J. SHARP.

BOTTLE CAPPING MACHINE.

APPLICATION FILED MAR. 21, 1917.

1,278,038.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

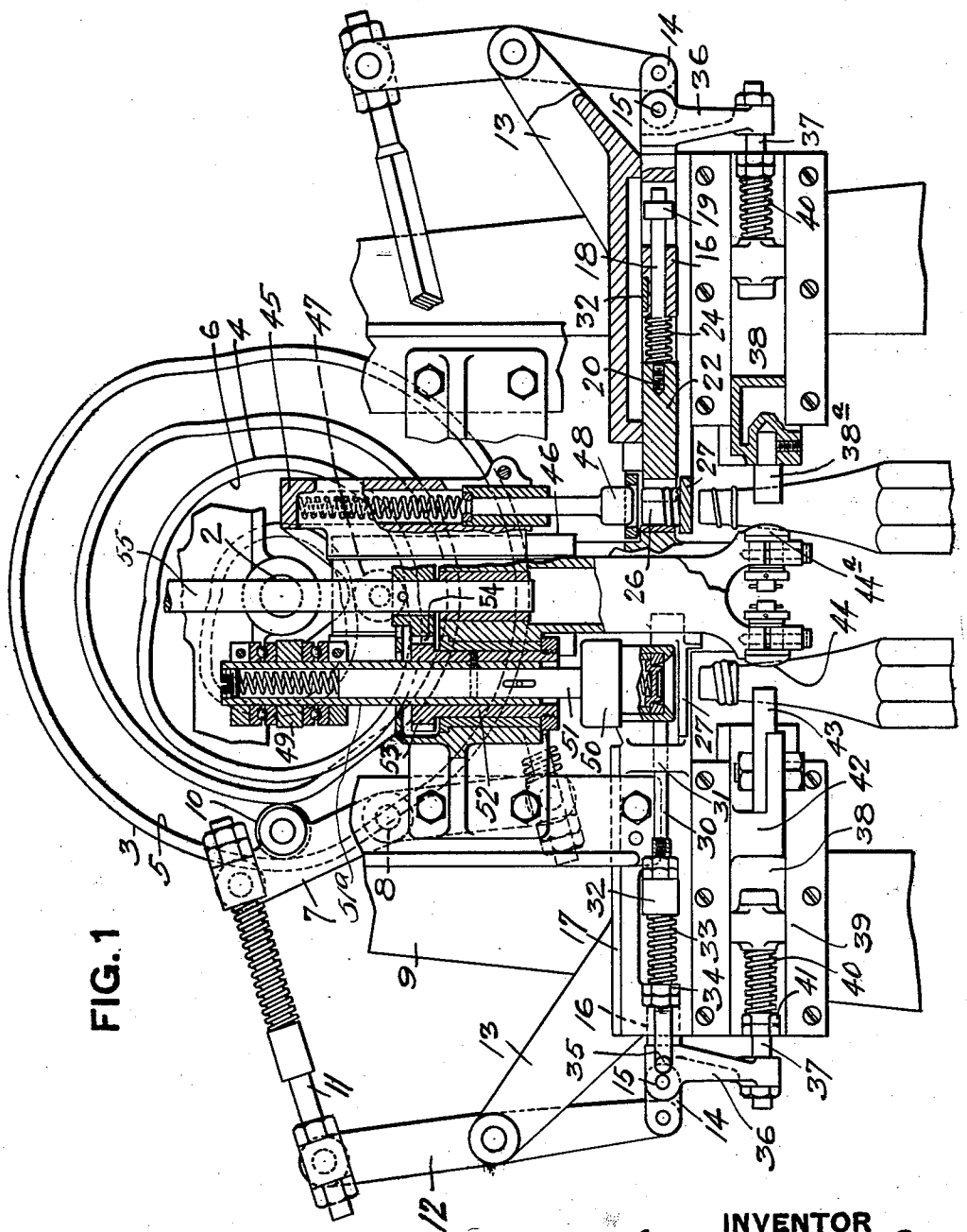


FIG. 1

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2 SHEETS—SHEET 2.

