

May 15, 1928.

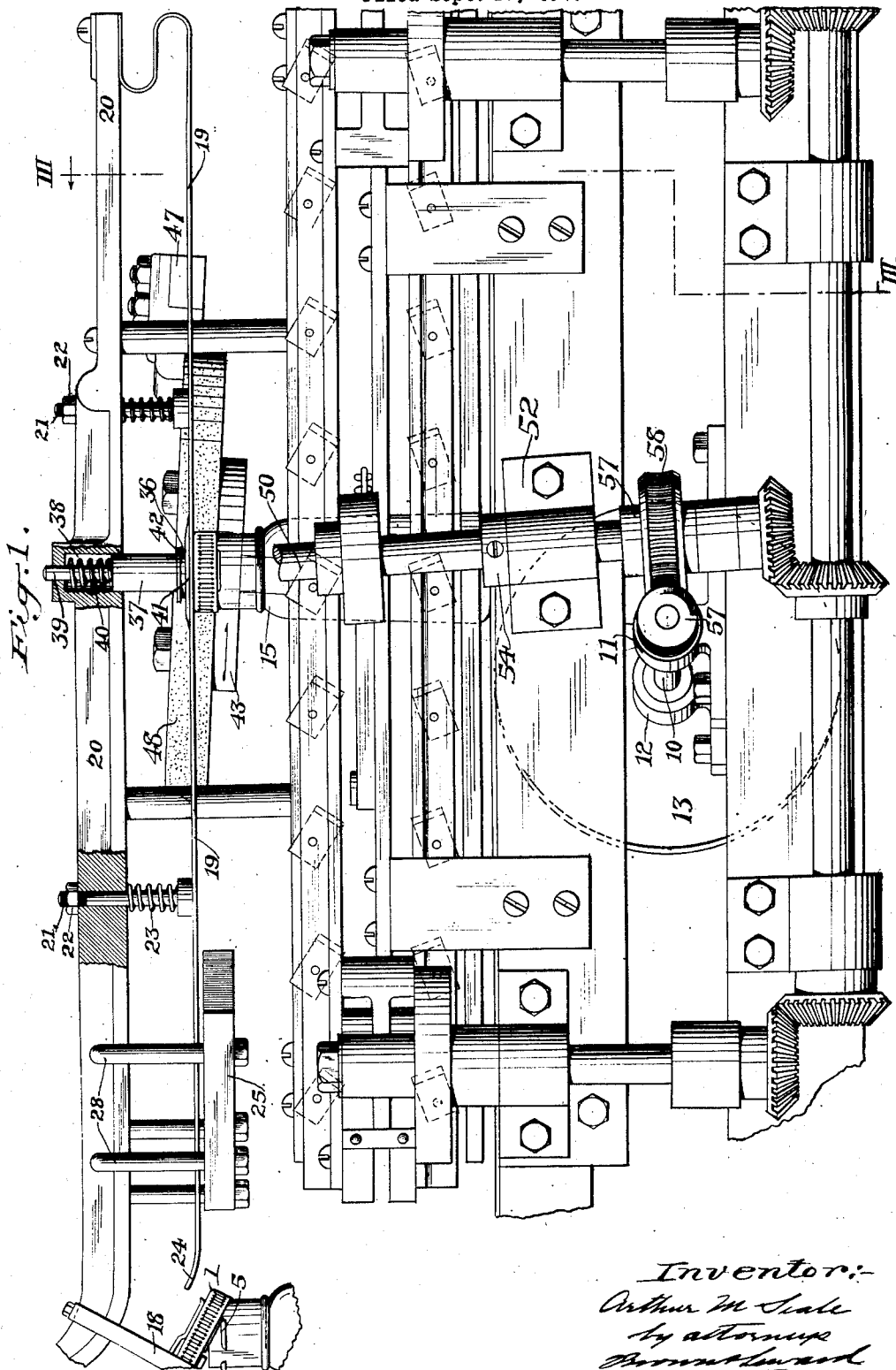
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A. M. SEALE

ATTACHMENT FOR BOTTLE CAPPING MACHINES

Filed Sept. 17, 1921

3 Sheets-Sheet 1



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May 15, 1928.

