May 29, 1928.

1,671,804

C. A. ALEXANDERSON

BOTTLE CAPPING MACHINE

Filed June 7, 1923

6 Sheets-Sheet 1

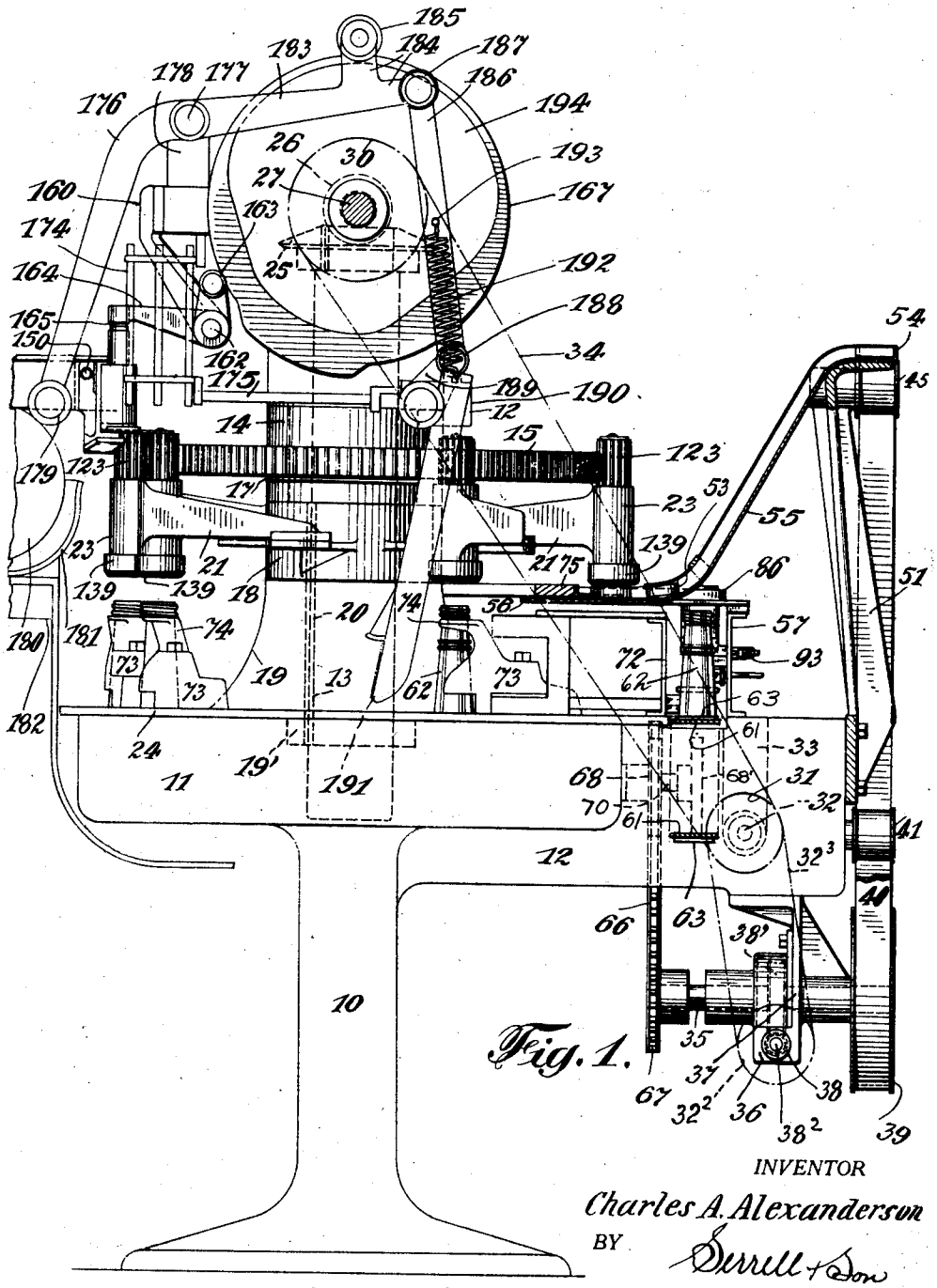


Fig. 1.

