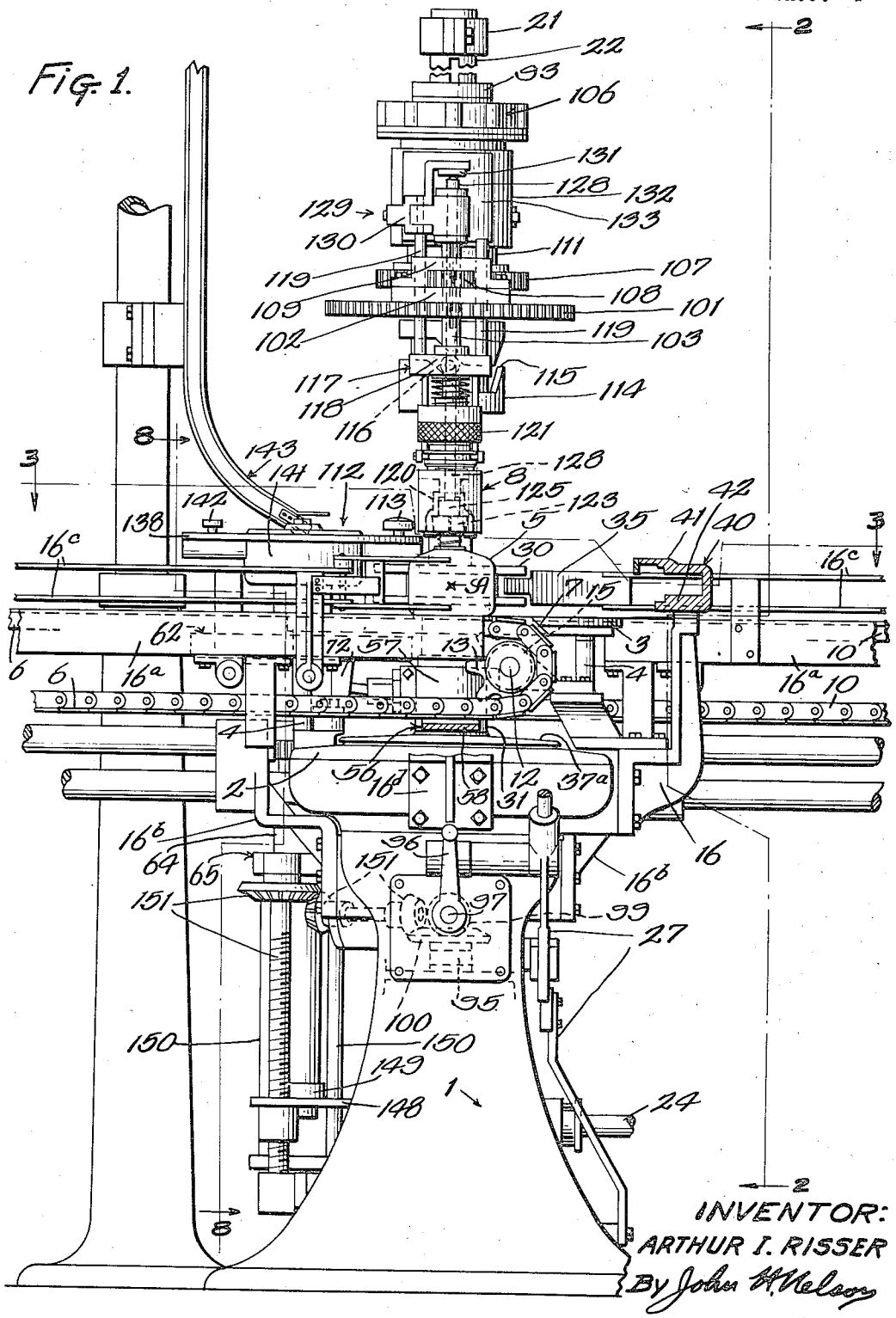
March 10, 1936. A. I. RISSER 2,033,358

CLOSURE APPLYING APPARATUS

Filed May 7, 1935 5 Sheets-Sheet 1

Fig. 1.

