July 20, 1954 N. V. BURDIN 2,684,192

CAPPING HEAD FOR BOTTLE CAPPING MACHINES

Filed Feb. 28, 1949 3 Sheets-Sheet 1

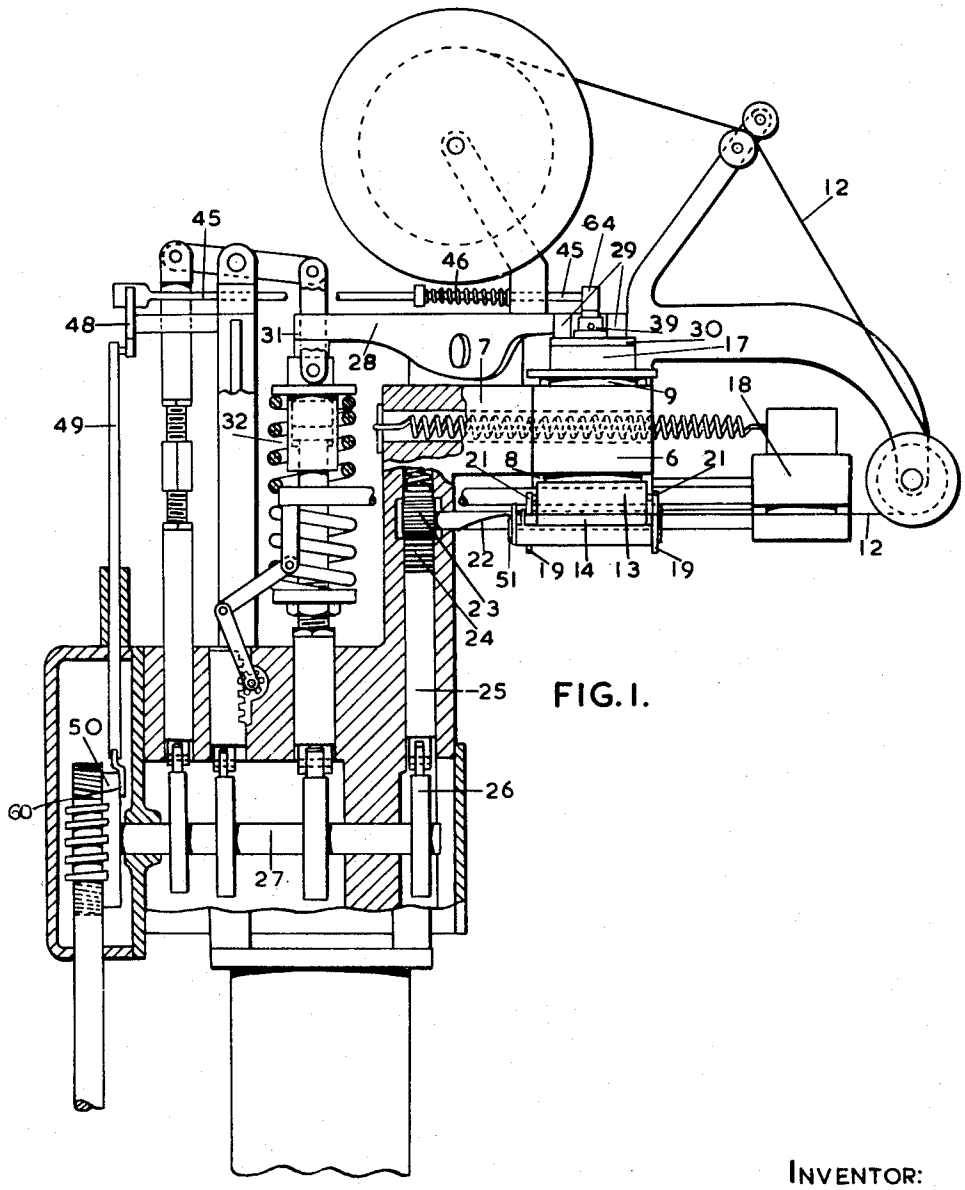


FIG. 1.

