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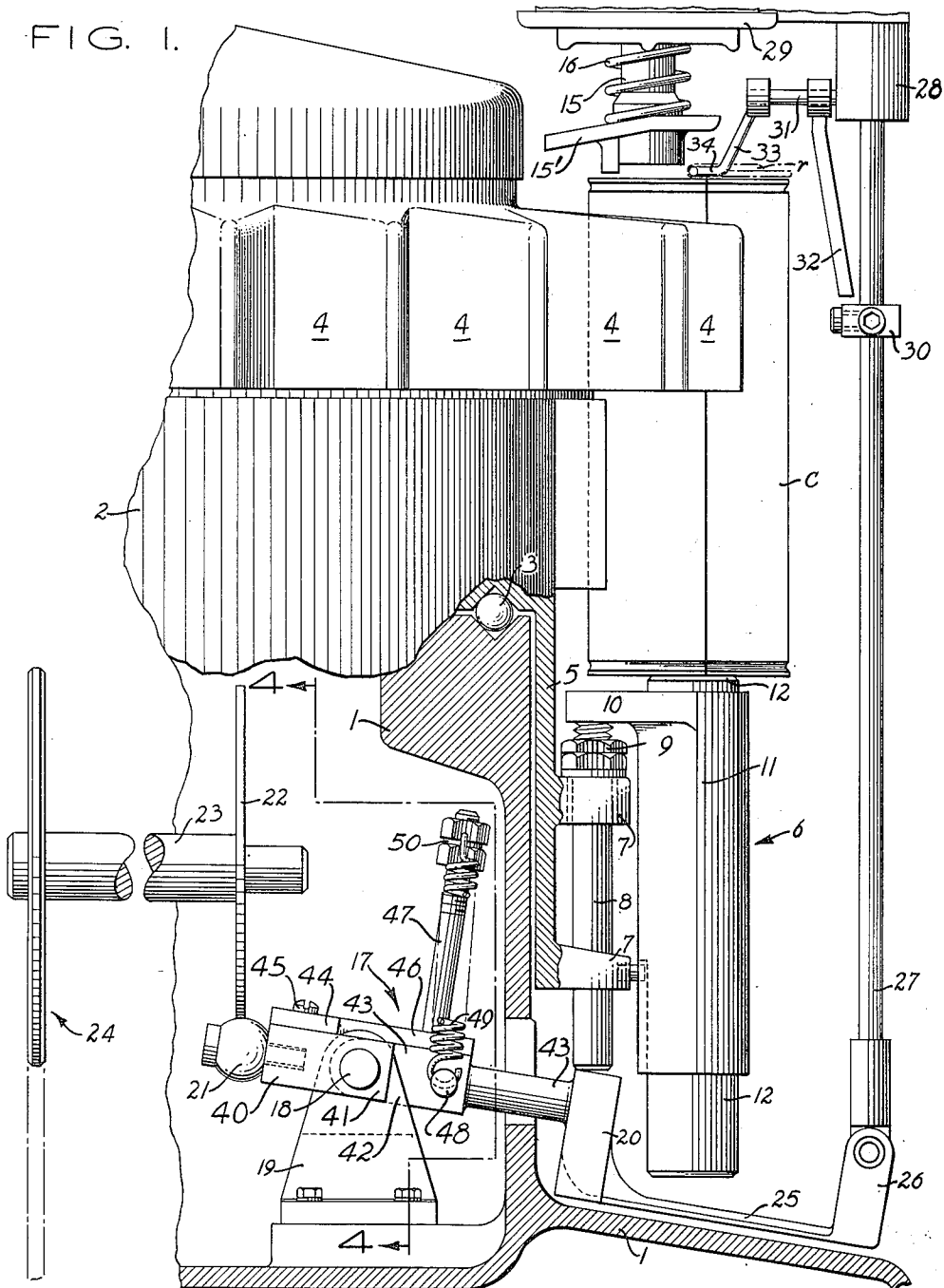
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DETECTOR MECHANISM FOR BOTTLE FILLING MACHINE

Filed Nov. 26, 1954

2 Sheets-Sheet 1

FIG. 1.



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FIG. 2.

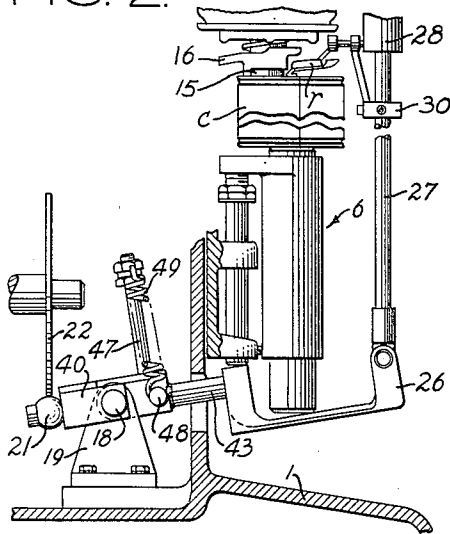


FIG. 3.