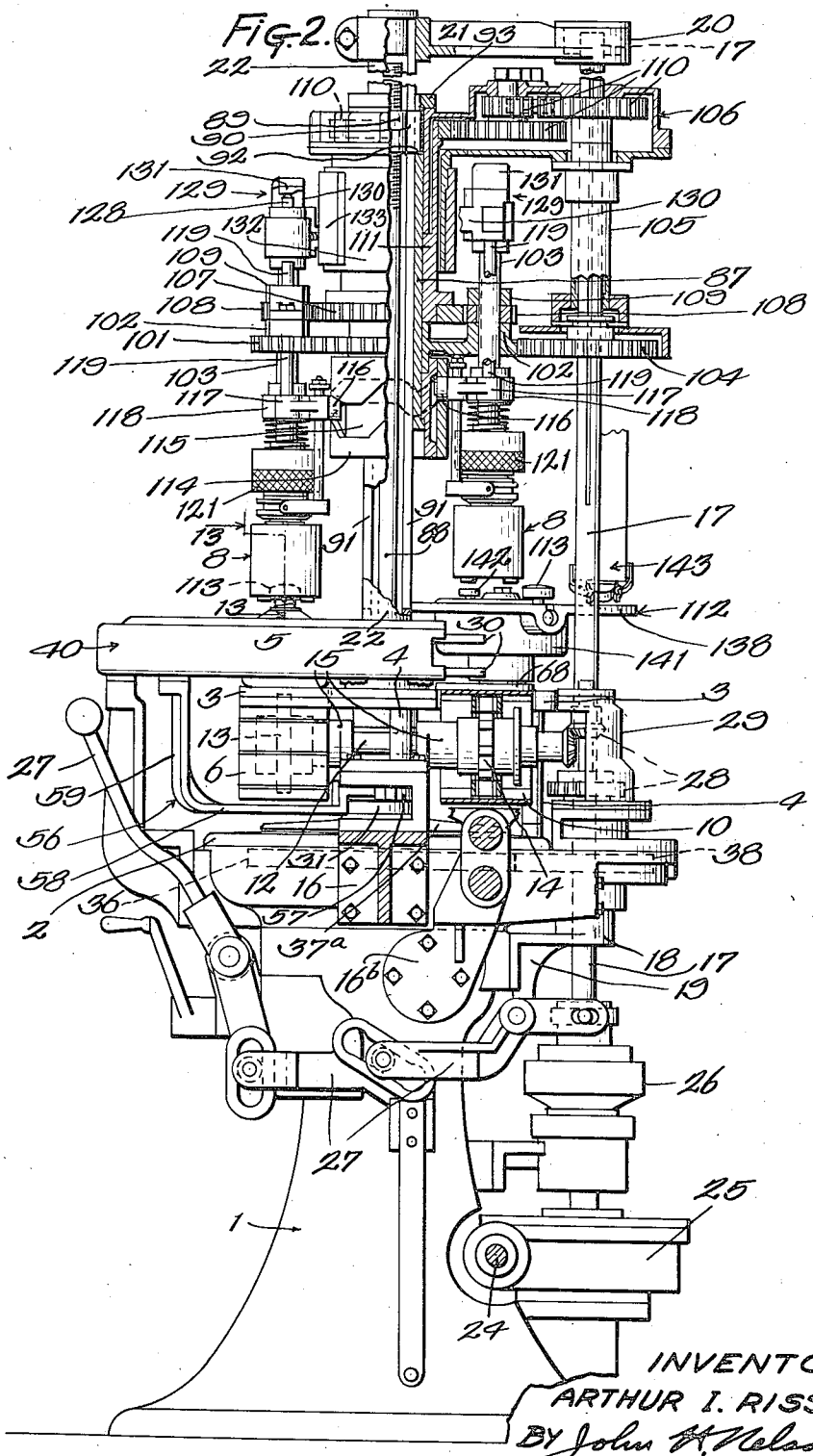


March 10, 1936. A. I. RISSER 2,033,358

CLOSURE APPLYING APPARATUS

Filed May 7, 1935 5 Sheets-Sheet 2

Fig. 2.



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Filed May 7, 1935 5 Sheets-Sheet 3

Fig. 4.

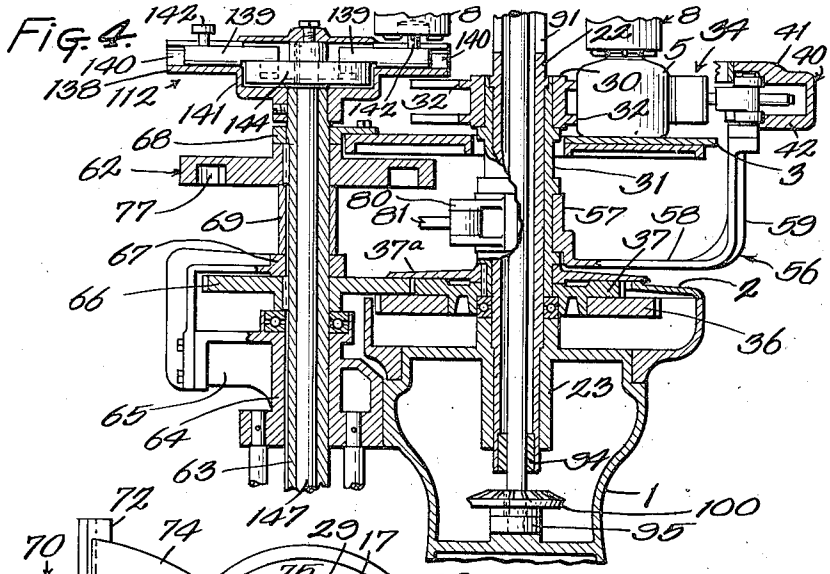
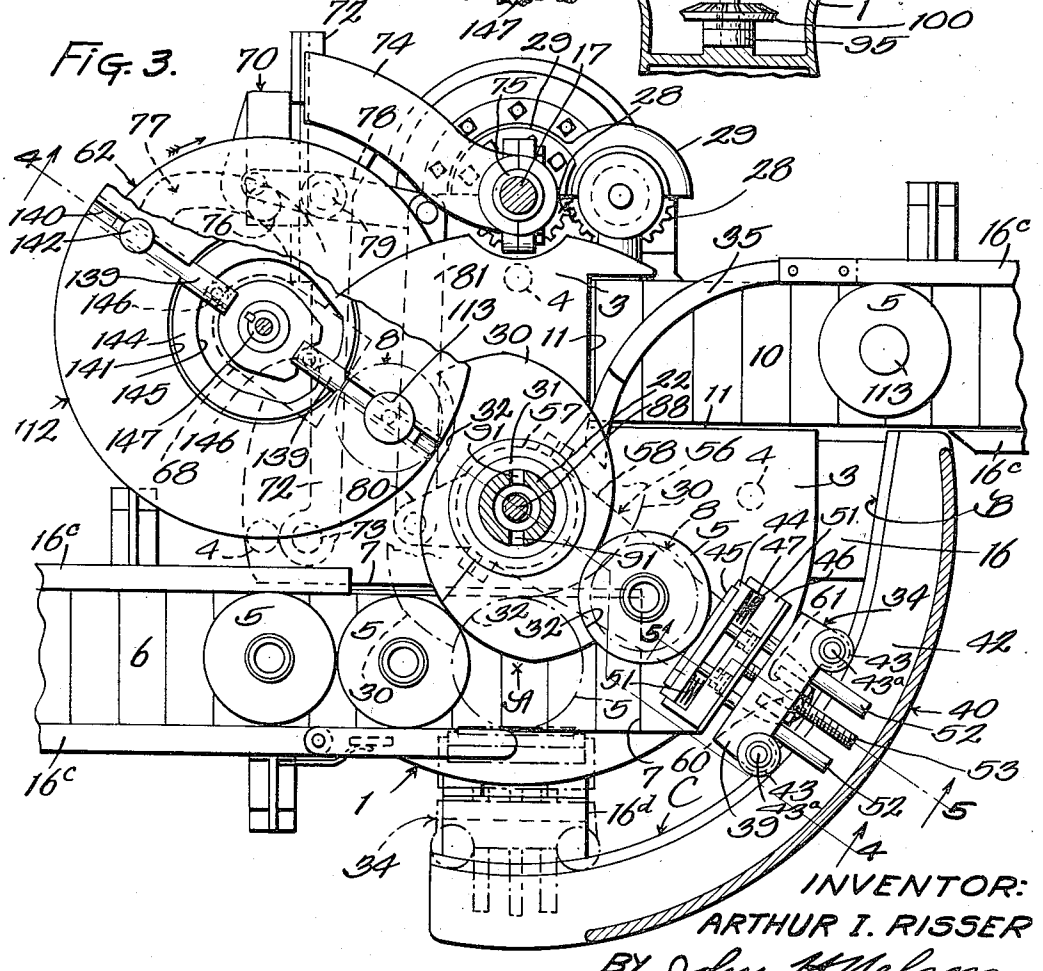


