

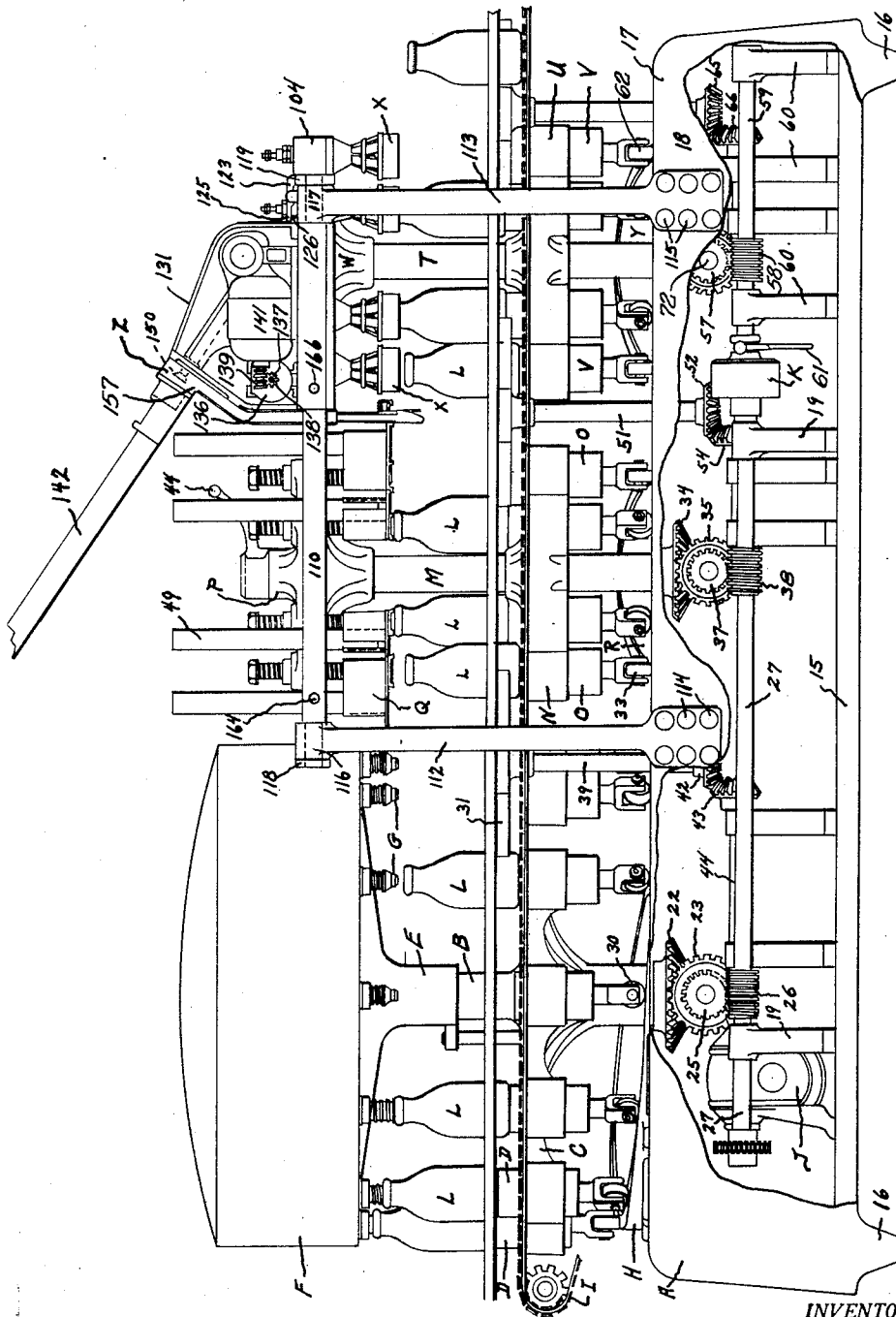
March 27, 1951

W. E. ZIMMERMAN
BOTTLE CAPPING MACHINE

2,546,205

Filed June 28, 1948

5 Sheets-Sheet 1



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5 Sheets-Sheet 2

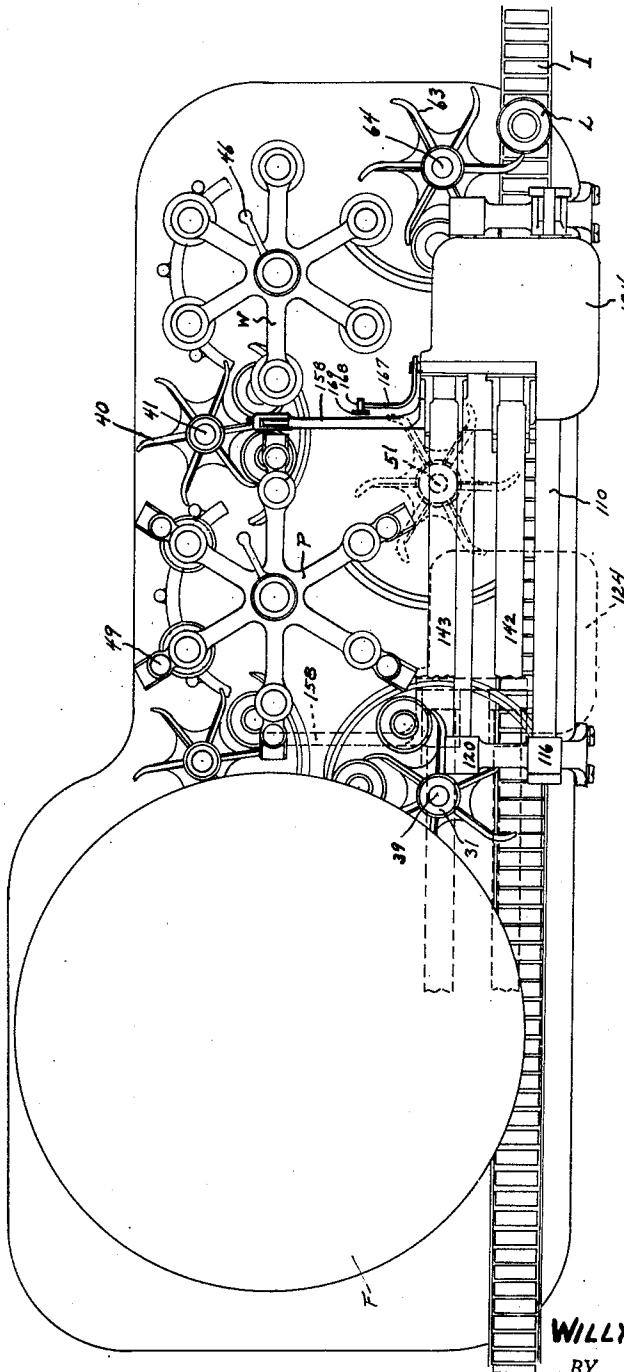
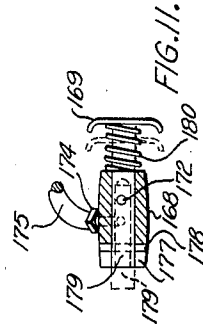


