

CAPPING MACHINE.

Patented May 21, 1912.

2 SHEETS—SHEET 1.

1,026,892.



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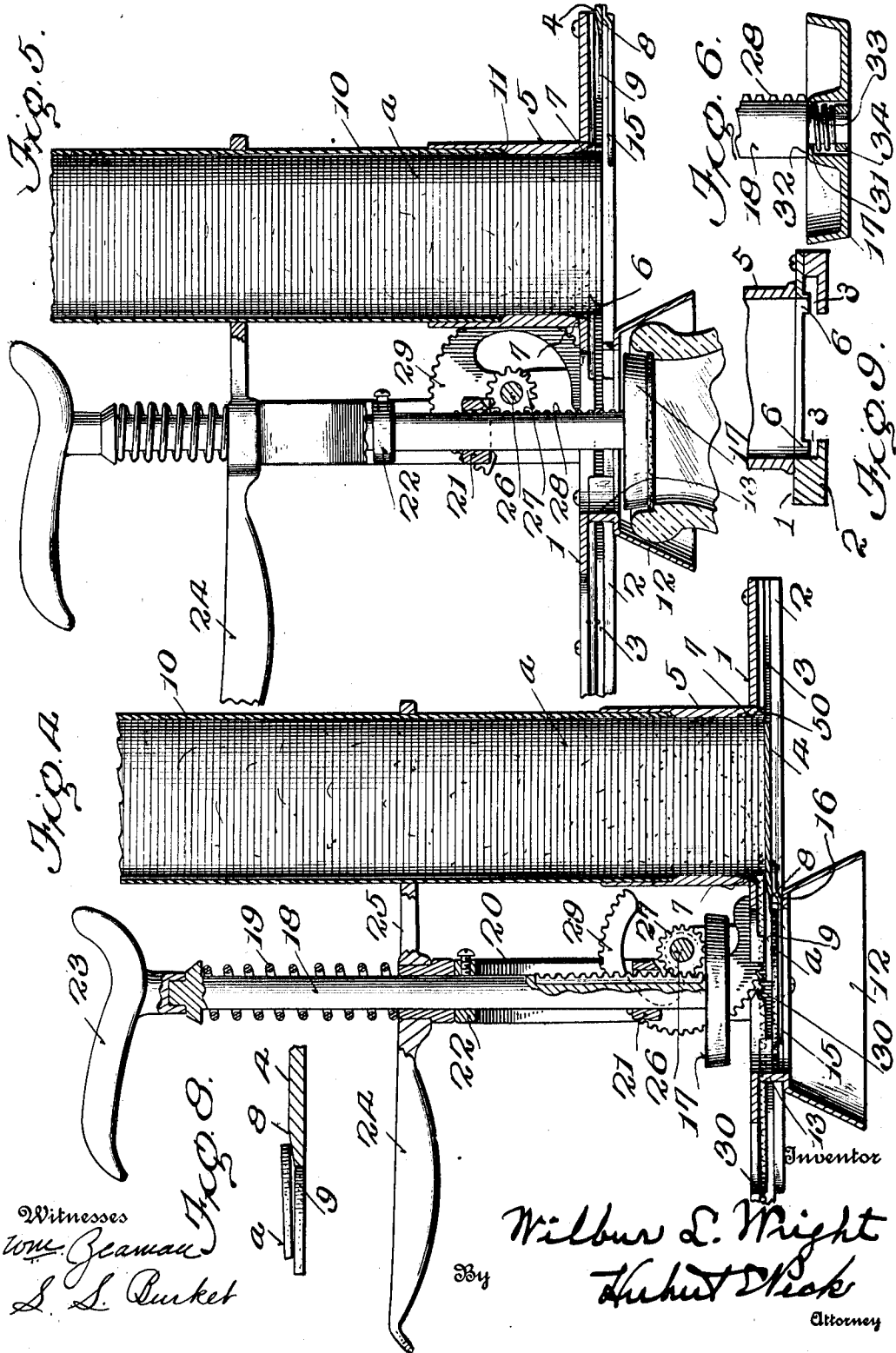
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CAPPING MACHINE.

APPLICATION FILED NOV. 5, 1909.

Patented May 21, 1912.

2 SHEETS-SHEET 2.

1,026,892.



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UNITED STATES PATENT OFFICE.

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CAPPING-MACHINE.

1,026,892.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed November 5, 1909. Serial No. 526,388.