FIG. 2

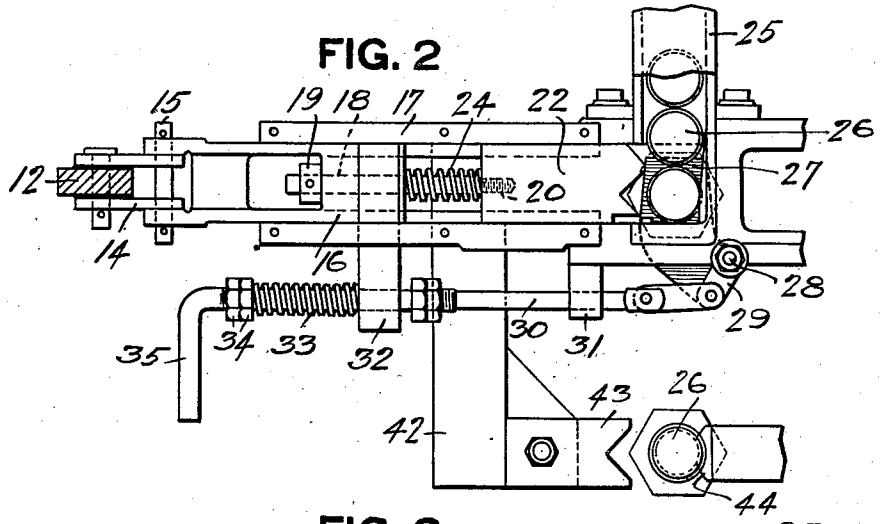


FIG. 3

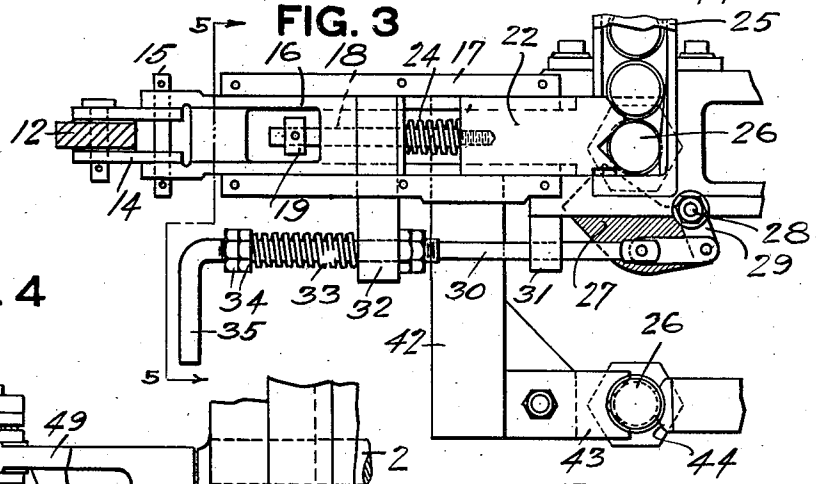


FIG. 4

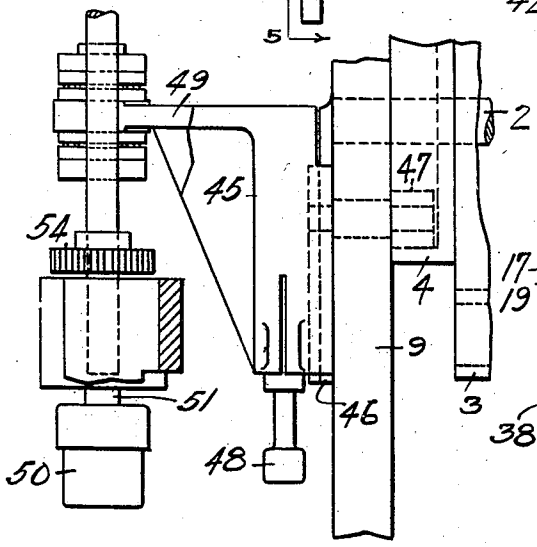
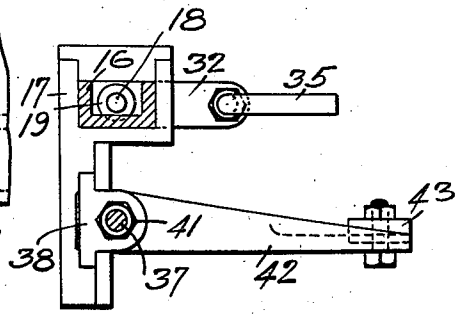


FIG. 5



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UNITED STATES PATENT OFFICE.

JOHN SHARP, OF OAKMONT, PENNSYLVANIA.

BOTTLE-CAPPING MACHINE.

1,278,038. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed March 21, 1917. Serial No. 156,345.

To all whom it may concern:

Be it known that I, JOHN SHARP, a citizen of the United States, and resident of Oakmont, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Bottle-Capping Machines; and I do hereby declare the following to be a full, clear and exact description thereof.

