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CAPPING MACHINE FOR CONTAINERS
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By
CAPPING MACHINE FOR CONTAINERS

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In small stores and the like, where ice-cream and similar frozen commodities are sold in small quantities, it is desirable to sell predetermined quantities of ice-cream and the like, in containers of a selected size, and cap said containers when filled for sanitary reasons. Large automatic machines for capping containers are too expensive for small establishments, and this invention, therefore, has been devised for the purpose of producing a comparatively small manually operable capping machine whereby filled containers having caps seated therein are carried in an intermittently rotatable table beneath a crimping mechanism to permit the rims of the container to be individually deflected and crimped inwardly over the flange of the cap to hold the cap in position.

It is an object of this invention to provide a manually operable capping machine, whereby the rims of paper containers and the like, are adapted to be conveniently cramped over the margins of inserted caps or closures.

It is also an object of this invention to provide a machine having a rotatable table for carrying filled containers having caps loosely seated therein to permit the upper margins of the containers to be cramped over the margins of the caps one at a time by means of a crimping device operable by a manual control which also governs the rotation of the table.

It is a further object of this invention to provide a machine for bending over and crimping the margins of filled paper cups which are carried by a table which is adapted to be intermittently rotated through given distances to permit filled cups carrying caps to be moved into a centered position beneath the crimping device.

It is furthermore, an object of this invention to provide a paper cup capping machine adapted to crimp the upper margins of the cups over the caps by manually operating a treadle mechanism, which when operated, first causes rotation of a cup carrier through a predetermined distance to properly center a filled cup and then cause operation of a crimper to cause the upper margin of the centered cup to be deflected and crimped over the cap previously inserted in the cup.

It is an important object of this invention to provide an inexpensive and simplified form of paper cup capping machine embracing a manually operable control, which when actuated, first serves to partially rotate a cup carrying table to center a cup and then actuates a crimping mechanism which deflects and crimps the margin of a centered cup over the flange of a cap previously inserted in the cup.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a side elevation of a cup capping and crimping machine embodying the principles of this invention.

Figure 2 is an enlarged vertical detail section through the crimping mechanism of the machine with parts shown in elevation, and with parts broken away.

Figure 3 is a top plan view of the machine taken on line III—III of Figure 1, with the supporting table omitted.

Figure 4 is an enlarged detail top plan view of the pawl and ratchet mechanism taken on line IV—IV of Figure 1.

Figure 5 is an enlarged bottom view of the crimping mechanism taken on line V—V of Figure 2.

Figure 6 is a fragmentary vertical section of the crimping mechanism showing a portion of the cup supporting table, and illustrating the lowermost position of the rim deflecting collar.

Figure 7 is a similar sectional view illustrating the crimping device in its lowermost position completing the crimping of the deflected rim of the cup.

Figure 8 is an enlarged fragmentary top plan view of a portion of the rotatable table with the centering bolt therefor, in a retracted position.

Figure 9 is an enlarged fragmentary sectional view taken on line IX—IX of Figure 10.
1, and illustrating the mechanism for governing the retraction of the centering bolt, and the means for actuating the pawl and ratchet.

As shown on the drawings:
The reference numeral 1, indicates a platform or work-bench provided with legs 2 for supporting the same upon a floor 3, or other suitable support. Secured on the floor 3 beneath the platform 1, is a pedestal or bracket 4, provided with a vertical slot 5 through which a pin 6 projects. The pin 6 is carried transversely on a floating foot treadle or lever 7, and has slidable engagement in the bracket slot 5 to afford a pivot for the foot treadle when the same is depressed, and said pin reaches the lower end of the slot. Attached to the lever 7, intermediate its ends, is the lower end of a connecting rod or link 8 which projects upwardly through an opening 9 in the platform 1. Fastened on the lower portion of the connecting rod 8 is a collet 10 for engagement with a tension spring 11 connected to the bottom surface of the platform 1. The spring 11 normally acts to hold the foot treadle or lever 7 in normal raised position with the pivot pin 6 seated in the upper end of the slot 5.