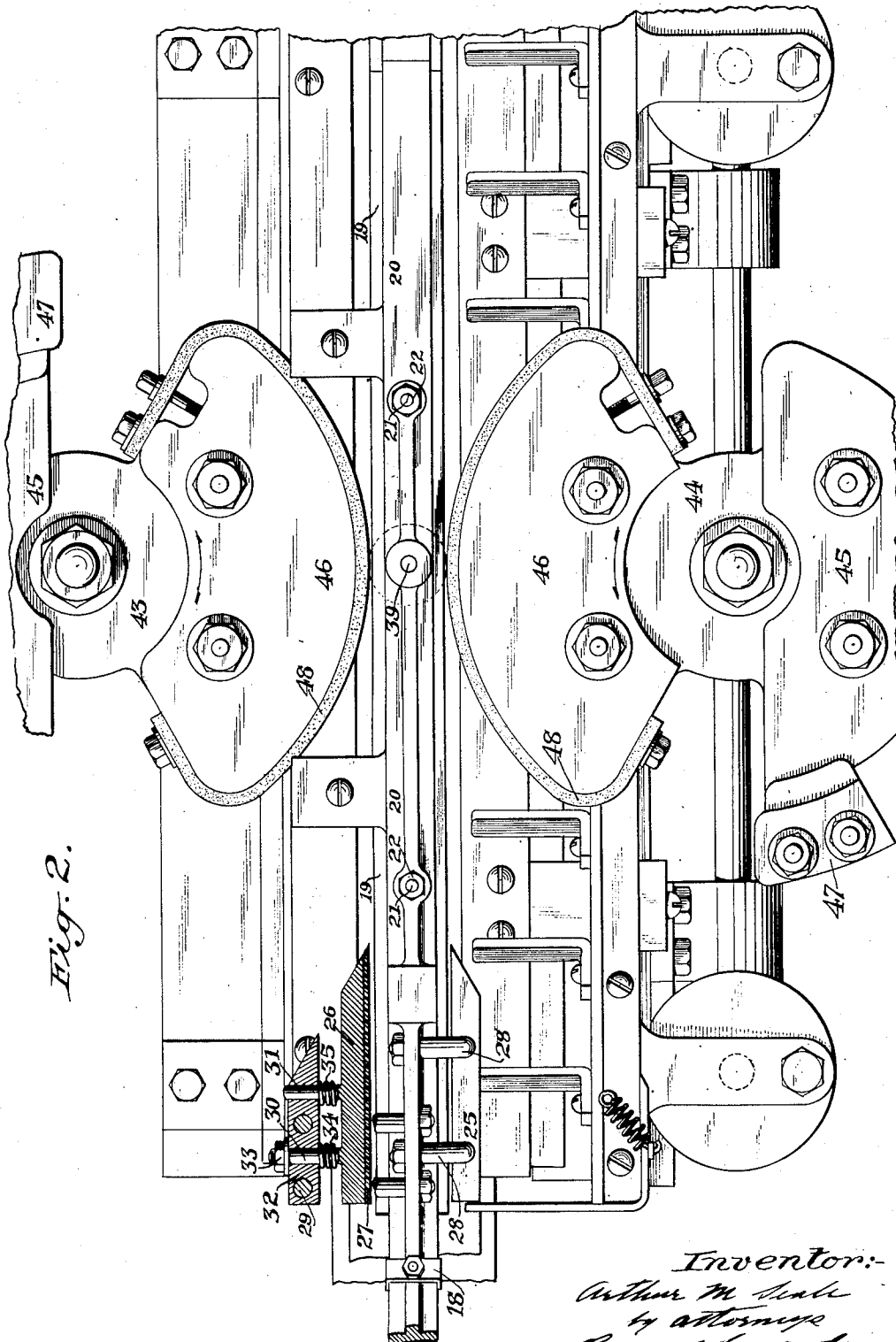
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