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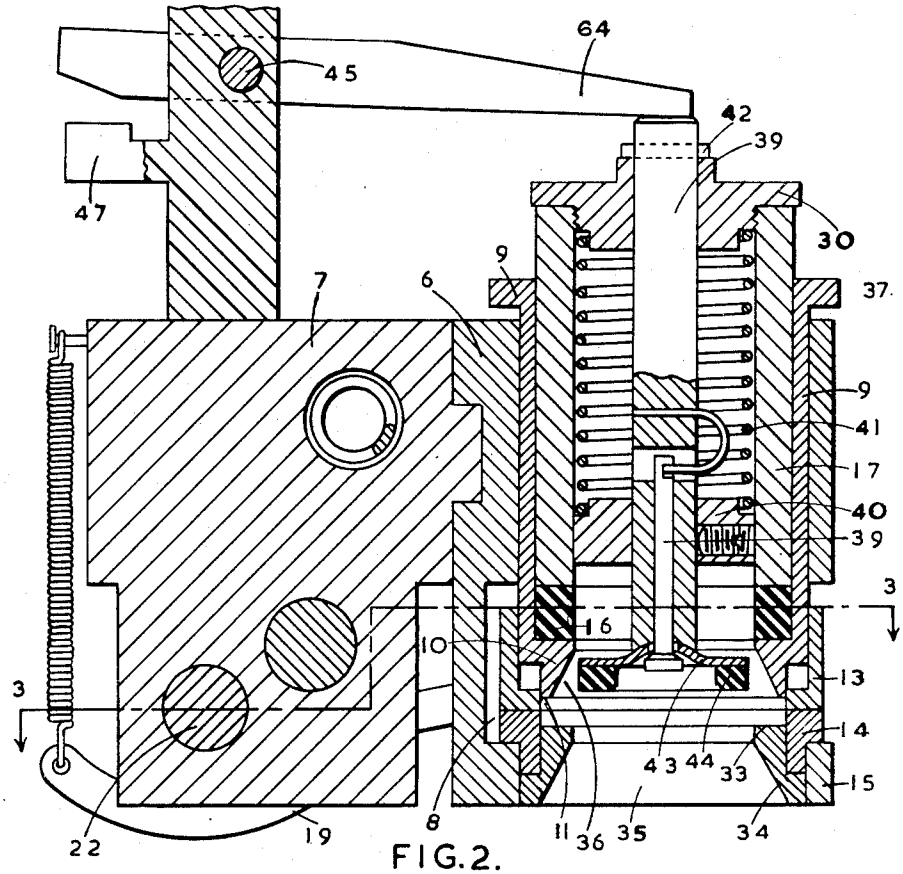


FIG. 2.

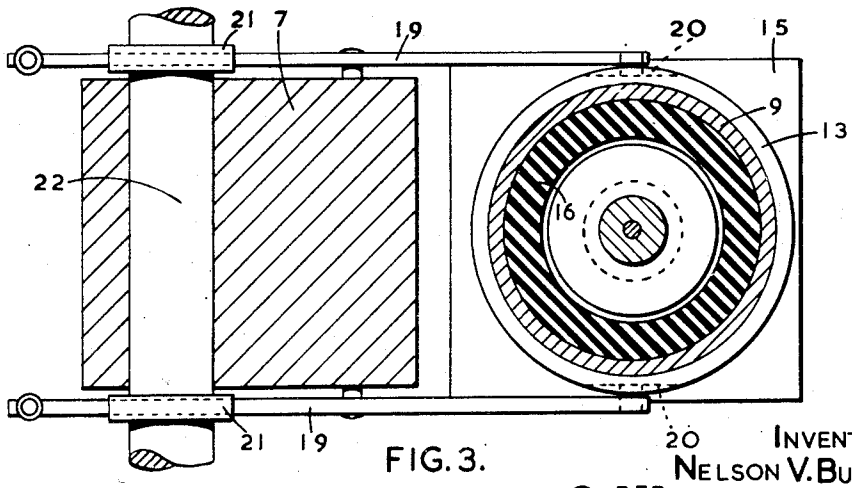


FIG. 3.

