A. MALMQUIST.

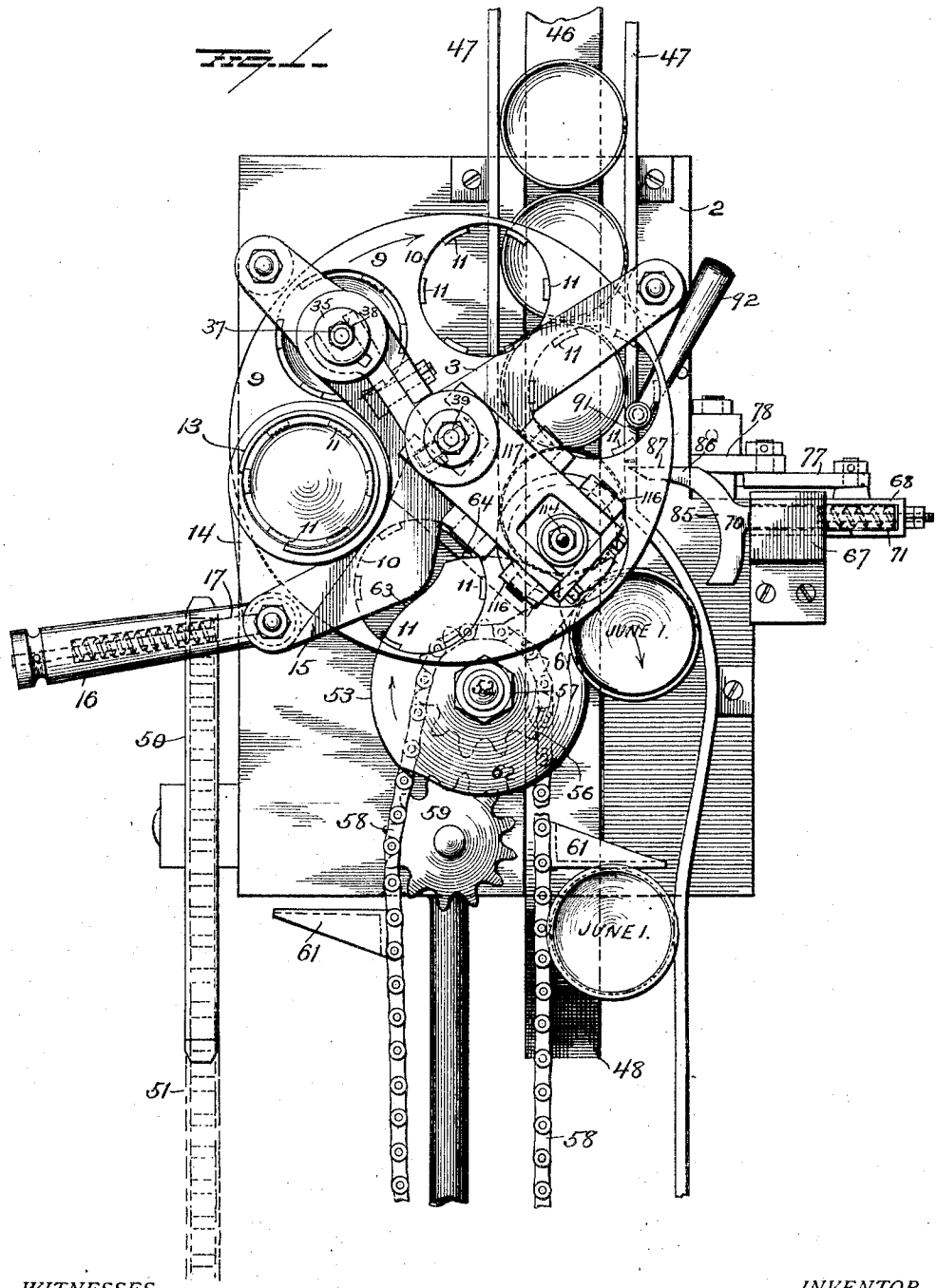
MACHINE FOR CAPPING CANS.

APPLICATION FILED JULY 18, 1913.

1,099,757.

Patented June 9, 1914.

5 SHEETS—SHEET 1.



WITNESSES

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MACHINE FOR CAPPING CANS.