Fastened upon the top of the platform 1 is an upright metal frame 13 having a foot or base portion 14 which is integrally connected to the upright frame section 15, by means of a web or arm 15. Journaled in a vertical opening 16 in the foot section 14 of the framework is a vertical shaft or post 16. Secured on the shaft 16 a short distance above the top of the foot 14, is a ratchet 17 adapted to be actuated by means of a pawl 18. The pawl 18 has one end thereof pivotally supported on the outer end of a crank-arm 19, which is rotatably engaged on the shaft 16 between the ratchet 17, and the top of the frame foot 14. Connected to the outer end of the pawl 18 is one end of a control spring 20, the other end of which is attached to the crank-arm 19. The spring 20 serves to hold the toothed end of the pawl 18 in resilient engagement with the ratchet 17. Pivotally connected to the outer end portion of the crank-arm 19, is one end of a control rod 21, the other end of which is pivotally engaged through one arm of a bell-crank 22, which is pivoted on a bolt 23 secured in the web 15 of the machine framework. The upper end of the connecting rod 8 (Figure 1), is pivotally engaged through the end of the short arm of the bell-crank 22.

Mounted on the upper end of the shaft 16 is a rotatable table 24 having a plurality of tapered cup holders or sockets 25, the tops of which project above the top surface of the table and terminate in a beveled rim or ring 27 disposed to the inside of a stop shoulder 28. The table 24 is thus arranged to have a plurality of conical paper cups or containers 29 seated therein with the upper margins or rims of the cups projecting above the bevel rings 27. Before the cups 29 are seated in the tapered cup holders 26, each of said cups 29 is filled with a quantity of ice-cream 30, or other product which is to be dispensed. When the filled cups are seated in a ring upon the table 24, flanged paper caps 31 are loosely seated within the tops of the cups above the contents thereof with the flanges 32 of the caps seated against the inner surface of the cups, as illustrated in Figure 2. If desired the caps 31 may be positioned in place within the upper portions of the filled cups prior to the time that said cups are deposited or seated in the cup holders 26 of the rotatable table.

Slidably mounted in a horizontal passage 33 provided in the vertical frame 13 is a centering latch or bolt 34 having a tapered end 35 shaped to engage in the centering notches 25 of the table 24. Engaged behind the centering bolt 34 is a coiled spring 36 which is seated in the passage 33 with the outer end of said spring engaged against a retaining cap or plug 37 removably engaged in the threaded outer end of the passage 33, as clearly illustrated in Figure 2. The movement of the latch bolt 34 is limited by means of a pin 38 which projects diametrically through the latch bolt, and is slidable in a passage or slot 39 (Figure 8) provided in the web of the upright frame 13.

The outer end of the pin 38 is secured in a hooked hanger arm 40, the upper end of which is pivoted on a pin 41 supported in the side of the web of the vertical frame 13. The lower hooked end of the hanger arm 40 is positioned in coacting engagement with the long arm of the bell-crank 22 so that the control spring 11 acting on the connecting rod 8 causes the bell-crank to hold the hanger arm 40 in its outer position, whereby the pin 38 acts to hold the centering bolt 34 in its retracted position, as illustrated in Figure 8, compressing the coil spring 36.

