, 136,
198/212

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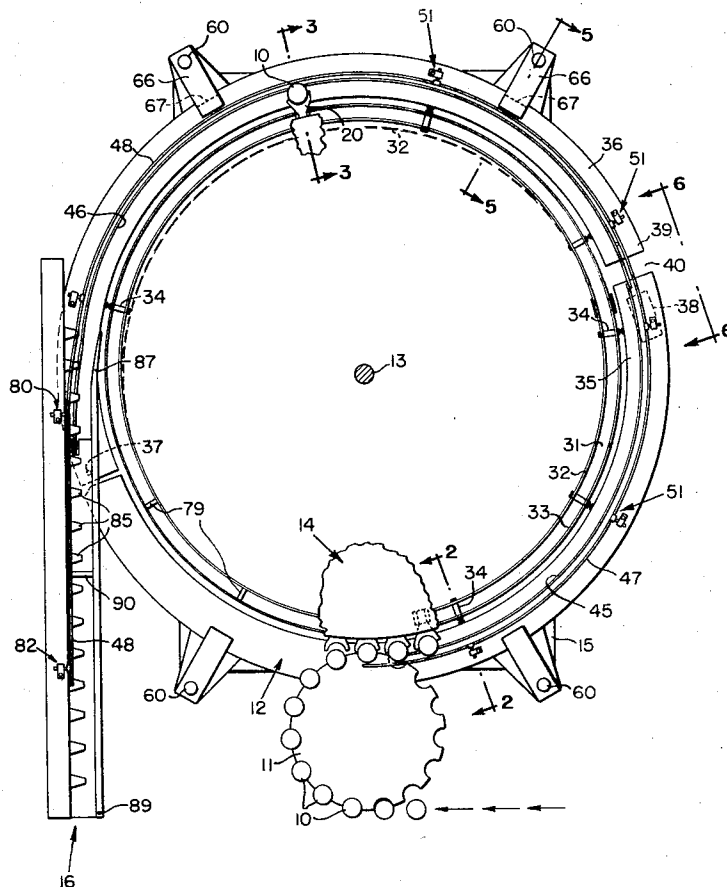
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ABSTRACT

Containers being filled with flowable material are held beneath filling assemblies on a rotating filling wheel by chucks and guide rails. Two chucks, one positioned above the other, are attached to the filling wheel by pivoted levers at each filling station. A cam follower connected to one of the chucks rides in a cam track defined by two strips which extend around the filler. These cam strips and some of the guide rails are attached to two ring segments. One of the segments is fixed in place and the other is pivoted at one end. When the free end of the pivoted ring segment is moved away from the fixed segment, the portion of the cam track attached to the pivoted ring segment, one bottom guide rail and one outer guide rail are moved away from the axis of rotation of the filling wheel; and the containers passing above this segment are gradually tilted. The containers are untilted as they move off the filling wheel onto a discharge conveyor by the guide rails and by a discharge guide. The discharge guide is connected to one of the movable guide rails so that it moves with it.