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6 Sheets-Sheet 2

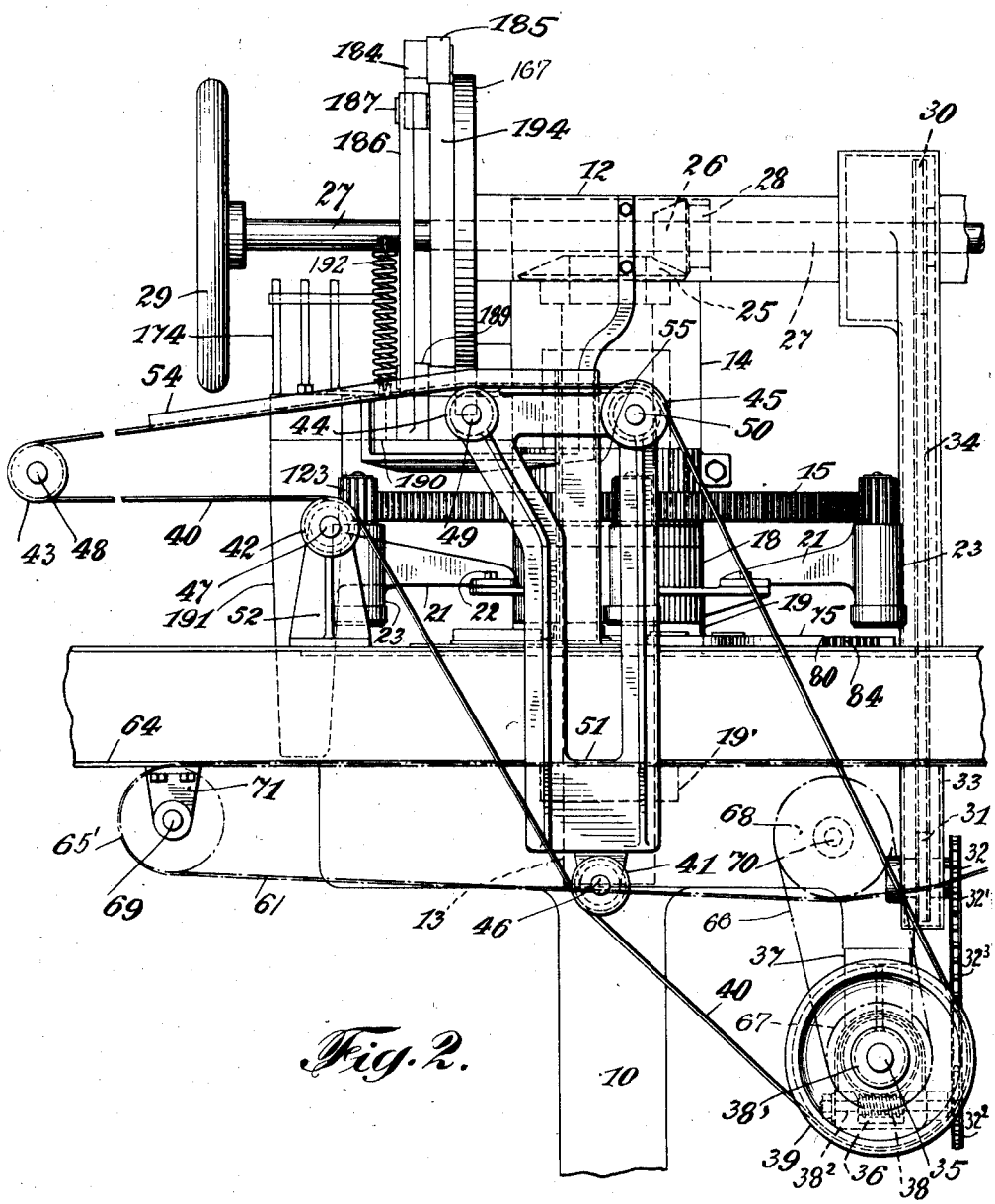


Fig. 2.

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BOTTLE CAPPING MACHINE

Filed June 7, 1923 6 Sheets-Sheet 3

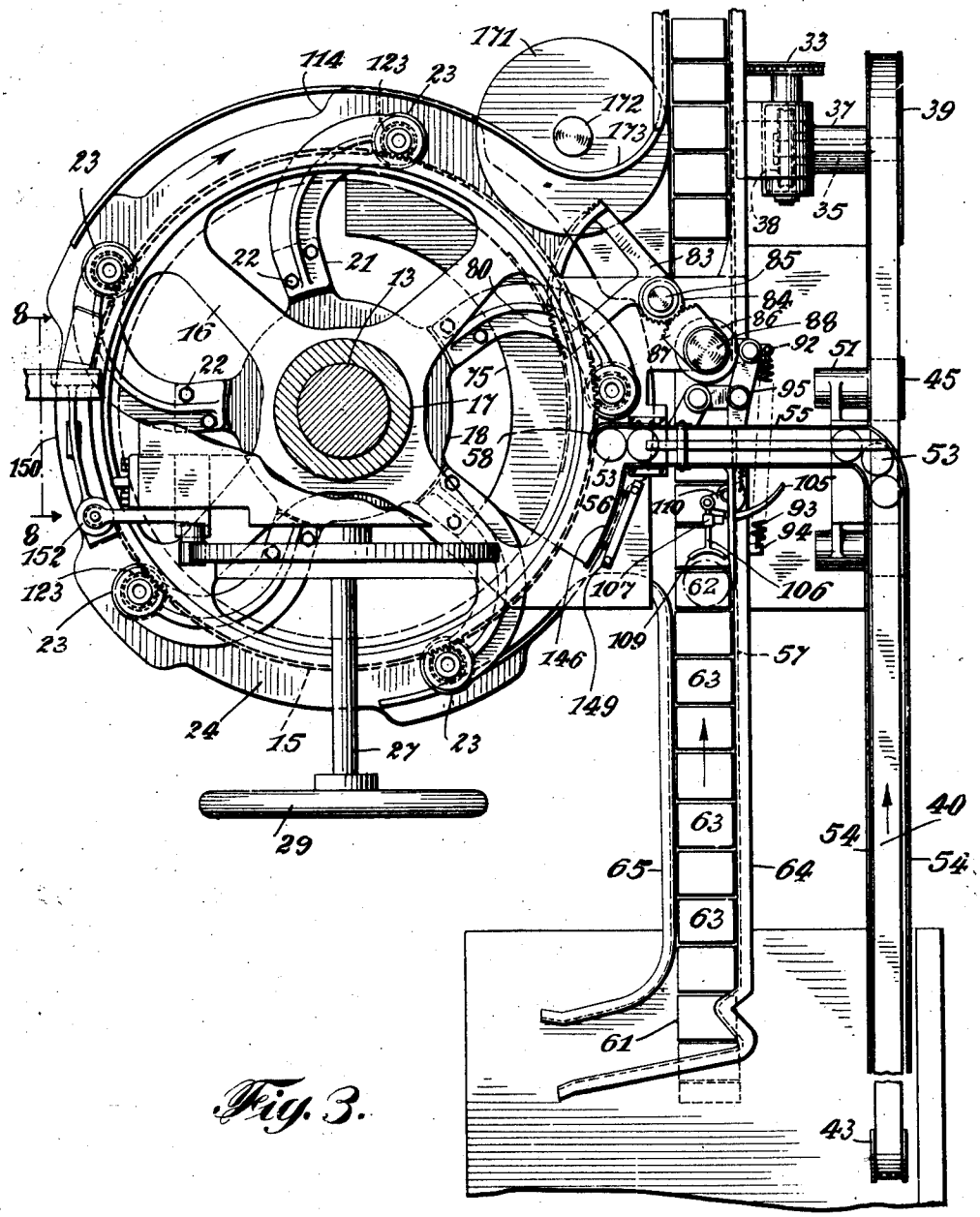


Fig. 3.

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BOTTLE CAPPING MACHINE

Filed June 7, 1923 6 Sheets-Sheet 4

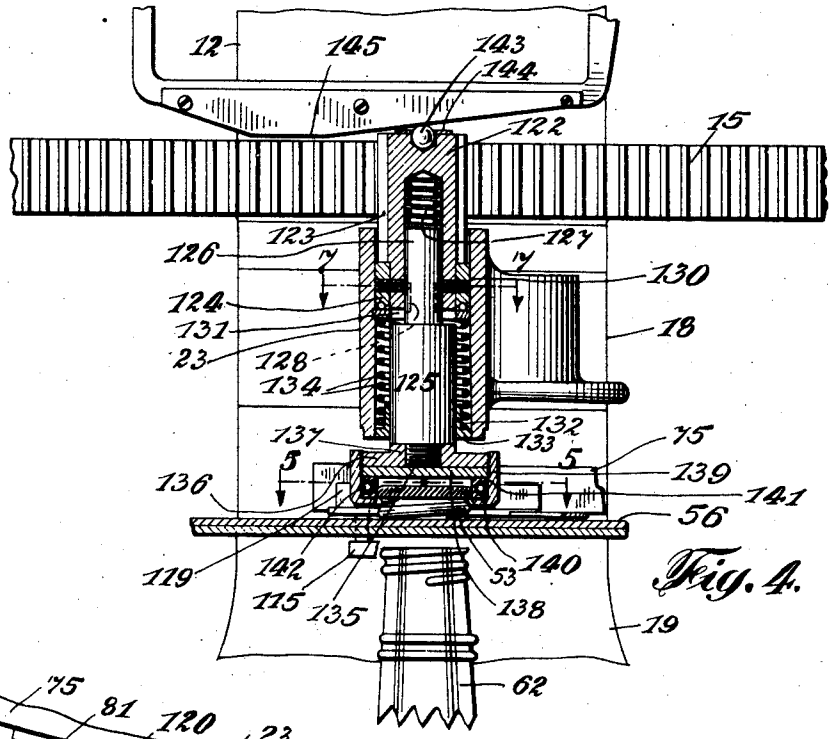


Fig. 4.