FIG. 2



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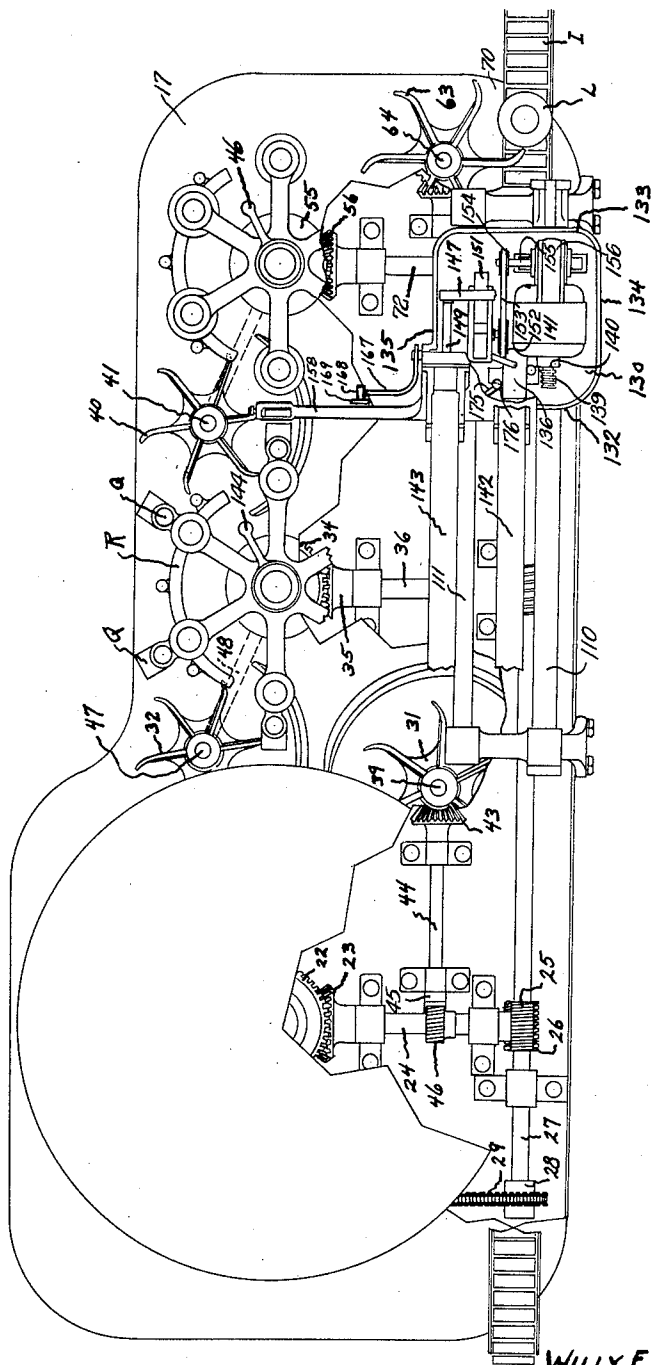


FIG. 3.

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5 Sheets-Sheet 4

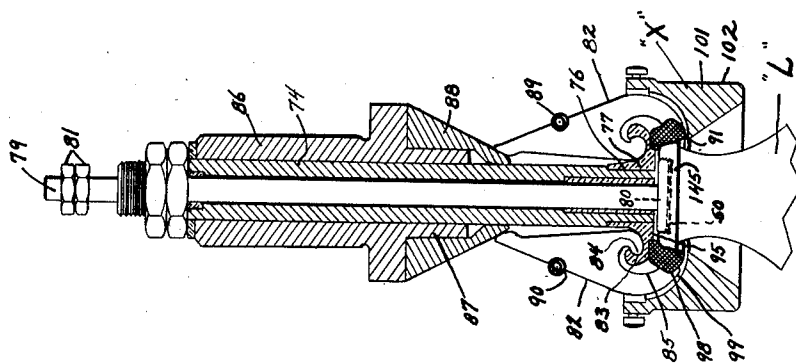


FIG. 8

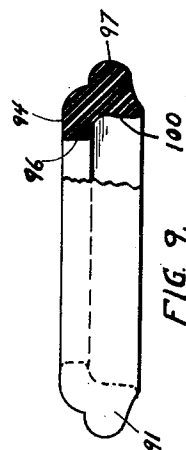


FIG. 9.

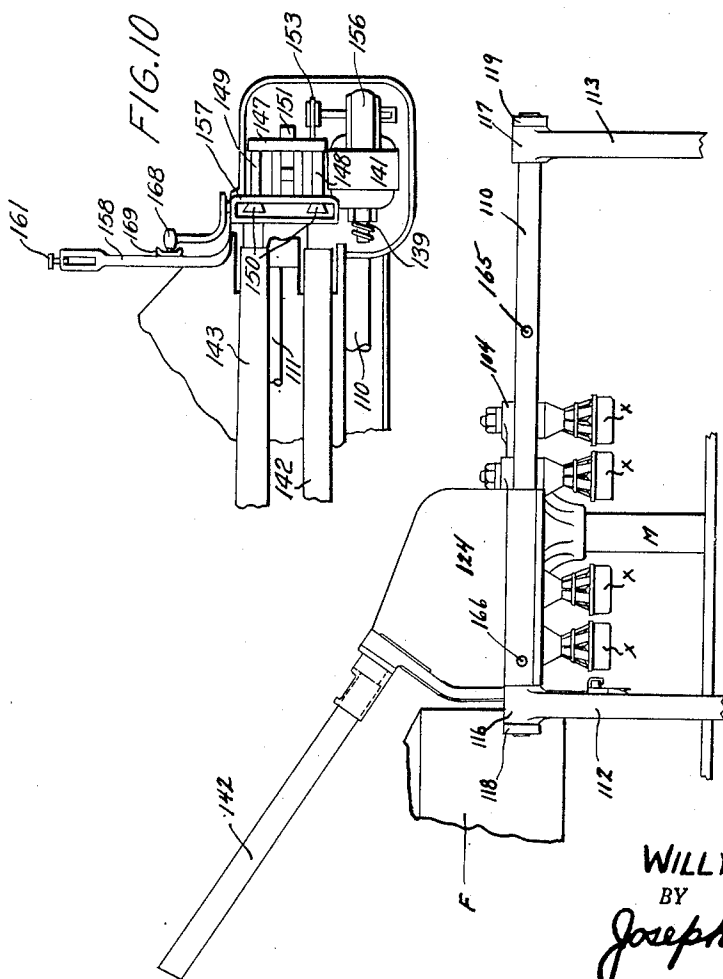


FIG. 4.