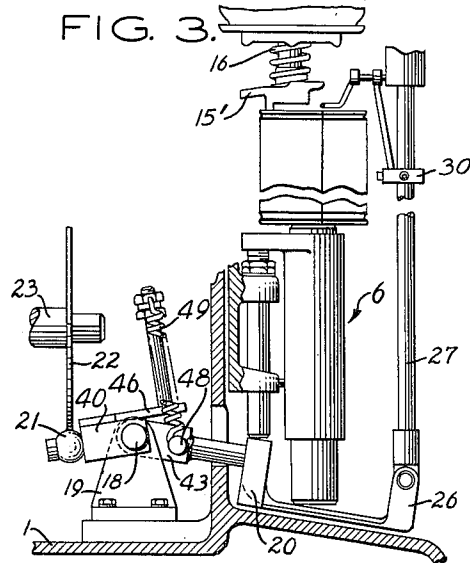


FIG. 4.

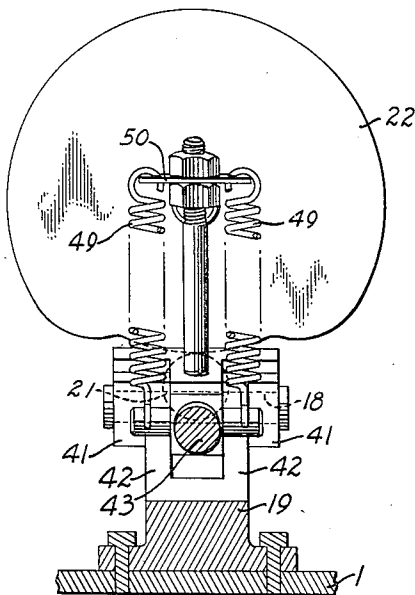
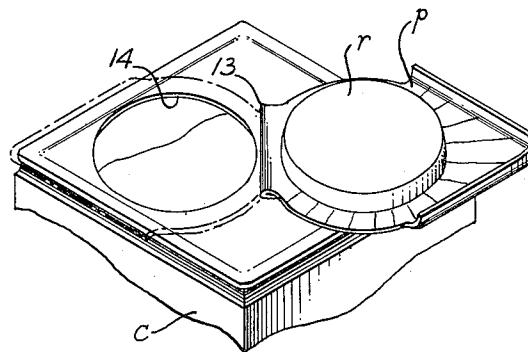


FIG. 5.



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DETECTOR MECHANISM FOR BOTTLE FILLING MACHINE

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5 Claims. (Cl. 226—96)

This invention relates to a paper container or cardboard bottle filling machine and in particular to an elevating means and detector mechanism associated therewith in a machine of the type in which a bottle support on a revolving turret-operated machine is adapted for vertical reciprocation in order to present the bottle to a filler spout for the filling operation.

One object of the invention is to provide in a bottle filling machine of this type simplified means for detecting the absence of a bottle and/or an improperly opened bottle and for preventing the elevation of the bottle support under such circumstances.

The invention will be described in connection with a revolving turret-type machine for handling cardboard containers or bottles which have a recessed type of closure plug fixed on the container top wall and hinged for swinging to a sealing position in the bottle opening. Specific objects and advantages of the invention will appear from the following disclosure.

In the drawings,

Fig. 1 is a side elevation of the detector mechanism on a revolving turret-type filling machine with the casing of the latter cut away to show the elevating means;

Fig. 2 is a view with parts cut away and similar to Fig. 1 on a reduced scale showing the parts in bottle-filling elevated position;

Fig. 3 is a view similar to Fig. 2 showing the parts latched by the detector mechanism to prevent the elevation of a bottle support and bottle to bottle filling position;

Fig. 4 is a sectional view on line 4—4 of Fig. 1; and

Fig. 5 is a view in perspective of a bottle top showing the hinged closure plug.

Referring to the drawings, Fig. 1 shows a turret base frame member 1 with a turret frame 2 supported thereon as on roller bearings as shown at 3 for revolving the turret on the base. On the periphery of the turret at the upper portion thereof are a series of angularly arranged bottle receiving wall members 4 between which a cardboard carton may be disposed during its passage around the turret frame. The turret is also provided with a lower skirt portion 5 on which is arranged a series of elevator platform mechanisms, such as generally designated by the numeral 6. Platform mechanisms 6 include a pair of vertically spaced support bearing lugs 7 in the bearings of which a slidable stem 8 is carried. Above the upper bearing 7 the stem 8 is threaded, nuts 9 being mounted thereon for vertical adjustment. Stem 8 carries at its upper end an overhang 10 of a platform support element 11. The bottom of a carton c is adapted to be seated on an adjustable post 12 vertically positioned in member 11.

