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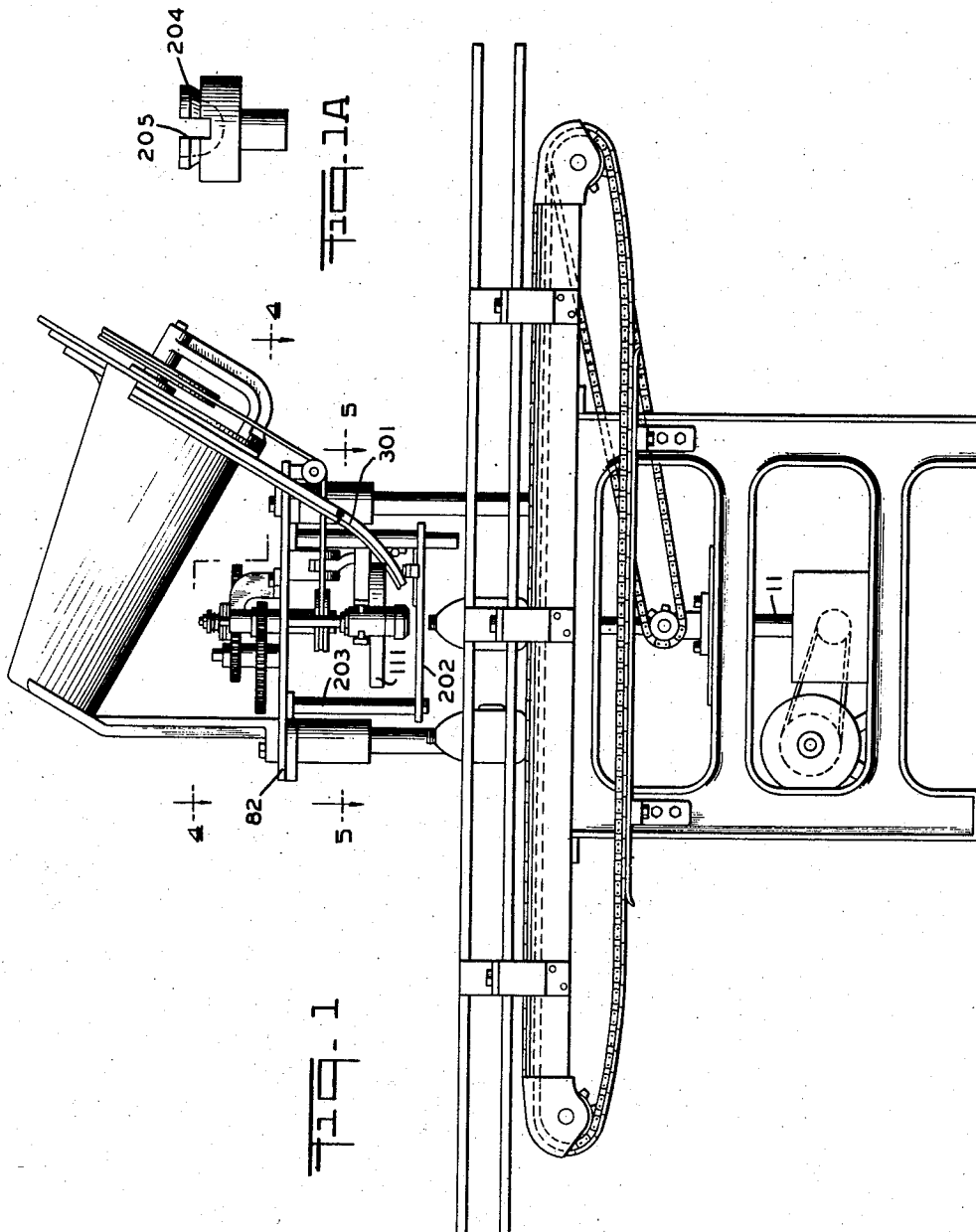
M. S. RESINA