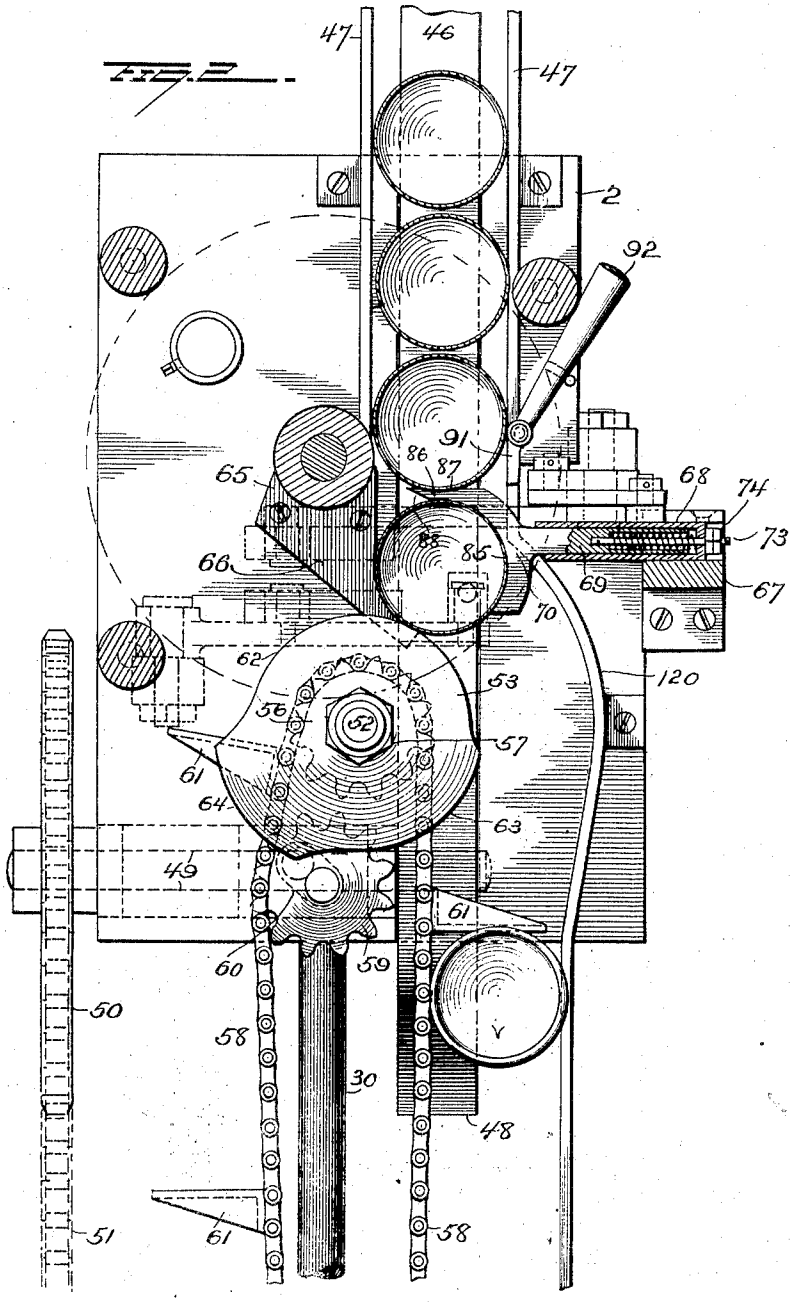
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5 SHEETS—SHEET 2.

FIG. 2.



WITNESSES

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5 SHEETS—SHEET 3.

FIG. 3.