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CAPPING HEAD FOR BOTTLE CAPPING MACHINES

Filed Feb. 28, 1949 3 Sheets-Sheet 3

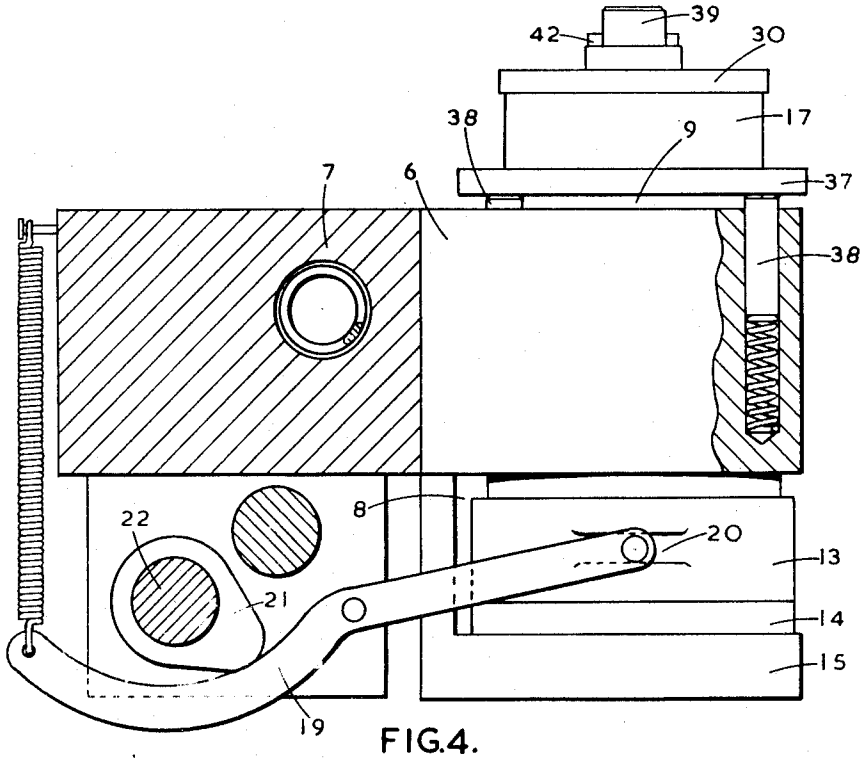


FIG.4.

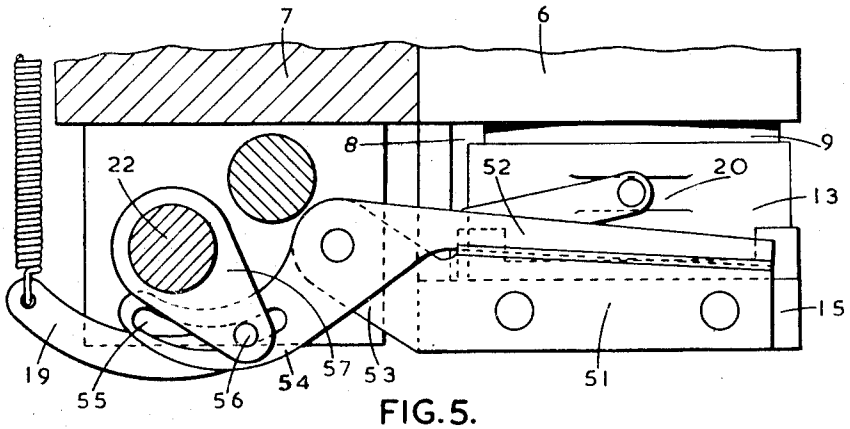


FIG.5.

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UNITED STATES PATENT OFFICE

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CAPPING HEAD FOR BOTTLE CAPPING MACHINES

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Application February 28, 1949, Serial No. 78,694

1 Claim. (Cl. 226—80)

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The present invention relates to bottle capping machines of the type embodying a resilient member which is distorted to effect the crimping of the cap in capping the bottles with aluminium or the like foil, and has for its object to provide an improved and simplified construction of capping head.

Referring to the drawings,

Figure 1 is an elevation partly in section of a bottle capping machine according to the present invention.

Figure 2 is a vertical section on an enlarged scale of the capping head.

Figure 3 is a section on the line 3—3 of Figure 2, and

Figures 4 and 5 are views in elevation of the capping head showing the foil clamping and waste foil cutting mechanisms respectively.