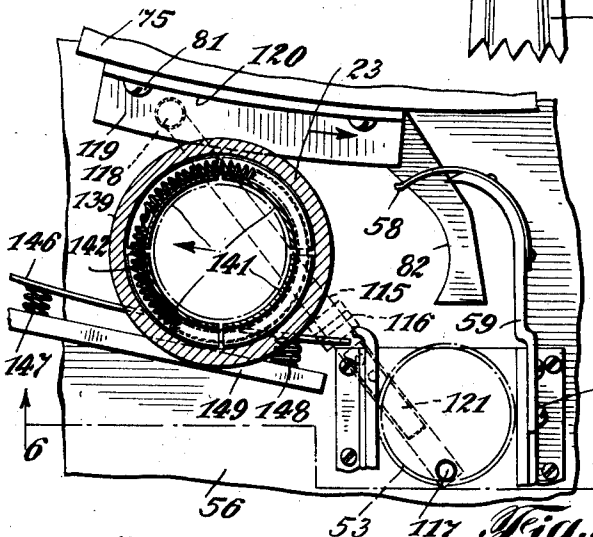


Fig. 5.

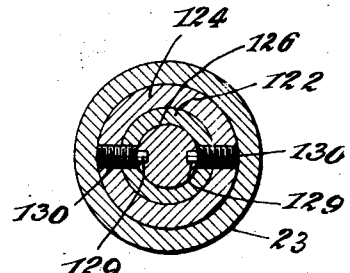


Fig. 7.

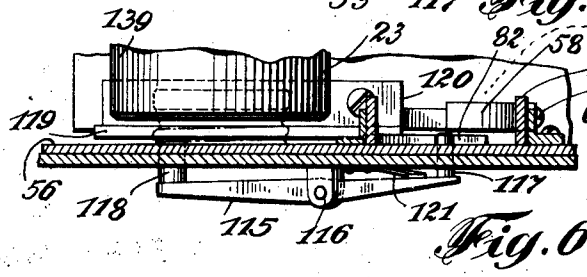


Fig. 6.

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BOTTLE CAPPING MACHINE

Filed June 7, 1923 6 Sheets-Sheet 5

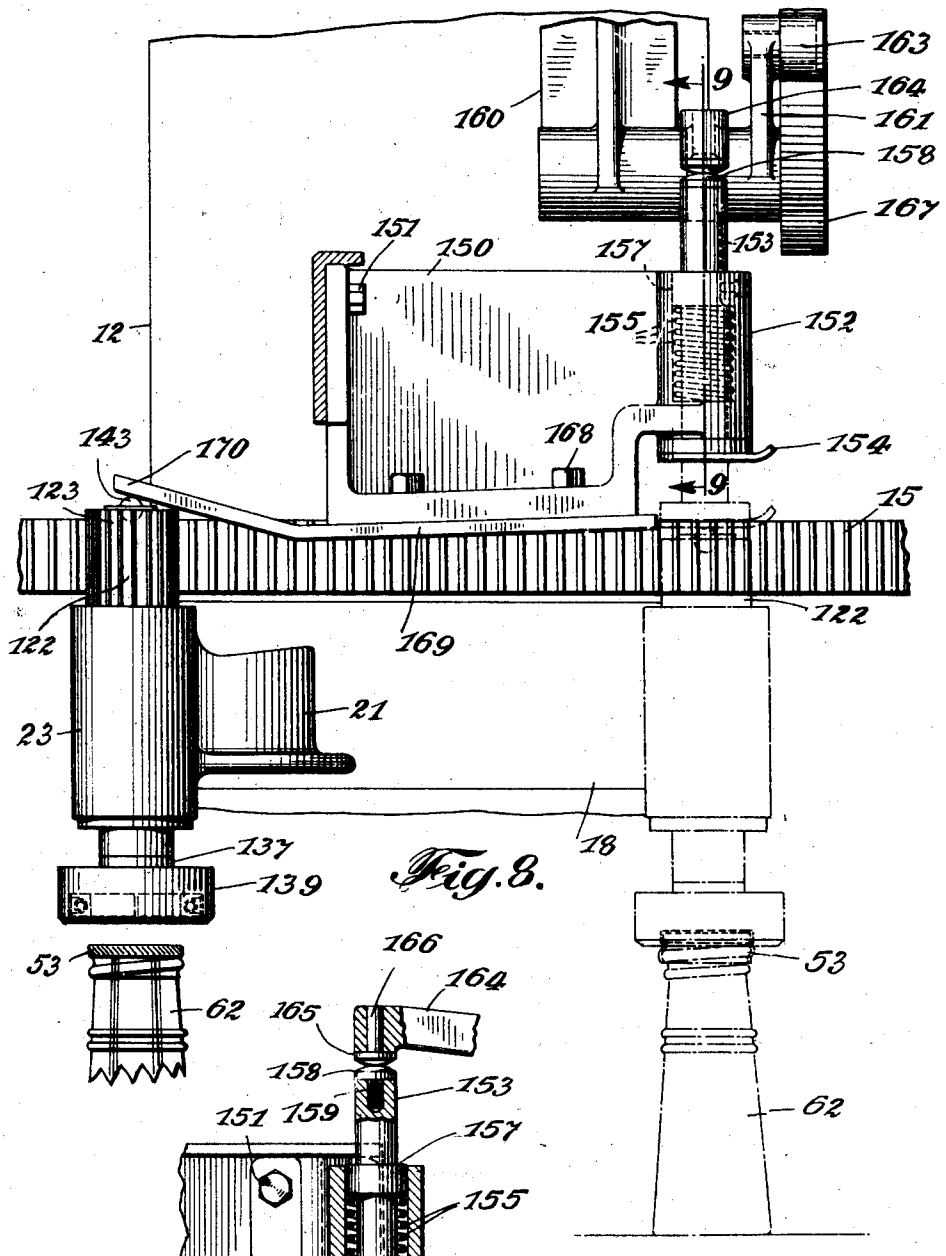


Fig. 8.