Fig. 3.



INVENTOR:
ARTHUR I. RISSER
BY John H. Nelson
ATTY.

March 10, 1936. A. I. RISSER 2,033,358

CLOSURE APPLYING APPARATUS

Filed May 7, 1935 5 Sheets-Sheet 4

Fig. 5.

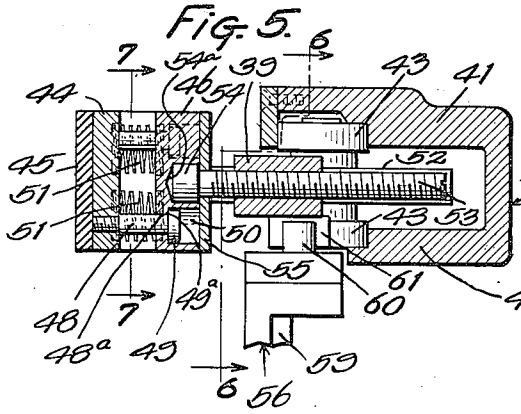


Fig. 6.

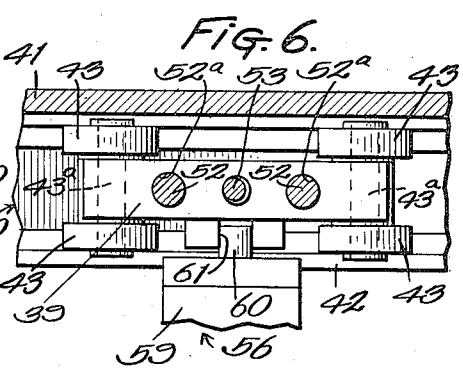


Fig. 7.

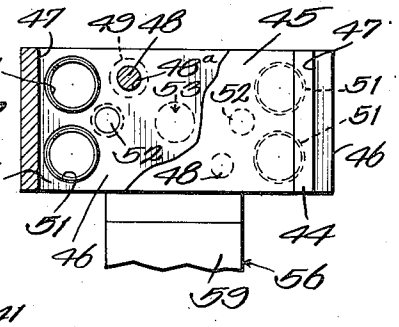
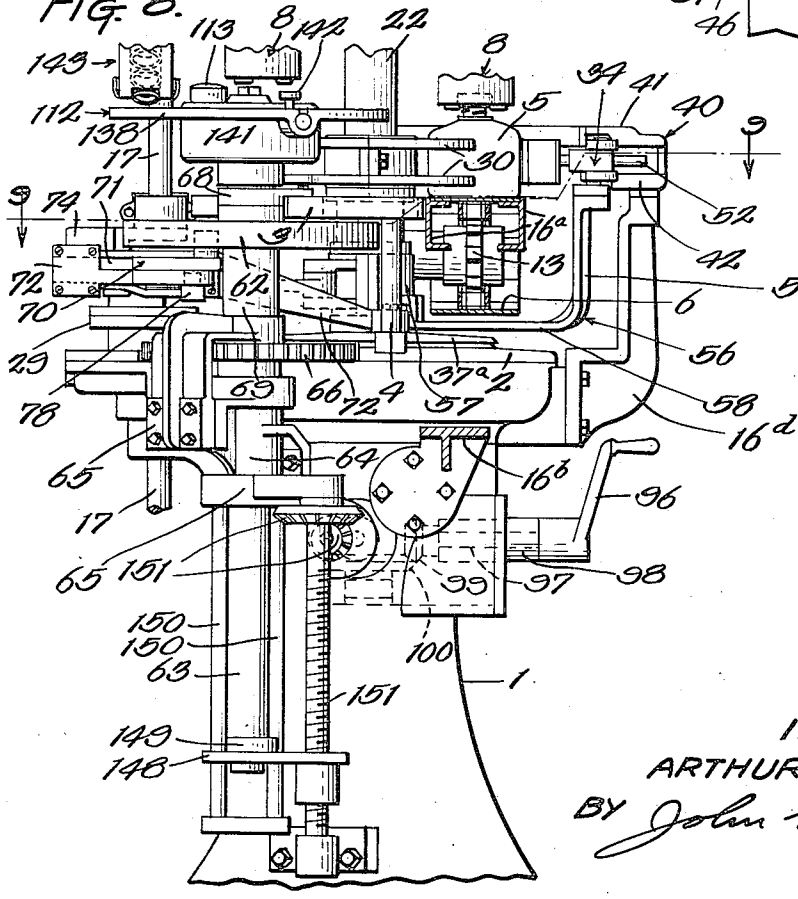


Fig. 8.



INVENTOR:
ARTHUR I. RISSER
BY John B. Nelson
ATTY.

March 10, 1936. A. I. RISSER 2,033,358

CLOSURE APPLYING APPARATUS

Filed May 7, 1935 5 Sheets-Sheet 5

Fig. 9.