15 Claims, 12 Drawing Figures



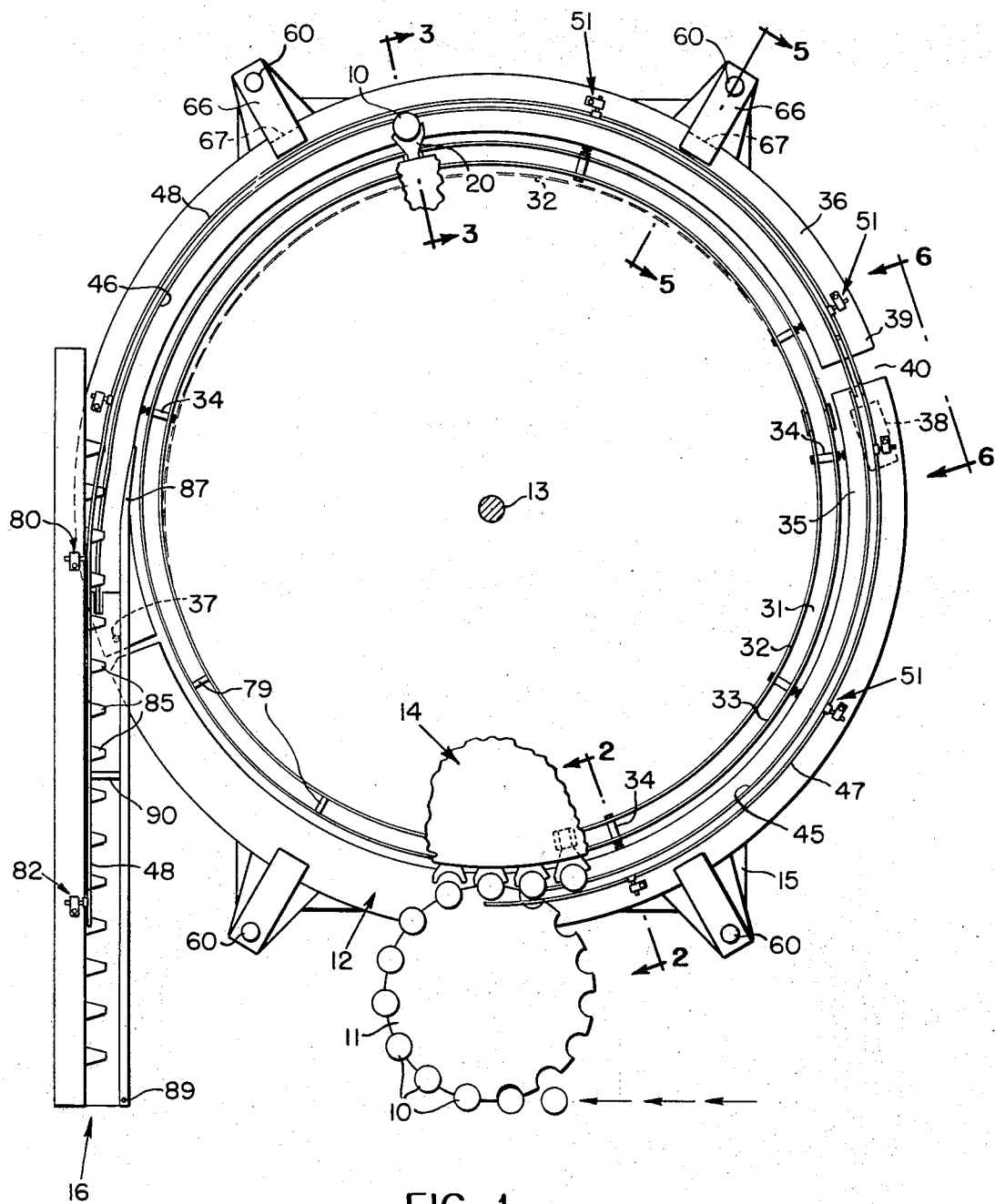


FIG. 1

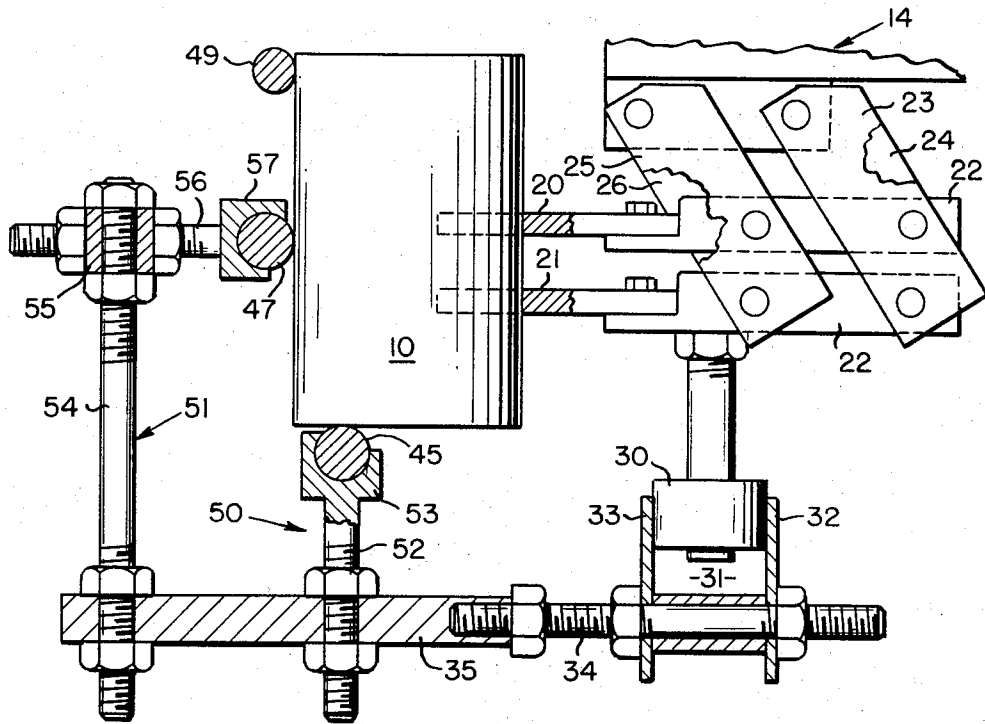


FIG. 2

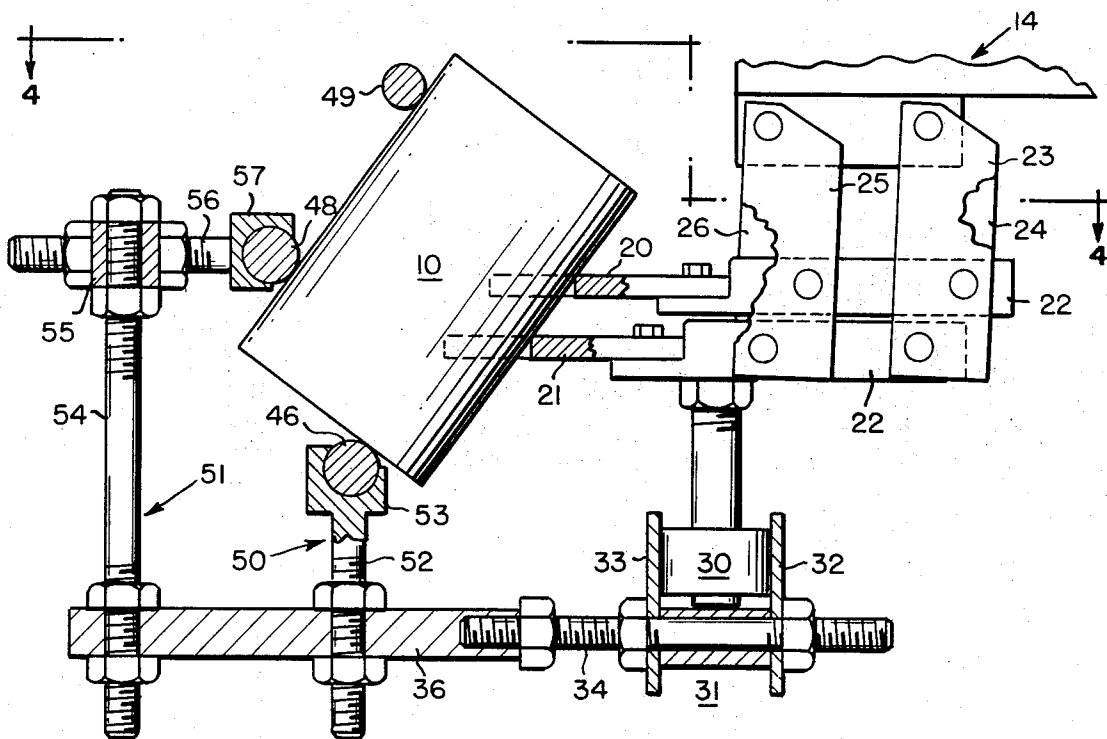
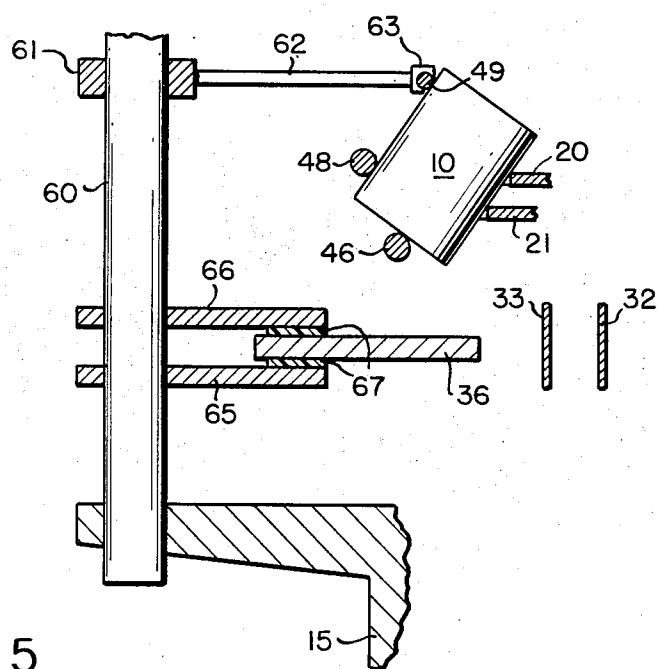