Supported upon the vertical frame 13 is a rim crimping mechanism comprising a vertically slidable plunger rod 41A, which is slidably engaged in a sleeve 42 integrally supported on the frame 13 by arms 43. The upper end of the plunger rod 41A is provided with an apertured tongue 44 through which a pivot pin 45 is engaged with the ends of said pin projecting through a pair of toggles or links 46, the upper ends of which are pivotally engaged on a pin 47, carried transversely in one end of a fulcrumed beam 48. The beam 48 is fulcrumed intermediate its ends on a pin 49, which is supported on a bracket 50 mounted upon the top of the ver-
tical frame 13. Connected to the rear end portion of the fulcrum beam 48 is the upper end of a coil spring 51, the lower end of which is attached to a pin 52 secured to the lower portion of the vertical frame 13. The spring 51 normally acts to hold the plunger rod 41a in an elevated or retracted position. Pivotedly connected to the rear end of the fulcrum beam 48 is the upper end of a long connecting rod 53 which projects downwardly through an opening 54 in the platform 1, and has the lower end thereof pivotally connected to the rear end of the foot treadle 7. Fastened to the lower portion of the connecting rod 53 is a collar 55, to which the upper end of a control spring 56 is connected. The lower end of the control spring 56 is attached to a screw eye 57, fastened in the floor 3. Secured to the lower end of the plunger rod 41a is a plate or disc 58, held in place by means of a screw bolt 59. Attached to the plunger plate 58 are a pair of posts 60 having rigidly secured on the lower ends thereof, a crimping head or die 61 provided with a circular recess 62 to permit the crimping die 61, when in its lowermost position, to seat over a cap retaining or plunger head 63, as illustrated in Figure 7. The plunger head 63 is provided with a shank 64, which projects upwardly through an opening in the center of the crimping die 61. A screw bolt 65 serves to hold the cap holder head 63 secured within a deflecting cap or hood 66. The deflecting hood 66 is provided with a pair of apertures through which the posts 60 are adapted to slide. The deflecting cap 66 is resiliently held in contact with the top of the crimping die 61 by means of a coiled spring 67, positioned between the disc 58 and the top of the deflecting cap 66, and engaged around the heads of the screw bolts 59 and 65. Secured within the deflecting cap 66, is a deflecting ring 68 provided with a plurality of beveled teeth 69, which slidably interfits with peripheral crimping teeth 70, formed on the exterior of the crimping die 61 (Figure 5).

The operation is as follows:

Before the machine is operated, the operator deposits predetermined quantities of ice cream or the like, in a plurality of conical paper cups 30, placing flanged paper caps 31 within the upper ends of the cups above the contents thereof. The filled cups are then seated in the holders 26 of the wheel 24, ready to be crimped for the purpose of retaining the caps in place.

With the wheel 24 properly loaded, the operator depresses the floating foot treadle 7, which first begins to pivot, with the lower end of the connecting rod 53 serving as a fulcrum. The pin 6 is thus permitted to gradually move downwardly in the slot 5. With the starting of the depression of the foot treadle 7, the connecting rod 8 is gradually pulled downwardly tensioning the spring 11, and causing the bell-crank 22 to pivot with the long arm thereof moving away from the hooked end of the hanger arm 40, thereby permitting the compressed spring 36 to push the centering bolt 34 outwardly toward the periphery of the table 24. While this operation of the centering bolt takes place, the rod 21 operated by the bell-crank 22, causes the crank arm 19 to be slightly rotated or rocked on the shaft 18, thereby causing the spring controlled pawl 18 to coact with the ratchet 17 and rotate the same one-eighth of a revolution, thereby causing a cup carrying holder 26 on the table to be moved beneath the crimping mechanism for positioning a new centered cup in line with the latch or centering bolt 34, thereby allowing the said spring controlled centering bolt to seat in the notch to hold the table in a centered position. It will thus be seen that each of the cup holders is adapted to be moved in turn into a centered position beneath the crimping mechanism. With the continued downward movement of the foot treadle 7, the treadle pin 6 gradually reaches the lower end of the slot 5, and said pin now acts as a fulcrum point for the foot treadle, causing the rear end of the foot treadle to move upwardly to cause operation of the connecting rod 53, and tensioning of the springs 51 and 56. The upward movement of the connecting rod 53 pivots the beam 48 about its fulcrum 49, thereby causing the front end of the beam to swing downwardly to cause the connecting links 46 to slide the plunger rod 41a downwardly through the sleeve 42 from the position illustrated in Figure 2, into the position illustrated in Figure 6. This downward movement of the plunger rod 41a moves the deflecting cap 66 downwardly causing the beveled edges of the teeth 69, within the deflecting cap, to engage the upper rim or edge of the centered cup 29, and reflect or bend said margin inwardly into the position illustrated in Figure 6. As the rim is being deflected the plunger rod 41a causes the plunger head 63 to be moved downwardly to seat against the upper surface of the cap 31, to hold the same in place during the deflecting operation on the upper rim 29 of the cup. With the continued downward movement of the plunger rod 41a, the lower edge of the deflecting cap 66, is brought into engagement with the stop shoulder 28 of the cup holder so that movement of the deflecting cap 66 and the cap holding head 61, is stopped. The spring 67 is thus compressed and the posts 60 slide downwardly through the apertures in the top of the deflecting cap 66. The crimping die 61 is thus moved downwardly from the position illustrated in Figure 6, into the position shown in Figure 5, causing the crimping teeth 70 to slide downwardly between the deflecting teeth 69, and into engagement with the partially deflected
margin of the centered cup to cause said margin to be completely bent over and cramped around the upwardly projecting flange 32 of the cap 31, thereby completing the cupping and crimping operation.