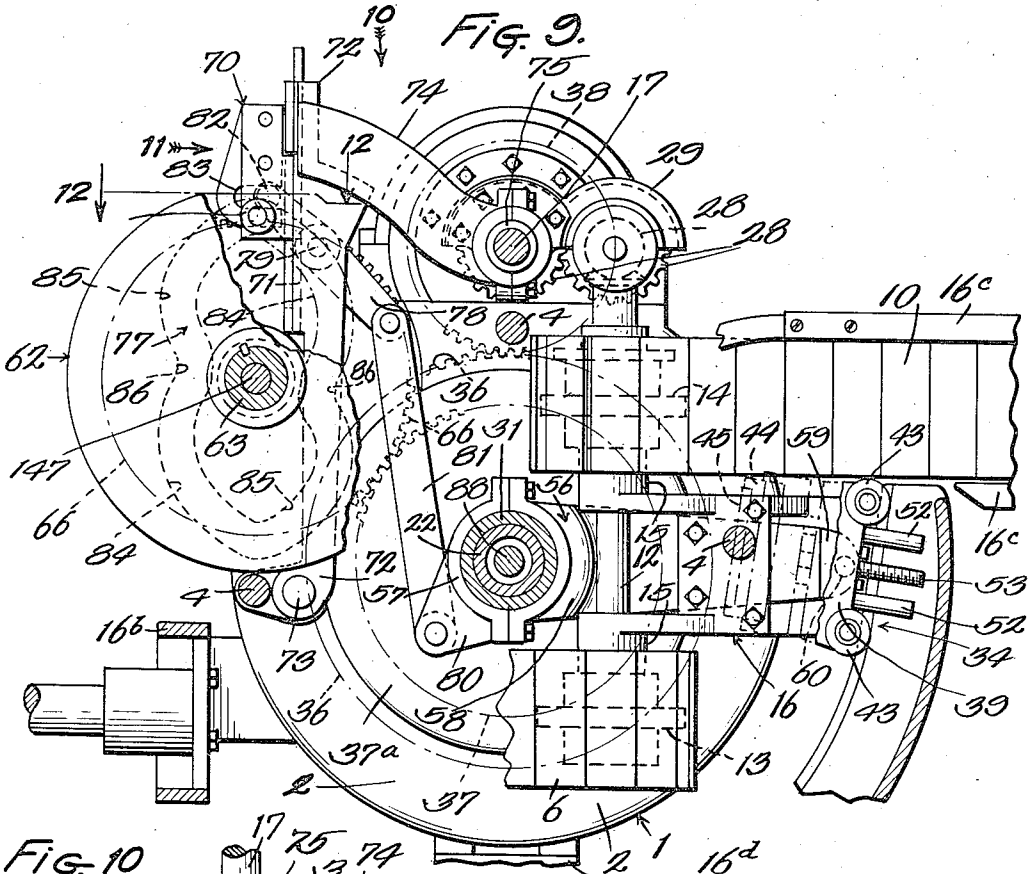


Fig. 10

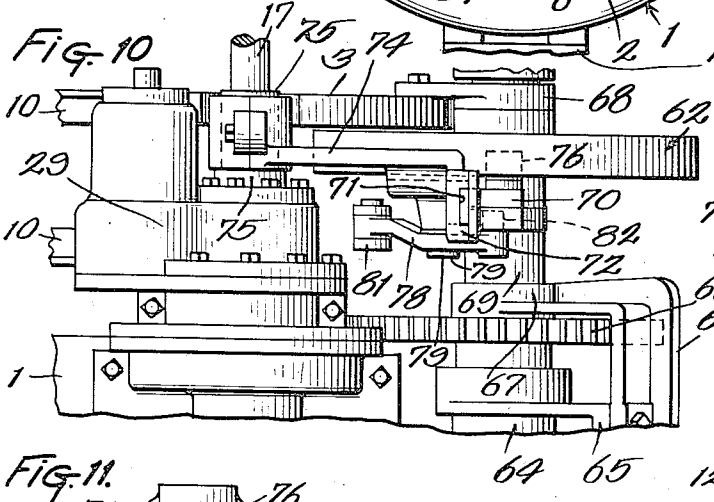


Fig. 11.

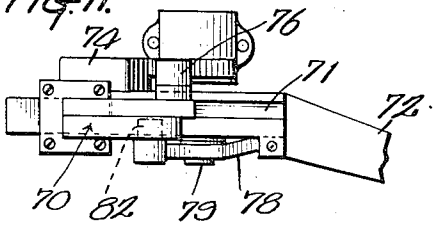


Fig. 12.

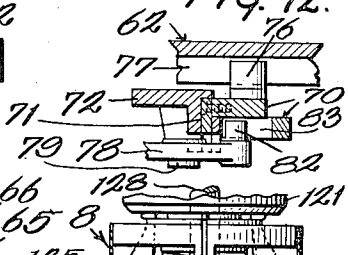
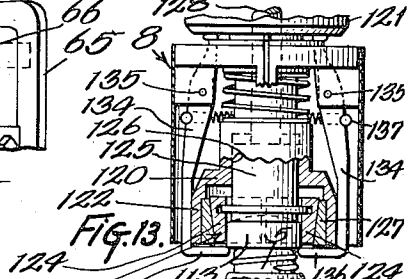


Fig. 13.



INVENTOR:
ARTHUR I. RISSER
BY John A. Nelson
ATTY.

Patented Mar. 10, 1936

2,033,358

UNITED STATES PATENT OFFICE

2,033,358

CLOSURE APPLYING APPARATUS

Arthur I. Risser, Chicago, Ill., assignor to U. S. Bottlers Machinery Co., Chicago, Ill., a corporation of Illinois

Application May 7, 1935, Serial No. 20,208

21 Claims. (Cl. 226—88)

This invention relates to closure applying apparatus or machines, and more particularly pertains to such apparatus for applying screw caps to containers.

One of the objects of the invention is to provide such apparatus with simple and efficient means for holding containers during the capping operation.

Another object of the invention is to provide such apparatus having a plurality of cap applying heads and unitary means for holding the containers during the capping operation of the heads.

Another object of the invention is to provide such unitary means for holding containers as mentioned, that can be quickly arranged to accommodate various sizes of containers whereby the output of the apparatus is increased.

The attainment of the foregoing objects is accomplished by certain improvements and organizations of elements or parts, as will be hereinafter more fully described, and, upon reference to the description, other objects and advantages as well as certain novel features will become apparent, which features are defined in the accompanying claims.