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5 Sheets-Sheet 5

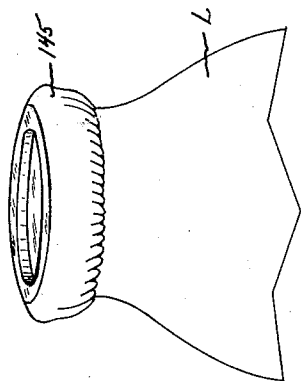


FIG. 6

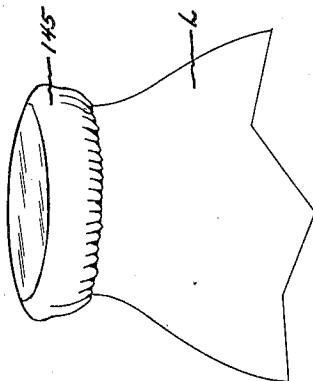


FIG. 7

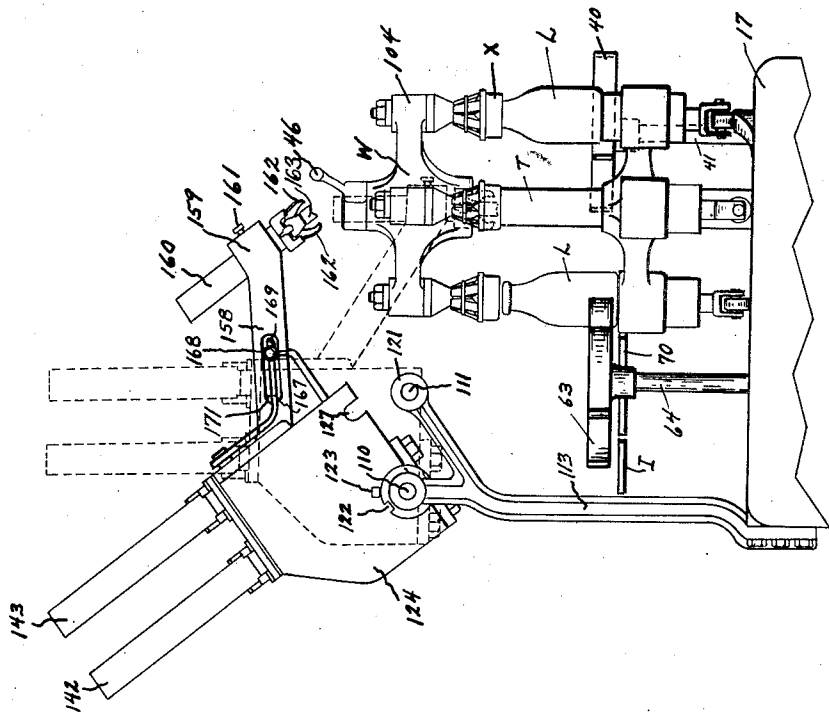


FIG. 5

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UNITED STATES PATENT OFFICE

2,546,205

BOTTLE CAPPING MACHINE

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Application June 28, 1948, Serial No. 35,592

10 Claims. (Cl. 226—75)

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This invention relates to improvements in a bottle capping machine particularly adapted though not necessarily limited in its use for sealing milk bottles, and one of the objects of the invention is to provide an improved machine of this character in which there is provided means adapted to feed the bottles to a bottle filling mechanism, to a disc applying mechanism, to a hood applying mechanism, and to a hood sealing mechanism, and from which machine the bottles may be removed.

A further object is to provide in a machine of this character improved means to fill bottles, to prevent the application of disc caps in the mouth of the bottles after they are filled, but allowing the application of flexible skirted hood caps onto said filled bottles and the sealing of said hood caps thereon.

A further object is to provide in a machine of this character improved means whereby the disc cap applying mechanism can be removed, the hood-cap sealing mechanism substituted in its position on the machine, and the hood-cap applying mechanism moved horizontally to a position on said machine ahead of said sealing mechanism.

A further object of the invention is to provide a mounting or support mechanism for a capping apparatus, said mechanism of a kind which is adjustable horizontally to adapt the apparatus for applying flexible, moldable skirted hood caps to bottles for contraction and securing thereon; said apparatus embodying mechanism for moving bottles to a point beneath a hood-cap applying means, means for feeding a hood to the mouth of said bottles during their movement beneath the hood cap applying means, said hood-cap applying means comprising a hood magazine on a suitable support, a hood delivery chute having one end disposed in the path of travel of the bottles and the other end disposed adjacent said hood magazine, said chute being narrow in its horizontal dimension and shaped for a hood to roll edgewise thereon from the hood magazine, means for transferring said hoods from said magazine to said chute controlled by a predetermined number of hoods in the chute, and means to suspend a hood in the path of said moving bottles; thus, when the bottle to which the hood is to be applied moves to the hood cap applying station, the forward edge of the bottle head around the bottle mouth engages against the skirt of the hood, causing the hood to be tilted and drop onto the mouth of the bottle.

Another object of the invention is to provide a bottle capping machine with a stationary support and having a mechanism for filling bottles, mechanism for applying disc caps in the mouth of said bottles, conveying means for moving said bottles to hood cap applying mechanism, said mechanism including a magazine for preformed

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hood caps, a hood delivery chute having one end disposed in the path of travel of the bottles and the other end disposed adjacent said hood magazine, means to transfer said hoods from said magazine to said chute, and automatic means operable in accordance with the movement of said bottles whereby each bottle receives a preformed hood cap from said chute, mechanism for sealing said hood caps on said bottles, and means whereby said hood-cap applying mechanism can be moved to a different location upon the stationary support should the disc cap applying mechanism be removed and hood-cap sealing mechanism substituted therefor, whereby the filled bottles may be hood capped and sealed without the use of disc caps.

Another object of the invention is to provide a mechanism of the above type having novel and improved details of construction and features of operation.

Another object is to provide a novel and improved mechanism of the above type having characteristics suited for commercial operation.

Another object is to provide a novel and improved cap applying and sealing machine with a stationary support, whereby the entire power driven cap applying unit arranged upon said support can be moved horizontally thereon as a complete unit.