At this point in the operation the operator releases the foot treadle 7, permitting the control spring 11 to pull the front end of the foot treadle upwardly until the pin 6 reaches the upper end of the slot 5. The upward movement of the foot treadle actuates the connecting rod 8 and the bell-crank 22, to cause the connecting rod 21 to swing the crank-arm 19 back into normal position, thereby moving the pawl 18 rearwardly into engagement with the next tooth of the ratchet 17, ready for the next feeding operation. The return of the bell-crank 22 to its normal position causes the hanger arm 40 to be swung outwardly, whereby the pin 39 causes retraction of the centering bolt 34 and release of the rotatable table 24.

With the release of the foot treadle 7, the control springs 51 and 56 also act on the connecting rod 33, and the fulcrummed beam 48 to cause the plunger rod 41a to be pulled upwardly, thereby raising the deflecting mechanisms, as well as the cap holder, out of engagement with the capped cup.

The machine is now ready to be again operated to cause rotation of the table 24 to advance the next filled container or cup into a centered position beneath the cupping mechanisms. The filled cups or containers carried by the rotatable table 24 are thus individually brought into a centered position to permit the upper margin of the cup to be cramped over the flange of the cap seated within the open upper portion of the cup. The improved machine affords a simple and inexpensive arrangement whereby containers which have previously been filled and provided with flanged caps disposed above the contents of the cups are adapted to be cramped over the flanges of the caps to hold the caps in position, thereby affording a sanitary arrangement for dispensing ice creams, ices and similar products.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:
1. A container capping machine comprising a rotatable table adapted to carry a plurality of filled containers having caps therein, rim deflecting and crimping mechanisms mounted above said table, means for rotating said table, and a resiliently supported floating device connected with said rotating means, and with said rim deflecting and crimping mechanisms to first cause centering of a filled container, and then cause operation of said deflecting and crimping mechanisms to cause the flange of the container to be bent inwardly and then cramped over the margin of the cap seated in said container.

2. A container capping machine comprising a table rotatably mounted thereon, a spring controlled mechanism mounted above said table, a device for actuating the same, a foot treadle connected with said rotating means and with said device to operate the same, and a plurality of resilient means for retaining said foot treadle in a floating position.

3. A container capping machine comprising a rotatable table adapted to carry a plurality of filled containers having caps seated therein, means for centering the table, mechanisms for rotating the table, deflecting and crimping mechanisms mounted above said table, a spring controlled device for holding said deflecting and crimping mechanisms in position, and a spring controlled floating foot treadle connected with said mechanisms, and with said means, to first cause operation of said rotating mechanism, and release of said centering means to rotate the table and then cause operation of said deflecting and crimping mechanisms when the floating foot treadle is operated.

4. A capping machine comprising a platform, a framework supported thereon, a table rotatably supported on said framework, pawl and ratchet means connected with said table, a bell-crank mechanism connected to operate the pawl and ratchet mechanism, a centering bolt for coaction with said table, a control member connected with said centering bolt, and contacting said bell-crank mechanism, a rim deflecting and crimping device supported on said framework above said table, a spring controlled mechanism connected with said deflecting and crimping device, and a spring controlled floating member connected with said spring controlled mechanism to actuate the same to first cause rotation and centering of the table, and then cause operation of said deflecting and crimping device to crimp the margin of a container over the flange of a cap seated therein.