In the drawings:

Fig. 1 is a front view of the machine embodying one form of the invention, and showing certain parts broken away and parts in section to disclose other parts.

Fig. 2 is a vertical section of the machine as taken substantially on the section line 2—2 of Fig. 1, with parts in section, parts broken away and other parts omitted to disclose parts otherwise hidden.

Fig. 3 is a plan section of the machine as taken substantially on the section line 3—3 of Fig. 1 with certain operating parts in changed position, parts broken away and other parts omitted, and the view being of larger scale than Fig. 1.

Fig. 4 is a vertical section of the machine as taken substantially on the section line 4—4 of Fig. 3 with parts omitted and other parts shown in full lines.

Fig. 5 is an enlarged detail vertical section of the container holding means as taken substantially on the section line 5—5 of Fig. 3, but showing certain parts in normal position.

Fig. 6 is a detail section of the holding means as taken substantially on the section line 6—6 of Fig. 5.

Fig. 7 is a detail section of said holding means as taken substantially on the section line 7—7 of Fig. 5 with portions of certain cooperating parts shown in full lines.

Fig. 8 is a vertical detail section of the machine as taken substantially on the section line 8—8 of Fig. 1.

Fig. 9 is an enlarged plan section of the machine as taken substantially on the section line 9—9 of Fig. 8, with parts broken away and showing certain operating parts in changed position.

Fig. 10 is a detail elevation of a rear portion of the machine as viewed in the direction of the arrow 10 of Fig. 9.

Fig. 11 is a detail side elevation of certain parts shown in Fig. 9, as indicated by the arrow 11 of said figure.

Fig. 12 is a detail vertical section of certain parts of Fig. 9, as taken substantially on the section 12—12 of said figure.

Fig. 13 is an enlarged vertical section of one of the capping heads of the invention with certain parts shown in full lines and other parts broken away, the view being taken substantially on the section line 13—13 of Fig. 2.

The structure illustrated, forming one embodiment of the invention, forms part of the subject matter of my copending application for patent on Container closure applying apparatus, Ser. No. 759,930, filed December 31, 1934, in which the capping mechanism herein disclosed generally, is more fully disclosed and claimed.

The structure includes a supporting frame or base in the form of a hollow upright circular pedestal 1 having a centrally open cover 2 suitably secured thereon upon which is supported, in spaced relation thereabove and coaxial therewith, a container support or table in the form of a substantially circular shelf 3 secured to the cover by posts 4.

The containers or bottles 5 to be capped are placed on a container feeding conveyor 6 in the form of an endless link-belt of the cleated sprocket chain type, whose upper stretch moves toward and in the plane of the top surface of the shelf 3, which is cut away, as at 7, to accommodate said upper stretch of the belt. Each container is then conveyed by the belt 6 to its end at the front of the shelf whereupon the container is disposed at a receiving station, as at A, of Figs. 1 and 3, in cooperative relation with transporting means, embodying the invention, which transports same over the shelf in an arcuate path about the axis of the pedestal, during which time the container is capped by one of two capping devices or heads

8 disposed above the shelf. On continued movement of the container during transport, after being capped, it is deflected onto a container receiving conveyor 10 in the form of a link-belt similar to the conveyor 6, and whose upper stretch is in the plane of the shelf which is cut away, as at 11, to accommodate the inner end of the belt, whereupon the capped container is carried away from the machine.

The conveyors 6 and 10 are arranged respectively along the front and rear of the machine to extend in opposite directions from their inner ends. Extending horizontally under the shelf to one side of the pedestal axis is a shaft 12 on which are sprockets 13 and 14 over which are received the inner ends of the conveyors 6 and 10 respectively, to be driven in unison. The shaft is mounted rotatably centrally in spaced bearings 15 of a bracket structure 16 secured to the base.

The conveyor belts 6 and 10 extend from their driving sprockets to the left and right of the base, respectively, and the upper stretch of each belt is supported upon a horizontal guide structure 16*a*, mounted on a bracket 16*b* on the base, and upon which structure is mounted guide rails 16*c* above the belt between which the containers are guided when conveyed. In that the outer end of each guide structure is not shown, it will be understood that on said ends are provided idler sprockets or other suitable means for supporting the belts.

For driving the conveyor shaft 12, as well as other mechanism later described, a main vertical drive shaft 17 is disposed at the rear of the machine, whose lower portion is rotatably mounted in a bearing 18 of a bracket 19 on the base, and whose upper portion extends considerably upward to be received in a bearing 20 of a bracket member 21 secured on the top end of a stationary vertical column 22 in the form of a hollow shaft extending centrally upward of the base which has a central bearing 23 in which the lower end of the column is secured firmly. The drive shaft 17 is in driven connection with a main drive shaft 24 through the intermediation of a suitable speed reducing device 25 mounted on the base, and from which device the shaft 24 extends. The device is in suitable connection with the shaft 17 through a common clutch device 26 controlled by lever mechanism 27 mounted on the base. The drive shaft 17 drives the conveyor shaft 12 through suitable gearing 28 arranged in a gear housing 29 mounted on the top of the base.

The container transporting means, in connection with which the invention is mainly concerned, includes a container positioning member 30 in the form of a wheel disposed above the shelf 3 and rotatably mounted on the central column 22, surrounding which is a sleeve 31 extending through an aperture in the shelf, and on the top end of which sleeve is secured the wheel. The wheel has opposite container positioning pockets 32, which, upon counterclockwise rotation of the wheel as seen in plan, are alternately brought into cooperative relation with containers being conveyed into the machine on the conveyor 6, to receive same as they arrive at the receiving station A. The wheel is preferably formed in halves which are firmly held together on the sleeve 31 by bolts, so that the wheel can be easily removed when substituting a similar wheel with larger or smaller pockets in accommodating various sizes of containers.

Upon being received in a pocket of the positioning wheel, a container is held firmly therein, so that it will not rotate during the capping operation thereof, by container gripping or engaging means of the invention inclusive of a container holding device 34 which is caused to travel with the wheel during about one quarter of its revolution after receiving the container, whereupon the device is operated to release the container at the end of its said movement. On continued movement of the wheel, the capped container is deflected by an arcuate inward extension 35 of the outer guide rail of the receiving conveyor on which it is carried from the machine.