Fig. 9.

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BOTTLE CAPPING MACHINE

Filed June 7, 1923 6 Sheets-Sheet 6

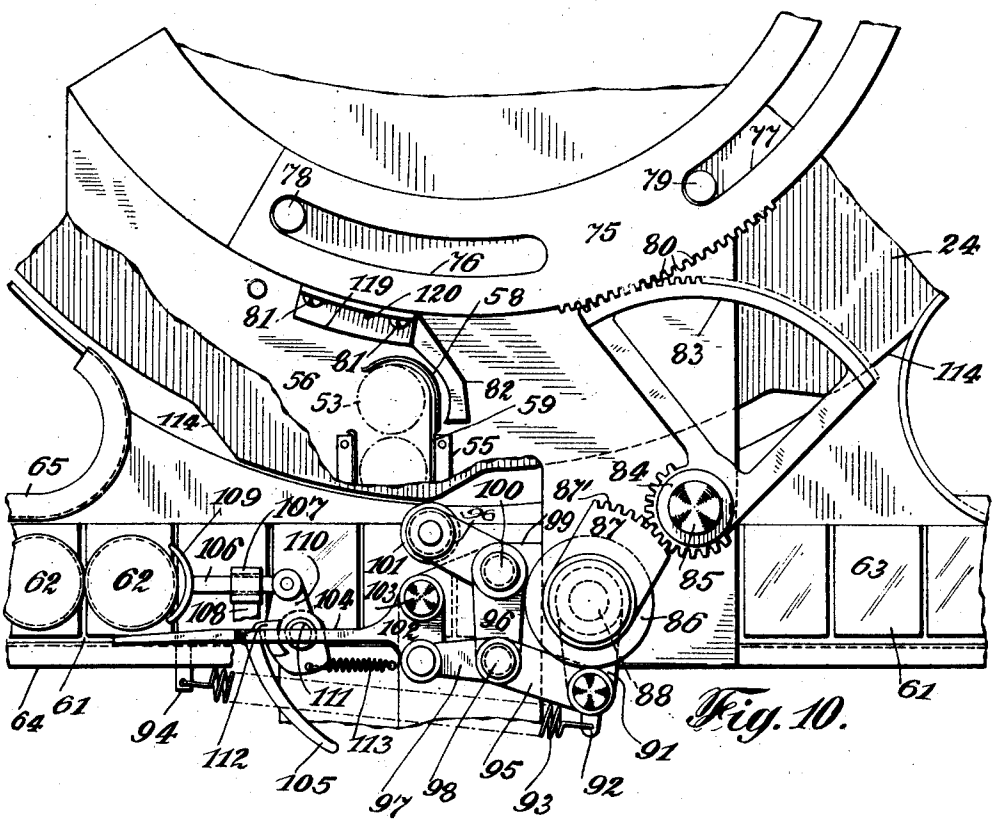


Fig. 10.

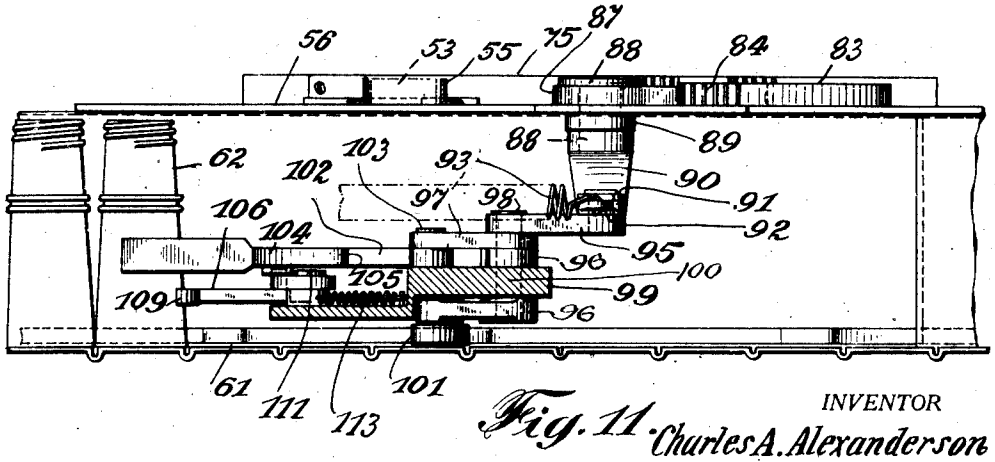


Fig. 11.

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Patented May 29, 1928. 1,671,804

UNITED STATES PATENT OFFICE.

CHARLES A. ALEXANDERSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO EUGENE W. DURKEE, OF NEW YORK, N. Y; EMMA W. DURKEE, HELEN W. D. MILEHAM, AND GUARANTY TRUST COMPANY OF NEW YORK, ADMINISTRATORS OF SAID EUGENE W. DURKEE, DECEASED.

BOTTLE-CAPPING MACHINE.

Application filed June 7, 1923. Serial No. 643,836.

This invention relates to bottle capping apparatus, and more particularly to means for applying screw-threaded caps to bottles provided with threaded necks.

The invention consists essentially in providing a plurality of spaced cylindrical holders for the capping mechanism, with means for moving such holders in a circle over a turntable upon which the bottles are carried, and means for continuously rotating such capping mechanism within the holders during their circular movement so that the threaded caps are picked up at a predetermined point, and afterwards screwed upon the threaded necks of the bottles, the movement of the holders being at the same speed as that of the turntable so that the cap carrying devices are always in alignment with a bottle at the time a cap is to be attached thereto.

One object of the invention is to provide for the feeding of the caps one at a time at proper intervals, and a further object is to provide means whereby no cap will be fed unless a bottle is being carried forward to the turntable.

With these general objects in view the invention consists in the combination, details of construction and arrangement of parts which are hereinafter particularly described.

In the accompanying drawings:

Figure 1 is a front elevation of the machine, partly in section.

Fig. 2 is an elevation at the right hand side of the machine.

Fig. 3 is a top view of the machine, parts being broken away, and the vertical shaft and hub of the stationary rack being in section.

Fig. 4 is a detail view showing one of the holders for the capping mechanism in section, and the means for operating such mechanism when picking up a cap.

Fig. 5 is a detail view of such mechanism enlarged taken on the broken line 5—5 of Fig. 4.

Fig. 6 is a side view of the same taken on the line 6—6 of Fig. 5.