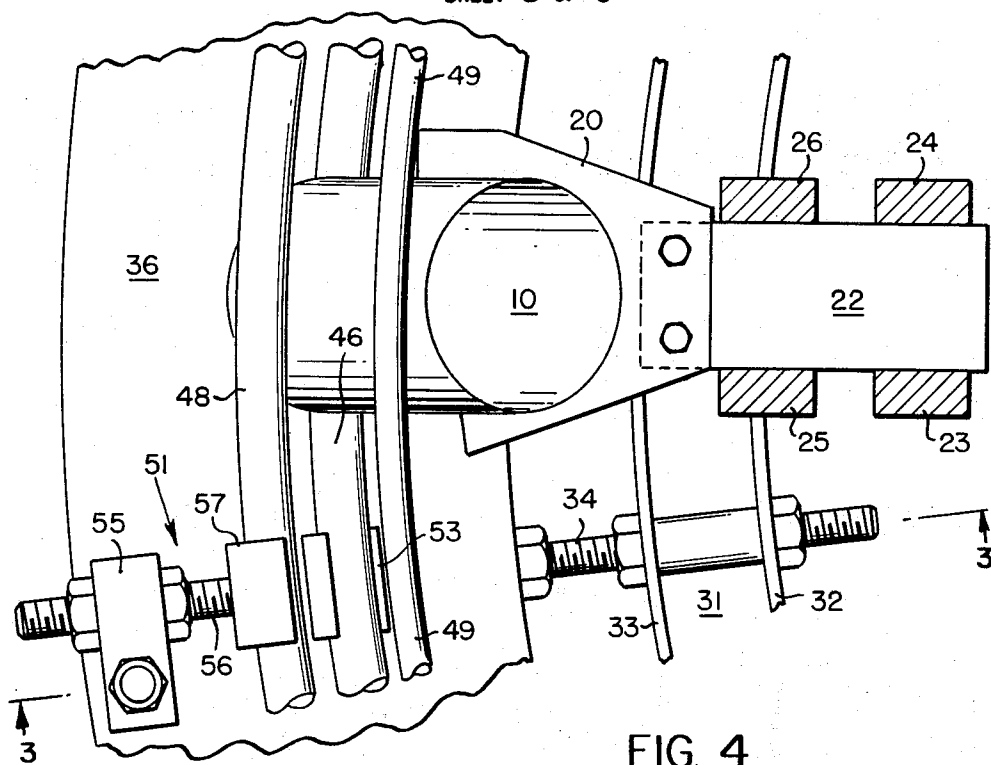
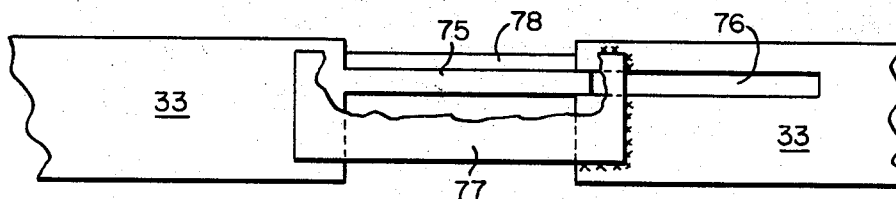
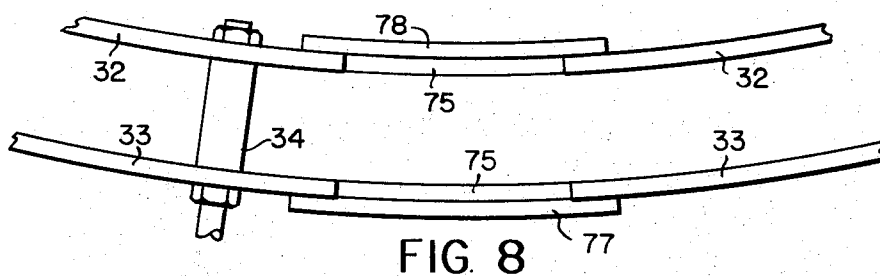
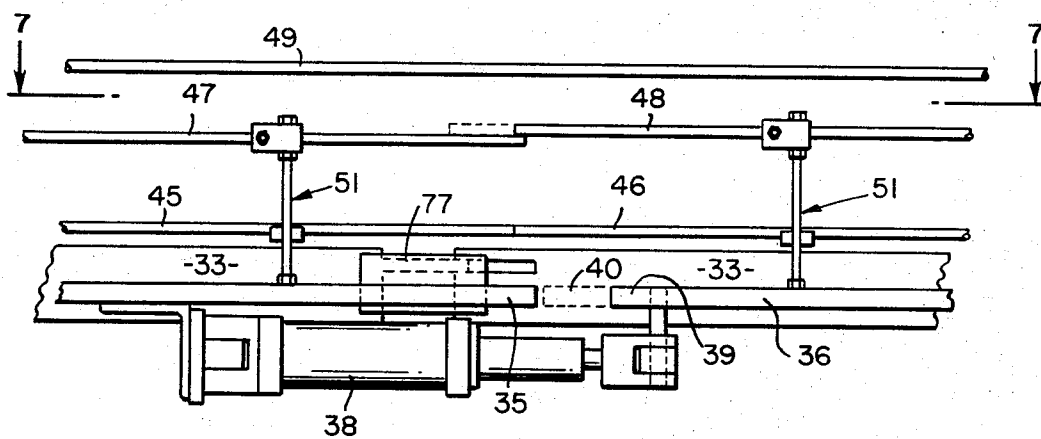
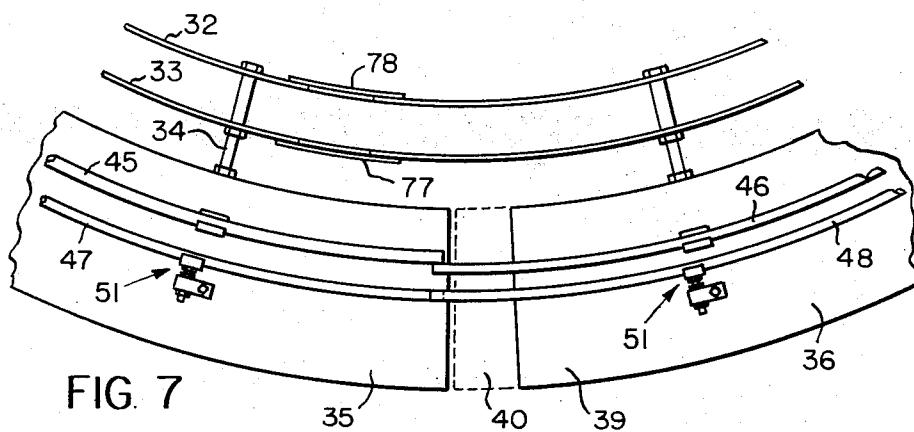
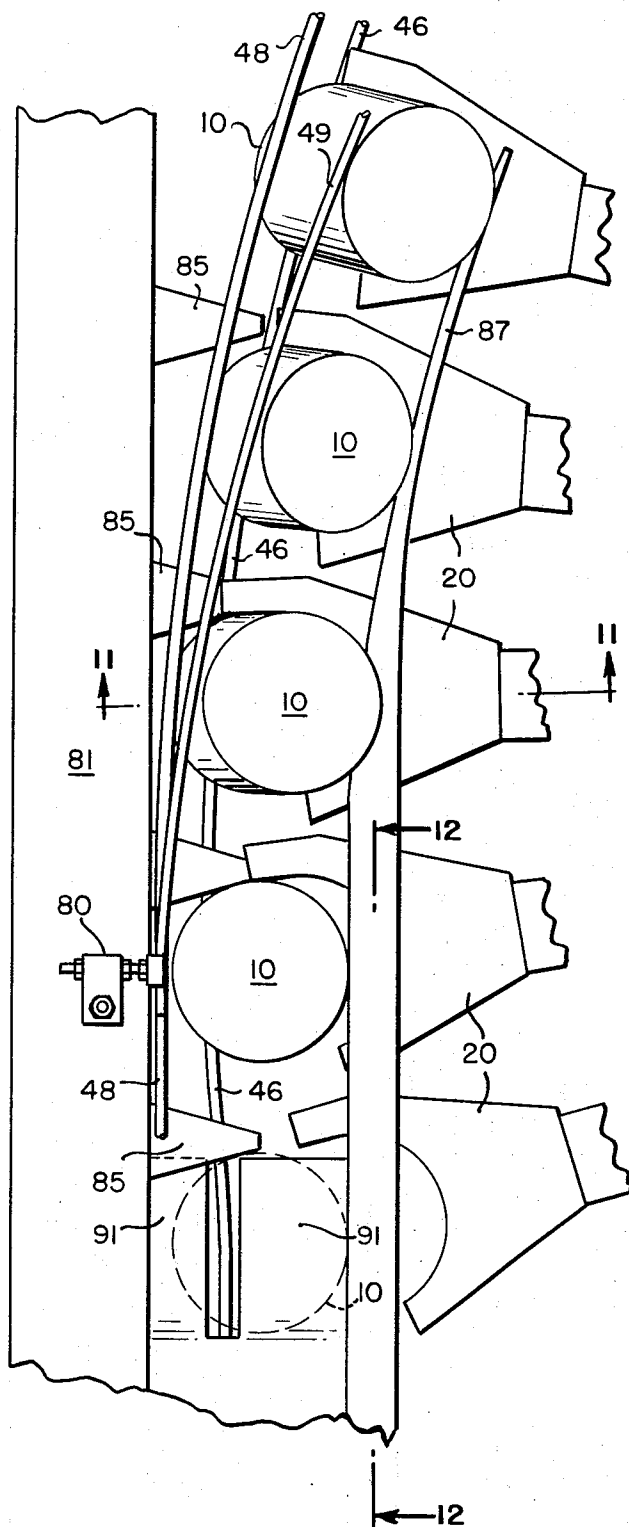