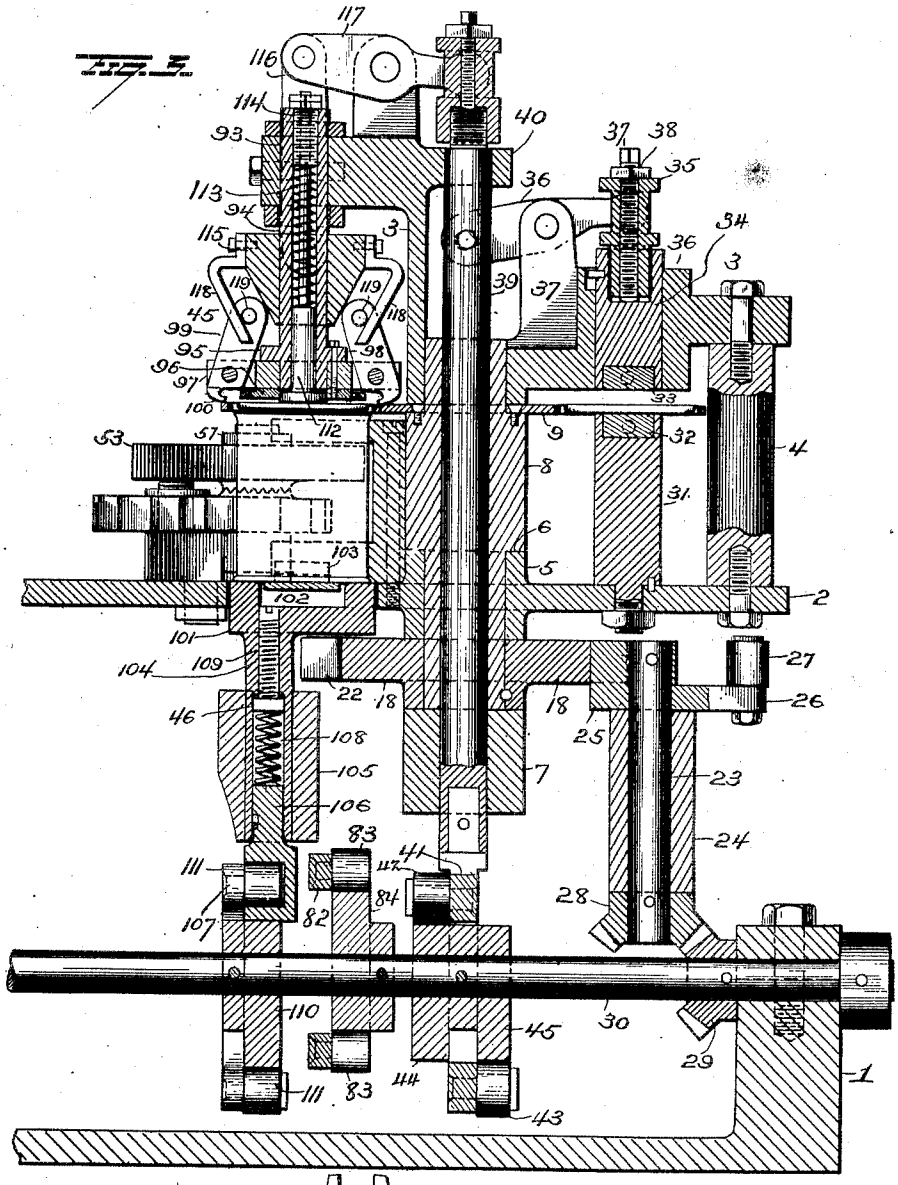
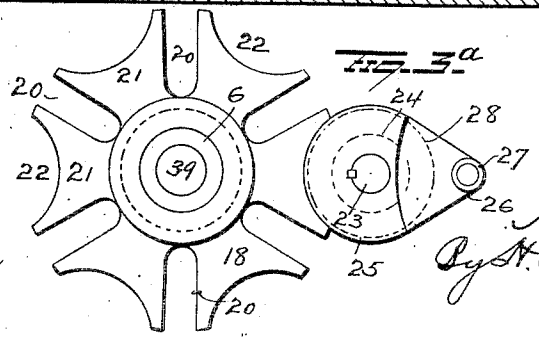


FIG. 3a.



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5 SHEETS—SHEET 4.

Fig. 4.