Fig. 7 is a sectional view enlarged on the line 7—7 of Fig. 4.

Fig. 8 is a detail view in enlarged size looking at the machine from the point indicated by the broken line 8—8, Fig. 3, illustrating the means for operating the capping mechanism when a cap is screwed upon the top of a bottle.

Fig. 9 is a sectional view on the broken line 9—9 of Fig. 8.

Fig. 10 is a top view showing in detail the mechanism for pushing the bottles from the feed belt onto the turntable, and for holding and carrying forward a cap after it has passes down the inclined chute, and

Fig. 11 is a side view of the same.

Similar reference numerals indicate like parts throughout the several views.

Referring to the drawings, 10 indicates a column supporting the stationary bed 11, and frame 12 of the machine.

A rotary vertical shaft 13, has its lower end seated in a circular recess in the bed 11, as shown in broken lines Fig. 1. and is supported above the bed in a bearing 14 fixed to the frame of the machine. The said recess in the bed is preferably enlarged at its top for the purpose hereafter mentioned.

15 denotes a circular rack horizontally positioned provided with spaced arms 16, extending from a central hub 17, fixed to the bearing block 14, whereby the rack is held stationary. Hubs 18 and 19, are secured to the vertical shaft 13 in any suitable manner, such as by a key 20, shown in broken lines in Fig. 1.

Attached to the hub 18 and projecting horizontally therefrom are a plurality of equally spaced curved arms 21. One end of each of these arms is securely fixed to the hub 18 by bolts 22, or other suitable means. The other or free end of each arm carries a tubular holder 23, for the capping mechanism hereinafter described.

These holders are preferably made integral with the arms, but may be separate members, and secured to the arms in any suitable manner.

24 indicates a turntable integral with the hub 19, whereby it is rotated horizontally by the vertical shaft 13, and uniformly with the arms 21.

The hub 19 is preferably provided on its bottom with an annular boss 19′ surround-

ing the central opening in the hub. This boss being seated in the enlargement of the recess in the bed as shown in broken lines Fig. 1.

A bevel gear 25 is fixed upon the upper end of the vertical shaft 13 which meshes with a bevel gear 26 fixed upon a horizontal shaft 27 supported in bearings 28, upon the frame of the machine. The horizontal shaft 27 is driven by any suitable power, preferably by a motor (not shown) but it may also be rotated by a hand wheel 29 fixed to the opposite end of the shaft 27 as shown in Figs. 2 and 3.

The hubs 18 and 19 being fixed to the vertical shaft 13, it will be seen that the arms 21 carrying the tubular holders 23, and the turn table 24, will be rotated simultaneously and at the same speed when the vertical shaft is rotated by means of the bevel gears 25 and 26 during the revolution of the horizontal shaft 27.

A sprocket wheel 30 is fixed upon the shaft 27 and another sprocket wheel 31 of smaller diameter is fixed upon a stub shaft 32 supported in bearings in a bracket 33 upon the frame 12. A sprocket chain 34 extends over these wheels 30 and 31.

The stub shaft 32 carries a sprocket $32'$ which connects with sprockets 32^2 mounted on the shaft 38^2 by a chain 32^3. Fixed to the shaft 38^2 is a worm 38 meshing with a worm gear $38'$ upon a shaft 35 which drives a pulley 39. A belt 40 extends over the pulley 39 and over idlers 41, 42, 43, 44 and 45 upon shafts 46, 47, 48, 49 and 50, supported in bearings upon brackets 51 and 52 fixed to the frame of the machine as shown in Fig. 2.

The caps 53 are fed by hand onto the belt 40, which travels between side rails 54 which are curved towards the turn table 24 at approximately its center, whereby the caps are conveyed into the inclined chute 55, and fall by gravity upon the platform 56, supported by the upright 57 attached to the frame of the machine. The lowermost cap is caught and held by a curved finger 58, secured to a bracket 59 attached to the frame by screws 60, or other suitable means.

61 indicates an endless conveyor for the bottles 62.

The bottles are placed by hand upon this conveyor at the front of the machine and carried forward by it to the point at which they are pushed off upon the turn table 24, by the mechanism hereafter described. This conveyor may be of any suitable construction, but I prefer to employ a chain belt carrying a plurality of plates 63 hinged together, traveling between side rails 64 and 65, the rail 65, being removed between the points at which the bottles are pushed upon the turn table and that at which they are delivered therefrom, the ends of said rail being curved at such points to guide the bottles towards and from the turn table at the respective points.

The conveyor 61 passes over sprocket wheels $65'$ fixed to shafts 69, supported in bearings upon brackets 71 fixed to the frame of the machine, and may be driven by any suitable means. In Fig. 2 of the drawings I have illustrated a sprocket wheel 68 fixed to a shaft 70 rotated by a chain belt 66 which passes over the sprocket 68 and over the sprocket wheel 67 which is fixed to the shaft 35. The sprocket 68 is located beyond the conveyor, and the shaft 70 extends within the conveyor belt and at this point there is fixed a drive sprocket wheel $68'$ which engages the links on the inner side of the belt 61, and thus drives the conveyor. This drive sprocket being of the same size as the sprocket 68, is not shown in Fig. 2 of the drawing as it would cover the sprocket 68, and obscure the means for rotating the shaft 70.

A shield or guard 72 is supported upon the frame 12, adjacent the periphery of the turn table 24 at the point where the bottles are pushed from the conveyor 61 upon the turntable to prevent any possibility of the bottles being thrown off by centrifugal force.

Bolted or otherwise fixed to the top of the turntable 24, adjacent its periphery are a plurality of equally spaced members 73 each provided with an arm 74 forked at its upper end which members engage the bottles after they have been conveyed to the turntable, and hold them in the desired spaced relation while they are upon the turntable.

Slidably mounted upon the platform 56 is a semi-circular plate 75 provided with two curved longitudinal slots 76 and 77, spaced at a predetermined distance apart into which project pins 78 and 79 fixed to the platform 56. The periphery of this plate 75 is provided at a predetermined point with teeth 80, and secured to the periphery of the plate 75 by screws 81, or other suitable means at a predetermined point from said teeth is an arm 82, somewhat curved on one side, which when the parts are in the position shown in Figs. 3 and 10 is slightly below and adjacent the back of the curved spring finger 58 by which one of the caps 53 is at that time being held.

A segment gear 83 provided with a toothed hub 84 pivoted at 85, to the platform 56 meshes with the teeth 80 on the plate 75.

A disk 86 rests upon the top of the platform 56 to which it is secured in any suitable manner, and is provided with a central circular opening registering with a like opening in the platform.