5. A capping machine comprising a rotatable support for holding a filled container having a flanged cap seated therein, a crimping device, spring controlled mechanisms connected to said rotatable support and with said crimping device, and a floating mechanism connected to be manually actuated to first cause centering of the rotatable support, and then cause operation of the crimping device to cause the upper margin of the centered container to be cramped over the flange of the cap seated in said container.
6. A capping machine comprising a holder adapted to carry a filled container having a flanged cap seated therein, a crimping device, means for moving the holder into a position beneath the crimping device, a spring controlled centering bolt adapted to be released when said means is operated to hold said holder in a centered position beneath said crimping device, and a floating member having a plurality of pivot points and connected with said centering means and with said crimping device, said floating member being mounted to be manually operated to first pivot about one pivot point to actuate the centering means, and then shift to a second pivot point to cause operation of the crimping device.

7. A container capping machine comprising a holder adapted to carry a filled container having a flanged cap seated therein, a crimping device, means for moving the holder beneath the crimping device, a centering mechanism in coacting engagement with said means, connecting rods connected with said holder and with said crimping mechanism, springs connected to said connecting rods, and a manually operable member supported by said connecting rods and adapted to be operated to first cause movement of the holder and release of said centering mechanism to maintain the holder in a centered position beneath the crimping mechanism, and then cause actuation of said crimping mechanism to cause the margin of the container to be bent and cramped over the flange of said cap.

8. A capping machine comprising a support, a holder rotatably mounted thereon adapted to receive a filled container having a flanged cap seated therein, means for rotating the holder, a spring controlled connecting rod connected with said means, a spring controlled centering bolt, a hanger arm engaged by said means for normally holding the centering bolt in a retracted position out of engagement with said holder, a crimping mechanism, a spring controlled mechanism connected therewith for operating the same, a manually operable member supported by said connecting rod and by said toggle mechanism, a slotted bracket, and a pin carried by said manually operable member, and projecting into the slot of said bracket to permit said member to be operated to first cause rotation of said holder, and release of said centering bolt to center the holder beneath said crimping device, and then cause actuation of said spring controlled mechanism to actuate the crimping mechanism to cause the margin of a filled container to be bent over and cramped around the flange of the container cap.

9. In a capping machine of the class described, the combination with a holder for receiving a filled container having a flanged cap seated therein, of a plunger rod movably supported above the holder, a crimping mechanism supported on said plunger rod, a rim deflecting device engaged over said crimping mechanism, a cap holding head carried by said deflecting device, and means for operating the plunger rod to first cause the holding head to be moved into engagement with the cap, then cause the deflecting device to contact the rim of the container to deflect the same, and finally cause the crimping mechanism to crimp the deflected edge of the container over the flange of said cap.

10. In a capping machine of the class described, the combination with a holder adapted to carry a filled container having a flanged cap seated therein, of a slidable plunger rod, means for actuating the same, a crimping device supported on the plunger rod, a spring controlled deflecting mechanism slidably supported on said crimping device, and a cap holding device carried by said deflecting mechanism and adapted to seat against the cap when the deflecting mechanism and the crimping device are actuated to cause the rim of the container to be cramped over the flange of said cap.

11. A capping machine of the class described, comprising a notched rotatable wheel adapted to carry a plurality of filled containers each having a flanged cap seated therein, a pawl and ratchet means for operating said table, a bell-crank connected with said pawl and ratchet means, a spring controlled connecting rod attached to said bell-crank, a spring controlled centering bolt for coaction with the notched table to hold the same in a centered position, a hanger arm connected with said centering bolt and engaged by said bell-crank to hold the centering bolt in a retracted position, a slidable plunger rod mounted above said table, rim deflecting and crimping mechanisms carried by said plunger rod, a plunger head carried by the deflecting mechanism, a spring controlled mechanism connected with said plunger rod, a foot treadle supported by said connecting rod and by said spring controlled mechanism, a slotted bracket, and a pin carried by said foot treadle, and slidably engaged in the slot of said bracket.