FIG. 3

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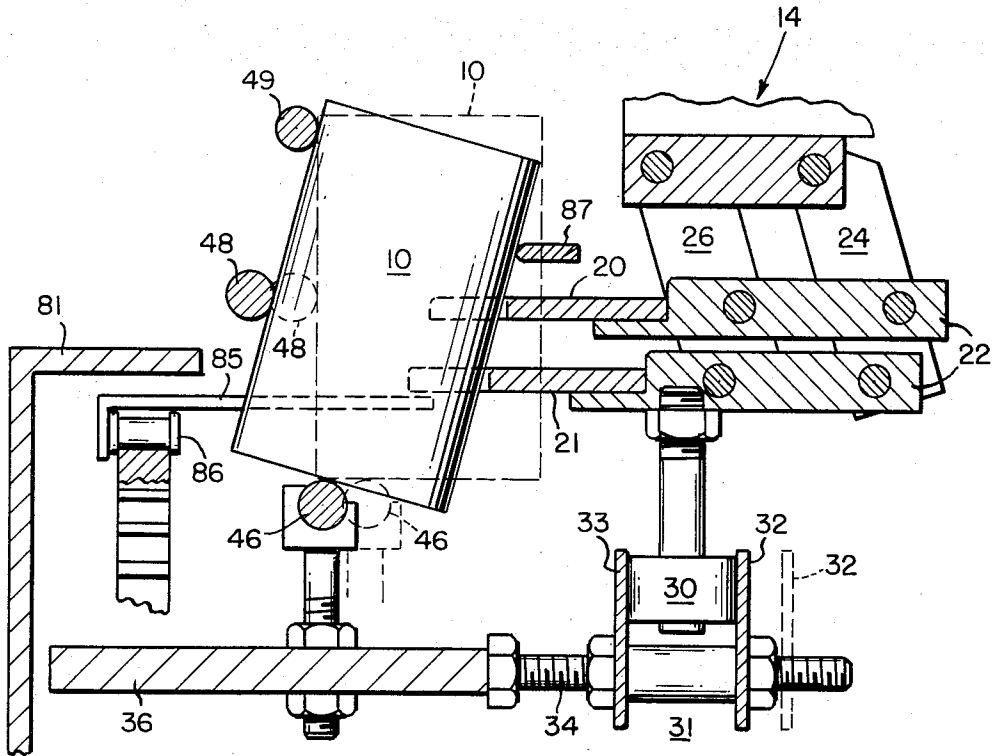