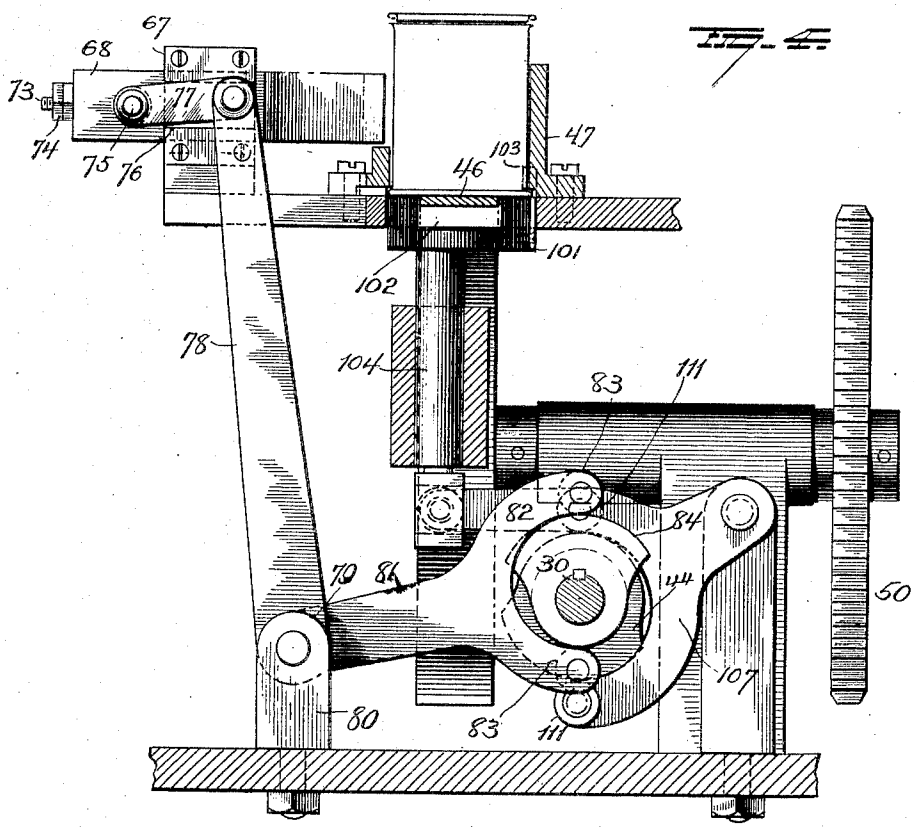


Fig. 5.

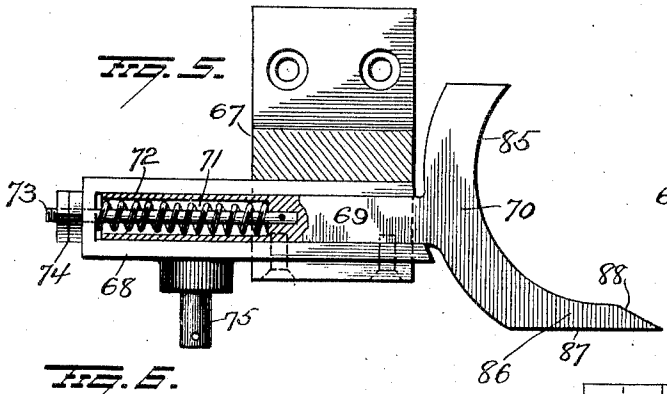


Fig. 7.

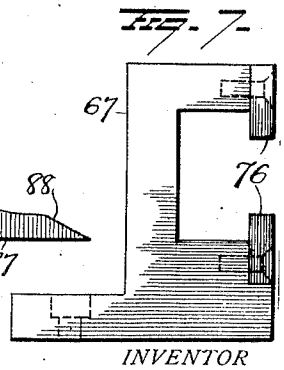
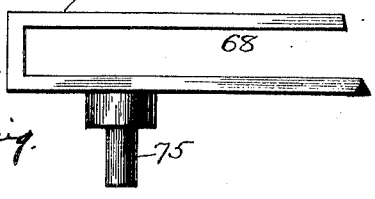


Fig. 6.



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5 SHEETS—SHEET 5.

Fig. 10.

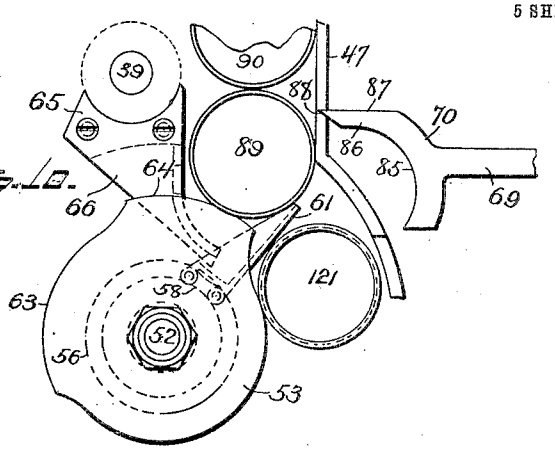


Fig. 8.