A broad flat arm 87 rests upon the disk 86 and is provided with a spindle 88 which

extends through the openings in the disk and platform in which it is rotatable. This spindle is secured below the platform to the hub 89 of a depending arm 90 at the lower end of which there is a right angle arm 91, with a projecting lug 92. The ends of the flat arm 87 are rounded, and the projecting end is provided with teeth 87′ which mesh with the teeth on the hub 84 of the segment gear 83.

A spiral spring 93 is attached at one end to the lug 92, and at its other end to a lug 94 fixed to the frame of the machine. A link 95 is pivotally connected at one end to the end of the arm 91, its other end being pivotally connected to the end of one arm of a bell crank 96 and to one end of a link 97 by a pivot pin 98.

The two arms of the bell crank lever 96 are integral with a central hub, one arm extending from the top of the hub and the other arm from the lower end of the hub so that the upper arm passes over the top of a part 99 of the frame while the lower arm passes beneath the part 99 as shown in Fig. 11. A fulcrum pin 100 passes through an opening in the hub, the lower end of the pin 100 passing into an opening in the part 99 of the frame. To the end of the lower arm of the lever 96 is pivotally connected a roll 101. The other end of the link 97 is pivotally connected to one end of a link 102, the other end of which is connected with a stationary pivot 103.

The link 102 has an extension 104 which acts as a pusher rod normally extending parallel with the conveyor 61. This pusher rod carries a curved arm 105 projecting outwardly therefrom at approximately the middle of the rod.

A rod 106 extends parallel with the conveyor 61 and is slidably supported at a predetermined height above the same in a bearing 107, at one end of a bracket 108, its other end being secured to the frame of the machine.

Upon one end of the rod 106 is a semi-circular member 109 which faces the bottles as they are carried forward upon the conveyor 61. The other end of the rod 106 is pivotally connected to one end of a link 110 pivoted at 111, to the frame, and curved on one side correspondingly with the curvature of the arm 105 carried by the push rod 104. Upon the curved side of the link 110, there is a catch 112 which normally projects over the inner end of the curved arm 105, being retained in such position by a spiral spring 113 one end of which is secured to the outer end of the link 110, its other end being connected to the frame of the machine.

As the bottles 62 are carried forward upon the conveyor 61, the foremost bottle contacts with the semi-circular end 109 of the rod 106 forcing the rod backward which turns the link 110 on its pivot pin 111 against the tension of the spring 113, releasing the catch 112 from the curved arm 105, whereby the push rod 104 is free to turn upon the pivot 103, contacting with the foremost bottle and pushing it from the conveyor 61 onto the turntable 24 during which movement of the push rod, the spring 113 is prevented from contracting by the curved arm 105, being carried in front of the catch 112. This movement of the push rod occurs simultaneously with the operation of the segment gear 83, and at the time one of the caps 53 has dropped into engagement with the spring finger 58, all of which are effected through the medium of the link 95, lever 96 and links 97 and 102, which are operated intermittently by the spaced cams 114 upon the periphery of the turntable contacting with the roll 101 on the end of the crank lever 96.

When one of the elevations on the cam 114 passes off the roll 101, the spring 93 is free to contract thereby drawing the arm 91 forward whereby the flat arm 87 is given a partial rotation, its teeth 87′ engaging the teeth on the hub 84 of the segment gear 83 gives such segment a movement in the opposite direction while the teeth on its periphery meshing with the teeth 80, on the plate 75, will carry said plate in the same direction. This movement of the plate 75 draws the curved arm 82 closely beneath the spring finger 58 when it contacts with the cap at that time held by said finger, releasing the cap therefrom, and carrying it along upon the platform 56 into a position to be picked up by the mechanism hereinafter described.

At the time the pusher 82 reaches its extreme forward movement the next elevation on the cam 114 contacts with and passes over the roll 101, depressing the same whereby the spring 93 is expanded returning the parts to their initial positions or that shown in Figs. 3 and 10.

A diagonally arranged bar 115 is pivoted at or near its center to a lug 116, secured to the under side of the platform 56. This bar 115 is provided at one end with a vertical pin 117, and at its other end with another vertical projection or pin 118. These pins project through holes in the platform provided for that purpose. When one of the caps has been released from the finger 58, and carried forward under the picking up mechanism by the arm 82, as above described, the pin 118 at one end of the bar 115 is depressed by the flange 119 of the strip 120, to which the arm 82 is secured, thereby throwing upward the other end of the bar and the pin at that end which engages the next cap passing down the inclined chute 55 preventing the further movement

of such cap until released, which is done when the flange 119 passes off the top of the pin 118 on the return movement of the parts, by the action of the spring 121 upon that end of the bar 115. This is best illustrated in Figs. 5 and 6 of the drawings.

It will be seen from the foregoing description that unless the catch 112 is released, the push bar 104 and segment gear 83 will remain stationary in the positions shown in Fig. 10, and that the catch is only released when a bottle is being carried forward upon the conveyor 61, consequently unless a bottle is being thus conveyed no cap will be released from the finger 58 by which it is held during such inaction of the segment gear.

Each of the tubular holders 23 carries the capping mechanism next described.

An upright shaft 122 is arranged in the upper part of the holder and projects a predetermined distance above the top of the holder, this projecting portion being provided with longitudinal teeth 123 which mesh with the teeth on the circular stationary rack 15. The lower portion of this shaft 122, passes into a bushing 124 within the holder. The shaft is provided with a central vertical bore extending to a predetermined distance from its upper end.

A plunger 125 is provided with a spindle 126 which fits into said bore, its upper end bearing against the lower end of a spiral spring 127 which is located within the bore in the space between its top and the upper end of the spindle 126. The spindle 126 has upon opposite sides vertical slots 128 of predetermined length and the reduced ends of pins 129 project into these slots, said pins passing through threaded openings in the bushing 124 and shaft 122, and being provided with screw threads 130.

A ring 131 surrounds the spindle 126 below said slots 128, and a sleeve 132, having a flange 133, which is fixed to the holder 23, surrounds the plunger 125 at the bottom of the holder.

A coiled spring 134 surrounds the plunger, one end being connected to the ring 131, and its lower end seated upon the flange 133 of the sleeve 132.

The plunger 125 is provided at its bottom with a threaded projection 135, which is screwed into a threaded opening in the center of a circular plate 136, provided with a boss 137; the bottom of the projection 135 rests upon another circular plate 138, in contact with the plate 136. Both of these plates are threaded on their peripheries and screw into the threaded upper end of a throat member 139. This member is open both at top and bottom, but is provided with an inturned annular flange 140 at its bottom upon which is seated a cap gripping member 141 divided into four segments, each segment having a groove on its outer side to receive the spiral spring 142, the outer sides of the sections contacting with the interior surface of the member 139 above its flange 140.