FIG. 11

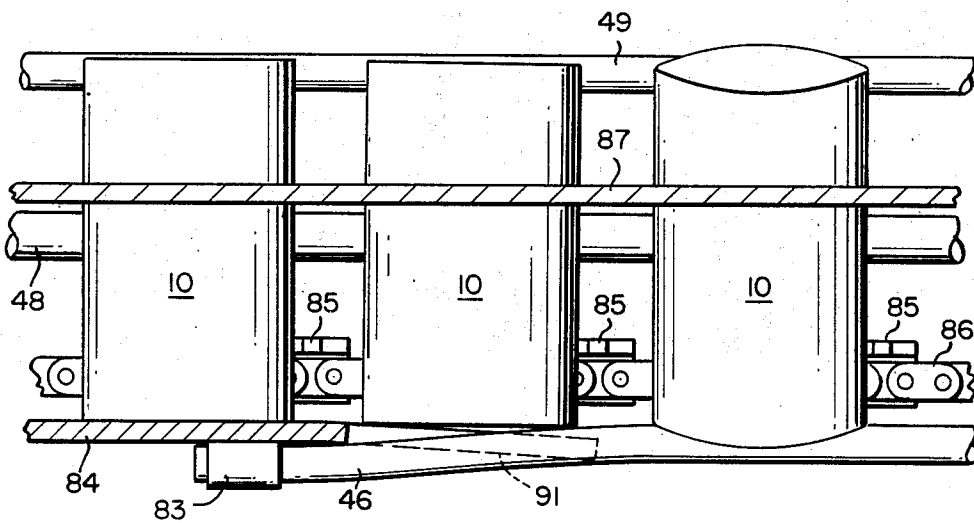


FIG. 12

ROTARY FILLING MACHINE

BACKGROUND OF THE INVENTION

This invention relates to a rotary machine for filling containers with flowable material and more particularly to means for holding and tilting the containers passing through the machine.

Rotary filling machines are used for filling containers such as cans, bottles, cartons and the like with a wide variety of flowable materials such as juices, oils, soups, tomato pastes, baby foods, apple sauce and many others which run the gamut from thin, free-flowing liquids to material such as pulpy vegetable products with just sufficient liquid to render them sluggishly flowable. These machines usually have a rotary filling wheel with a number of filling assemblies spaced about its periphery. The containers are held in place beneath the filling assemblies by chucks that rotate with the filling wheel and by stationary guide rails and/or support plates that hold the containers in the chucks and guide them around the machine.

Modern rotary filling machines operate at a relatively high rate of speed. Thus, significant centrifugal forces are exerted on the material in the containers. Under certain conditions, these forces will throw low viscosity fluids out of the fuller containers unless the containers are tilted. Rotary filling machines have been provided with guide rails and support plates arranged to tilt the containers. However, prior art tilting devices have not provided any means for straightening the tilted containers up when the machine was stopped. As a result, when the machine was stopped low viscosity fluids would spill out of the inside of the tilted containers. Furthermore, prior art devices have not provided any means for adjusting the tilt of the containers for different operating speeds or the like.

SUMMARY OF THE INVENTION

It is an object of this invention to provide improved means for holding and tilting containers passing through a rotary filling machine in order to prevent spillage from the containers. The invention provides a machine having a rotating filling wheel with a pair of chucks, positioned one above the other and attached to the filling wheel by at least one pivoted lever, at each filling station. A cam follower attached to one of the chucks moves in a cam track that extends around the machine. A portion of the cam track can be positioned further away from the axis of the filling wheel than the rest of the track, and as the cam follower moves along this portion of the track the chucks tilt the container they are holding.

Another object of this invention is to provide means for straightening the containers when the machine stops. This is accomplished by providing means to move the above mentioned portion of the cam track toward the axis of rotation of the filling wheel in order to give the track a substantially circular configuration. This brings all the containers passing through the machine to a substantially vertical position.

A further object of this invention is to provide means for automatically tilting and untilting the cans with a one point adjustment. This is accomplished by attaching the movable portion of the cam track to a semi-circular ring segment which is pivoted at one end and providing means for moving the other end of the ring segment.

A further object is to provide means for automatically varying the degree of tilt of containers passing through the machine for different machine speeds. This is accomplished by making the movement of the end of the ring segment proportional to the rotary speed of the filling wheel.

A still further object is to provide an improved means for straightening the tilted containers as they move off the machine onto a discharge conveyor. An outer guide rail that restrains the containers as they move around the machine extends along the discharge conveyor to a pivot point. This guide rail moves to adjust for different degrees of tilt of the containers. The outer guide rail and a discharge guide, which extends along the discharge conveyor to a second pivot point located further along the discharge conveyor, define a channel through which the containers move onto the discharge conveyor. The discharge guide and the outer guide rail are connected by a bridge member located between the point where the discharge guide picks up the containers and the point about which the outer guide rail pivots. As a result, when the outer guide rail moves, the discharge guide is moved a lesser amount. Thus, these members automatically compensate for the tilting and untilting of the containers on the machine. The relative movement of these members can be adjusted quite easily, by varying the location of one or both pivot points or the location of the bridge member, to suit a variety of containers and operating conditions.

Other objects and advantages of this invention will be apparent from the following description.

DRAWINGS

FIG. 1 is a plan view of one embodiment of this invention.

FIG. 2 and 3 are cross-sectional views, taken along lines 2—2 and 3—3 of FIG. 1, showing the positions of containers at two spots on the machine shown in FIG. 1.

FIG. 4 is a fragmentary plan view of the fill station illustrated in FIG. 3.

FIG. 5 is a cross-sectional view taken along lines 5—5 of FIG. 1, showing the means for supporting some of the components of this embodiment.

FIG. 6 is an elevation view showing the means for adjusting the degree of tilt of containers passing through the machine.

FIG. 7 is a fragmentary plan view taken along lines 7—7 of FIG. 6.

FIG. 8 is a detailed plan view showing the overlapping ends of the strips that define the cam track.

FIG. 9 is an elevation view of the elements shown in FIG. 8.

FIG. 10 is a plan view showing the containers moving off the machine onto the discharge conveyor.

FIGS. 11 and 12 are cross-sectional views taken along lines 11—11 and 12—12 of FIG. 10.

DETAILED DESCRIPTION

Referring to FIG. 1, incoming containers 10 are fed by a star wheel 11 (such as those shown in U.S. Pat. No. 2,666,564 to E. S. Minard and our copending application, Ser. No. 216,588, filed Jan. 10, 1972) to a rotary filler, generally referred to as 12. The filler has a rotary filling wheel 14 mounted for rotation about a central shaft 13 supported by a base 15 and driven by means such as those shown in the Minard patent. A plurality

of filling assemblies (not shown) are spaced about the periphery of filling wheel 14. As each incoming container is positioned beneath a filling assembly, a valve in the filling assembly is opened and the container is filled as it is carried around the machine by the filling wheel to a discharge conveyor, generally referred to as 16.

Referring now to FIGS. 2-4, the containers are held beneath the filling assemblies by upper chucks 20 and lower chucks 21, positioned one above the other beneath the filling assemblies. The chucks are bolted to chuck supports 22 which are attached to the filling wheel 14 by pivoted levers 23, 24, 25, 26. Two of these levers 23, 24 (one on each side of the chuck supports) are closer to the axis of rotation of the filling wheel than the other two levers 25, 26 are. This arrangement holds the upper and lower chucks generally parallel to each other and allows them to move towards and away from the axis of rotation of the filling wheel. The reason for this will be made apparent below.