The turret 2 is adapted to be intermittently advanced to successively present a series of cartons c at stations annularly disposed about the periphery of the turret for the various operations of loading the platform, opening the carton, filling the carton, closing, and sealing and capping the same and for unloading the carton from the turret. The mechanism herein illustrated constitutes lifting and

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detector mechanism as positioned adjacent the filling station for the purpose of lifting or detecting and preventing the lifting of an unopened or improperly opened closure flap on the bottle as it is presented to the filling mechanism. In Fig. 5 the top of a milk bottle or carton is shown with the closure plug p hinged at 13 adjacent the inner side of the opening 14 of the bottle top wall. The plug p is formed with a recessed portion as at r and is adapted to swing from the full line position of Fig. 5 to the dotted line position shown therein so that the recess may be sealed within the edges of the opening 14. Prior to being presented at the filling station at which station a filling spout 15 (Fig. 2) is adapted to be extended within the opening 14 for the filling operation it will be appreciated that the plug p is folded back against the top wall of the carton in the full line position of Fig. 5. Thus the plug will cause no interference with the insertion of the filling spout 15 in the bottle opening 14 as the bottle is raised. The mechanism as disclosed herein is adapted to prevent the raising of the bottle for such insertion in the event the plug p is not folded back properly. If the plug is properly positioned the container will be lifted vertically and the valve lever 15' pushed upwardly against its spring 16 on the valve spout. The filling operation takes place in the raised condition of the carton.

In the drawings Fig. 1 represents the non-filling position of the bottle elevator mechanism; Fig. 2 represents the filling position thereof; and Fig. 3 represents the relative position of the parts of the elevating means with the detector mechanism in latched position, wherein the operation of the lifter mechanism is rendered inactive.

As best shown by Fig. 1, the lifter means includes a lever mechanism generally indicated by numeral 17 with the lever pivoted as at 18 on a frame bracket mounting 19 intermediate the ends of the lever. The pivot 18 is positioned inwardly of the vertical wall of frame support 1 at one side of the vertically reciprocable bottle support 6 at the bottle filling station. The lever extends through the sidewall of the frame 1 and at its outer end is formed with a lifter portion 20 for engagement against the lifting stem 8 and carriage of the same upwardly. Portion 20 thus elevates the bottle support from non-bottle filling to its bottle filling position. Inwardly of the pivot 18 at the inner end of the lever a cam roller 21 is carried for engagement by a cam wheel 22 fixed on a drive shaft 23 suitably driven by a motor (not shown) through the chain and sprocket connection indicated at 24. The cam 22, as best shown by Fig. 4, is formed to hold the inner end of the lever 17 depressed for the greater period of one revolution of the cam and thus serve to hold the elevated position of platform 6 during the filling operation.

At the outer end of lever 17 is an underslung extension 25 with an upwardly turned end 26 pivotally linked to a vertically disposed detector rod 27. The rod 27 extends from the link 26 to a guide support 28 suitably fixed to the bottom end of the filling chamber housing indicated at 29 and from which the filling spout 15 depends. The rod 27 is freely slidable in the block 28 and carries in lower spaced relation thereto a latch arm stop 30 adjustably fixed on rod 27. Pivotaly carried in block 28 and at right angles to the rod 27 is a rotatable latch pin 31 extending in the direction of the spout 15. On pin 31 adjacent block 28 is fixed a depending latch arm 32 adapted to freely hang with its tip upwardly adjacent stop collar 30 of rod 27. In this position the arm 32 prevents upward movement of rod 27. Also fixed on pin 31 at the end thereof is a bent detector finger or feeler 33. The finger 33 is angularly set with relation to the arm 32 and is adapted to hang freely with its outer bent end 34 in the path of a recessed plug of a carton when the plug, as in Fig. 5, is folded back away from the opening 14. Thus, when a carton is brought into registration at the filling sta-

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tion, at the lower non-bottle filling elevation the plug, if turned back from the opening, will strike the end 34, pivot the finger 33 upwardly and rotate the pin 31 in block 28. The swing of pin 31 carries the latch arm 32 out of the upward path of stop 30 and releases the same for upward travel of rod 27 and the elevator 6. In the event the plug on the top of the carton is not turned back to strike the finger 33, the latch arm 32 remains in latching position and blocks upward movement of rod 27. Rod 27 in latched condition prevents the upward movement of the outer end of the lever 17 through a lost motion connection between the inner and outer ends thereof and accordingly maintains the lifting portion 20 in depressed condition. The elevator mechanism 6 remains in lowered position and the bottle is not raised for the filling operation during rotation of cam 22.