2,434,053

CAP FEEDING MACHINE

Filed March 12, 1945

5 Sheets-Sheet 1



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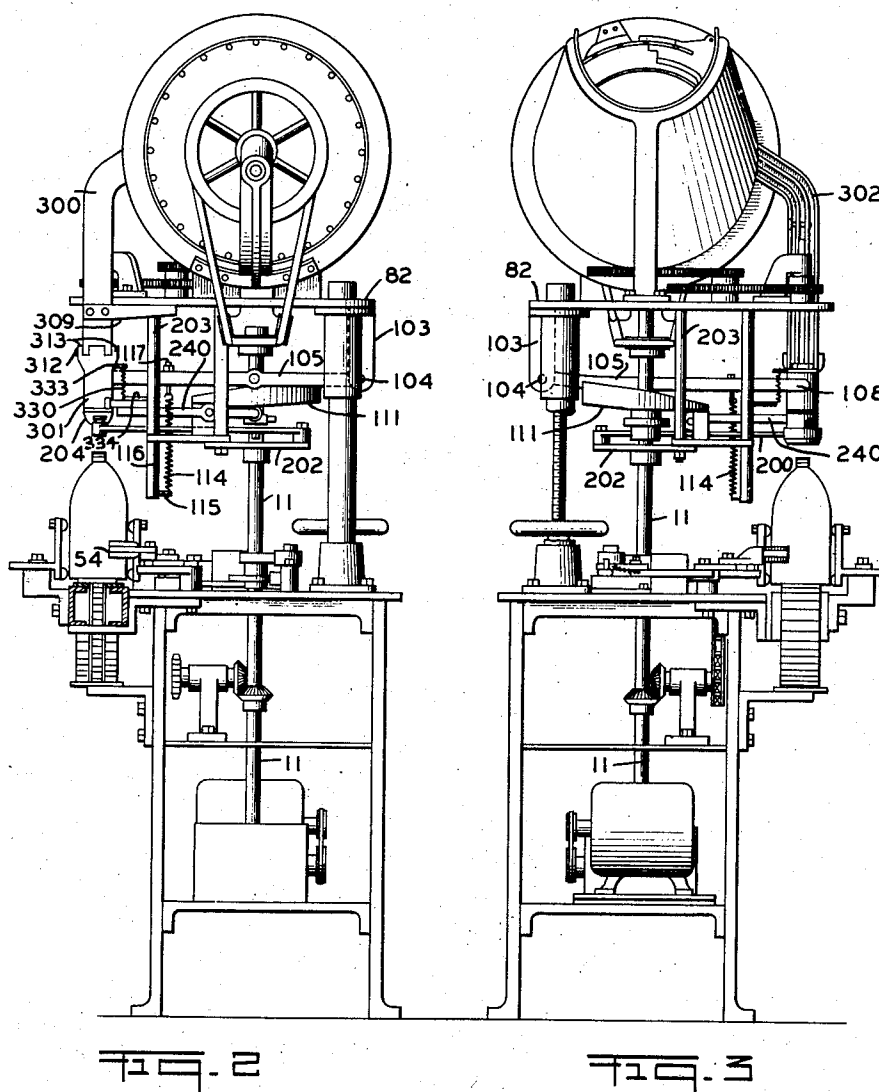
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5 Sheets-Sheet 2



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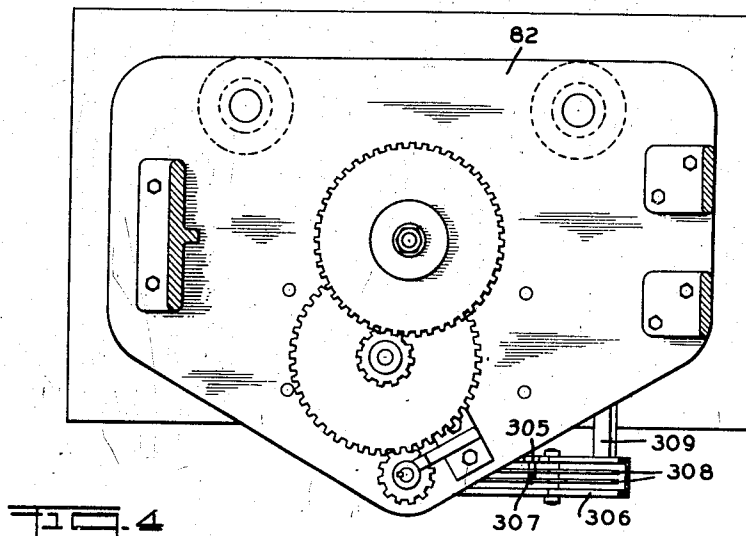
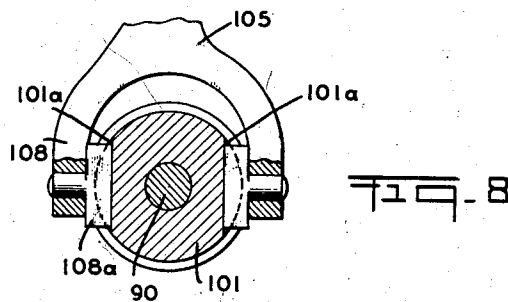
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CAP FEEDING MACHINE