My invention relates to a bottle-capping machine.

The invention relates more particularly to the mechanism for bringing the caps into position and holding them in position to be acted on by a plunger for forcing the cap from its holder onto the bottle as well as to means coöperating therewith for holding the bottle during the operation of applying the cap by screwing the cap thereon. By my invention I arrange to have these operations take place simultaneously so that while a cap is being held in position to be applied to a bottle, the previous bottle on which the cap has already been applied is being held in position for the screwing-on operation.

The invention is illustrated in connection with suitable cap-sealing mechanism, that which is shown being the Owens type of machine, the operation of which is well understood by those skilled in the art.

In the accompanying drawing, Figure 1, is an end view, partly in section, of a duplex machine embodying my invention; Fig. 2 is a horizontal sectional view of the cap and bottle-holding mechanism for one-half of the machine, the section being taken on the line 2—2, Fig. 1; Fig. 3 is a like view showing the parts in holding position; Fig. 4 is a detail view of the cross-head of the machine which carries the capping-plunger and screw-chuck; and Fig. 5 is a section on the line 5—5, Fig. 3.

In the drawing, the numeral 2 designates a power-driven shaft on which are mounted the cams 3 and 4 having the camways 5 and 6 respectively. An arm 7 pivoted at 8 in the frame 9 has the roller 10, which engages the camway 5 of the cam 3. The arm 7 is connected to the rod 11 and the opposite end of said rod is connected to the lever 12 pivoted to the bracket 13. The lower end of the lever 12 is connected to the link 14 connected by the pin 15 to the slide 16, which moves in the guide 17. A pin 18 has a collar 19, which engages the slide 16, the forward end 20 of said pin is connected to the cap-holder 22. A spring 24 is interposed between the cap-holder and the slide to permit the cap-holder to yield slightly when the cap is acted on by the plunger, which forces the cap down out of the holder onto the bottle.

A chute 25 is provided to feed the caps 26 to the holder, and in order to support the cap temporarily which is brought into position to be held by the holder, I provide the plate 27. This plate is pivoted at 28 to the frame and a short arm 29 connects said plate through link connection to the outer end of the rod 30, moving in guides 31 and connected by the strap 32 to the slide 16. A spring 33 is interposed between the strap 32 and the nuts 34 on the rod 30. The rod 30 has the handle 35, and the operator by grasping the handle 35 and forcing in the rod 30 may operate the plate 27 by hand when desired, although as hereinafter set forth, the plate is ordinarily worked automatically by the movement of the slide 16.

The arm 36 is carried by the pin 15. Connected to the arm 36 is the pin 37, which connects the slide 38 moving in guides 39. The slide carries the jaw 38^a which is adapted to engage and hold the bottle against an abutment 44^a during the positioning of the cap on the bottle, and an arm 42 is connected to the slide which carries the jaw 43, which coöperates with the stationary holder 44 for holding the bottle while the cap is being screw seated. The spring 40 surrounds the pin 37, being interposed between the slide 38 and the nuts on said pin to cushion the slide. By the above construction, it will be apparent that the movement of the lever 12 operates simultaneously the cap-holder and the bottle-holders, as will be more fully hereinafter referred to.

The mechanism for operating the means for forcing the cap out of the holder onto the bottle, and for operating the means for screwing the cap on the bottle form no part of my invention, the mechanism which I have illustrated being well-known chucking and plunger mechanism for capping machines; and I do not wish to limit my invention to a machine employing this type of capping mechanism, as it will be apparent other mechanism may be employed for effecting this operation of the machine. My invention is illustrated in connection with a duplex machine in which two rows of bottles are having the caps applied simultaneously,—the bottles traveling through the

machine in parallel rows, being conveyed by a suitable carrier (not shown). Two caps are placed in position at one time, and two bottles are having the caps screwed thereon. The plungers for applying the caps and the chucks for screwing on the caps are arranged in pairs, to operate on both rows of bottles simultaneously as to each pair.

In Fig. 1 the section is taken transversely of the machine on a line which cuts through only one plunger of the pair of plungers and through one chuck of the pair of chucks, the chucks being in advance of the pair of plungers. In Fig. 4 the relative position of the plungers and chucks is shown longitudinally of the machine.

The plungers and chucks are carried by a cross-head 45, which is mounted to reciprocate in a guide 46. This cross-head 45 has the pin and roller 47, which engages the camway 6 of the cam 4. Mounted in the cross-head is the plunger 48, which is adapted when lowered by movement of the cross-head to force the cap onto the bottle.