Another object is to provide novel and improved mechanism for applying and sealing laminated caps, consisting of layers of paper and metal-foil, to bottles as desired.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which:

Figure 1 is a front elevation of filling, disc-cap applying, hood cap applying and sealing machine embodying the present invention;

Figure 2 is a top plan view of the machine shown in Figure 1;

Figure 3 is a top plan view, partly in section, of the machine shown in Figure 2, and illustrating the power driving mechanism;

Figure 4 is a fragmentary front elevation, and illustrating the hood-cap applying mechanism in a position removed from that position shown in Figure 1;

Figure 5 is a fragmentary end view of the machine shown in Figure 1, with parts removed, the hood-cap applying mechanism shown dotted in normal position, and said mechanism shown in full lines in a slanting or leaning position whereby it can be moved in a horizontal direction;

Figure 6 is a fragmentary, perspective view of a milk bottle having a skirted hood cap covering

the mouth of the bottle and with the central portion of the hood-cap pressed downwardly into contact with a disc-cap arranged in the cap seat of the bottle beneath said hood;

Figure 7 is a fragmentary, perspective view of a milk bottle having a skirted hood cap covering the mouth of the bottle, and with the central portion of the hood-cap drawn tightly across said bottle mouth;

Figure 8 is a fragmentary, sectional view of a sealing head and of a bottle and closure illustrating the mechanism in a position deforming the central portion of the hood-cap and in a position to deform the closure about the bottle mouth;

Figure 9 is an elevational view with a portion in section showing a rubber member adapted to engage the closure during deforming operations.

Figure 10 is a partial top plan view, partially in section, of the machine shown in Figure 2, and illustrating the closure withdrawing means, the magazine, and hopper associated therewith.

Figure 11 is a sectional view of a valve means and parts associated therewith, and illustrating the means to break the vacuum acting through the closure engaging cups to stop the feeding of closures to the hopper associated therewith.

In order to obtain a general understanding of the bottle capping machine, the essential elements will be briefly pointed out. Then, later on, these parts will be more fully described. As previously indicated, the machine comprises a filling element, a capping element, and a hooding element; these elements are all mounted upon a base A. The filling element includes a central column B, a bottle carrier C, bottle supports D carried by said carrier C, tubular member E surrounding said column B to adjust vertically the milk tank F for filling various size bottles, the filling heads G, and cam-track H supported upon base A. The capper element, on the other hand, includes the tubular standard M, the carrier N mounted to rotate about said standard, the bottle supports O, the supporting head P located at the upper end of the standard M, the capper heads Q carried by the supporting head P, and the cam R supported upon the base A. The hooding element, on the other hand, includes the tubular standard T, the carrier U mounted to rotate about said standard, the bottle supports V, the supporting head W located at the upper end of the standard T, the sealing heads X carried by the supporting head W, the cam Y, and the hood supply and delivery mechanism Z. In addition to the filling, capping and hooding elements, there is included the conveyor I by which the bottles are brought to the filler, and carries them from the machine, and there is also a motor J, necessary shafting and an associated clutch K. And, in many of the views are seen bottles L which the machine fills, caps and hood seals.

The base A is, in the present instance, a casting of fairly regular outline provided with a lower floor 15, legs 16, upper floor, or top flange 17, and substantially vertical peripheral side web members 18. The floor 15 extends substantially over the entire extent of the base forming support for the motor J and the bearing supports to support the desired line shafting. The particular arrangement and/or types of various motor and line shaft supports, clutches and parts is not a matter of great importance since different designers might prefer quite a different arrangement of parts and types thereof. This base A is provided with four legs 16, a pair at the filler end of the

base, and the other pair is located at the hood sealing end of the same.

Mounted upon the tubular member E and projecting thereabove is a milk container F for holding the milk, or other liquid, with which the bottles L are to be filled, and which liquid is discharged through suitable filling heads G. The container F is adjustably supported upon the member B in any suitable manner, preferably through the medium of telescoping members B and E, the member B being mounted upon the base A and the member E being connected with the bottom of the container F. Said milk container F and member E are connected to a vertical shaft, the lower end of said shaft being connected to a large bevel gear 22, and this gear meshes with another bevel gear 23 carried at one end of a shaft 24. The opposite end of said shaft 24 carries a worm-gear 25, and this gear meshes with another worm-gear 26, which is carried on shaft 27 adjacent one end thereof. Shaft 27 is supported by members 19 and at one end of the shaft 27 at the filler end of the base, it carries a sprocket 28 which is driven by a chain 29, said chain 29 being connected with a sprocket mounted upon a motor shaft extending outwardly from the electrically driven motor J mounted upon lower floor 15.

A stationary cam track H is secured to the top flange 17 upon which cam rollers 30 travel, to rise and fall. The bottle carrier C is constantly turned when bottles are being filled, and while turning, the bottle supports D thereof are gradually elevated from the plane, proper, of the carrier and gradually restored to this plane. As the central column B and bottle carrier C turns, the cam rollers 30 move bodily therewith over the cam track H to elevate and lower the bottle supports D to enable these carrier sections to function. The bottle supports D are hollow piston-like members with springs incorporated therein so that in the raising and lowering of the bottles, should the bottles encounter undue strain, the spring within said support will yield to prevent the bottles from breaking.

The bottles are fed to the filling mechanism of this apparatus by means of an endless conveyor belt I. A notched timing wheel or star wheel 31 is positioned upon shaft 39 to remove the bottles from the conveyor and move them to a point in proximity to the path of rotation of the bottle supports D. Shaft 39, which drives notched wheel 31, is directly connected to shaft 24 by intermeditation of bevel gear 42 on the lower end of shaft 39, gears 43 and 45 on shaft 44, and worm gear 46 mounted upon shaft 24. Another notched wheel 32 is provided for receiving the filled bottles and for moving them to a point in proximity to the path of rotation of the bottle supports O of the capping element. Wheel 32 is mounted upon shaft 47 which is driven by shaft 48, and which is driven by gears connected to and driven by shaft M. A stationary cam track R is secured to the top of flange 17 upon which cam rollers 33 travel, to rise and fall. The bottle carrier N is constantly turned when bottles are being filled at the filler, and while turning, the bottle supports O thereof are gradually elevated from the plane, proper, of the carrier N, and gradually restored to this plane, because the cam rollers 33 move bodily therewith over the cam track R to enable the carrier sections to function as desired. The bottle supports O are similar in construction to the supports D described above. Raising of said bottle supports O brings the bottles L in contact

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with aligned capping heads Q of the capping mechanism where said bottles receive a disc cap to close the mouth of each bottle. Each capping head is equipped with means to hold tubes 49 containing disc caps 50. The construction and operation of said heads Q is well known in the bottle capping art. The supporting head P can be adjusted vertically upon standard M so that the capping heads will function with bottles of various sizes by turning adjustment screw 144. The bottle carrier N and supporting head P of the capping mechanism receive their rotating movement from being fixed to tubular standard M which has a large bevel gear 34 at the bottom thereof and which is in mesh with a bevel gear 35. Said gear 35 is mounted upon one end of shaft 36, said shaft having a worm gear 37 secured upon its opposite end and which is in mesh with worm gear 38 mounted upon shaft 27. By this arrangement, all of the mechanism of the filler and the capper elements are driven from the shaft 27 which is driven by chain 29 and which itself is driven by motor J. When the capping of the bottle is completed the bottle can be conveyed to the hood sealing element by notched timing wheel 40 supported by shaft 41. If the filled and capped bottles are not desired to be hood sealed, the notched wheel 40 can be removed from shaft 41 and placed upon shaft 51, shown dotted in Figure 2, whereby the bottles are conveyed directly to the conveyor I. Motion is imparted to shaft 51 through gears 52 and 54 shown in Figure 1, said gears connected to shaft 36 by means of a short shaft and gears not shown. Motion is imparted to the conveyor I from any suitable source, not shown.