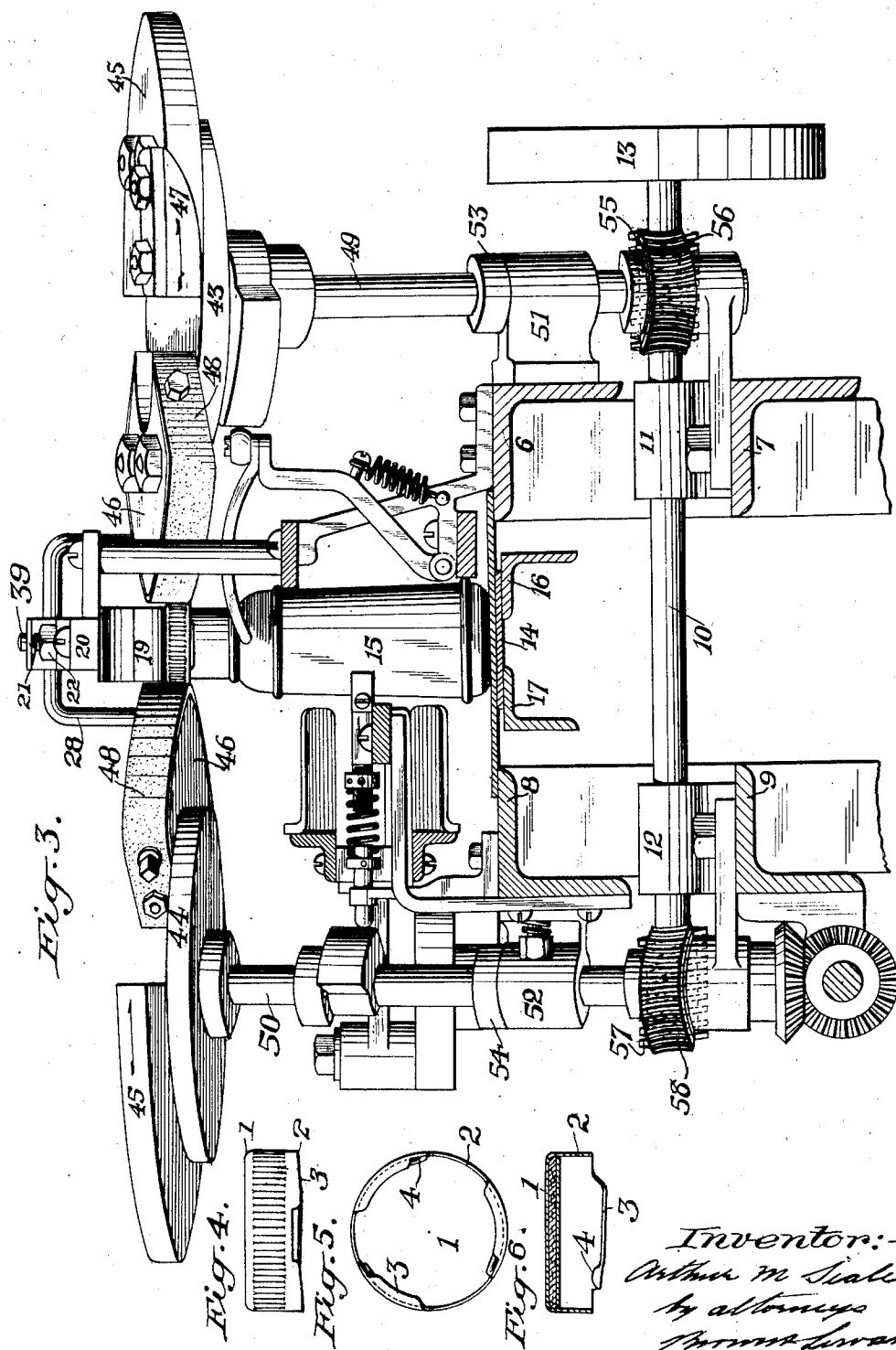
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ATTACHMENT FOR BOTTLE CAPPING MACHINES