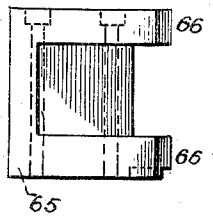


Fig. 11.

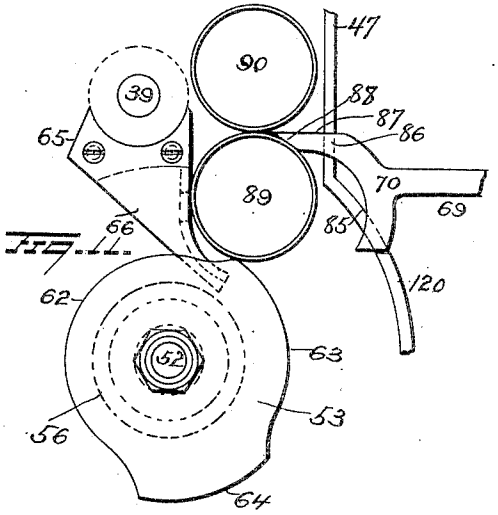


Fig. 9.

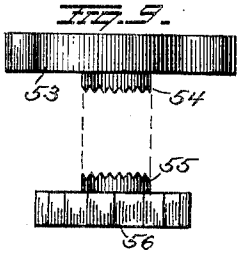
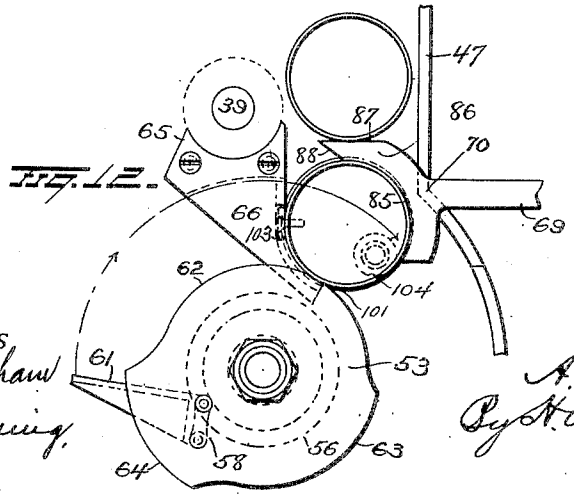


Fig. 12.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR CAPPING CANS.

1,099,757. Specification of Letters Patent. Patented June 9, 1914.

Application filed July 18, 1913. Serial No. 779,761.

To all whom it may concern:

Be it known that I, ADOLPH MALMQUIST, of South Bellingham, in the county of Whatcom and State of Washington, have invented certain new and useful Improvements in Machines for Capping Cans; 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 improvements in machines for capping cans, and more particularly to means for automatically attaching caps to cans without hermetically sealing the latter, prior to the subsequent operation of exhausting and hermetic sealing.

One object of my present invention is to so construct capping mechanism for cans that the caps may be applied to the cans in such manner as to avoid spilling the contents of the cans.

With this and other objects in view, the invention consists in certain novel features of construction and combinations of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a machine embodying my improvements; Fig. 2 is a horizontal sectional view partly in plan; Fig. 3 is a transverse sectional view; Fig. 3ª is a plan view, partly in section, showing the feed mechanism for the cap carrier; Fig. 4 is a view partly in section and partly in elevation showing the can platform and spacing means and mechanism for operating the same; Fig. 5 is a view partly in plan and partly in section showing the spacing device and its mountings; Fig. 6 is a detail view of the carrier for the can spacer; Fig. 7 is a detail view of the bracket through which said carrier and shank of the spacer move; Fig. 8 is a detail view of the can stop; Fig. 9 is a view showing the cam 53 and its operating means, and Figs. 10, 11 and 12 are diagrammatic views showing different stages in the operations of the devices which control the feeding of cans to and from the crimping mechanism for the caps.

1 represents suitable framework which comprises in its structure a platform or table 2 supported a proper distance above the base, and a super-frame or spider 3 supported a distance above the table by posts such as illustrated at 4, Fig. 3.