To all whom it may concern:

Be it known that I, WILBUR L. WRIGHT, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Capping-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in capping machines, and the like; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanation of the accompanying drawings showing what I consider my preferred embodiments from among other formations, arrangements and constructions within the spirit and scope of my invention.

The invention consists in certain novel features in construction and in arrangements and combinations of parts and elements as more fully and particularly set forth hereinafter.

Referring to the accompanying drawings:—Figure 1, is a perspective of the machine. Fig. 2, is a bottom plan view thereof with the movable parts shown in positions assumed when the plunger is depressed. Fig. 3, is a cross section on the line 3—3, Fig. 2. Fig. 4, is a vertical longitudinal section showing the parts in normal position. Fig. 5, is a longitudinal vertical section showing the position of the parts when a cap is being seated in a bottle mouth. Fig. 6, is a detail vertical section through the plunger and a portion of the slide rod carrying the same. Fig. 7, is a reversed or bottom perspective of the portion of the base plate through which the cap magazine opens, the cap slide not being shown. Fig. 8, is a detail central vertical longitudinal section through the front portion of the cap slide, on an enlarged scale. Fig. 9, is a cross section through the base plate and centrally and vertically through the lower portion of the cap magazine.

In the drawings I show what might be termed a hand capping machine adapted to carry a magazine or load of caps and to apply the same successively to bottle mouths, while the machine is carried and

manipulated by hand, although I do not wish to so limit my invention as features thereof are adaptable to multiple capping machinery, and for capping various receptacles and for handling various kinds of disks or caps.

In the specific example illustrated, I show a horizontal elongated metal base frame or plate 1, formed at the opposite longitudinal edges of its under face or bottom with parallel longitudinal depending ribs 2, having longitudinal grooves 3, opening inwardly through their inner vertical edges and forming parallel slideways. The base or frame is shown open below and between said slideways but is closed above the same except at the points hereinafter mentioned.

4, is a flat plate longitudinally and slidably arranged at the under face of the base and at its opposite longitudinal edges fitting and slidable in the grooves 3. This plate constitutes the cap feeding slide of the machine and is formed to normally close the otherwise open bottom or lower end of the cap magazine 5. The cap magazine is in the form of an open end vertical tube or socket rigid with and rising from the base at a point intermediate the length and width thereof, and of a diameter to loosely receive a vertical stack of horizontally disposed caps, such as *a*, and permit free downward movement thereof through the magazine. In the specific example illustrated, this socket or magazine 5, is in the form of an open end cylinder or tube above and registering with a transverse opening for the passage of caps down through the base plate with the lower edge of the tube terminating above the bottom floors of grooves 3. The transverse internal diameter or width of said tube is greater than the distance between the inner vertical edges of the ribs 2, and about equal to the width of the slide 4, so that the bottom cap of the pile in the magazine can drop from the magazine and onto the bottom floors of the grooves 3, below the horizontal plane of the top walls of said grooves. In this connection it should be noted that the vertical width of each groove 3, and of the flat slide 4 is approximately that of the thickness of the cap *a*; being slightly greater than the thickness of the cap so that each cap can freely slide along said grooves and will be upheld in the

downwardly open space between the ribs 2, by its opposite edge portions resting on the floors of said grooves. A depending stop flange or edge 50, is arranged at the under face of the flat top plate or base 1, and between the inner vertical edges of the ribs 2, and just in rear of said bottom discharge opening from the cap magazine to sweep the top face of the slide and prevent the cap on the slide (the bottom cap of the pile) moving back with the slide when the slide is making its backward stroke to enable said cap to drop into the grooves 3, and in front of the slide.

At the front of the opening through the base plate 1, for the passage of caps from the magazine to the slide and grooves 3, the space between the bottom face of bottom plate 1, and top face of the slide and between the longitudinal edges of the ribs 2, is unobstructed, to permit free forward passage of caps along the grooves 3, even though such caps have handles or other short projections above their top faces. In this connection, it will be noted that the top face of the slide between ribs 2, is spaced a distance from the under face of base plate 1, and that projections at the bottom faces of the caps can move freely forward in the open bottom space between the ribs 2.