The chuck support to which the bottom chuck is attached also carries a cam follower 30 which rides in a cam track 31, defined by two cam strips 32, 33, extending around the filler 12. The cam strips 32, 33 are attached by studs 34 to two semi-circular ring segments 35, 36, best seen in FIG. 1, which are attached to the base 15 of the filler.

One of the ring segments 35 is immovably fixed to the base. However, the other ring segment 36 pivots about a post 37 (located near the point where the containers move off the filling wheel 14 onto the discharge conveyor 16) mounted in a plate bolted to the end of immovable ring segment 35.

A hydraulic or pneumatic cylinder 38, best seen in FIG. 6, connects the free end 39 of the pivoted ring segment 36 to the immovable ring segment 35. The cylinder 38 is adapted to move the free end 39 of the pivoted ring segment away from the immovable ring segment 35 and provide a gap 40 between them, or (as is shown in phantom in FIGS. 1, 6 and 7) to move the free end 39 back towards the immovable ring segment 35 to close the gap.

When the gap is closed, all portions of the cam strips 32, 33 are the same distance from the axis of rotation of the filling wheel 14. Thus, the cam track 31 has a substantially circular configuration. However, when the gap is opened the portions of the cam strips 32, 33 attached to the pivoted ring segment 36 are moved further away from the axis of rotation of the filling wheel 14. This radial displacement is minimal at both ends of the pivoted ring segment and at a maximum near its center. (In FIG. 1 the position of the inner cam strip 32 when the gap is closed is shown in phantom to illustrate this radial displacement).

The effects of this radial displacement of the cam track can be seen by comparing FIG. 2, which is a cross-sectional elevation view through the fixed ring segment 35, and FIG. 3, which is a cross-sectional elevation taken through the pivoted ring segment 36 in the region of maximum radial displacement of the cam track. In FIG. 3, the cam track has moved the cam follower 30 attached to the bottom chuck support further away from the axis of rotation of the filling wheel, thereby pivoting the levers 23, 24, 25, 26 which attach the chuck supports to the filling wheel. As the levers pivot, the top chuck 20, which is closer to the axes about which the levers pivot than the bottom chuck 21

is, moves less. Thus, as the chucks move from the position shown in FIG. 2 to the position shown in FIG. 3, the containers 10 are tilted.

The containers remain in the vertical position shown in FIG. 2 until they pass the gap 40 between the immovable and pivoted ring segments. At this point the containers will be partially full, but they will not be full enough to require tilting to prevent spillage. After the containers pass the gap they are gradually tilted, due to the increasing radial displacement of the cam track, into the position shown in FIG. 3. At about this point, the containers are filled completely and the filling valves are closed.

Bottom guide rails 45, 46, which are positioned beneath the containers 10 and support the containers as they move around the filler, and outer guide rails 47, 48, 49, positioned outside the path of travel of the containers, cooperate with the chucks in holding and tilting the containers. One of the bottom guide rails 45 and one of the outer guide rails 47, both of which extend from the point where the containers are picked up from the star wheel 11 to the gap 40 between the ring segments, are attached to the immovable ring segment 35. The other bottom guide rail 46 and one of the other outer guide rails 48, which is positioned at approximately the same height as outer guide rail 47, are attached to the pivoted ring segment 36. These guide rails 46, 48, extend from the gap 40 around the filler and for a short distance along the discharge conveyor. Since these guide rails are attached to the pivoted ring segment, they move with the cam track and cooperate with the chucks in tilting the containers.

The remaining outer guide rail 49, which extends from the container pick up point all the way around the filler to the discharge conveyor, is secured to the base 15 of the filler. This guide rail is stationary and, as may be seen in FIG. 3, the chucks and the movable guide rails pivot the containers about this stationary rail 49.

Referring to FIGS. 2, 3 and 4, the bottom guide rails 45, 46 and outer guide rails 47 and 48 are attached to the ring segments 35, 36 by a plurality of holders 50, 51 spaced around the filler. The bottom guide rail holders 50 consist of threaded rods 52 secured to the ring segments and short bars 53 attached to the end of the rods 52. The bars 53 have openings through which the bottom guide rails 45, 46 are threaded. As may be seen in FIGS. 2 and 3, the bars 53 are cut away so that the containers can slide along the rails without hitting the bars.

The holders 51 for outer guide rails 47, 48 have vertical rods 54 mounted to the ring segments. Short blocks 55 are mounted on top of the vertical rods 54 and horizontal rods 56 extend through the blocks 55. These horizontal rods 56 carry bars 57, which are similar to the bars 53 of the bottom guide rail holders. Outer guide rails 47 and 48 are threaded through the openings in these bars 57.

The mounting means for the stationary outer guide rail 49 can be seen in FIGS. 1 and 5. Four vertical posts 60 are attached to the base 15 of the filler. Clamps 61 are attached to these posts and rods 62 extending from the clamps carry cut away bars 63 which support the stationary outer guide rail 49.

The vertical posts 60 also carry the two semi-circular ring segments 35 and 36. As shown in FIG. 5, the pivoted ring segment 36 is supported by brackets 65, 66 attached to the vertical post 60 and bearing pads 67,

attached to the brackets, which allow ring segment 36 to pivot in the horizontal plane while maintaining its vertical position. The mounting for the immovable ring segment 35 is similar except that the top brackets 66 and the bearing pads 67 are omitted and the ring segment 35 is bolted to the bottom support brackets 65.

The foregoing arrangement provides a simple, one-point adjustment for varying the degree of tilt of the containers on the machine to suit a variety of conditions. Preferably, the means for supplying fluid to the hydraulic or pneumatic cylinder 38, which opens and closes the gap 40 between the free end 39 of the pivoted ring segment and the immovable ring segment 35, is adapted to open the gap when the filling wheel 14 starts to rotate and to close it when it stops. As a result, when the wheel stops the cam track becomes substantially circular and all of the containers on the machine are brought to the vertical position. This prevents material from spilling out of the tilted containers. When the wheel starts to rotate again the gap 40 is reopened and the containers above the pivoted ring segment 36 are tilted once again.

If the filler is used at a variety of speeds means may be provided for varying the movement of the free end 39 of the pivoted ring segment to suit the different conditions. For example, one or both ends of the hydraulic or pneumatic cylinder 38 may be mounted on an adjustable support that limits the maximum stroke of the cylinder's piston. Alternatively, if a variable speed electric drive is used to run the filler, it may be preferable to use a stepping motor to open and close the gap. The one point adjustment system of this invention makes it possible to use these, or a variety of other systems, to provide the flexibility needed to cope with a wide variety of filling speeds and other changes in operating conditions.