In the top of the shaft 122 there is a rounded recess into which is placed a ball 143, which is held in said recess by a plate 144 fixed to the top of the shaft and having a central opening through which the ball projects. 145 denotes a cam bracket fixed to the frame of the machine which acts upon the ball 143, in the manner hereinafter described. The mechanism just described is best illustrated in Figs. 4, 5 and 7 of the drawings.

The movements of the parts are so timed that when a cap has been carried by the arm 82 to its extreme movement, the cap is directly in alignment with the throat member 139, and gripper 141, at the same time the upper end of the shaft 122 is passing under the cam bracket 145, the ball 143, coming into contact with the inclined under surface of the bracket causing the shaft 122 to be depressed against the action of the springs 127 and 134, thereby pressing down the plunger 125, which in turn presses downward the throat member 139 over the cap 53 which is then frictionally engaged by the gripper 141 (see Fig. 4) and as the cam 145 continues to act in a further depression of the shaft 122 while traveling under said cam the cap is more firmly grasped by the gripper and carried along thereby. The parts are returned to a normal position when the ball 143 passes under the upwardly inclined end of the bracket 145, by the expansion of the springs 127 and 134; the cap however still being held by the gripper 141. The pins 129 acting in the slots 128 of the spindle 126, limit the downward movement of the shaft 122.

It is important that when the caps are released from the curved finger 58 by the pusher 82, and carried forward thereby that their movement be uniform, particularly when they reach the point exactly in alignment with the picking up mechanism, and to prevent any possible chance of any irregular movement of the caps when the pusher reaches its extreme forward movement I provide a strip 146 connected by coiled springs 147 and 148 to a bar 149, supported upon the frame of the machine in any suitable manner, which strip exerts a slight frictional bearing upon the caps sufficient to prevent any displacement and to hold them in true alignment with the mechanism by which they are picked up.

With the mechanism within the holders 23, continuously rotating through the gearing at the top of the shafts 122, meshing with the stationary rack 15, and such holders traveling around the rack at the same speed as that of the turntable 24 which carries

the bottles 62 in regularly spaced order as before described, the picked up caps are carried directly above and in exact alignment with the bottles, and are screwed over their necks by the means next described.

A bracket 150 fixed to the frame of the machine by bolts 151, or other suitable means, supports at one end a housing 152 in which is located a plunger 153 provided with a presser foot 154 at its lower end exterior of the housing. This plunger is surrounded within the housing by a coiled spring 155, one end of which is seated upon an annular shoulder 156 inside the housing with its upper end bearing against a collar 157 fixed to the plunger. The top of the plunger 153 is provided with a rounded head 158 having a threaded stem 159 which is screwed into a threaded recess in the top of the plunger.

Another bracket 160 is fixed to the frame of the machine above the bracket 150. A link 161 is pivoted at one end to the lower end of the bracket 160, by a pivot pin 162, the free end of the link 161 carries a roll 163. This link 161 at its pivoted end is connected to an arm 164, the free end of which is provided with a rounded head 165, having a smooth stem 166, extending into an opening in the free end of the arm. This head 165 contacts at all times with the head 158 at the top of the plunger 153.

A cam 167 fixed to the drive shaft 27 has upon its periphery an elevation which at predetermined intervals during the revolution of the shaft 27 contacts with the roll 163 at the end of the link 161, forcing downward the headed end of the arm 164, thereby depressing the plunger 153, and its presser foot 154. This action takes place at the moment one of the holders 23 has reached a point directly in alignment with the presser foot 154, whereby the presser foot striking the ball 143 at the top of the shaft 122, depresses the same and the throat member 139 so that the cap being at that time carried by the segmental ring 141 is brought into contact with the top of a bottle and in consequence of the continuous rotation of the throat member 139, the turning of the cap upon the neck of the bottle is started.

The bottom of the bracket 150 is slightly inclined downwardly in the direction of the travel of the holders 23, and secured to this inclined bottom by bolts 168, or otherwise, is a flat plate 169 similarly inclined for a predetermined distance from which point it terminates in an upwardly inclined direction as at 170. At the moment that the screwing of a cap upon the neck of a bottle is started as just described, the geared end of the shaft within the holder carrying such cap is closely adjacent the end of the downwardly inclined portion of the plate 169, so that before the presser foot 154 rises by the expansion of the spring 155 after the enlarged portion of the cam 167 moves off the roll 163, the ball 143 at the top of the shaft in contact at that time with such presser foot is carried under the downwardly inclined surface of the plate 169, and during its travel thereunder the cap has been completely screwed down over the neck of the bottle, so that when the holder reaches the upwardly inclined end 170 of the plate 169, the cap is released from the grasp of the segmental ring 141, which is then elevated with the throat member 139 above the capped bottle by the expansion of the springs 127 and 134.

The operation just described is most clearly illustrated in Fig. 8 of the drawings, the broken lines showing the relative positions of the members at the time the screwing of a cap upon the neck of a bottle is begun, and the full lines the position of such parts after the cap has been fully attached to the bottle and released from the grasp of the segmental ring.

The bottles thus capped are carried by the turntable until they reach the disk 171 fixed to a vertical shaft 172, mounted in suitable bearings supported by the frame of the machine, which shaft is rotated counter clockwise by any suitable means. The capped bottles as they are delivered from the turn table upon the disk 171, are carried by it to and upon the conveyor 61, being guided by the curved guide rail 173. The capped bottles may be taken from the conveyor by hand, or carried to a table or any suitable receptacle.

The machine in its entirety includes means for applying labels to the bottles as they are carried around upon the turn table and between the times that a cap has been picked up by one of the gripper members 141 and before it is screwed upon the neck of a bottle.

A label holder 174 is connected to one end of an arm or bracket 175, fixed at its other end to the frame of the machine. A swinging arm 176 is pivotally connected at its upper end by a pivot pin 177 to the upper end of an upright 178 fixed to the frame of the machine. The upper end of the arm 176 is curved and extends downwardly at an inclination, and has pivotally connected to its lower end a roll 179 which normally contacts with a revolving glue roller 180 supported in a glue receptacle 181 seated upon a bracket 182 fixed to the frame of the machine.

Another arm 183 is pivotally connected at one end to the pivoted end of the arm 176, and extends therefrom in a slightly upward inclination, and has at a predetermined distance from its other end a vertical branch 184, to the upper end of which is pivoted a

roll 185. At the end of the arm 183 beyond the branch 184, a downwardly projecting arm 186 is pivotally connected by a pivot pin 187. This arm is slightly inclined outwardly and its lower end is pivotally connected by a pivot pin 188 with one end of a short link 189, the other end of which is pivotally connected to a lug 190 upon a swinging trough 191, bifurcated at its lower end.