Means are provided to separate the cap being fed forward from the caps in the pile, that is to hold back the caps immediately above the cap being fed forward. For instance, the top walls of the grooves 3, are notched or cut out at the lower end of the magazine to permit the caps to drop into the slide and therefrom to the non-cut floors of the grooves, thereby forming shoulders 6, at the front ends of said notches to engage the edge of the cap resting on the cap on the floors of the grooves and hence holding back said upper cap from forward movement with the cap being fed permitting the slide to pass under said upper cap to uphold the same and the pile in the magazine.

The lower portion of the interior of the magazine tube 5, is preferably elliptical or elongated, see 7, in the direction of reciprocation of the cap forcing slide 4, so that the internal diameter or width of said tube in the direction of feeding movement of the caps is greater than the diameter of the caps, thereby allowing the caps in the lower end of said magazine tube limited play or slight movement in the direction of feed and also permitting the formation of air spaces between the inner front and rear surfaces of said tube and the edges of the caps so that the caps can freely move down in the lower end of the magazine without the interference caused by the formation of air cushions. In other words, the air can freely escape from between the adjacent faces of caps moving down in the magazine.

In its normal position, the cap forcing slide 4 is arranged below the cap magazine, closing the lower end thereof and with the bottom cap in the pile resting on the top face of said slide. In performing its operative stroke the slide is moved rearwardly in the grooves 3 until the front edge moves back from the open end of the magazine tube. The bottom cap in the tube then drops onto the floors of the grooves 3 and in front of the transversely concaved cap engaging and pushing edge 9, of the slide, and the slide then moves forward on its cap feeding stroke, pushing the cap forwardly in the grooves 3, and from the lower end of the magazine to deliver the same to the cap applying devices. A sufficient space is left between the top face of the cap pushing slide and the front bottom edge of the cap magazine or discharge throat therefrom between the stop shoulders 6, to permit the free passage without interference of handle tabs or the like which may be secured on the top faces of the caps. The top face of the cap forcing slide is preferably beveled, see 8, downwardly and forwardly to the front cap engaging edge 9 for the purpose of engaging the cap in the magazine above the cap being forced forward and thereby raising the pile of caps in the magazine to permit ready separation of the cap being fed forward in the grooves 3, from the caps in the magazine and thereby tending to avoid jamming or wedging the caps during the feeding operation.

In the specific example illustrated, I show a comparatively short cap magazine or socket 5 internally enlarged a distance above its lower end to receive an insertible removable cap tube such as 10, and forming an internal beveled shoulder 11, to receive the lower end of said cap tube and to permit caps to freely slip past said shoulder down in the magazine 5. The cap tube 10, can be the card board or other tube forming a part of the original package in which the caps are supplied to the dealer or user of the capping machine.

At a point a short distance in front of the cap magazine, the base 1, is formed with a transverse opening for the passage of the cap seating plunger, said opening adapted to be brought into alinement with and over the mouth of the bottle to receive the cap; means being provided to hold the cap brought forward by the slide, in said opening for deposit in the bottle mouth.

12, is a downwardly flaring bottle mouth holding and centering ring or funnel depending from and fixed to the base 1, in alinement with the opening therethrough below the plunger. This bottle mouth guide, holder, or centering device is formed with an upwardly extending neck 13, fitting the under face of the flat portion of the base 1

and between the ribs 2 and closing the space between said ribs at the front of the opening through the base, while the opposite or rear portion of the said neck is cut away or slotted in the horizontal plane of the grooves 3, for the passage of the cap pushed by the slide into the opening beneath the plunger. The limit of the forward or cap feeding stroke of the slide is so arranged preferably, that the slide does not project through said neck and into the opening inclosed thereby. In other words, the slide on its forward stroke stops before projecting through said neck but moves a sufficient distance to push the cap into said opening and to permit the same to drop therein, and the slide in its normal position is arranged at its limit of forward or feeding movement and in this position the slide closes the lower end of the magazine and its front edge 9, is arranged approximately flush with the inner surface of said neck 13. Hence I provide means for holding the cap, brought forward by the slide, in said opening within the neck, until the machine is applied to the bottle and the cap seating plunger starts on its downward movement. In the specific example illustrated, the holding device for the cap ready to be deposited in the bottle mouth, consists of a thin flat usually sheet metal finger 15, projecting forwardly from and carried by the cap forcing slide. The finger is arranged centrally and longitudinally of the slide and is at its rear end secured to the bottom face of the slide and extends forwardly and horizontally in continuation thereof and about diametrically across the cap receiving opening or neck 13, when the parts are in normal position. About at its rear end and about just below the central portion of the slide edge 9, said cap receiving and supporting finger is formed with a downward offset 16, to throw the horizontal cap receiving portion of the finger into a horizontal plane below the horizontal plane of the grooves 3, so that when the slide reaches its limit of forward movement the cap forced forward thereby will drop from the grooves 3, onto the finger 15, and will be held thereby in a horizontal position about centrally within the neck 13. In this connection it might be noted that the internal diameter of the neck 13, is greater than the diameter of the caps and than the width of the cap forcing slide, so that the grooves 3, open and merge into the neck 13, in advance (in the direction of feeding movement of the slide) of the transverse internal diameter of said neck.