FIGS. 6-9 illustrate the overlapping of the various guide rails and cam strips at the gap 40 between the two ring segments. Referring to FIG. 6 and 7, the bottom guide rails 45 and 46 are mounted at substantially the same height, with the end of guide rail 45 laterally displaced to clear the end of guide rail 46. Similarly, outer guide rails 47 and 48 are mounted at substantially the same distance from the central axis of the filling wheel with the end of guide rail 47 vertically displaced to clear the end of guide rail 48. Since the containers moving past guide rails 45 and 47 (which are attached to the immovable ring segment 35) are always vertical, the placement of these guide rails need not be exact. However, since guide rails 46 and 48 cooperate in the tilting of the containers, the position of these rails must be controlled rather closely. Thus, it is preferable to displace the ends of rails 45 and 47 to clear rails 48 and 49 rather than vice versa.

As may best be seen in FIGS. 8 and 9, the mating ends of the strips 32, 33 that define the cam track meet at tongue and groove joints. There are tongues 75 on the ends of the strips which are attached to the immovable ring segment and mating grooves 76 on the ends attached to the pivoted ring segment. Plates 77, 78 welded to the grooved ends of the cam strips 32 and 33 (on the outside of the cam track) reinforce the tongues 75 and hold them in the grooves 76.

Referring now to FIG. 1, the cam strips 32 and 33 are connected to the two ring segments 35 and 36 by studs 34 spaced around the portion of the filler normally occupied by containers. The portion of the cam track be-

tween the point where the containers move off the filling wheel onto the discharge conveyor and the point where containers are picked up from the star wheel is not connected to the fixed ring segment. This provides enough flexibility to absorb the movement at the pivoted end of ring segment 36. The portions of the cam strips 32 and 33 between the discharge and pickup points are separated by spacers 79 which maintain the proper width of the cam track.

As the containers move off the filling wheel 14 onto the discharge conveyor 16, they must be straightened up again. The means for doing this are illustrated in FIGS. 1, 10, 11 and 12. Guide rails 46, 48 and 49 extend along the discharge conveyor and are connected to it. The stationary outer guide rail 49 (which has been omitted in FIG. 1 for clarity) extends to a holder 80, which is similar to the outer guide rail holders 51 that secure outer guide rails 47 and 48 to ring segments 35 and 36. The holder 80 for the stationary outer guide rail is mounted on the conveyor cover 81 in the area where the containers are brought back to the vertical position.

The movable outer guide rail 48 extends further along the discharge conveyor (see FIG. 1) to a similar holder 82, also mounted on the conveyor cover. The opening in this holder is slightly larger than the openings in the cutaway bars of holders 50 and 51. Thus, this holder prevents lateral movement of the end of guide rail 48, but permits the guide rail to move longitudinally when ring segment 36 is pivoted.

The movable bottom guide rail 46, like the stationary outer guide rail 49, extends along the discharge conveyor 16 to the area where the containers are brought back to a vertical position. As best seen in FIG. 12, bottom guide rail 46 extends through a guide 83 mounted beneath the main platform 84 of the discharge conveyor. Like the holder 82 for the movable outer guide rail 48, guide 83 permits the end of the bottom guide rail 46 to move longitudinally when the pivoted ring segment 36 moves.

All of the guide rails 45 to 49 are preferably made of molybdenum disulfide. This gives the movable guide rails 46 and 48 the flexibility they need in the area of the discharge conveyor and provides a smooth, low friction surface that minimizes wear on the containers and minimizes the danger of scratching or breaking fragile containers such as glass bottles.

The containers moving out of the chucks 20 and 21 on the filling wheel 14 are picked up by fingers 85, attached to an endless chain 86, that carry the containers along the discharge conveyor. The containers are guided out of the chucks by the guide rails and by a discharge guide 87 positioned inside the path of the containers. The guide rails and the discharge guide define a channel through which the containers move off the filling wheel 14 onto the discharge conveyor 16. This channel has a gradually decreasing curvature, and as the channel straightens out the containers are brought back to the vertical position by the guide rails and the discharge guide. As is best seen in FIG. 11, the discharge guide 87 is positioned above the movable outer guide rail 48 but below the stationary outer guide rail 49. This provides three point contact with the sides of the containers and insures that the containers will be straightened up surely and positively.

As is shown in phantom in FIG. 11, when ring segment 36 is pivoted to close the gap between it and ring

segment 35 outer guide rail 48 moves laterally (or radially), the containers moving between this guide rail and the discharge guide are straightened up, and the discharge guide 87 must move laterally with outer guide rail 48 to compensate for the movement of the containers. However, due to their relative locations, the discharge guide does not need to move as much as outer guide rail 48. The proper relative movement is provided by selectively positioning the points about which these members pivot.

Referring again to FIG. 1, the end of the movable outer guide rail 48 is prevented from moving laterally by the holder 82. Thus, in effect, rail 48 pivots about this holder when ring segment 36 pivots. The discharge guide pivots about a post 89 which is located further along the discharge conveyor than holder 82. The discharge guide 87 and the movable outer guide rail 48 are connected to each other by a rigid bridge member 90. Due to the different locations of the pivot points, when the outer guide rail 48 moves laterally, the discharge guide is pivoted by a lesser amount. The relative movement may be easily adjusted by moving one or both pivot points and/or the bridge member. Thus, this system may be adjusted to a variety of sizes and types of containers quite simply.

Referring again to FIGS. 10 and 12, after the containers are moving in a straight line and there is no further need to tilt them, they move off the movable bottom guide rail 46 along two ramps 91, which straddle guide rail 46, onto the main platform 84 of the discharge conveyor along which they are carried by the fingers 85 and endless chain 86.

OPERATION

To recapitulate, the containers 10 are held and tilted by the chucks 20, 21 and guide rails 45, 46, 47, 48 and 49. One of the bottom guide rails 46 and one of the outer guide rails 48 are attached to pivoted ring segment 36; as are the strips 32, 33 that define cam track 31.

When the filler is started, the free end 39 of pivoted ring segment 36 is moved away from the fixed ring segment 35. Thus, a portion of cam track 31 and the movable guide rails 46 and 48 are moved away from the axis of rotation of filling wheel 14; and the containers moving above the pivoted ring segment are gradually tilted. When the machine stops the hydraulic or pneumatic cylinder 38 that connects the two ring segments closes the gap 40 between them. This brings the cam track back to a substantially circular configuration and all the containers on the machine are brought to a substantially vertical position.