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3 Sheets-Sheet 3



Inventor:-
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Patented May 15, 1928.

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UNITED STATES PATENT OFFICE.

ARTHUR M. SEALE, OF BROOKLYN, NEW YORK, ASSIGNOR TO PARAGON CAN & CAP COMPANY, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

ATTACHMENT FOR BOTTLE-CAPPING MACHINES.

Application filed September 17, 1921. Serial No. 501,428.

The present invention relates to machines for applying closures to receptacle and more particularly to machines for applying closures of the screw type.

5 An object of the invention is to provide a machine of the above character in which the closures may be applied to the receptacles with great rapidity and without injury to the receptacles or to the coating on the closures.

10 Another object of the invention is to apply the screw closures to the receptacles by exerting longitudinal pressure on the closures first to seat them and then imparting a rotary movement to the closures for securing them tightly on the receptacles.

15 Another object of the invention consists in providing certain improvements in the construction, form and arrangement of the several parts whereby the above named and other objects may be effectively attained.

20 Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

25 A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, wherein—

30 Fig. 1 represents a detail side elevation of a bottle capping machine embodying my invention.

Fig. 2 represents a detail top plan view of the same.

35 Fig. 3 represents a detail transverse section taken in the plane of the line III—III of Fig. 1, looking in the direction of the arrows.

Fig. 4 represents one of the caps in side elevation.

40 Fig. 5 represents the same in bottom plan.

Fig. 6 represents a section taken centrally through the cap.

45 The cap which my machine is intended to apply is herein shown as comprising the top 1, the depending flange 2 and the segmental inclined projections 3 which are formed by cutting away the bottom edge of the depending flange 2 and turning the projecting portions inwardly. Stops 4 are provided for limiting the rotary movement of the cap,

which stops are herein shown as formed by distorting the segmental projections 3 at their rear ends.

The bottle to which the cap is to be applied is herein shown as being provided with exterior segmental projections 5 forming a plurality of shoulders arranged to receive beneath them the internal segmental projections 3 of the cap.

60 The mechanisms for feeding the bottles, feeding the caps thereto and the ejection of the bottles may be of any well known or approved form, the parts of the mechanisms illustrated in the accompanying drawings being of the type disclosed in the copending application of Robert G. Clark, filed April 14, 1920, Serial No. 373,922.

65 The machine includes a frame comprising two opposite pairs of upper and lower longitudinal side bars 6, 7, 8, 9, suitably connected. The main drive shaft 10 is mounted in suitable bearings in brackets 11, 12 on the side bars 7, 9 and it is arranged so as to extend diagonally across the machine. It may be provided at one end with a pulley 13 adapted to receive a belt in order to impart rotary motion to the shaft from a suitable source of power (not shown).

70 A conveyor belt 14, adapted for feeding the bottles 15 leads longitudinally through the machine between the side bars 6, 8 and rests on tracks 16, 17. This conveyor belt may be driven at the desired speed from any suitable source of power (not shown) in order to feed the bottles into and eject them from the machine.

75 A chute or other suitable means 18 is provided for delivering the caps successively onto the mouths of successive bottles, which means may be of any well known or approved form. The bottle with its cap loosely positioned thereon is passed into the machine beneath a spring pressed top guide 19 which extends longitudinally through the machine. The rear end of this guide 19 is secured to a top bar 20 which surmounts the frame. Bolts 21 projecting from the top guide 19 extend loosely through the top bar 20 and above the same they are provided with nuts 22 for limiting the downward movement of the top guide. Springs 23 surrounding the bolts 21 are located between the top guide 19 and the bottom of the top bar 20 for yieldingly holding the top guide at the limit of its downward movement. The

front end of this top guide 19 may be turned upwardly as shown at 24 to more readily permit the passage of the bottle with the cap loosely positioned thereon into engagement

6 with the top guide.