17, is the cap seating plunger normally elevated above the cap receiving opening through the base 1. This plunger is carried by a vertical slide rod 18, normally and yieldingly upheld by coiled spring 19 longitudinally arranged on the upper portion

thereof between a shoulder thereon and the upper end of the rod guiding and carrying yoke or frame.

20, is a vertically disposed rigid yoke or frame, usually bifurcated and at the lower ends of its two legs or opposite vertical sides resting on and fixedly secured to the base 1. A distance above the base 1, the yoke 20, is formed with a horizontal transverse bridge or brace 21, having a vertical guide opening or eye for the slide rod 18. The upper end of the yoke 20, is also formed with a vertical guide opening for the slide rod 18.

22, is a longitudinally adjustable stop on the slide rod 18 to engage the upper end of the yoke 20, and limit upward movement of the rod. At its upper end the slide rod is provided with a transversely arranged rigid saddle 23, usually formed with a concaved or depressed upper face to receive the palm of the band in depressing or forcing the plunger down to operate the machine on its cap seating and feeding strokes. The upper end of the yoke 20, is shown provided with a horizontally disposed rearwardly extending rigid handle or finger hold 24, arranged a distance below the saddle 23 and forming a finger hold by which the machine can be upheld and supported by the fingers while being carried and while being applied to the bottle mouths.

25, is an arm rigid with and projecting forwardly and horizontally from the upper end of the frame or yoke 20, and at its front end formed with a guiding and holding ring to detachably receive the cap tube 10, and maintain the same in the upright position.

Suitable actuating connections are provided between the slide rod 18, and the cap forcing slide 4, for actuating said slide on the reciprocation of said rod. In the specific example illustrated, I show a transverse rotary shaft 26 arranged between and carried by the lower portions of the legs of the yoke 20, and this shaft 26, is provided with a pinion 27, rigid therewith and meshing with the toothed rack 28, arranged longitudinally of the push rod 18. 29, is a toothed sector rigid with the shaft 26, and arranged at one end thereof within the yoke 20, and meshing with a toothed rack 30, rigid with and arranged longitudinally of the cap forcing slide 4. This rack 30, is elongated a considerable distance rearwardly beyond the slide and is rigid therewith and arranged on the top face of one longitudinal edge portion thereof, and the groove 3, receiving said edge portion is longitudinally enlarged at its inner end to receive the rack 30, so that said rack slides beneath the under surface of the base 1, as more clearly appears from Figs. 1 and 3. The base 1, is formed with an opening receiving the sector 29, and exposing the rack

30, thereto, and permitting the sector to mesh with the rack. This rack 30, also serves as a guide for maintaining the slide in its proper position during reciprocation thereof.

The arrangement of the operating connections between the slide rod 18, and the slide 4, is such that the spring 19, normally maintains the slide rod 18, at its limit of upward movement, also normally maintains the slide 4, at its limit of forward movement, see Figs. 1 and 4. With the parts thus in their normal positions, a cap is presumably held by the finger 15, within the opening below the plunger 17. When the device, carried by the handle 24, is placed on a bottle mouth, with the guide 12, properly centering the bottle mouth, downward pressure of the hand on the saddle 23, forces the plunger down against the tension of the spring 19, and at the same time the gearing 28, 27, 29, and 30, reciprocates the slide 4, rearwardly, thereby moving the finger 15, rearwardly from the cap allowing the cap to drop into the mouth of the bottle, before the plunger 17 has descended a sufficient distance to interfere with the rearward movement of the finger 15. As soon as the finger 15, has withdrawn from the cap receiving opening or neck 13, the plunger descends therethrough and properly seats the cap in the bottle mouth and on the sealing shoulder thereof. While the plunger is thus performing its function, the slide 4, passes rearwardly from beneath the cap magazine and a cap drops into the grooves 3, in front of said slide, so that when the pressure of the hand on saddle 23, is released, the spring 19, will return the plunger to its normal elevated position and through the medium of the hereinbefore gearing will move the slide 4, on its forward feeding stroke to deposit a cap in the cap receiving opening and onto the finger 15, in readiness for the next seating stroke of the plunger. By lowering the top face of the finger 15, below the level of the grooves 3, and of the slide 4, the cap resting on the finger 15, is stripped therefrom by engagement with the rear wall of the ring or neck 13, below the level of grooves 3, when the finger is withdrawn rearwardly from said neck.