The lever arm mechanism 17 comprises a forked inner arm portion 40 having legs 41. The yoke of portion 40 is disposed inwardly of pivot 18 and carries the cam roller 21. As shown by Fig. 4 the bracket 19 is formed with upstanding spaced leg supports 42 carrying the pivot 18. Outwardly of legs 42 on pivot 18 are pivoted the legs 41 of the forked arm 40. Between the leg supports 42 the inner end section of the outer arm portion 43 of the lever is pivotally carried on pivot 18.

The arm portions 40 and 43 each being pivoted on pivot pin 18 are linked by a spring resisted lost-motion connection comprising a hold plate 44 fixed at 45 to arm 40, with a forward plate extension 46 bridging the pivot 18 and overlying the adjacent end of arm 43, an upstanding post 47 at the end of the extension and a spring anchor cross plate 50 carried at the top of the post; a spring cross pin 48 spaced forwardly of the pivot 18 and carried in the arm 43; and a pair of springs 49 anchored between the ends of cross pin 48 and the ends of anchor plate 50.

It will readily be seen that the elevating movement of the outer end of the lever arm 43 may be accomplished by the tension of springs 49 when the cam 22 depresses the forked arm 40 and pivots the latter arm on pin 18 (Fig. 2). When the arm 43 is held against upward movement by the latching of rod 27, the pivotal action of arm 40 will merely serve to stretch the springs 49 (Fig. 3). The elevated position of the platform and bottle during the normal bottle filling cycle is shown by Fig. 2 wherein the springs 49 raise the bottle through arm 43 and the elevator platform 6. The latched position of the mechanism under conditions where no bottle rests on the platform or where the closure plug does not serve to unlatch rod 27 is shown by Fig. 3 wherein the springs have taken up the pivotal motion of the arm 40 and post 47. The springs of course will return the arm 40 to its normal position as in Fig. 1 at the end of the filling dwell of the cam 22.

What is claimed is:

1. In a bottle filling machine having a freely, vertically reciprocable bottle support and means to elevate said support from a non-bottle filling to a bottle filling position; a lever pivoted intermediate its ends at one side of the support for swinging movement in a vertical plane, means carried by one arm of the lever intermediate the end of said arm and said pivot for engaging said support to elevate the latter from non-bottle filling to bottle filling

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position, means acting on the other arm of said lever to periodically swing said first arm upwardly to effect said elevation of the support, means acting on said first arm to arrest upward movement thereof in the absence of a properly opened bottle on said support, and a spring resisted lost-motion connection between the arms of the lever.

2. Apparatus according to claim 1 in which the said arresting means comprises a vertically slidable rod linked to said first arm with a collar fixed on said rod and latching means for engaging said collar, said latching means including a shaft rotatable on an axis transverse to said rod above said collar and having a vertically disposed latch arm fixed thereto normally hanging with its outer end in the path of said collar, said shaft also having a feeler arm extending therefrom in angular relation to said latch arm with its outer end above said bottle support for engagement by a properly opened bottle thereon.

3. Apparatus according to claim 1 in which the arms of said lever are independently pivoted on a common axis and one of said arms is provided with a member bridging said axis and carrying spring means linked to the other arm normally urging said arms into alignment with one another.

4. The apparatus of claim 3 in which said lever arm carrying the bridging member has forked legs pivoted on said axis and the inner end of the other arm is pivotally carried on said axis between said legs, said bridging member being fixed to the yoke of the legs and carrying at its outer end a spring post, said post and other lever arm having springs linked between the same and urging said arm in the direction of said bridging member.

5. In a bottle filling machine having a freely vertically reciprocable bottle support and means to elevate said support from a non-bottle filling to a bottle filling position; a lever pivoted intermediate its ends at one side of the support having a spring resisted lost-motion connection between the arms of the lever and normally maintaining the arms in alignment for swinging movement in a vertical plane, one arm of the lever intermediate the end of said arm and the pivot being engageable against the support to raise the support from non-bottle filling to bottle filling position, cam operated means engaging the other arm to swing said first arm upwardly to raise said support, a vertical slidably supported rod linked to the outer end of said first arm with a stop collar fixed thereto, and detector latch means for engaging said stop collar to prevent movement of said rod and first lever arm in the absence of a properly opened bottle on said support, said latch means comprising a freely rotatable shaft supported on an axis at right angles to said slidable rod, a vertically depending arm fixed to said shaft and hanging with its end normally lying in the vertical path of said collar, and a feeler arm on the shaft angularly fixed relative to said depending arm for engagement by a properly opened bottle on said support, movement of the feeler causing rotation of said depending arm out of the path of the said collar.

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