This one point adjustment system not only provides a simple reliable method for tilting the containers passing through the machine; but also makes it relatively easy to adjust the degree of tilt of the containers for a variety of operating conditions, such as different speeds of the filling wheel.

Since the radial displacement of the pivoted ring segment 36 (and of the cam track and movable guide rails) varies along this ring segment, the containers moving above it are gradually tilted into the position shown in FIG. 3. At about this point, the containers are filled completely and the filling valves are closed.

As the full containers move off the rotating filling wheel 14 onto discharge conveyor 16 they are gradually straightened up by guide rails 46, 48 and 49 and

discharge guide 87. The discharge guide, which is on the opposite side of the containers from outer guide rails 48 and 49, is mounted above the movable outer guide rail 48 but below the stationary outer guide rail 49. This provides three point contact with the sides of the containers and insures that the containers will be straightened up surely and positively.

The discharge guide 87 is connected to the movable outer guide rail 48 by a bridge member 90. Thus, when the machine is stopped and the outer guide rail 48 moves in towards the center of the machine, discharge guide 87 moves along with it. The relative movement of these two members depends upon the placement of the holder 82 about which guide rail 48 pivots and the post 89 about which the discharge guide pivots. Thus, the untilting system may be easily adjusted to suit a variety of sizes and types of containers.

The apparatus described above is but one example of many possible embodiments of this invention. The description of this apparatus is merely illustrative and is not intended to limit the scope of this invention, which is defined by the appended claims.

We claim:

1. In a high speed, rotary machine for filling containers with flowable material, an improved means for holding and tilting containers passing through the machine comprising:

- a. a rotating filling wheel;
- b. a pair of spaced chucks, one positioned directly above the other, attached to the filling wheel by at least one pivoted lever;
- c. a bottom guide rail positioned beneath the containers and supporting the containers as they move through the filling machine;
- d. an outer guide rail positioned outside the path of travel of the containers, whereby the containers are held between the chuck and the outer guide rail;
- e. a cam track extending around the machine;
- f. means for positioning a portion of the cam track further away from the axis of the filling wheel than the rest of the track; and
- g. a cam follower attached to one of said chucks and moving in said cam track, whereby as the cam follower moves along the portion of the cam track that is further away from the axis of the filling wheel the chucks and guide rails tilt a container held therein.

2. Container holding and tilting means according to claim 1 wherein the pair of chucks are attached to the rotating filling wheel by at least two pivoted levers, one of said levers being closer to the axis of rotation of the filling wheel than the other lever.

3. Container holding and tilting means according to claim 1 further comprising means to move said portion of the cam track towards the axis of rotation of the filling wheel to give the track a substantially circular configuration, whereby all of the containers passing through the machine are brought to a substantially vertical position.

4. Container holding and tilting means according to claim 3 wherein the means for moving said portion of the cam track comprises;

- a. a semi-circular ring segment to which the cam track is attached, said ring segment being pivoted at one end; and
- b. means for moving the other end of said ring segment.

5. Container holding and tilting means according to claim 4 including means for moving the end of the ring segment by an amount proportional to the rotary speed of the rotating filling wheel.

6. Container holding and tilting means according to claim 3 including means for adjustably moving the outer guide rail with the cam track.

7. Container holding and tilting means according to claim 6 further comprising:

- a. a discharge guide, said discharge guide and said movable outer guide rail defining a channel along which the containers move off the filling wheel onto a generally linear path;
- b. a first pivot point located along said path, said movable outer guide rail extending to said pivot point;
- c. a second pivot point located further along said path than said first pivot point, said discharge guide extending to said second pivot point; and
- d. a bridge member connecting the outer guide rail to the discharge guide at a location ahead of said first pivot point, whereby as the outer guide rail moves the discharge guide is moved by a lesser amount.

8. Container holding and tilting means according to claim 3 including means for adjustably moving the bottom guide rail with the cam track.

9. Container holding and tilting means according to claim 1 further comprising a base to which the rotating filling wheel is attached, said outer guide rail being secured to the base, whereby the chucks tilt the containers about the guide rail.

10. In a high speed, rotary machine for filling containers with flowable material, an improved means for holding and tilting containers passing through the machine comprising:

- a. a base;
- b. a filling wheel rotatably attached to the base;
- c. a pair of spaced chucks one positioned directly above the other, attached to the rotary filling wheel by at least two pivoted levers, one of said levers being closer to the axis of rotation of the filling wheel than the other lever;
- d. a pair of semi-circular ring segments, one of said ring segments being immovably secured to said base, and the other ring segment having one end that pivots about a point adjacent to one end of said immovable ring segment, whereby the other end of said pivoted ring segment can move toward and away from the other end of the immovable ring segment;
- e. a pair of strips attached to the immovable ring segment and to the pivoted ring segment with the ends of the strips overlapping at the movable end of the pivoted ring segment, said strips defining a cam

track that has a generally circular configuration when the movable end of the pivoted ring segment is positioned near the end of the immovable ring segment;

f. a cam follower attached to one of the chucks and riding in the cam track; and

g. means for moving the movable end of the pivoted ring segment away from the immovable ring segment, whereby a portion of the cam track is moved further away from the axis of rotation of the rotating filler wheel and the chucks tilt a container held therein as the cam follower moves along this portion of the cam track.

11. Container holding and tilting means according to claim 10 further comprising a bottom guide rail positioned beneath the containers moving through the machine and an outer guide rail positioned outside the path of travel of said containers, said guide rails being attached to said pivoted ring segment and moveable with said cam track, whereby the guide rails cooperate with the chucks in tilting the containers.

12. Container holding and tilting means according to claim 11 wherein;

- a. the movable outer guide rail extends from the machine to a first pivot point located along a discharge conveyor that carries the containers away from the filling machine in a generally linear path;
- b. a discharge guide extends along the discharge conveyor to a second pivot point located further along the conveyor than the first pivot point, said discharge guide and said outer guide rail defining a channel along which containers move onto the discharge conveyor; and
- c. a bridge member connects the outer guide rail to the discharge guide at a location intermediate the point where the discharge guide picks up the containers and said first pivot point, whereby as the outer guide rail moves, the discharge guide is moved by a lesser amount.

13. Container holding and tilting means according to claim 11 further comprising a stationary guide rail secured to said base and positioned outside the path of travel of the containers, whereby the chucks and the movable guide rails tilt the container about the stationary guide rail.

14. Container holding and tilting means according to claim 10 including means for adjusting the movement of the pivoted ring segment for different rotary speeds of said rotating filler wheel.

15. Container holding and tilting means according to claim 10 wherein the means for moving the movable end of the pivoted ring segment comprises a pneumatic or a hydraulic cylinder.

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