If so desired the sector 29, can be recessed to straddle the cross brace 21, of the yoke 20, and to engage said brace at its limits of oscillation in opposite directions.

It will be noted that the rack bar 30, on the slide acts as a guide to steady the slide against lateral play. Vertical thrust of the operating mechanism on the slide is avoided, inasmuch as the actuating force or power is applied to the slide in a direction parallel to the length thereof by means of sector 29, as will be readily understood by those skilled in the art.

If so desired, the plunger 17, can be so mounted on or connected to the lower end of the rod 18, as to be capable of limited vertical rocking movement or oscillation on and independently of the rod end to conform to unevenness in the bottle mouth or deflection of the bottle or cap from proper positions. To this end, I show the end of the rod reduced within the plunger bore, and the internal diameter of the bore greater than the diameter of said reduced end. The plunger is formed with a contraction forming shoulder 31, at the upper end of said bore and engaging shoulder 32, of the rod. An expansible coiled spring 33, is arranged around the reduced extremity of said rod and compressed between shoulder 32, and a washer 34, secured on the lower extremity of the rod and within the lower end of the bore. The plunger bore is of sufficient diameter to permit the plunger a limited vertical rocking movement on the reduced end of the rod and against the tension of said spring which tends to yieldingly hold the plunger in a horizontal position at right angles to the rod 18. I do not however, wish to limit my invention to this specific arrangement.

Advantages are attained by having the slideway for the cap forcing slide open below the magazine and cap, as dust can thereby drop from the machine and danger of conveying dust to the bottles is thereby avoided, and furthermore access can be easily gained to the lower end of the magazine and to the caps therein, and damaged or wedged caps can be easily removed.

It is evident that various changes, variations, and modifications can be resorted to without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the exact construction shown but consider myself entitled to all departures within the spirit of my invention.

What I claim is;—

1. In a capping machine, in combination, a horizontally disposed base at its under side having opposite longitudinal cap-edge-receiving grooves, said base being open at the bottom between said grooves, the distance between said grooves being less than the diameter of the caps, a cap magazine opening through said base and through the top walls of said grooves whereby caps can drop from said magazine onto the bottom walls of said grooves, the top walls of said grooves at the front of said opening forming stop shoulders holding back the cap immediately above the cap in the grooves, said grooves at the front ends terminating in an opening adapted to register with the bottle mouths to be capped, whereby the caps drop from the front ends of said grooves into said opening, a cap seating plunger movable through said opening, a cap forcing slide

movable in said grooves to push each cap forwardly therein and to normally close said grooves against entrance of caps thereinto, and operating means.

2. In a capping machine, in combination, a base formed with a vertical cap-delivery opening adapted to register with the bottle mouths to be capped, a cap-seating plunger movable through said opening, said base having depressed longitudinal cap supporting ledges at their front ends terminating in said opening to drop caps thereinto, said ledges being spaced apart a distance less than the diameter of the caps, whereby caps are supported on said ledges by their diametrically opposite edge portions resting thereon, said base having a vertical cap-supply opening above said ledges so that caps can drop therethrough onto said ledges, spaced cap abutments in front of said cap-supply opening and a distance above said ledges approximately equal to the thickness of the caps to permit each cap to move forward on said ledges and under said abutments and to hold back the cap in said opening and immediately over the cap on the ledges, a reciprocatory slide to push caps forwardly on said ledges from said supply opening to said delivery opening, and actuating means.

3. In capping machine, in combination, a frame having longitudinal depending ribs along its under side formed with longitudinal cap-edge-receiving grooves opening through their inner edges and arranged a distance below the intervening bottom face of the frame, said grooves being spaced apart a distance less than the diameters of the caps and of a width approximately equal to the thickness of the caps, said frame having a vertical-cap receiving opening extending through the top walls of said grooves to deliver caps onto the bottom walls of said grooves, said frame also having a cap delivery opening therethrough at which said grooves terminate at their front ends to drop caps thereinto, a reciprocatory slide along its opposite edges fitting and sliding in said grooves to force caps forwardly therein, a cap forcing plunger movable through said delivery opening, and actuating means.