When it is desired to hood cap and seal a hood-cap upon a bottle, the notched or star wheel 40 moves the disc capped bottle to a point beneath a hood-cap applying means Z embodying a hood delivery chute having its lower end disposed in the path of travel of the bottle and the upper end disposed adjacent a pair of hood magazines. The lowermost hood in the delivery chute engages the forward edge of the bottle bead around the mouth and causes the hood to be tilted and drop from the chute onto the mouth of the bottle. Said star wheel 40 continues to move the capped bottle to the bottle carrier U of the sealing machine and places said bottle upon one of the bottle supports V carried by said carrier U. The carrier can be adjusted vertically upon standard T so that the sealing heads will function with bottles of various sizes by turning adjusting screw 46. The carrier U and supporting head member W are secured to the tubular standard T which turns said carrier and head in timed relation with the filling and disc capping mechanism. The lower end of standard T is connected to a large bevel gear 55, and this gear meshes with another bevel gear 56 carried at one end of shaft 72. The opposite end of shaft 72 carries a worm gear 57, and this gear meshes with another worm gear 58 which is secured to shaft 59, said shaft being supported by members 60 secured to lower floor 15. Said shaft 59 is driven by motor J through the intermediation of shaft 27 and the clutch K; said clutch being engaged and disengaged when desired by the manual operation of handle 61. As the standard T and the bottle carrier U turn, the cam rollers 62 move bodily therewith over the cam track Y to elevate and lower the bottle supports V to enable the bottle and hood to come in contact with sealing heads X for sealing said hood upon the bottle.

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The bottle supports V are hollow like members and are similar in construction to the supports D and O described above. When the hooding and sealing of a bottle is completed the bottle is conveyed over platform 70 to the conveyer I by means of star wheel 63 secured to shaft 64, whereby the sealed bottle can be conveyed away. Shaft 64 has secured at its lower end a bevel gear 65, and said gear 65 meshes with another bevel gear 66 carried by a shaft 67. The opposite end of shaft 67 carries a worm gear 68 not shown, and this gear meshes with another worm gear secured to shaft 72. By this arrangement, all of the mechanism of the hood sealer elements are driven from the shaft 72.

The supporting head W carries a plurality of sealing heads X, said heads are clearly shown in Figures 1, 4, 5, and 8. Figure 8 shows a sealing head X with sealing elements in a position deforming the central portion of the hood-cap and in a position to deform the skirt portion of the closure about the bottle mouth. Sealing head X specifically shown in Figure 8 will now be described. Formed upon the lower extremity of shaft 74 is a tenon 76 which is of a size to receive and carry a member 77. Said shaft 74 is provided with an axial bore 78 within which is reciprocally mounted a plunger 79 having a disc-like head 80 at its lower end and threaded at its upper end to receive lock nuts 81. When said disc-like member 80 is constructed as shown in Figure 8, the closure 145 is depressed, causing the central portion thereof to come in contact with the disc cap positioned in the mouth of the bottle L as shown in Figure 6. When said member 80 is constructed of thinner material, or when flange 94 is made thicker thereby increasing the vertical height of surface 96, the closure 145 is formed tightly across the mouth of the bottle as shown in Figure 7. The embodiment of element 77 provides a series of spaces to accommodate a plurality of levers 82. Member 77 is formed with a curved portion 83 which provides a fulcrum seat for a reciprocally-shaped convex portion 84 formed on each of the levers 82. Each of the fingers 82 is provided with a configured interior formation 85 providing a relief or clearance to accommodate pivotal movement of the levers 82 about said curved portion 83. Surrounding shaft 74 is a cone bracket 86 with a depending sleeve-like portion 87 upon which is mounted a means 88 for actuating the levers 82.

In the embodiment illustrated in Figure 8, this means 88 is in the form of an inverted frusto-conically shaped member. The levers 82 are normally urged to the position shown in Figure 8 by means of a resilient extensible coil spring 89 formed into annular shape. The spring is adapted to engage in recesses 90 formed in the levers 82. The sealing head X is inclusive of a closure engaging means in the form of an annular member 91 of rubber or other deformable material. Member 91 is provided with an inwardly extending flange 94 with internal surface 96 which is adapted to snugly fit over a depending annular boss or flange 95 formed on member 77. The annular member 91 is provided with an outwardly projecting bead portion 97 which is adapted to engage in recess 98 formed in depending portion 99 of the levers 82. Member 91 is formed with an interior surface 100 of such configuration and dimension as to receive a bottle mouth and closure as illustrated in Figure 8.

Means are provided for aligning or centering the bottle and closure prior to the engagement of

the resilient ring 91 therewith. This guide means is inclusive of a member 101 which is formed with an annular exterior wall 102, and an angularly projecting inner wall 103. The guide member 101 is adapted to be removably mounted upon the member 77. The sealing heads X are employed in conjunction with the head carriers 104 which are members projecting from the supporting head member W.

The hood supplying and delivering mechanism Z comprises a unit slidably mounted upon two shafts 110 and 111, said shafts being supported by supporting members 112 and 113 rigidly secured to the vertical peripheral side web member 18. Support members 112 and 113 are substantially Y shaped members, the lower ends secured to web member 18 by bolts 114 and 115. Said shaft 110 is mounted in bearings 116 and 117 and held against horizontal movement by means of two collars, one collar 118 secured to the shaft 110 at its end adjacent the filler end of the machine, and one collar 119 secured to the shaft 110 at the hood-sealer end of the machine. Said shaft 111 is held in members 112 and 113 by cylindrical locking means 120 and 121. Collars 118 and 119 turn with the shafts 110 and 111. Collar 119 is shown by Figure 5 with a locking key slot 122, and a spring actuated key 123 drops into slot 122 when the housing 124 supporting the supplying and delivery mechanism is in a normal position as shown dotted in Figure 5. When it is desired to rotate said housing 124, as shown in Figure 5 by full lines, said key 123 is removed from slot 122 by the operator depressing key finger extension 125 and compressing spring 126. Said housing member 124 has a recess 127 along one side thereof whereby shaft 111 will coincide when supporting said housing in its normal position.