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5 Sheets-Sheet 3



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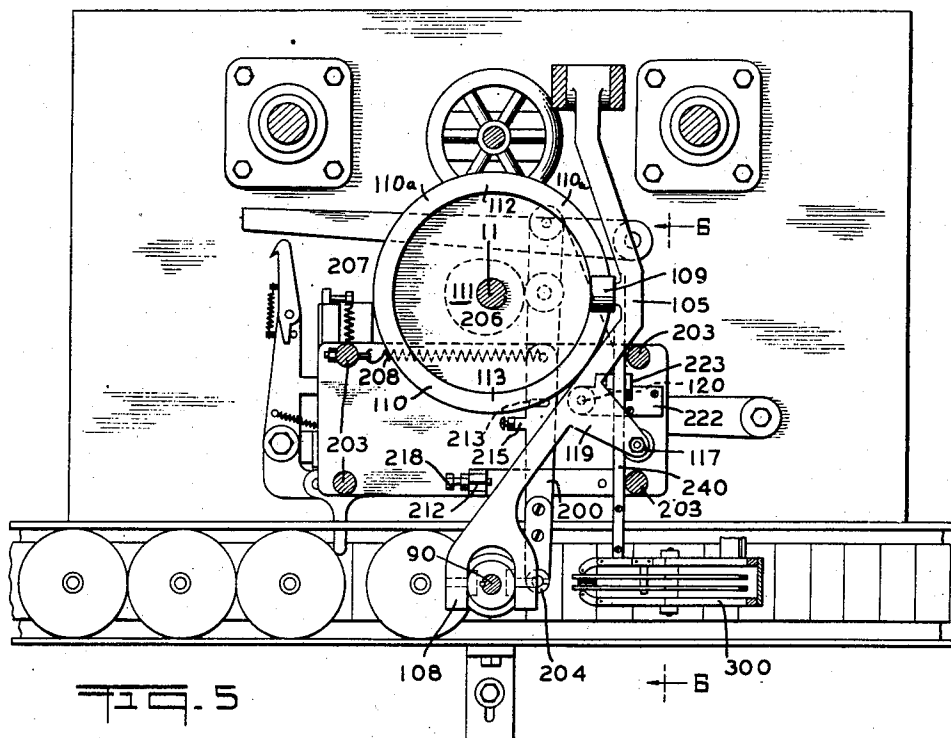
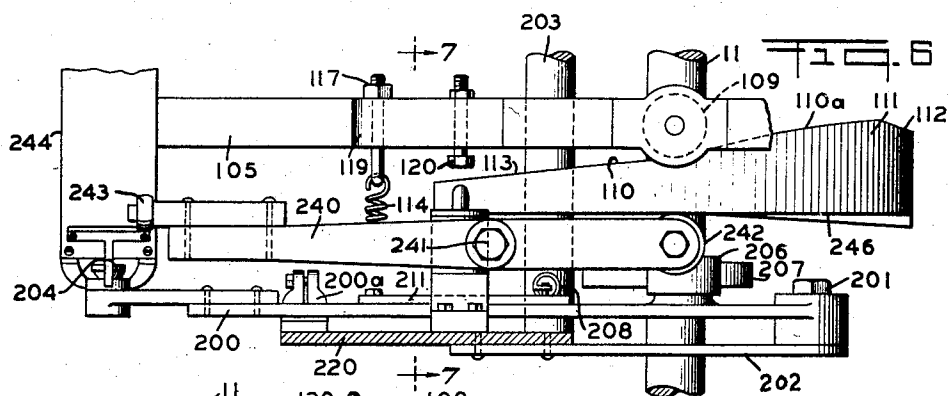
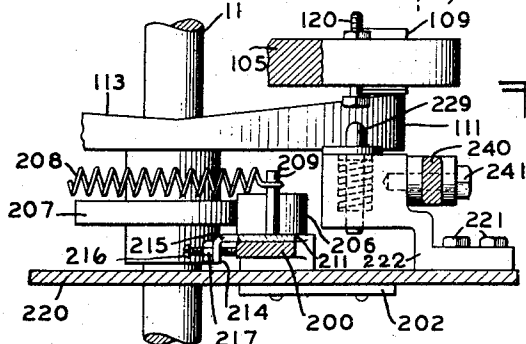
M. S. RESINA