4. In a capping machine, in combination, a horizontal frame having a cap-receiving opening and a cap-delivering opening spaced from said delivery opening, said frame having a pair of longitudinal cap-edge-receiving grooves of the approximate thickness of a cap and extending from said receiving opening and at their front ends terminating in said delivery opening, said grooves spaced apart a distance less than the diameter of the caps, said receiving opening extending through the top walls of said grooves to drop caps onto the bottom

walls thereof, a longitudinally unobstructed passage being provided between the top walls of said grooves and from the receiving opening to the delivery opening and over the top faces of caps being forced along said grooves, a slide at its opposite edges confined in said grooves to force caps forwardly along said grooves, a cap seating plunger, and actuating means.

5. In a capping machine, in combination, a horizontal frame having a vertical cap-receiving opening and a vertical cap-delivery opening, and a cap passage from the receiving opening to the delivery opening, a cap-stop spanning said passage at the rear of the receiving opening, a pair of cap-abutments at the front of said receiving opening spaced a distance apart less than the diameter of the caps, passages about equal to the thickness of the caps being provided below said abutments for the successive passage of the diametrically opposite edge portions of the caps, a reciprocatory slide movable below said stop and abutments for successively pushing caps through said passage way, a cap seating plunger, and actuating means.

6. In a capping machine, in combination, a frame having a cap passage way, a cap magazine opening into said passage way, the discharge end of the bore of said magazine being enlarged in the direction of transverse feeding movement of the caps therefrom, and a cap forcing slide in said way and traversing the discharge end of said magazine bore, said slide having a front cap engaging and forcing edge in width approximately equal to the thickness of the caps, the side face of the slide adjacent the magazine being beveled outwardly and rearwardly from said edge to raise the column of caps in the magazine as said edge is forcing the end cap laterally therefrom.

7. In a capping machine, a slide having a cap forcing portion and provided with a cap-upholding finger arranged below and in advance of said forcing portion, and means whereby the caps are dropped onto said finger and from operative relation with respect to said cap forcing portion.

8. In combination, in a capping machine, a frame having a cap slide way terminating in a cap delivery opening, a slide to push caps along said slide way and cause the same to drop therefrom into said opening, said slide provided with a forwardly projecting finger depressed below the cap supporting portion of said slide way and adapted to catch the caps when dropped from the front end of the slide way in said opening, cap seating means, and actuating mechanism.

9. A capping machine having supporting edges leading to a cap receiving vertical opening, a slide adapted to force a cap along said edges to said opening and pro-

vided with a forwardly projecting finger to receive and support a cap in said opening, and means to strip the cap from said finger when the slide moves on its return stroke.

- 5 10. A capping machine having a base with a vertical cap receiving opening there-
through, a bottle mouth guide fixed to said
base and depending therefrom and having a
neck extending upwardly into said opening
10 and at its front portion forming a cap stop
and at its rear side cut away for the trans-
verse passage of caps into said neck, a cap
forcing slide, withdrawable means to nor-
mally uphold a cap in said neck, said neck
15 having a fixed portion to strip the caps from
said means on the withdrawal thereof, and
a cap seating plunger.

11. A capping machine having a base
with a cap receiving opening, a plunger to
20 move down through said opening, a cap
magazine, cap supporting edges therefrom
to said opening, and a cap forcing slide to
move caps along said edges to said opening,
said slide provided with means normally ar-
25 ranged in said opening for supporting caps
therein, said means arranged to drop each
cap in said opening on the return stroke of
said slide.

12. A capping machine comprising a base
30 having a vertical cap receiving opening
therethrough, a cap seating plunger adapted
to move through said opening, a cap forcing
slide movable to said opening and adapted
to successively deliver caps thereinto and
35 provided with a forwardly projecting de-
pressed cap supporting finger normally ar-
ranged in said opening to receive the caps
dropped into said opening by said slide, and
a fixed stop to strip the cap from said finger
40 as the finger is withdrawn from the opening
and permit the caps to drop through the
opening.