The housing 124 consists of a lower floor 130, a top member 131, two end members 132 and 133, and two side members 134 and 135. Mounted upon the floor 130 is a vacuum pump 136 of conventional form. The rotor shaft 137 of the pump projects exteriorly and is fitted with a worm gear 138 which meshes with a worm gear 139 mounted on shaft 140 which projects exteriorly of the electric motor 141. The vacuum pump 136 is operated continuously by motor 141 to impress a subatmospheric pressure in the duct system associated with the valve chamber.

Carried on the upper portion of housing 124 are two magazines 142 and 143 for retaining the independent supplies of hood-type closures 145, the serving chute 158 and associated instrumentalities of the unit. The shape of the magazines and means to retain closures therein, closure withdrawing means and associated instrumentalities of similar construction have been shown and described in Patent 2,304,146 controlled by the owners of this application. The closure withdrawing mechanism comprises a housing adapted to receive for movement therein a reciprocable member 147. The member 147 carries a pair of interconnected spaced hollow plungers 148 and 149; only plunger 149 is shown in Figure 3; plungers 148 and numeral 149 are shown in Figure 10. The plungers are in axial alignment with the magazines carrying at their upper ends suitable fittings for removably supporting conically or cone shaped hollow flexible members 150 as shown dotted in Figure 1. Each of the flexible members 150 through the hollow plungers is in communication with reciprocable

member 147 which is connected with the duct system associated with the vacuum pump as shown in Patent 2,304,146.

Member 147 is caused to reciprocate by being connected with slide bar 151 which receives its motion through instrumentalities connected with pulley wheel 152, driven by belt 153 which is connected with pulley 154 mounted upon shaft 155 forming part of a gear reduction mechanism 156 directly connected at one end of the shaft of the electric motor 141. The hood type closures are transferred from the magazine tubes 142 and 143 into a hopper shaped member 157, to the lower end of which is connected an angularly disposed closure receiving and conveying chute 158; the hopper 157 is secured to the housing 124 by suitable means so that when said hopper is moved horizontally or turned angularly the chute 158 will move therewith. The chute 158 is provided with a horizontal extending portion 159 which has a vertically arranged rectangular hollow interior adapted to slidably receive and accommodate a vertically disposed chute section 160, the latter being held to the horizontal portion 159 by clamping means such as a thumb screw 161. The purpose of the adjustment is to accommodate the discharge of closures on to receptacles of different heights.

The lower extremity of the chute section 160 provides a discharge station for discharging or disposing of closures onto bottles. The closure discharge arrangements include a pair of closure retaining wings or members 162 which are pivoted to the chute section 160 by suitable means. Said wings are urged towards each other by means of a contractable spring. The contour of the members 162 is such as to resiliently retain a closure in discharge position until its removal by contact with a bottle mouth. Also pivotally supported upon said chute section 160 is a member 163 which is adapted to contact the upper surfaces of closures being discharged from the station and functions to properly direct the closures onto the bottle mouths, the pivotal support therefor, permitting the member 163 to assume a horizontal position as a closure deposited upon a bottle moves away from the discharge station.

The housing 124 normally rests upon both shafts 110 and 111; shaft 110 has two holes 164 and 165 drilled therein. A cylindrical key or spring operated pin 166 is carried by the housing 124. When said housing 124 is in normal horizontal position and placed at the opposite end of the machine from that of the filler, said pin 166 will snap into hole 165 and lock said housing from being moved horizontally. When the operator desires to hood-cap without the use of the disc cap, said pin 166 is removed from hole 165 and said housing is tilted as shown in Figure 5 to raise chute 158 and vertical section clear of the supporting head W. Said housing 124 is then moved horizontally along shaft 110 to its opposite end and allowed to rest again upon shaft 111. When the housing is in its new position, pin 166 will snap into hole 164, chute 158 and extension 160 will extend between the notched timing wheel 31 and supporting head P as shown dotted in Figure 2. Means are provided to limit the number of closures that are delivered into the closure receiving and conveying chute 149. Pivotally supported upon a shaft within the housing 124 is an arm or lever 167. The lower end of the lever 167 is formed with an elongated boss 168 which is bored to slidably accommodate a cylindrical member

179 which is provided with a head 169. The side wall of the chute 158 is formed with an opening 171 to accommodate the passage of said head 169. The member 179 has a hollow interior open to the atmosphere at the rear end thereof, the side wall of the hollow portion being provided with an orifice or opening 172. The boss portion 168 of the lever 158 is provided with an opening in which is disposed a hollow fitting 174 to which is connected a flexible tube 175 communicating with a fitting 176 connected with the housing of the vacuum pump 136. Said housing of the vacuum pump 136 contains mechanism for controlling the existence of vacuum effective through the closure engaging cups 150. The rear portion of the boss 168 is formed with a pair of slots or kerfs 177 to accommodate a stop or abutment pin 178 which extends through diametrically arranged openings in the wall of boss 168. The slots 177 serve as a guiding means to maintain the head 169 in proper relation to enter the opening 171 in the side wall of the closure chute 158. The pin 178 co-operates with the ends of the slots 177 to limit the relative forward motion of member 179 and the head 169, the member being urged in one direction toward the chute under the influence of an expansive coil spring 180. At each cycle of operation of the plungers 148 and 149, a pair of closures are conveyed from the magazines 142 and 143 into the hopper thence into the chute 146, suitable means within housing 124 causing the lever 167 to move the head 169 through the opening 171 in the side wall of the closure chute. If a closure is disposed in the chute so to be contacted by the head 169, said head 169 and member 179 are moved relative to the boss portion 168 to "break" the vacuum acting through the closure engaging cups 150 so as to temporarily prevent the further deposition of caps into the hopper 157.