The table 2 is provided with a bearing for a vertical tubular shaft 6—the latter also having a bearing at its upper end in the spider 3 and terminating at its lower end over a block 7 of the framework. The intermediate portion of the tubular shaft 6 is enlarged to form a drum 8, to upper end of which, a circular cap carrier 9 is secured so as to be disposed over the table 2. The cap carrier consists of a circular plate provided with a plurality of circular openings 10, into each of which, a plurality of lugs 11 project and constitute supports for can caps or covers. The carrier 9 receives the caps from a magazine 13 supported over the carrier by means of a bracket 14 hinged to an arm 15 and provided with a handle 16 carrying a spring-actuated latch device 17 for holding the magazine in position. By means of this construction, the cap magazine will be held in proper position over the cap carrier and may be moved laterally, should it be desired for any reason to prevent the feeding of can caps to the carrier.

It is necessary, as will be hereinafter made apparent, that the cap carrier shall have a step-by-step rotary motion imparted thereto, and for this purpose, the mechanism now to be described may be employed.

A disk or wheel 18 (Fig. 3) is secured to the lower end of the tubular shaft 6, and is made with a plurality of slots 20, thus forming an equal number of arms 21,—each of which latter is made with a curved recess 22, (as shown in Fig. 3ª). A vertical shaft 23 (Fig. 3) is mounted in a sleeve 24 in the framework and carries a head 25 having an arm 26 provided with a roller pin 27. Somewhat more than one-half of the head 25 is curved concentric with the axis of rotation of said head and the shaft 23 and is thus adapted to turn freely in any one of the curved recesses 22 of the wheel 18, as clearly shown in Fig. 3ª. The shaft 24 is provided at its lower end with a bevel gear 28 which receives motion from a bevel gear 29 on a drive shaft 30. It will be understood that while the head 25 bears the relation to the wheel 18 shown in Figs. 3 and 3ª, the rotary cap carrier will be at rest, but that when the shaft 23 shall have been turned sufficiently to cause the roller-pin 27

to enter an adjacent slot 20 of the wheel 18, motion will be imparted to the latter and the cap carrier 9 will be turned until the partly circular portion of the head enters the curved recess 22 of the adjacent arm 21 of wheel 18, when said cap carrier will have accomplished one step in the course of its rotation.

It is desirable that means be provided for marking the caps or covers (as a date mark for example), before they are applied to the cans. During the first step of the movement of the cap carrier, a cap will be taken from the magazine and disposed over a mandrel 31 secured to and rising from the table 2. The mandrel 31 carries at its upper end, a die section 32 and the coöperating die section 33 is carried by a plunger 34 which is vertically movable in a sleeve 36ª formed in the spider 3 over the cap carrier. The plunger 34 is provided in its upper end with a threaded socket to receive the exteriorly threaded lower portion of a flanged sleeve 35. The bifurcated arm of a lever 36 embraces the sleeve 35 between the flanges thereof, and this lever is pivotally supported between its ends by an arm 37 on the spider 3. By connecting the lever 36 with the die plunger 34 through the medium of the sleeve 35, such connection may be readily adjusted to insure the proper throw of the plunger, and the sleeve is held fixed when thus adjusted, by means of a screw 37 passing through the threaded interior of said sleeve and engaging the bottom of the socket in the plunger,—a suitable nut 38 being provided on said screw to engage the upper end of the sleeve. The lever 36 receives motion for operating the die plunger, from a vertical shaft 39 with which said lever is connected. The shaft 39 passes through the tubular shaft 6 and block 7 and has a bearing near its upper end in an arm 40 of spider 3. To the lower end of the shaft 39 a yoke 41 is secured and provided above and below the shaft 30 with arms carrying rollers 42—43 to coöperate with cams 44—45 secured to said shaft, to reciprocate said vertical shaft 39. After a can cap has been marked, the next partial rotation of the carrier 9 will move the cap to position under crimping mechanism 45 (which will be hereinafter more particularly described) and in position to be attached to a can body by the operation of said crimping mechanism.

My improvements are intended especially for crimping caps to cans which contain material which might be spilled if the cans be unduly jarred,—such material, for instance, as syrup or fruit with the juice thereof—and my improvements are therefore designed to automatically handle the filled cans prior and also subsequent to the application of the caps thereto, in such manner as to prevent spilling of the contents.