12. A capping machine of the class described, comprising a rotatable holder adapted to carry a filled container having a flanged cap seated therein, means for rotating and centering the holder, a crimping mechanism, spring controlled connecting rods connected with the centering means and with said crimping mechanism, a manually operable member supported by said connecting rods, and means coacting with said member to cause the same when actuated, to shift the point of pivotal movement thereof to first cause rotation and centering of said rotatable
holder, and then cause operation of said crimping mechanism to deflect and crimp the rim of a container over the flange of a cap seated therein.

13. A capping machine of the class described, comprising a holder adapted to receive a filled container having a flanged cap seated therein, means for centering the holder, a plunger rod, a toothed crimping support thereon, a toothed deflecting means slidably interfitting said toothed crimping device, a control spring engaged between said crimping and said deflecting means, a plunger head carried by said deflecting means, and operating means for actuating the plunger rod to first cause the plunger head and the deflecting device to be moved into engagement with the cap and rim of said container to deflect said rim, and then cause said crimping to slide with respect to said deflecting means to cause the deflected rim of the container to be crimped over the flange of said cap.

14. In a capping machine of the class described, the combination with a rotatable holder adapted to carry a plurality of filled containers having flanged caps seated therein, of a crimping mechanism mounted above said holder, spring controlled mechanisms for operating the holder and said crimping mechanism, a foot treadle suspended on said operating mechanisms, and means connected with said foot treadle to cause the same to shift points of pivotal movement to cause centering of the holder prior to the operation of said crimping mechanism.

15. In a capping machine of the class described, the combination with a crimping mechanism, of a holder rotatably mounted therebeneath, means for retaining the holder in a centered position beneath said crimping mechanism, a pawl and ratchet mechanism connected with said holder for rotating the same, a bell-crank connected with said pawl and ratchet mechanism, and normally holding said centering means in a retracted position, a spring controlled connecting rod attached to said bell-crank, a second spring controlled connecting rod connected with said crimping mechanism, a manually operable member hung on said connecting rods, a stationary bracket having a slot therein, and a pin on said manually operable member slidably engaged in said slot to permit the manually operable member to first pivot at its point of connection with the connecting rod for operating the crimping mechanism, and then cause shifting of the point of pivotal movement of said member to said pin when the same reaches the lower end of said slot.

16. In a capping machine of the class described, the combination with a holder adapted to carry a filled container having a flanged cap seated therein, a stop shoulder formed on said holder, a toothed crimping device, means for supporting the same, a spring controlled toothed deflecting device slidably interfitting said toothed crimping device, a plunger carried by said toothed deflecting device, and having sliding engagement with said crimping device, a slideable rod for supporting said toothed crimping device, and means for operating said slideable rod to cause said plunger to move downwardly into engagement with said cap, and also move said toothed deflecting device to engage and deflect the rim of said container and seat against said stop shoulder to permit the toothed crimping device to have a slideable relative movement with respect to said toothed deflecting device to engage the deflected rim of the container and crimp the same downwardly over the flange of said cap.

17. In a capping machine of the class described, the combination with a holder adapted to carry a filled container having a flanged cap seated therein, of a spring controlled deflecting device, a plunger supported therein, operating means for moving said deflecting device and plunger downwardly into respective engagement with the rim of the container and said cap, to hold the cap in position while said rim is being deflected, and a crimping device slidably engaged between said deflecting device and said plunger adapted to be actuated by said operating means after the deflecting operation to cause the deflected rim of the container to be crimped over the flange of said cap.

18. In a container capping machine including a container supporting means formed to be indexed past a work performing station and means at the station for securing a cap to the container carried by the support, means for indexing said supporting means and for actuating said securing means comprising a manually operable member common to both of said means and resiliently supported in a floating position.

In testimony whereof I have hereunto subscribed my name at New York city, New York County, N. Y.

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