The operation of the capping machine is as follows: The operator first fills the magazine tubes 142 and 143 with nested closures 145 in upright position. The operator then starts motor 141 in motion, which causes plungers 148 and 149 to draw closures 145 from magazines 142 and 143 and drop them into hopper 157 from which they travel to the discharge chute 158 until the chute is filled with closures. The operator then places tubes of disc caps 49 in the disc capping heads Q. After milk is placed in the container F, the operator will start the motor J and place the conveyor I in motion, which will bring empty bottles into contact with star wheel 31. Said wheel will guide the bottle onto a support D, upon which it will be moved upwardly into contact with a filling valve projecting downwardly from the rotating container F. The bottle will then come in contact with star wheel 32 which will convey the filled bottle to one of the supports O which revolves with the capping heads Q. The bottle is elevated until it comes into contact with one of said capping heads Q, where it automatically receives a disc cap from one of disc cap tubes 49. The bottle is then automatically lowered and carried over and into contact with star wheel 40, which carries the bottle onto support V, which is rotating with sealing heads X. As the bottle passes to support V, the mouth of said bottle contacts a closure disposed in the lowermost portion of vertical chute section 160. The bottle with closure 145 thereon is elevated into contact with one of the sealing heads X, where the rubber sealing member 31 squeezes the closure into contact with the bottle head. The bottle is automatically lowered and conveyed over plat-

form 70 to conveyor I by means of star wheel 63. The above described parts 167, 168 and 196 have also been shown and fully described in patent application Serial No. 674,054, now Patent No. 2,493,312, issued Jan. 3, 1950, controlled by the assignee of this application.

Very often it is desired by the dairy to seal bottles for schools, etc., with closures 145; however, omitting the disc caps 50. In such cases the operator removes the capping heads Q from the carrier P. The sealing heads X upon carrier W are then removed therefrom and placed upon carrier P. The operator then presses upon key 123 to remove it from slot 122, thereby unlocking the housing 124 from its normal position.

The housing is then tilted to the position shown in Figure 5; the pin 166 is then removed from hole 165 in shaft 110; said housing 124 is then caused to slide upon shaft 110 to the opposite end thereof, where pin 166 is placed in hole 164. With the housing 124 in the new location, the delivery chute 158 extends downwardly between star wheel 32 and bottle supports O as shown by dotted Figure 2. The bottle will receive a closure 145 and said closure will be pressed upon the bottle head by sealing head X now carried by carrier P. Said sealed bottle can travel from supports O to star wheel 40, then to supports V, then to star wheel 63 and then to conveyor I for delivery. If the operator transfers the star wheel 40 from shaft 41 to shaft 45, the sealed bottle can travel direct from the supports O to star wheel 40 on shaft 45 to the conveyor I for delivery. With this arrangement the operator changes the housing 124 and the entire working elements from one location to another without undue labor.

It is apparent that within the scope of the invention modification and different arrangements may be made other than is herein described, and the present disclosure is illustrative merely—the invention comprehending all variations thereof.

I claim:

1. The combination with a bottle sealing machine, of a supporting frame, a pair of vertical posts, one of said posts for supporting a disc-cap applying mechanism, and one of said posts for supporting a hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon said vertical supporting post, said post also adapted to support a hood-seal mechanism, a set of relatively fixed horizontal guides and supporting member associated with said supporting frame, a horizontal reciprocable slide member slidably engaged upon said guides, said slide member supporting a magazine for preformed hood-caps, a hood-cap delivery chute, and means whereby a single hood-cap is placed over the mouth of each bottle passing to said hood-cap sealing mechanism; said horizontal slide member being horizontally movable along said guides whereby said delivery chute will deliver hood-caps to bottles for sealing by a sealing mechanism supported by either of said vertical supporting posts.

2. The combination with a bottle sealing machine, of a supporting frame, a pair of vertical posts, one of said posts for supporting a disc-cap applying mechanism and one of said posts for supporting a hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon said vertical supporting post, said post also adapted to support a hood-seal mechanism, a set of relatively fixed horizontal guides and supporting members associated with said supporting

frame, a horizontal reciprocable slide member slidably engaged upon said guides, said slide member supporting a power unit, a magazine for preformed hood-caps, a hood-cap delivery chute, automatic means for transferring said hood-caps from said magazine to said chute, said automatic means controlled by a predetermined number of hood-caps in said chute, means connected with said chute to suspend a hood in the path of a bottle being moved to said hood-cap sealing mechanism, the forward edge of the bottle head around the top of the bottle engaging against the skirt of the suspended hood-cap and removing it from the chute; said horizontal slide member being horizontally movable along said guides whereby said delivery chute will deliver hood-caps to bottles for sealing by a sealing mechanism supported by either of said vertical supporting posts.

3. A combined filling and sealing machine for bottles comprising a filling machine having a framework a plurality of vertical posts, supported thereof, one of said posts for supporting a plurality of disc-cap applying mechanisms which are removably secured thereon, one of said posts for supporting a plurality of hood sealing mechanisms which are removably secured thereon, said post which supports said disc-cap applying mechanism also adapted to support a plurality of hood-sealing mechanisms, a set of relatively fixed horizontal, parallel guides supported upon said framework, a horizontal reciprocable slide member loosely engaged by said guides, said slide member supporting a hood-cap applying mechanism, including a magazine for preformed hood-caps, a hood-cap delivery chute, and automatic means whereby a single hood-cap is placed over the mouth of each bottle passing from said filling machine to said sealing head said horizontal slide member movable along said guides whereby said delivery chute will deliver hood-caps to a plurality of bottles for sealing by a plurality of sealing mechanisms supported by either of said vertical supporting posts.

4. A combined filling and sealing machine for bottles comprising a filling machine having a supporting frame, a pair of vertical posts, one of said posts for supporting a disc-cap applying mechanism and one of said posts for supporting a hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon said vertical supporting post, said post also adapted to support a hood-seal mechanism, a set of relatively fixed horizontal guides and supporting member associated with said supporting frame, a horizontal reciprocable slide member slidably engaged upon said guides, said slide member supporting a magazine for preformed hood-caps, a hood-cap delivery chute, and means whereby a single hood-cap is placed over the mouth of each bottle passing from said filling machine to said hood-cap sealing mechanism; said horizontal slide member being horizontally movable along said guides whereby said delivery chute will deliver hood-caps to bottles for sealing by a sealing mechanism supported by either of said vertical supporting posts.

5. A combined filling and sealing machine for bottles comprising a filling machine having a supporting frame, a pair of vertical posts, one of said posts for supporting a disc-cap applying mechanism and one of said posts for supporting a hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon said vertical supporting post, said post also adapted to

support a hood-seal mechanism, a set of relatively fixed horizontal guides and supporting members associated with said supporting frame, a horizontal reciprocable slide member slidably engaged upon said guides, said slide member supporting a power unit, a magazine for preformed hood-caps, a hood-cap delivery chute, automatic means for transferring said hood-caps from said magazine to said chute, said automatic means controlled by a predetermined number of hood-caps in said chute, means connected with said chute to suspend a hood in the path of a bottle moving from said filling machine to said hood-cap sealing mechanism, the forward edge of the bottle head around the top of the bottle engaging against the skirt of the suspended hood-cap and removes it from the chute; said horizontal slide member being horizontally movable along said guides whereby said delivery chute will deliver hood-caps to bottles for sealing by a sealing mechanism supported by either of said vertical supporting posts.