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CAP FEEDING MACHINE

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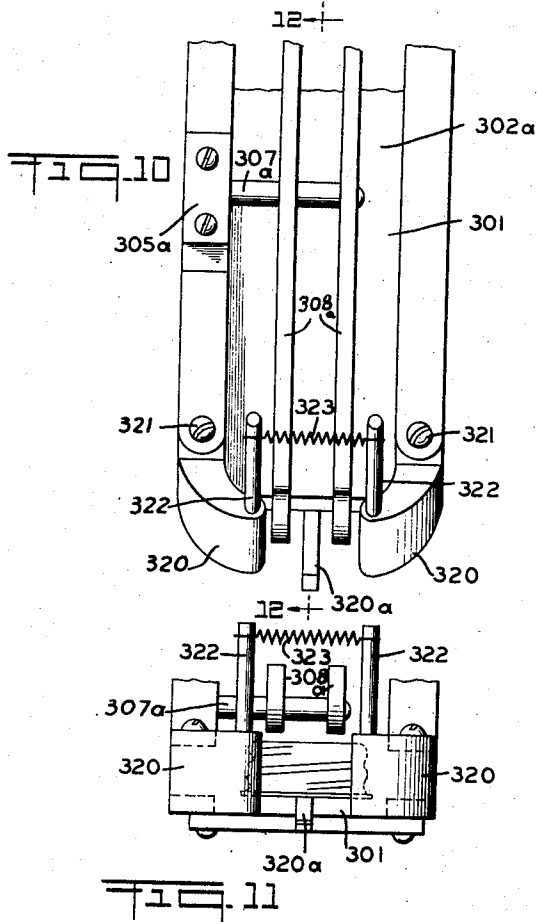
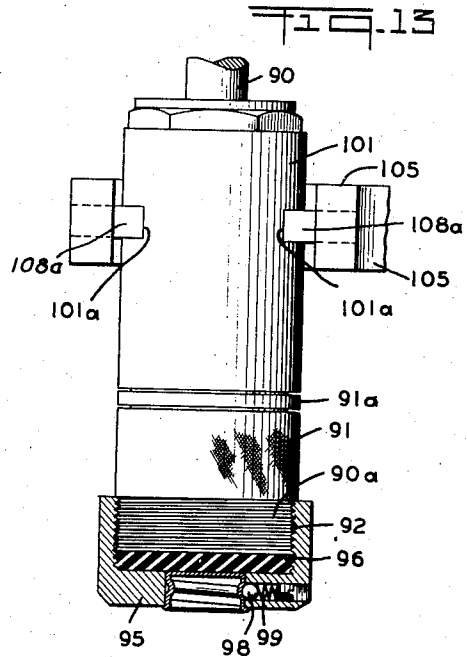
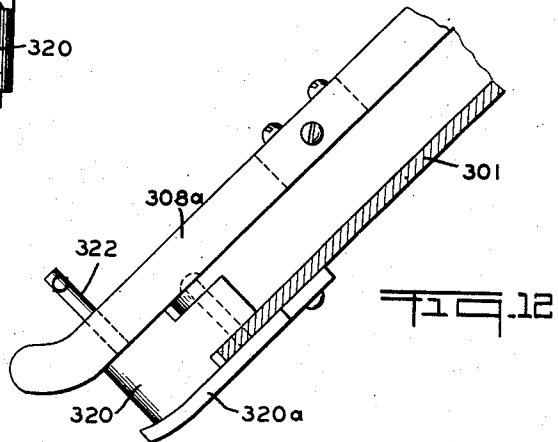
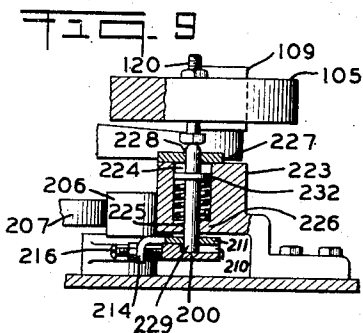
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Jan. 6, 1948.