The positioning wheel is continuously rotated by the drive shaft 17 through the intermediation of a spur gear 36 secured to the spur gear 37 mounted on the bottom end of the sleeve 31 within the top gear housing portion of the pedestal 1, and which gear 36 is in mesh with a spur gear 38 mounted on the drive shaft 17. Secured to the gear 37 is a cover 37*a* which overlap the cover 2 of the pedestal for enclosing the gears.

The container engaging or gripping means includes a head 39 in the form of an elongated block disposed in the plane of the positioning wheel and guided to oscillate approximately 90 degrees about the axis of the column 22 by means of an arcuately formed guide or cam 40 mounted at one end upon the bracket 16 on the side of the pedestal and at its other end it is mounted on a similar bracket 16*d* on the front of the pedestal. The cam 40 has inwardly projecting upper and lower track portions 41 and 42 respectively, which are recessed to provide guideways within which are received, so as to be guided, rollers 43 rotatably mounted above and below the block 39 on pins 43*a* at both ends thereof.

As best seen in Figs. 3, 4, 5, 6 and 7, disposed inward of the block 39 and mounted adjustably toward and away from the pedestal axis is a container engaging member or jaw 44 in the form of a flat block, having secured to its outer face a friction face member 45 of resilient material, such as leather for engaging so as to hold a container in a pocket of the positioning wheel. The engaging member or jaw 44 is resiliently supported on the head 39 through the intermediation of a carrier block 46 which has a guide formation 47 in its outer face within which is slidably mounted the jaw, whereby the jaw is depressible when engaging a container. The jaw has two spaced pins 48 slidably received in bores 48*a* in the carrier block and which jaw is limited for outward movement by the enlarged heads 49 of the pins engaging the bottom shoulders 49*a* of the enlarged portions 50 of the bores within which the pin heads are slidably received. The jaw is resiliently urged outward by means of compression coiled springs 51 which are interposed between the jaw and the carrier which are respectively recessed to receive the springs. The carrier is supported on the head 39, so as to be adjustable toward and away from the container positioning member or wheel to accommodate various sizes of containers, by means of two guide rods 52 extending from the carrier in spaced parallel relation and which are slidably received in bores 52*a* extending through the head. Extending threaded through

the head and disposed between the rods, is an adjusting screw 53 for adjusting the carrier toward or away from the head, and whose enlarged inner end portion 54 is confined for rotation within a recess 54a in the outer face of the carrier by means of a plate 55 mounted on the carrier and through which the screw passes.

As best seen in Figs. 2, 3 and 4, the guide 40 is disposed slightly above the plane of the shelf 3 with its track portions 41 and 42 extending from the front of the machine, just outside the container receiving station A, to the right side of the machine to terminate in end portions extending tangentially outward of the pedestal axis, as at B. Thus, referring to Fig. 3, as the head 39 is returning on the arcuate portions of the track portions 41 and 42, as at C, to its starting position opposite a pocket of the positioning wheel, the jaw 44 is caused to be depressed into spring-pressed engagement with a container positioned at the receiving station A and disposed in a pocket of the wheel, as best seen in dot and dash lines in Fig. 3, whereupon the container is held clamped or gripped between the head and the wheel. The head 39 is then caused to travel with the wheel upon the arcuate portions C of the tracks 41 and 42 with the container held from rotation during the capping operation thereof and until the head reaches the tangential end portions B of the tracks, which causes the retraction of the head to effect the release of the jaw 44 to permit the capped container to be deflected onto the receiving conveyor belt 10. The head 39 is then returned to its starting position to cooperate in a like manner with the other pocket of the wheel.

The head 39 is oscillated upon the tracks 41 and 42 in timed relation with the positioning wheel 30 by an operator such as a bell-crank arm 56 whose hub portion 57 is pivotally mounted on the sleeve 31 below the shelf 3. The operator arm has an arm portion 58 extending from its hub horizontally over the cover 2 of the base and continuing into an upright extension 59 projecting beyond the plane of the shelf and having an upstanding pin 60 received within a guide groove 61 in the bottom of the head 39 and which extends radially of the pedestal axis to permit radial movement of the head upon oscillation of the arm. The crank arm is oscillated twice upon a complete revolution of the wheel so that the head 39 alternately cooperates with the pockets 32 of the wheel.

Referring to Figs. 3 and 4, the crank arm 56 is operated by a cam disc 62 disposed horizontally just below the shelf 3 and mounted on and in sliding key connection with a rotating hollow shaft 63 vertically disposed alongside the shelf and mounted for vertical adjustment, for reasons later described, within an elongated bearing 64 of a bracket 65 secured to the side of the pedestal. The cam disc 62 is rotated in unison with but in opposite direction to the positioning wheel 30 by means of a spur gear 66 mounted on the shaft 63, in sliding key connection therewith, and meshing with the spur gear 37 of like size secured to the positioning wheel sleeve 31. The spur gear 66 is confined for rotation in a fixed plane between the bearing 64 and a bearing 67 of the bracket 65, and the cam disc is confined for rotation in a fixed plane between a bearing 68 on the shelf 3 and the bearing 67 through intermediation of a sleeve 69 surrounding the shaft 63.

Referring to Figs. 3 and 9 to 12, the cam disk 62 is operably connected with the crank arm 56 to oscillate same through the intermediation of a cross-head 70 mounted for horizontal reciprocation radially of the cam disc within a guide groove 71 of an elongated horizontal bracket portion 72 secured at one end on the top of the base as at 73, and having an angular extension 74 at its other end suitably secured to the drive shaft bearing 75 of the gear housing 29. The cross-head 70 has a roller 76 which is received within a cam groove 77 provided in the bottom side of the cam disc and is so formed to reciprocate the cross-head twice upon one revolution of the disc. The cross-head is connected to reciprocate the crank arm 56 by means of a rocker arm 78 centrally pivoted on the bracket portion 72 as at 79, and being connected at one end with the arm extension 80 of the crank arm through the intermediation of a link 81 and having its other end provided with a roller 82 which is received in a transverse slot 83 of the cross-head so as to be operated thereby.