A bracket 49 projects out from the cross-head 45, and said bracket carries a suitable chuck 50, which is mounted on the vertically-movable rod 51, which is slidable in a sleeve 51ª carried by ball bearings in the bracket 49. This rod is keyed to the sleeves 52 and 51ª. Sleeve 52 has the gear 53 at the upper end thereof which engages a pinion 54, which is keyed to a power-shaft 55, which is independently driven, the sleeve 52, rod 51, and the chuck 50 being driven thereby. When the cross-head is lowered, the chucks and the plungers are simultaneously lowered therewith, the chuck being driven continuously by the above-described drive connections.

When the machine is in operation, the caps are fed into the chute 25 and the apparatus is so timed that when the cap comes into position resting on the plate 27, the lever 12 is operated to move the cap-holder 22, the holder 38ª and the bottle-holder 43 simultaneously,—the one to engage the cap, and the other, the bottle in advance thereof, which has already had the cap placed thereon by movement of plunger 48.

This movement of the cap-holder acts through the strap 32 to advance the rod 30, which acts through the connections described to move the plate 27 from position under the cap. The cap-plunger 48 and the screwing-chuck are then lowered into position, the cap-plunger forcing the cap down onto the bottle and the screwing-chuck engaging the bottle already capped, and through the connections described a rotary movement is imparted to the chuck to screw the cap thereon. As soon as this has been accomplished, the plunger 48 and the chuck 50 are lifted and the lever 12 reversed to withdraw the bottle-holder and the cap-holder, while at the same time, the plate 27 is moved back into position to support the next cap which comes down the chute in position to be held on the next operation of the cap-holder.

What I claim is:

1. In a machine of the character described, the combination of a reciprocating cap-plunger, a cap-holder, a temporary support for the cap, means for advancing the cap-holder into engagement with the cap, and means actuated by the movement of the holder for moving said support out of the way as said cap-holder advances.

2. In a machine of the character described, the combination of a reciprocating cap-plunger, a temporary support for the cap, a yielding cap-holder, means for reciprocating said cap-holder, and connections between the holder and said temporary support whereby said support is moved by the movement of the cap-holder from beneath said cap as said cap-holder advances and is moved back into position as said cap-holder withdraws.

3. In a machine of the character described, the combination of a reciprocating cap-plunger, a temporary support for the cap, a reciprocating cap-holder having a yielding cap-engaging jaw, means for moving said cap-holder to bring said jaw into engagement with said cap, and connections between the holder and said support whereby said support is moved by the movement of the cap-holder from beneath said cap as said holder advances and is moved back into position as said holder withdraws.

4. In a machine of the character described, the combination of a reciprocating cap-plunger, a swinging plate temporarily supporting the cap, a reciprocating cap-holder having a yielding cap-engaging jaw, means for moving said cap-holder to bring said jaw into engagement with said cap, and connections between the holder and said plate whereby said plate is swung by the movement of the cap-holder from beneath said cap as said holder advances and is swung back into position as said holder withdraws.

5. In a machine of the character described, the combination of a reciprocating cap-plunger, a pivotally-mounted plate to temporarily support the cap, a reciprocating cap-holder, means for moving said holder into engagement with the cap, a rod, connections between said plate and said rod, and connections between said rod and said means for reciprocating said cap-holder.

6. In a machine of the character described, the combination of a reciprocating cap-plunger, a pivotally-mounted plate temporarily supporting the cap, a reciprocating cap-holder, means for moving said holder into engagement with the cap, a longitudinally-movable rod, connections between said

rod and said plate, connections between said rod and said means for reciprocating said cap-holder, and means for moving said rod independently of said cap-holder.

7. In a machine of the character described, the combination of a reciprocating cap-plunger, a temporary support for the cap, a slidably-mounted cap-holder, a slide, connections between said slide and said cap-holder, means for reciprocating said slide, and means operated by the movement of said slide for moving said temporary support.

8. In a machine of the character described, the combination with reciprocating cap-seating and cap-screwing mechanisms, of a reciprocating combined cap and bottle-holder, a reciprocating bottle-holder in advance of said first holder, and means for moving said holders simultaneously to hold said cap and said bottles while being acted on by said seating and screwing mechanisms.

In testimony whereof I, the said JOHN SHARP, have hereunto set my hand.

JOHN SHARP.

Witnesses:
ROBT. D. TOTTEN,
JOHN F. WILL.