Side guides 25, 26 are arranged in position to engage the opposite sides of the loosely positioned cap as the bottle and cap are fed into the machine. These guides are so arranged and constructed as to impart a reverse or unscrewing movement to the cap as the bottle with its cap passes between said side guides so as to ensure the seating of the cap before the cap reaches its mechanism for screwing the same onto the bottle. In the present instance this is accomplished by polishing the contact face of one of the side guides, as for instance the contact face of the guide 25 and by providing a rubber or other friction face 27 for the other side guide, in the present instance the cap 26. The side guide 25 is shown as fixedly supported by bars 28 depending from the top bar 20 and the side guide 26 is shown as yieldingly supported by the bars 29 depending from the top bar 20. This yielding movement of the side guide 26 is provided for by a bolt 30 and pin 31 extending laterally from the side guide 26 through a block 32 fastening to the depending bars 29, a nut 33 on the bolt 30, serving to limit the movement of the side guide 26. Springs 34, 35 on the bolt and pin 30, 31 serve to yieldingly hold the side guide at the limit of its inward movement.

35 The means which I have shown for exerting normal longitudinal pressure on the cap when the cap and bottle reach the position where the cap is to be screwed onto the bottle, comprises a spring pressed plunger 36 having a shank 37 slidably mounted in a recess 38 in the top bar 20, said shank having an upwardly extending pin 39 around which a coil spring 40 is provided within the recess 38 for yieldingly holding the plunger 36 at the limit of its downward movement, pressed against the top of the top guide 19. A wearing plate 41 is preferably interposed between the bottom of the plunger 36 and the top guide 19 for reducing wear at this point. This plunger 36 is provided with a circumferential flange 42 arranged in position to be engaged by the auxiliary longitudinal pressure exerting means, to be hereinafter described.

55 The means which I have shown for exerting additional longitudinal pressure on the cap and to thereafter rotate the cap to secure it in position on the bottle is constructed, arranged and operated as follows:—

60 I provide two oppositely inclined rotary elements, as for instance discs or wheels 43, 44, each of which bears a cam carrying segment 45 and a cap screwing segment 46, the cam being denoted by 47. The segment 46 may be provided with a friction facing or

band 48 of leather or other suitable material. These discs or wheels 43, 44 are carried at the upper ends of oppositely inclined upright shafts 49, 50, mounted in bearings contained in brackets 51, 52 that are secured to the outer faces of the side bars 6 and 8 of the machine frame. 70

Collars 53, 54 are pinned on the shafts 49, 50 to hold the same against downward longitudinal movement in their bearings. 75 The shafts 49, 50 are driven from the main shaft 10 through the worm wheels and worms 55, 56 and 57, 58 respectively.

The cams 47 carried by the segments 45 are arranged to simultaneously engage the top shoulder formed by the flange 42 upon opposite sides of the plunger 36 and press the plunger downwardly with still greater pressure than the pressure of its spring 40, to exert unyielding longitudinal pressure on the cap to ensure the proper seating of the cap before the cap is screwed onto the bottle. After these cams leave their engagement with the flange 42 of the plunger, the cap will be maintained in its seated position until the friction surfaces 48 of the segments 46 will come into rolling frictional contact with the opposite sides of the bottle cap for imparting a rotary movement, in the present instance a combined longitudinal and rotary movement to screw the cap tightly onto the bottle. The rotary movement of the cap is limited by the engagement of the stops 4 on the segmental projections 3 with the segmental projections 5 on the bottle. 100

The means for supporting and feeding the bottles step by step through the machine as well as the means for holding the bottles against rotary movement will not be described as they form no part of my present invention. 105