6. In a device of the character disclosed, in combination, a common support mechanism for a bottle filling, disc-cap applying, hood-cap applying and hood-cap sealing mechanism; a pair of rotatable vertical posts, one of said posts for supporting said disc-cap applying mechanism, and one of said posts for supporting said hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon its vertical supporting post and said post which supports said disc-cap applying mechanism adapted to support said hood-cap sealing mechanism; a set of relatively fixed horizontal guides and supporting members associated with said common supporting mechanism, a horizontal reciprocable slide member slidably engaged upon said horizontal guides, said slide member supporting a magazine for preformed hood-caps, a hood-cap delivery chute having one end adjacent said magazine and with a vertically adjustable discharge section having an end disposed in the path of travel of the bottles to be sealed, said chute being narrow in its horizontal dimension and shaped for a hood to roll edgewise therein from the hood magazine to its discharge section, means for transferring said hood-caps from said magazine to said chute controlled by a predetermined number of hood-caps in said chute; means whereby a single hood-cap is placed over the mouth of each bottle passing to said hood-cap sealing mechanism; and said slide member being horizontally movable along said guides whereby said delivery chute will deliver hood-caps to bottles for sealing thereon by a mechanism supported by either of said vertical supporting posts, thus, when the bottle to which the hood is to be applied moves to the hood cap applying station, the forward edge of the bottle head around the bottle mouth engages against the skirt of the hood, causing the hood to be tilted and drop onto the mouth of the bottle.

7. The combination with a bottle filling machine and sealing machine with a common stationary support, having a mechanism for filling bottles, mechanism for applying disc-caps in the mouths of said bottles when desired, mechanism for applying hood-caps over the mouths of said bottles, mechanism for sealing said hood-caps upon said bottles, conveying means for moving said bottles to said disc capping and hood-cap sealing mechanisms, a plurality of rotatable vertical posts supported by said common stationary support, one of said posts for supporting and rotating said disc-cap applying mechanism, and

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one of said posts for supporting and rotating said hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon its supporting post and said post which supports said disc-cap applying mechanism also adapted to support said hood-cap sealing mechanism, a fixed horizontal guide member and supporting means associated with said common stationary support, a horizontal reciprocable slide member slidably engaged upon said guide member, said slide member supporting means for storing a bulk supply of hood-caps, means for withdrawing successive hood-caps from said supply and depositing them in a delivery chute, means associated with said chute operable in accordance with the movement of the bottles to be sealed for applying a hood-cap over the top of a bottle disposed in the path of travel of said bottle, and said slide member being horizontally moveable along said guide whereby said delivery chute will deliver hood-caps to bottles for sealing thereon by a mechanism supported by either of said vertical rotatable posts.

8. A combined bottle filling and sealing machine having a common support, comprising, a filling machine with automatic mechanism for filling bottles, an automatic disc-cap applying mechanism for applying discs in the mouth of bottles, power driven means for moving filled bottles to said disc-cap applying mechanism removably mounted upon a vertical rotating shaft adapted to support either disc-cap applying mechanism or hood-cap sealing means, automatic hood-cap sealing mechanism mounted upon a vertical rotating shaft adjacent said first mentioned shaft, power driven means for moving bottles to said hood-cap sealing mechanism, and power driven mechanism for discharging said sealed bottles, said hood-cap applying mechanism including a magazine for preformed hood-caps associated with a delivery chute, a plurality of hood-caps in said magazine, means for supporting said hood-cap applying mechanism and its separate power driving unit on two horizontal shafts so that said mechanism and driving unit as an entirety may be readily tipped to one side and moved as an entirety to a new location along said shafts, said hood-cap delivery chute having one end disposed in the path of travel of the bottles and the other end disposed adjacent said hood magazine, said chute being narrow in its horizontal dimension and shaped for a hood to roll edgewise thereon from the hood magazine, automatic means for transferring said hood-caps from said magazine to said chute, said automatic means controlled by a predetermined number of hood-caps in said chute, means connected with said chute to suspend a hood in the path of a bottle being moved to said hood-sealing mechanism, the forward edge of the head around the top of said bottle engaging against the skirt of a hood-cap being suspended and causing said hood-cap to be removed from said chute.

9. In combination, mechanism for filling, capping, and sealing bottles, a common support for said mechanisms, a conveyor mechanism for moving filled bottles to a disc-cap applying station and then to a hood-cap applying mechanism, the hood-cap applying and sealing mechanism including a magazine for preformed hood-caps, a delivery chute, and a pneumatic means automatically controlled and operated in accordance with the movement of said bottles whereby each bottle receives a single hood-cap from said delivery chute, a pair of vertical posts, one of said posts

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for supporting a disc-cap applying mechanism and one of said posts for supporting a hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon its vertical supporting post and said post which supports said disc-cap applying mechanism also adapted to support a hood-sealing mechanism, a set of two relatively fixed horizontal parallel guides having a horizontal reciprocable slide housing member slidably mounted thereon and supporting said hood-cap applying mechanism, said slide member normally rests upon the two fixed parallel guides at one end thereof whereby the delivery chute will deliver hood-caps to bottles traveling between said disc-cap applying station and said hood-cap applying mechanism, means to allow tilting and horizontal moving of said housing whereby said housing can be moved to the opposite end of said parallel guides and whereby said housing can rest thereon so that said delivery chute will deliver said hood-caps to bottles traveling between the bottle filling mechanism and the first of said vertical posts, whereby bottles may be sealed with hood-caps and without disc-caps when a hood-cap sealing mechanism is mounted upon said first named vertical post, mechanism for sealing said hood-caps on said bottles, and mechanism for discharging said sealed bottles.

10. The combination with a bottle sealing machine, a plurality of vertical posts, one of said posts which supports said disc-cap applying mechanism, one of said posts for supporting a hood-cap sealing mechanism, said disc-cap mechanism being removably secured upon said vertical post which supports said disc-cap applying mechanism and said post also adapted to support a hood-sealing mechanism, a set of relatively fixed horizontal, parallel guides, in juxtaposition with said posts, a horizontal reciprocable slide member supported by said guides, said slide member supporting a power unit housing, said housing supporting a magazine for preformed hood caps, a delivery chute, means for transferring said hood caps from said magazine to said delivery chute, and automatic means operable in accordance with the movement of bottles upon said machine to said sealing heads whereby each bottle receives a single hood over the mouth of said bottle; said horizontal reciprocable slide member being horizontally movable along said guides whereby said delivery chute will deliver hood caps to bottles for sealing by a sealing mechanism supported by either of said vertical supporting posts.

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