To operate the rocker arm so that the least amount of jarring strain is imparted to the operating mechanism, the arm is caused to move the container holding device 34 from its starting position at a constant or invariable rate in unison with the positioning wheel 30, so as to cooperate with the opposite pockets of the wheel in holding containers during the capping operation, by two like cam rises 84 of the cam groove 77 of the cam disc 62, which cam rises continue from their high points into like cam depressions 85 so formed to return the holding device at a variable or accelerated rate to reduce the jarring action caused thereby at the ends of its movement. The holding head is caused to slightly dwell at its starting position, to further minimize said jarring action, by the cam dwell portions 86 connecting the low points of the cam rises 84 with the low points of their adjacent cam depressions 85.

Although various forms of well known capping devices or heads and operating mechanism therefor may be employed in connection with the present invention, it is preferable to employ such mechanism as is more fully described and claimed in my said copending application. To this end, surrounding the central column 22 and spaced above the positioning wheel 30, is a capping device mounting sleeve 87 connected on the column, so as to be normally stationary but vertically adjustable, by means of an adjusting screw shaft 88 centrally disposed in the hollow of the column and on which is a nut 89 having opposite wings 90 passing through elongated slots 91 in opposite sides of the column and being secured in opposite slots 92 in the top end of the sleeve 87 by means of a ring nut 93 threaded onto the said end. The screw shaft passes through a bearing 94 at the bottom of the column and rests upon a thrust bearing 95 mounted on the base. The screw shaft is operated by a hand crank 96 mounted on a horizontal shaft 97 rotatably mounted in a bearing 98 in the base and on the end of the shaft is a bevel gear 99 in mesh with a bevel gear 100 on the bottom end of the screw shaft.

Rotatably mounted on the supporting sleeve 87 is a capping device supporting member 101 in the form of a spur gear through which are reciprocably mounted in vertical bearings 102, on opposite sides of its axis, two hollow spindles 103 at the bottom ends of which are mounted

the capping heads or devices 8. The spindles are arranged centrally above the container positioning pockets of the positioning wheel 30 and are rotated about the column with the wheel by the gear 101 being in driven connection with a spur gear 104 mounted on the drive shaft 17 in sliding key connection therewith. The gear 104 is suitably rotatably mounted at the lower end of a bearing sleeve 105 depending from one end of an elongated horizontal gear housing 106, through which the shaft 17 passes, and whose other end is suitably mounted on the top end of the mounting sleeve 87.

The spindles are continuously rotated for operating the capping heads in the application of screw caps, by means of a spur gear 107 mounted rotatably on the mounting sleeve 87, and which is in mesh with a smaller spur gear 108 mounted in sliding key connection on each spindle between the bearing 102 and a bearing 109 of the gear 101. The gear 107 is driven for operating the spindles and capping heads by means of its connection with the drive shaft 17 through suitable gearing 110 mounted and arranged in the housing 106 and with which the top end of the hub 111 of the gear 107 is operably connected.

In general, the capping heads have an undulatory path of movement about the axis of the column, whereby each head is slightly lowered with its spindle from its uppermost position into cooperative relation with a cap feeder head 112 mounted on the top end of the shaft 63, to receive a screw cap 113, then is slightly raised until it is lowered over a container at the receiving station A, to travel in cooperative relation therewith in applying the cap thereto while it is held by the holding device 34, whereupon on the completion of the capping operation, the capping head is returned to its uppermost position preparatory to another cycle of operation.

Said operation of each capping head is effected by a drum cam 114 mounted fixedly on the lower end of the mounting sleeve 87 and having a peripheral cam groove 115 within which is received the roller 116 of a cross-head 117 in whose bearing 118 the spindle of the capping head is rotatably mounted. Each cross-head is held from rotating with its spindle by having two upright guide rods 119 reciprocably mounted so as to extend through the gear 101.

Referring to Figs. 1, 2 and 13, briefly, each capping head 8 includes a hollow chuck head 120 frictionally connected to its spindle through a friction clutch 121. The chuck head has an enlarged hollow concentric bottom end 122 within which is mounted a screw cap chuck 123 including a plurality of annularly arranged closely adjacent cap gripping members or jaws 124 loosely carried on a chuck bottom portion 125 reciprocably mounted in the reduced inner bore portion 126 of the chuck head. The jaws are contracted for gripping a cap on the downward movement of the bottom by a ring cam 127 mounted within the chuck head portion 122 so as to surround the jaws and having a downwardly converging conical inner cam surface with which the outer surfaces of the jaws are correlatively formed.

The bottom portion is mounted on the lower end of an operator stem 128 reciprocably mounted in the spindle and extending thereabove to be depressed by a lever device 129 in causing the jaws to grip a cap in effecting the application of same to a container when same is in cooperative relation with the head.

The lever device includes a bell-crank lever 130 centrally fulcrumed on the top end of one of the guide rods 119 and having a cam end 131 in operable connection with the top end of the chuck stem to operate same. The lever is operated to cause the gripping of a cap, during the capping operation, by a drum cam 132 concentric with the central column 22 and mounted on the gear casing 106, with which cam the free end of the lever is in suitable spring pressed engagement to be operated by the cam rise 133 of the cam.

As best seen in Fig. 13, a cap is held loosely within the chuck of each capping head after being placed therein by the feeder head, and until the cap is gripped, by a group of resilient fingers 134 disposed about the chuck head and depending from their pivotal connections 135 on the head to continue into inwardly extending bottom end portions 136 which project under the chuck to support the cap. The fingers are held contracted about the chuck head by an endless coiled spring 137 surrounding the fingers.

With particular reference to Figs. 1, 3, 4 and 8, the cap feeder head 112 which is described more fully in said copending application, includes a horizontal rotating feeder disc 138 mounted on the top end of the hollow shaft 63. Disposed in the feeder head disc, extending from opposite sides of its axis, are radial slides 139, or rods, reciprocably mounted in guideways 140 in the top surface of the disc, which guideways open at their inner ends into a circular housing portion 141 of the disc. On each rod 139 is an upstanding cap carrying pin 142 on which, upon rotation of the disc, is placed a cap by a cap supply device 143, which cap is then in turn fed by the feeder head to a capping head as same is lowered into cooperative relation therewith, during which time the opposite capping head is applying a cap to a container.