In carrying the present invention into practice as shown upon the accompanying drawings, the body member of the capping head consists of a block 6 secured to the machine frame 7, said block 6 being provided with a vertical bore and provided near its lower end with a relatively wide horizontal slot 8 whose plane lies at right angles to the axis of the vertical bore.

A sleeve 9 is slidably disposed in said vertical bore which is provided at its lower edge with an inwardly directed flanged portion 10, said flanged portion 10 being tapered internally at its lower edge to form a cutting edge or punch 11, the internal taper forming a lead for the bottle top, said cutting edge 11 being adapted to cut discs from strip foil 12 fed through the beforementioned slot 8 in the block 6.

Surrounding the sleeve 9 and contained within the slot 8 is a ring 13 adapted to clamp the strip foil 12 against a part 14 carried by the lower part 15 of the body member whilst a disc is being cut therefrom by means of the aforesaid punch 11.

Positioned within the sleeve 9 and resting on the inwardly directed flange 10 thereof is a resilient ring 16 of rubber or the like suitable material upon which ring rests a second slidable sleeve 17 co-axially disposed within the sleeve 9.

In operation the strip foil 12 is fed through the slot 8 in the body member 6 between the ring 13 and part 14 for example by means of the feeding head 18 described in my co-pending application Ser. No. 78,693, a patent has now been granted and numbered 2,621,842. By means of cam operated levers 19 engaging horizontal grooves 20 formed in the beforementioned clamping ring 13, Figure 4, the latter is operated in a downward direction to clamp the foil 12 against the part 14

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carried by the lower portion 15 of the body member 6.

The levers 19 are operated by cams 21 which are mounted on the shaft 22, which shaft is driven by the rack and pinion mechanism 23, 24. The rack 24 is formed on the follower 25 for the cam 26 mounted on the cam shaft 27 of the machine, Figure 1.

The application of pressure to the sleeve 17 is effected by means of the beam 28 having a bifurcated end 29 which bears upon the cap 30 of the sleeve 17, said beam 28 at its other end 31 being operated by spring mechanism which is generally designated 32 and is in accordance with my co-pending application Ser. No. 78,693.

When pressure is applied to the cap 30 of the innermost sleeve 17 which by means of the resilient ring 16 and flange 10 on the outer sleeve 9, causes the latter to descend and cut a disc from the strip foil 12, said disc after cutting, resting on a flanged portion 33 of a lead 34 for the bottle top. On insertion of a bottle into the opening 35 at the lower end of the body part, said bottle carries with it the previously cut metal foil disc up within the capping head, so that the top of the bottle and the foil cap lie within the plane contained by the resilient ring 16. In passing up into the capping head the foil disc is wrapped around the bottle top by the internally tapered portion 36 of the sleeve 9 hereinbefore referred to, by causing the overlapping portion of the disc to lie against the bottle neck.

Further pressure on the innermost sleeve 17 causes the resilient ring 16 to be distorted and crimp the foil cap around the top of the bottle, further downward movement of the sleeve 9 being prevented at this stage by means of an outwardly directed flange 37 formed at the top edge thereof bearing against the top of the block 6. Upon release of the pressure on the resilient ring 16 the latter assumes its normal shape and the bottle top is then free to be withdrawn from the capping head.

Suitable return plungers 38 Figure 4 are mounted in the block 6 and are spring loaded so as to engage the outwardly directed flange 37 at the top of the sleeve 9 so as to return same and the innermost sleeve 17 to their inoperative positions after the capping head operating mechanism has ceased to exert pressure on the cap 30 of said innermost sleeve 17.

In order to clamp the disc cut from the foil 12 on the bottle top and thus prevent displacement during the wrapping operation which follows and also provide checking means to ensure

that a bottle is inserted the required distance into the capping head for capping purposes, there is provided a plunger 39 disposed within the innermost sleeve 17, said plunger 39 taking a bearing in the cap 30 provided at the upper end of the sleeve 17.