M. S. RESINA
CAP FEEDING MACHINE
Filed March 12, 1945

2,434,053

5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,434,053

CAP FEEDING MACHINE

Manuel S. Resina, Brooklyn, N. Y.

Application March 12, 1945, Serial No. 582,233

3 Claims. (Cl. 226—88)

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The present invention relates to improvements in bottle capping machines and relates more particularly to improvements in machines for automatically applying screw caps or the like to bottles and jars.

The main object in my invention is to provide an improved machine for applying screw caps to bottles or jars in an efficient manner. It includes an improved means for feeding caps to the cap applying means.

Another object of my invention is to provide a means for automatically applying screw caps to bottles or jars in which the cap feeding means are automatically rendered inoperative when there is no bottle present in the cap receiving position.

Still another object in my invention is to provide improved cap chute means in a bottle capping machine.

Other objects of my invention will be set forth in the following description and drawings which illustrate preferred embodiments thereof, it being understood that the above statements of the objects of my invention are intended generally to explain the same without limiting it in any manner.

Figure 1 is a front elevational view of my improved machine.

Figure 1A is a side detail elevational view of the cap receiving head of the cap feeding arm.

Figure 2 is a right side elevational view.

Figure 3 is a left side elevational view.

Figure 4 is a sectional view along the line 4—4 of Figure 1.

Figure 5 is a sectional view along line 5—5 of Figure 1.

Figure 6 is a left side elevational view in detail of the cap feeding arm and the chute tilting arm.

Figure 7 is a sectional view along line 7—7 of Figure 6.

Figure 8 is a top plan fragmental view of the chuck bearing and engaging fork.

Figure 9 is a detail sectional view of the control mechanism of the cap feeding arm.

Figure 10 is a top plan view of the lower end of the cap chute.

Figure 11 is a front elevational view of the lower end of the cap chute showing a cap held by the cap holding jaws.

Figure 12 is a sectional view along the line 12—12 of Figure 10.

Figure 13 is a front detail elevational view of the cap applying chuck.

On the drawing, a vertical bushing member 101 rotationally engages the shaft 90 above the body

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member 91, and has the ball member 91a positioned between body member 91 and bushing 101, said bushing member having a pair of parallel horizontal grooves 101a formed therein. Depending from the rear of the plate 82 is a bifurcated pin retaining member 103, said member 103 retaining pin 104 between its lower ends, said pin pivotally engaging the rear end of the chuck oscillating arm 105. The forward end of the arm 105 is forked and said fork 108 has a pair of parallel bar members 108a pivotally mounted at the ends of said fork members, said bar members engaging the bushing grooves 101a. Horizontally projecting to the left of the arm 105 is the roller 109, said roller engaging the upper cam surface 110, of the cam 111, said cam being rotationally rigid with the shaft 11. The upper cam surface of said cam 111 has a pair of raised surfaces 110a, and a pair of depressed surfaces 112 and 113, the depressed surface 113 being lower than the depressed surface 112, said depressed surface 112 being in contact with the roller 109, when the chuck is in the cap receiving position, the cam surface 113 being in contact with the roller 109, when the chuck is in the cap applying position. Tension spring 114 connected to a pin 115, which pin is positioned at the lower end of the depending rod 116, has its other end connected to the arm 105, by means of a screw 117, said spring impelling the free end of the arm 105, and the dependent chuck C, to its lowermost position against the action of the cam 11, on the roller 109. Projecting forwardly and to the right of the arm 105 is the projection 119, said projection having at its outer end a depending adjustable set screw 120, the function of which will be hereinafter described.

The cap feeding mechanism, whose function is to transfer a cap from the cap chute to a position where the cap may be engaged by the cap applying chuck, comprises a horizontally reciprocating arm 200, said arm swingably mounted by means of pin 201 to the horizontal plate 202, said plate being secured to the lower ends of the depending arms 203 of the top plate 82. Projecting above the front end of the cap feeding arm 200 is the cap engaging head 204, said cap engaging head being of such size and shape as to comfortably engage the inside of a cap and said head having the transverse groove 205 formed therein, said groove being normal to the length of the arm 200. A vertical roller 206 positioned on the top face of the arm 200 anterior to the pin 201 engages the peripheral face of the cam 207, said cam being rotationally rigid with the shaft 11.