Each cap carrier pin 142 is caused to travel in a circular path about the axis of the feeder disc until it reaches its zone of cooperative relation with a capping head, whereupon it is retracted to travel, during a short period, coaxial with the capping head to insure the feeding of a cap thereto. To this end, each guide rod 139 is operated by a stationary disc cam 144 in whose cam groove 145 the rollers 146 of the guide rods are received. The disc cam 144 is disposed in the housing 141 of the feeder disc and is mounted on the top end of a stationary shaft 147 disposed in the hollow shaft 63.

The cam supporting shaft 147 is fixedly connected at its bottom end with a cross-head 148 having a bearing 149 for supporting the lower end of the hollow shaft 63. The cross-head 148 is reciprocably mounted on two guide rods 150 depending from the bracket 65, and is operated to vertically adjust the feeder head 112 in unison with the vertical adjustment of the capping mechanism on the column 22, in accommodating containers of various height, by suitable gearing mechanism 151 operably connecting the crosshead with the gear 100 on the bottom end of the adjusting screw shaft 88.

The chuck mechanism of the capping heads broadly forms part of the subject matter of my copending application for patent on Screw cap applying machines, Ser. No. 704,619, filed December 30, 1933, in which said mechanism is broadly disclosed and broadly claimed.

Having thus described my invention, I claim:

1. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head inclusive of a container engaging member.

2. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head having a movable container engaging jaw controlled by movement of the head.

3. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head having a spring pressed container engaging jaw adapted to have pressure engagement with a container during its cooperative relation with the head.

4. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head having a spring pressed container engaging jaw adapted to have pressure engagement with a container during its movement with the head and controlled by the head upon its final movement to effect the release of the container.

5. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head, a carrier adjustably mounted on the head, and a container engaging jaw resiliently mounted on the carrier and arranged to be moved toward or away from a container upon adjustment of the carrier.

6. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head, and a stationary guide on which the head is mounted movably back and forth in a fixed path, said guide arranged whereby the head will travel with a container in cooperative relation therewith during its said portion of movement then moved out of cooperative relation therewith at the end of its movement.

7. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head, and means for moving the head back and forth whereby the head is moved at a constant rate with a container then is returned at a varying rate.

8. The combination with a machine of the class described having means for transporting containers constantly through the machine in uniform single order and means for applying screw caps to the containers during a portion of their said movement, of unitary container holding means mounted to move back and forth in a fixed path and arranged to travel in cooperative relation with each container during its said portion of movement, wherein the last means includes a container holding head, and means inclusive of a cam for moving the head back and forth whereby the head is moved at a constant rate with a container then returned at a varying rate so that its movement is gradually increased then decreased.

9. The combination with a machine of the class described having a plurality of cap applying heads arranged to travel in an endless path, of container holding means for the heads including a container holding head mounted to move back and forth in a fixed path so as to travel in cooperative relation with the capping heads successively during a portion of their said movement and a container engaging member carried on the holding head.

10. In a container screw capping machine, a constantly moving container positioning member having a plurality of container positioning formations, means for holding containers in said formations during a portion of movement of the member inclusive of a container engaging jaw, and means for causing the jaw to travel in cooperative relation with the formations of the member successively.

11. In a screw cap applying machine, a plurality of screw cap applying heads equally spaced around and mounted to rotate about a common vertical axis, and container holding means for the heads including a container holding head mounted to move back and forth in a fixed path about said common axis and being arranged and operably connected with the capping heads to cooperate therewith successively in one direction of its said movement.

12. The structure as defined in claim 11, including means operably connecting the holding head with the capping heads inclusive of an operator mounted to oscillate about said common axis for operating the holding head.

13. The structure as defined in claim 11, including a guide upon which the holding head is mounted to move in its said path, and means operably connecting the holding head with the capping heads inclusive of an operator arm mounted to oscillate about said common axis and being in loose connection with the holding head to operate same.

14. The structure as defined in claim 11, including means operably connecting the holding head with the capping heads inclusive of an operator mounted to oscillate about said common axis for operating the holding head and a cam for controlling the operation of the operator.

15. In a machine of the class described, the combination with a plurality of cap applying heads arranged to travel in an endless path, of means for holding containers in cooperative relation with the capping heads during a portion of their movement including a container holding head mounted to move back and forth so as to move successively in unison with the capping heads, and resilient container engaging means carried on the holding head.

16. The structure as defined in claim 15, wherein the last means comprises a spring pressed container engaging jaw.

17. In a machine of the class described, a rotating container positioning member having annularly arranged container positioning formations, an oscillating container holding head oscillatable about the axis of the member and operably connected thereto to alternately move in unison therewith, and resilient means carried on the head for urging so as to hold a container in a formation of the member when moved therewith.

18. In a machine of the class described, a rotating wheel having a plurality of peripheral container positioning pockets, a container holding head movable about the axis of the wheel and operably connected therewith to move in unison with the pockets of same successively and in cooperative relation therewith during a portion of movement of the wheel.

19. In a machine of the class described, a container supporting table, a rotating wheel arranged over the table and having annularly arranged container positioning pockets, an arm below the table and oscillatable about the axis of the wheel, means carried on the arm for holding a container in a pocket, and means for oscillating the arm to cause the holding means to successively cooperate with the pockets.

20. In a machine of the class described, a plurality of cap applying heads arranged to move in an endless path, container holding means for the heads inclusive of a container engaging jaw, and means for moving the jaw in unison with the heads successively and in cooperative relation therewith during a portion of their said movement.

21. In a machine of the class described, a plurality of cap applying heads arranged to move in an endless path, container holding means for the heads inclusive of a container holding head, means for moving the holding head in unison with the capping heads successively and in cooperative relation therewith during a portion of their said movement, and resilient container engaging means carried on the holding head.

ARTHUR I. RISSER.