From the above description it will be seen that I have provided novel means for ensuring the seating of the caps on the bottles after they have been loosely positioned thereon and that I have also provided not only means for screwing the caps tightly onto the bottle, but also novel additional means for exerting endwise pressure on the caps to ensure their being seated in proper position to catch their threads when the screwing action commences. The machine is adapted to apply the caps rapidly and securely without damage to the coating on the closures and without danger of spilling the contents of the receptacles. 110 115 120

It is evident that the length of the screw segments may be varied to suit caps of different types and that the position of the cams with respect to the screwing segments may be varied to suit different requirements. While the preferred embodiment of the invention is exemplified in a machine for capping bottles, it is obvious that its features 125 130

are applicable for applying and screwing caps to receptacles of any character.

As various changes may be made in the above embodiment without departing from the spirit of the invention, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. In a machine for screwing caps onto bottles, coacting rotary devices located on opposite sides of the cap, and having elements arranged to simultaneously exert unyielding longitudinal pressure on the cap and other elements arranged to impart a rotary movement to the cap.

2. In a machine for screwing caps onto bottles, coacting rotary devices located on opposite sides of the cap and having cams arranged to simultaneously exert unyielding longitudinal pressure on the cap and segments arranged to impart a rotary movement to the cap.

3. In a machine for screwing caps onto bottles, a top guide for the cap and rotary means having a cam arranged to exert unyielding longitudinal pressure on the cap through the top guide and also having a segment arranged to engage the cap to impart a rotary movement to the cap.

4. In a machine for screwing caps onto bottles, a top guide for the cap and coacting rotary devices located on opposite sides of the cap and having cams arranged to simultaneously exert unyielding longitudinal pressure on the cap through the top guide and also having segments arranged to impart a rotary movement to the cap.

5. In a machine for screwing caps onto bottles, cap positioning means including yielding side and top guides and a rotary device having a cam arranged to exert unyielding longitudinal pressure on the cap through the top guide and also having a segment arranged to engage the side of the cap to impart a rotary movement thereto.

6. In a machine for screwing caps onto bottles, cap positioning means including yielding side and top guides, and coacting rotary devices located on opposite sides of the cap and having cams arranged to simul-

taneously exert unyielding longitudinal pressure on the cap through said top guide and also having segments arranged to engage the opposite sides of the cap for imparting a rotary movement to the cap.

7. In a machine for screwing caps onto bottles, rotary means comprising an inclined shaft carrying two segments, one having a cam for exerting longitudinal pressure on the cap and the other having a friction surface arranged to engage the side of the cap for imparting a rotary movement thereto.

8. In a machine for screwing caps onto bottles, rotary means comprising two oppositely inclined shafts, each carrying two segments, one having a cam for exerting longitudinal pressure on the cap and the other having a friction surface arranged to engage the side of the cap for imparting a rotary movement thereto.

9. In a machine for screwing caps onto bottles, means for feeding a bottle with its cap loosely positioned thereon, means for imparting an unscrewing movement to the cap to seat the same, said means including a side guide having a friction surface engaging the side of the cap, and means for screwing the cap onto the bottle.

10. In a machine for screwing caps onto bottles, means for feeding a bottle with its cap loosely positioned thereon, means for imparting an unscrewing movement to the cap to seat the same, said means including side guides, one having a non-friction surface engaging the cap and the other a friction surface engaging the cap, and means for screwing the cap onto the bottle.

11. In a machine for screwing caps onto bottles, means for feeding a bottle with its cap loosely positioned thereon, means for imparting an unscrewing movement to the cap to seat the same, said means including side guides, one having a non-friction surface engaging the cap and the other a friction surface engaging the cap, one of said guides being yieldingly mounted, and means for screwing the cap onto the bottle.

In testimony, that I claim the foregoing as my invention, I have signed my name this 16th day of September, 1921.

ARTHUR M. SEALE.