A bearing member 40 is also secured to the plunger 39 within said sleve 17, said member 40 being a sliding fit in said sleeve 17 and engaging the lower end of a compression spring 41, contained within that part of the sleeve 17 defined by said bearing member 40 and cap 30. In this manner the plunger 39 is spring loaded within the sleeve 17 and retained in its normal position by a transverse pin 42 or the like abutment formed on the plunger 39, which pin normally abuts the top of the said cap 30.

Universally pivoted to the lower end of said plunger 39 is a disc 43 which is surfaced at its underside with a resilient or other suitable material 44, said disc 43 being adapted to engage the top of the bottle inserted into the capping head and take up the alignment thereof. The pivotal mounting of the disc 43 is such that it pivots about a centre lying in the plane of contact between the resilient underside 44 and a bottle top, so that the minimum of side displacement of the disc 43 with respect to the bottle occurs during the aligning action; which displacement, if great, would cause excessive displacement of the foil with respect to the bottle top. In this way the disc 43 is adapted to firmly and uniformly engage bottles having uneven tops such as is often the case with commercial bottles.

Upon a bottle being inserted into the capping head the bottle top first contacts a portion of foil therein and pushes same further into the capping head. Whilst the portion of foil is being pushed further into the capping head it is held firmly on the bottle top by means of the aforesaid disc 43 and the spring loading of the plunger 39 carrying the disc 43. Thus the portion of foil is firmly held on the bottle top whilst it is wrapped about the bottle neck and subsequently crimped thereon.

The plunger 39 and disc 43 may also serve as means to check the position of the bottle top in the capping head and for this purpose the upper exterior end of the plunger 39 is arranged to bear against a lever 64 mounted on a shaft 45 (Figures 1 and 2). This lever 64 is preferably spring loaded by a co-axial torsion spring 46 against the plunger 39 and in addition to operating against a stop 47 so as to limit the movement of said plunger 39, also operates through the bell crank lever 48 pivoted on the machine frame, a rod 49 adapted to trip a control lever 60 carried by a clutch 50, which clutch controls the drive to the cam shaft 27. The clutch 50 is of the type in which the control lever 60 is spring loaded to maintain the clutch engaged, and when said clutch is engaged the lever 60 rotates with same, but upon the lever being tripped the clutch is disengaged and the lever held stationary.

When a bottle is inserted into the capping head the rod 49 is raised to allow the control lever 60 to pass underneath said rod and so maintain the drive. However, if a bottle is not present in the capping head or not fully inserted therein the rod 49 is not raised so that the clutch control lever 60 is tripped and the drive to the machine ceases.

The disposition of the control lever 60 on the clutch is such that when a bottle is fully inserted in the capping head, said lever passes under the raised rod 49. Thus after the insertion of the last bottle into the capping head, the machine would continue to operate in readiness for a further bottle, but in the event of no further bottle being inserted into the capping head the machine then stops.

In order to assist in the disposal of the perforated foil as waste, as it issues from the capping head a pair of cutters 51, 52, are provided. One cutter 51 is fixedly mounted on the lower part 15 (Figure 5) of the body member or may be carried by the machine frame 7 whilst the other cutter 52, is pivotally mounted on an extension 53 of the cutter 51 and provided with an arm 54 having a slot 55 therein, which slot 55 is engaged by a pin 56 carried by an arm 57 fast with the beforementioned shaft 22. Thus each time foil is fed through the capping head the perforated waste foil issuing therefrom is cut off, the cut off waste foil falling into a suitable receptacle or the like therefor.

I claim:

Improvements in capping heads for bottle capping machines, having combined therewith foil feeding mechanism, comprising in combination, a body part, an outer sleeve slidably mounted in said body part having a cutting edge at one end thereof, an inner sleeve concentric with the before-mentioned sleeve, an abutment on the interior of the outer sleeve, a resilient ring located on said abutment which is adapted to be compressed by the inner sleeve for crimping the foil disc on a bottle top, a clamping ring for clamping the foil during the foil cutting operation, levers pivotally mounted on said body part and connected to said clamping ring, cam members rotatably mounted on said body part and operating said levers through a rack and pinion mechanism, a driving shaft for the machine, a cam member on said driving shaft to operate said rack and pinion mechanism in timed relationship with the foil feeding mechanism and means for applying pressure to the inner and outer sleeves to effect the foil cutting and crimping operations.

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