A tension spring 208 having one of its ends fixed, has its other end secured to pin 209 positioned on arm 200 and impels said arm in a clockwise direction.

Formed in the top face of the arm 200 intermediate the ends thereof is the longitudinal depression 210, said depression being covered by the adjustable plate 211. The plate 211 has the end transverse slot 212 and the intermediate transverse slot 213 formed therein and also has the depending flange 214 positioned on lateral extension 215 of the plate 211. The slot 213 is positioned over the depression 210 and is adjustable relative thereto by means of the adjustment screw 216 engaging the vertical flange 214, said screw being fixed by the nut 217 and the position of the plate 211 being fixed by screw 218 passing through slot 212 and engaging a threaded bore in the arm 200.

Positioned on the plate 220 by means of bolts 221 is the bracket member 222, said bracket member having the horizontal ledge 223, the bottom face of said ledge being just about the level of the top face of the plate 211. A vertical cylindrical aperture 224 terminating in the lower coaxial reduced aperture 225 has the horizontal flange 226 formed at its lower end and has a cover plate 227 covering said aperture 224, said cover plate having a vertical bore 228 formed therein of the same diameter as and coaxial with the aperture 225. Slidably engaged by the aperture 225 and the bore 228 is the plunger 229, said plunger 229 being maintained in its topmost position by means of the compression spring positioned between the top face of the horizontal flange 226 and the bottom face of washer 232, said washer being fixed to the plunger 229. When the plunger 229 is in its topmost position, the bottom of said plunger is above the level of the top face of plate 211 and said plunger is so positioned as to be adapted to pass through the aperture 213 formed in plate 211. The aforescribed adjustable screw 120 is so positioned as to press down on the top face of the plunger 229 when the arm 105 is at its lowermost position. An adjustable stop member 200a is positioned on plate 220 and limits the clockwise motion of the cap feeding arm 200.

A vertically rotatable chute tilting lever 240 is swingably secured to the side face of the horizontal ledge 223 of the bracket member 222 by means of the pin 241, said lever 240 having a vertical roller 243 positioned at its front end, said roller being rotatable about an axis parallel to the longitudinal axis of the lever 240 and being slidably in contact with the bottom face 244 of the tiltable chute. Positioned on the rear of the lever 240 is the vertical roller 242, said roller engaging the bottom cam surface 246 of the cam 111.

The chute for leading the properly positioned caps from the hopper mechanism to the cap transferring arm consists of a stationary chute portion, said stationary chute being at a small angle to the vertical and the tiltable chute 301 hingedly connected to the bottom of the stationary chute. The stationary chute comprises a track member 302 which leads forwardly and downwardly towards the left from the hopper and thence continues downwardly to the left, said stationary chute being channel shaped, the open side facing upwardly. Positioned along the top face of the track side member 306 are the vertical projections 305, said vertical projections 305 having the lateral extensions 307, said lateral extensions being parallel to the base of the track member and normal to the side walls thereof, and

said extensions engaging the pair of guide members 308, which guide members are parallel to the base of the track member and whose purpose is to keep the caps in proper position.

Bracket 309 extending from the plate 82 forms an intermediate support for the chute 300, the end portion of said bracket being secured to the bottom face of the chute. The lower ends of the side members of the stationary chute 300 extend beyond the base member thereof and are hingedly connected by means of pins 312 to the side lateral extensions 313 of the lower tiltable chute 301, the base of the chute 301 extending to the base of the chute 300, thus forming a continuous track. The chute 301 is of the same general construction as the chute 300, comprising the channel shaped track 302a, vertical side projections 305a, extensions 307a, said extensions engaging the guides 308a. The bottom of the chute 301 curves towards the horizontal and has the finger extension 320a secured to the bottom of the base of said chute and projecting forwardly therefrom. Hingedly secured to the lower ends of the sides of the track 302a by means of pins 321 are the jaws 320, said jaws 320 having the pegs 322 vertical extending above the front ends thereof, the tops of said pegs 322 engaging the ends of the tension spring 323, which spring maintains the jaws 320 in normally closed position. The purpose of the jaws 320 is to prevent the caps from sliding from the chute due to their accumulated weight unless the additional force of the cap transferring arm is applied thereto and the purpose of the finger 320a is to prevent any caps from falling through the space surrounded by the lower edges of the chute base and jaws. A tension spring 330 having one of its ends secured to projection 333 of the chute 301 and its other end secured to the horizontal projection 334 of the stationary arm 116 maintains the chute in its lowermost position.