The pivot pin 188 extends from the fixed end of the bracket 175, so that the link 189 and trough 191 turn upon such pivot pin. A spiral spring 192 is connected at one end to a pin 193, projecting from the arm 186 and its other end is connected to the frame of the machine.

A cam 194 is fixed upon the drive shaft 27 and during the revolution of such shaft acts intermittently upon the roll 185, to lift the arm 183 which swings the arm 176 away from the glue roller 180 at the same time forcing down the arm 186 against the action of the spring 192 which turns the link 189 thereby also turning the trough 191, at its pivoted end carrying its other end upwardly, in which movement the roll 179 carried by the swinging arm 176 rides over the forked end of the trough spreading glue thereon, the continued upward movement of the trough brings such glued surface directly under the label holder 174, causing the lowermost label in the holder to adhere to the bifurcated end of the trough upon which the glue has been spread. At this moment the cam 194 passes off the roll 185 when the parts are drawn back to their normal position by the contraction of the spring 192.

This return action takes place at the time one of the bottles is approaching the lower end of the trough 191 and as the bottle passes through the opening in the lower end of the trough it comes in contact with the glued label adhering thereto carrying the label away from the trough, the label at the same time sticking to the bottle upon which it may be wiped or smoothed by hand or otherwise if necessary.

It will be seen from the foregoing description that the invention relates essentially to applying screw threaded caps to bottles having threaded necks, and comprises rotating mechanism for picking up one cap at a time, carrying it forward in alignment with a traveling bottle, screwing it upon the threaded neck of the bottle; means for feeding the caps one at a time at predetermined intervals, and means for preventing the feeding of the caps when no bottle is being carried from the conveyor to the turntable.

While I have particularly described the apparatus as employed for capping bottles, it will be obvious that it is equally available for applying covers to other characters of containers provided with threaded necks, such as fruit jars or metallic cans or receptacles.

I claim as my invention:

1. In bottle capping apparatus, a vertical rotary shaft, a plurality of tubular holders, a hub fixed to said shaft and provided with spaced projecting arms to the free ends of which said holders are secured, capping mechanism carried by said holders, means for rotating said capping mechanism during the rotation of said shaft, a turn table provided with a hub fixed to said shaft, spaced bottle engaging members fixed to the turn table in alignment with said capping mechanism, a platform, means for feeding the caps to the platform, means for conveying the caps to position to be received by the capping mechanism, and a resilient member contacting with the caps at such point.

2. In bottle capping apparatus, a vertical rotary shaft, a plurailty of tubular holders, a hub fixed to said shaft and provided with spaced projecting arms to the free ends of which said holders are secured, capping mechanism carried by said holders, means for rotating said capping mechanism during the rotation of said shaft, a turn table provided with a hub fixed to said shaft, spaced bottle engaging members fixed to the turn table in alignment with said capping mechanism, a platform, means for feeding the caps to the platform, means for arresting the movement of the caps, and means for releasing the caps therefrom and conveying them to position to be received by the capping mechanism.

3. In bottle capping apparatus, a vertical rotary shaft, a plurality of tubular holders, a hub fixed to said shaft and provided with spaced projecting arms to the free ends of which said holders are secured, capping mechanism carried by said holders, means for rotating said capping mechanism during the rotation of said shaft, a turn table provided with a hub fixed to said shaft, spaced bottle engaging members fixed to the turn table in alignment with said capping mechanism, a platform, means for feeding the caps to the platform, means for arresting the movement of the caps, means for releasing the caps therefrom and conveying them to position to be received by the capping mechanism, and a risilient member contacting with the caps at such point.

4. In apparatus for capping bottles having threaded necks, the combination of a vertical shaft, a support for the same, means for rotating said shaft, a plurality of tubular holders, a hub fixed to the shaft provided with spaced arms to the free ends of which said holders are secured, a stationary rack surrounding said shaft, a plunger in each of said holders, a geared head connected to each plunger and meshing with said rack, a

coiled spring surrounding each plunger for returning it to its initial position, a throat member secured to the bottom of each plunger exterior of the holder, a spring pressed segmental ring within each of said throat members, a turn table provided with a hub fixed to said shaft, spaced bottle engaging members fixed to said turn table in alignment with said throat member, a platform, means for feeding the caps to the platform, and means for conveying the caps to position to be received by said segmental rings.

5. In apparatus for capping bottles having threaded necks, the combination of a vertical shaft, a support for the same, means for rotating said shaft, a plurality of tubular holders, a hub fixed to the shaft provided with spaced arms to the free ends of which said holders are secured, a stationary geared rack surrounding said shaft, a plunger in each of said holders, a coiled spring surrounding each plunger for returning it to an initial position, a throat member secured to the bottom of each plunger exterior of the holders, a spring pressed segmental ring within each of said throat members, a geared head connected to each plunger and meshing with said rack, a platform, means for feeding the caps to the platform, a pusher for moving the caps to position in alignment with said throat members, a ball within a semicircular recess in the top of each geared head, a fixed cam bracket acting upon said balls to depress the plungers and throat members whereby the caps are picked up by said segmental rings, a turn table provided with a hub fixed to said vertical shaft, and spaced bottle engaging members fixed to the turn table in alignment with said throat members.

6. In an apparatus for capping bottles having threaded necks, the combination of a vertical shaft, a support for the same, means for rotating said shaft, a plurality of tubular holders, a hub fixed to the shaft provided with spaced arms to the free ends of which said holders are secured, a stationary rack surrounding said shaft, a plunger in each of said holders, a geared head connected to each plunger and meshing with said rack, a ball within a semi-circular recess in the top of each geared head, a throat member secured to the bottom of each plunger exterior of the holder, a spring pressed segmental ring within each of the throat members, a turn table provided with a hub fixed to said vertical shaft, spaced bottle engaging members fixed to said turn table in alignment with said throat members, a platform, means for feeding the caps to the platform, a pusher for moving the caps to position in alignment with said throat members, a fixed cam acting upon said balls to depress said plungers and throat members whereby the caps are picked up by the segmental rings, a housing, a fixed support for the same, a plunger within said housing, a presser foot secured to the lower end of such plunger exterior of the housing, means for depressing the plunger in the housing so that the presser foot contacts with the balls in the respective geared heads successively depressing the picked-up caps over the tops of the bottles, and a fixed cam with which said balls come into contact, whereby the caps are screwed upon the bottles while said heads are passing under said cam.

Signed by me this 28th day of May 1923.

CHARLES A. ALEXANDERSON.