13. In a capping machine, in combina-
45 tion, a frame formed with opposite longi-
tudinal cap-edge-receiving slideways, a cap
magazine from which the caps are adapted
to drop onto said slideways, said frame
having a cap delivery opening, a bottle
centering device depending from said frame
50 and having a neck entering said delivery
opening, a cap seating plunger movable
through said delivery opening and neck,
said slideways terminating at said neck so
as to drop the caps freely thereinto, a cap
55 slide for pushing the caps along said slide-
ways and to said neck, operating means nor-
mally maintaining said slide withdrawn
from said neck, and means for supporting
caps in said neck and below the horizontal
60 plane of forward movement of the caps in
said slideways.

14. A capping machine comprising a base
having a vertical cap receiving opening
therethrough, a cap magazine opening
65 through said base, said base provided with

parallel separated cap supporting edges
from said magazine to said opening, a cap
forcing slide movable along said edges to
force the caps successively into said open-
ing, said slide being normally at its limit
70 of forward movement toward said opening
and closing the bottom of said magazine
and provided with means normally arranged
in said opening to support a cap therein,
and a cap seating plunger adapted to move
75 down through said opening.

15. In a capping machine, in combination,
a frame, a cap magazine, a cap seating
plunger, a reciprocatory slide for deliver-
ing caps to the path of the plunger and
80 provided with a longitudinal rack bar, said
frame having a guide way for said bar for
maintaining the slide against lateral dis-
placement, a frame rising from said first
mentioned frame, a plunger rod guided by
85 said last mentioned frame and provided
with a longitudinal rack, and a transverse
rock shaft carried by said last mentioned
frame and provided with a pinion in mesh
with said rod rack and with a gear in mesh
90 with said slide rack.

16. In a capping machine, in combination,
a horizontally disposed frame, a recipro-
catory cap forcing slide movable in and
guided by said frame and at its top face
95 provided with a fixed longitudinal rack in-
closed within said frame, a vertical yoke
frame fixed to said first mentioned frame,
a reciprocating rod guided by said yoke
frame and provided with a longitudinal
100 rack, a rock shaft mounted in said yoke
frame above said first mentioned frame and
provided with gearing in mesh with said
racks, substantially as described.

17. In a capping machine, in combination,
105 a frame having a cap receiving opening and
a cap delivery opening and formed with a
slideway between said openings, a cap forcing
slide movable in said way and having a
fixed longitudinal rack along an edge por-
110 tion thereof, a cap seating plunger pro-
vided with a plunger rod having a rack,
and rotary gearing between and operatively
connecting said rod and slide racks.

18. A capping machine having a push
115 rod and a cap seating plunger carried there-
by and loosely and rockably mounted and
confined on the end thereof, said rod having
a reduced shouldered end and said plunger
having an enlarged bore loosely receiving
120 said end, and a coiled spring on said end
and within said bore and yieldingly hold-
ing said plunger in its normal position with
respect to said rod.

19. In combination, a frame having longi-
125 tudinal cap-and-slide-receiving grooves, a
cap forcing slide therein, means for actu-
ating said slide, and a cap magazine, said
frame having an opening from said maga-
zine to said grooves and extending through
130

the top wall of the grooves and forming cap separating shoulders 6, substantially as described.

20. In a capping machine, in combination, a horizontal frame having a cap receiving opening and a cap delivery opening, a bottle centering device depending from said frame and having a neck entering said delivery opening, a bottle seating plunger movable through said delivery opening, said frame formed with opposite longitudinal cap edge receiving slideways from said receiving opening to said delivery opening and extending through and terminating in said neck to deliver caps thereinto, a cap slide for pushing caps along said slideways and into said neck, the rear portion of said neck forming a cap stop and the front portion of said neck forming a fixed wall preventing caps delivered into the neck from returning with the slide, and actuating means.

21. In a capping machine, in combination, a horizontally disposed frame, a cap magazine, a cap seating plunger, a reciprocatory slide for delivering caps to the path of the plunger and provided with a longitudinal rack, said frame having a guide way for said rack, a yoke frame fixed to and rising from said first mentioned frame, a vertically disposed rod for said plunger guided by and movable in said yoke frame and provided with a longitudinal rack, a transverse rock shaft carried by said yoke frame and provided with gears in mesh with said racks respectively, stop mechanism, and a spring acting on said rod and slide.

In testimony whereof I affix my signature, in presence of two witnesses.

WILBUR L. WRIGHT.

Witnesses:

HERBERT C. EMERY,
HUBERT E. PECK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."