The operation of my machine is as follows:

The hopper mechanism feeds properly positioned caps into the entrance to the chute 300, which caps travel to the bottom of chute 301, the lowest one being held between the jaws 320 and above the finger 320a. The arm 200 is caused to oscillate by the cam 207 between a position where the head 204 is directly below and in line with the cap applying chuck, which position may be adjusted by the member 200a and a point to the right of the outlet of chute 301. The chute tilting arm 240 is caused to oscillate by the bottom face 246 of the cam 111, the cams 207 and 111 being so positioned and shaped that when the arm 200 moves toward the right, arm 240 elevates the bottom of chute 301 and allows the head 204 to freely pass thereunder. When the arm 200 moves towards the left, the outlet end of chute 301 is allowed to fall to its lowermost position, the head 204 upon its travel to the left engaging a cap, carrying the cap from between the jaws 320 to a point directly below the cap applying chuck.

The cap applying chuck C is caused to periodically move up and down by the cam 111 through the arm 105, the vertical movement of said chuck during a single revolution of the cam 111, being from its topmost position down to the cap receiving position up to its topmost position, down to the cap applying position and thence back to its topmost position. When the arm 200 is in its most clockwise position, the chuck C comes down and engages a cap held on the head, 204, the balls 98 resiliently gripping the same and lifting it from the head 204, which head 204 and arm 200

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then move from the path of the chuck. Thereafter, the rotating chuck moves downwardly and applies the held cap to a bottle held in position by clamp 54 and when the cap has been sufficiently secured the balls 98 are forced inwardly against the action of the springs 99, thus causing slippage between the chuck C and the cap. Should, by accident, the cap become jammed in the chuck, the shaft clutch mechanism would slip thus preventing breakage. After the cap has been applied, the chuck returns to the upper position and is ready to begin another cycle.

The cams 111 and 207 are so positioned relative to one another that when the chuck is in cap applying position, the arm 200 is in its most counter-clockwise position and the slot 213 is directly below the plunger 228. If there is no bottle present in the cap receiving position, arm 105 will travel to a lower position than otherwise and screw 120 will depress the plunger 228 causing the bottom thereof to pass through the slot 213 and will hold the same in such position until the arm 200 is allowed to move clockwise by the cam 207, the side wall of the slot 213 thereby engaging the side wall of the plunger holding the same in depressed position and rendering the cap feeding arm 200 inoperative. Upon a complete rotation of the cam 207, the arm 200 will be moved counter-clockwise thus releasing the plunger 228 and if there is no bottle present in the cap receiving position, the above described operation will again be repeated. On the other hand if there is a bottle held by the clamp 54, the arm 200 will be returned to its normal operating cycle.

I have shown preferred embodiments of my invention but it is obvious that numerous omissions and alterations may be made without departing from its spirit.

The present application is a continuation in part of application Serial No. 404,160 filed July 26, 1941, now Patent No. 2,371,650, dated March 20, 1945, for Container capping machine or the like.

I claim:

1. In a machine of the character described

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means for transferring a cap from a cap chute to a cap applying chuck, said means comprising a rotatably mounted arm having a cap engaging head positioned on the free end of said arm, means for resiliently impelling said arm so that the cap engaging head is in the path of the cap applying chuck, means for reciprocating said arm beyond cap receiving position, and thence to cap receiving position, means for rendering said arm dormant beyond the cap receiving position when there is no container present in cap receiving position.

2. In a machine of the character described, a rotating cap applying chuck, means for reciprocating said chuck in a vertical direction, a cap chute, means for conveying a cap from said cap chute to the cap applying chuck, said means comprising a pivoted arm having a cap engaging head at its free end, means for reciprocating the free end of said arm between the vertical path of the cap applying chuck to a point beyond the outlet of the cap chute, said arm having an aperture formed therein, a plunger aligned with said aperture and being normally out of engagement therewith, the said chuck reciprocating means causing said plunger to engage said aperture when no container is present in cap receiving position thereby rendering the cap conveying means inoperative.

3. A device as claimed in claim 2, said lever being operated by the rotation of a cam, on a shaft; said cap applying chuck being reciprocated by the rotation of a second cam; both of said cams being mounted on said shaft.

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