The filled cans (without caps) are fed to the machine from any convenient source, by means of a belt conveyer 46. The table 2 is slotted for the accommodation of this conveyer and guides 47 are secured upon the table at respective distances of the conveyer. The conveyer passes under the capping mechanism and over a band wheel 48 carried by a shaft 49. This shaft is disposed transversely below the table and may be provided with a sprocket wheel 50, to which motion is imparted by a sprocket chain 51 from any suitable source of power.

A short shaft 52 projects upwardly from the table 2, and on this shaft, a cam 53 is mounted and provided with a serrated hub 54 to mesh with a similarly serrated hub 55 on a sprocket wheel 56 also mounted on said short shaft. By thus connecting the cam 52 with the sprocket wheel, it may be readily adjusted and will be held at the desired adjustment by a nut 57 on the end of shaft 52. Motion is imparted to the sprocket wheel 56 and hence to the cam 53, by a sprocket chain 58. This chain receives motion from any convenient source and is maintained at proper tension by an idle sprocket 59 carried by an adjustable crank 60. The chain 58 is provided with a plurality of arms 61 for moving capped cans from the crimping mechanism and conveying them to sealing mechanism, not shown. The cam 53 is so constructed that the three portions 62—63 and 64 of its peripheral edge are different distances from the axis of the cam, each of said portions of the cam being adapted to engage a can, as will be hereinafter explained.

A block 65 is located at one side of the conveyer belt 46 and provided with stop fingers 66 disposed in proximity to the cam 53 and in position to position a can under the crimping mechanism,—said stop fingers being so spaced, one above the other, as to permit the conveyer fingers 61 to pass between them. Beyond the opposite side of the conveyer 46 and approximately opposite the crimping mechanism, a bracket 67 is secured to the framework and serves as a guide for a slide 68. This slide is made in the form of a yoke and receives the shank 69 of a can spacer 70, said shank having a recess 71 in which a spring 72 is located. One end of this spring bears against the bottom of the recess in the shank and at its other end, said spring bears against the closed end of the guide 68. A rod 73 is secured at one end to the shank 69; passes through the spring 72 and the closed end of the yoke slide 68 and at its free end, said rod is threaded to receive nuts 74. By these means, the spacer will have a yielding mounting and may be adjusted relatively to the slide. The slide 68 is provided at one side with a pin 75 (the guide bracket 67 being constructed to

form a slot 76, as shown in Fig. 7, for the accommodation of said pin), and with this pin, one end of a link 77 (Fig. 4) is connected. The other end of the link 77 is pivotally connected with the upper end of the long arm 78 of an L-shaped lever 79 mounted in a bracket 80 on the framework. The arm 81 of the L-shaped lever 79 is bifurcated to form a yoke 82, the arms of which carry rollers 83 to coöperate with a cam 84 secured to the shaft 30. By these means, the slide 68 will be reciprocated to move the spacer 70 toward and from the can path. The spacer 70 is formed with a curved forward edge 85 to conform to the curved contour of a cam, and with a finger 86 having a straight outer edge 87 and a beveled portion 88 at its free end.

When a can on the conveyer 46 approaches the crimping mechanism, it will be met by the portion 62 of the cam 53 (as shown at 89, Fig. 10) by which it will be stopped. While cam 53 is turning with its portion 64 in engagement with the can 89, the spacer will begin to move toward the can. As the cam 53 continues to turn, with its portion 63 in contact with the can, the spacer 70 will continue to move so as to force the can against the stop arms 66 and so that the beveled end of the spacer arm 86 will become disposed approximately at the juncture of the can 89 with the following can 90, as shown in Fig. 11. The cam 53 has now turned until the portion 63 thereof is about to leave the can. As the cam 53 continues to turn, the portion 62 thereof will come into position to receive the can 89 and the spacer 70 will continue to move forwardly its finger 86 entering between the two cans 89 and 90 and pressing the former against the curved portions of the stop fingers and the edge 62 of the cam 53, said spacer partially embracing the can and coöperating with the stop fingers and cam to position the can under the crimping device, while the straight face 87 of the spacer finger 86 will engage the can 90 and hold it and the cans behind it, from moving.

Should it be desired, for any reason, to stop the feeding of the cans to the positioning devices above described, this may be accomplished by means of a pivoted stop 91 which normally forms a part of one of the guides 47,—a suitable, normally locked handle 92 being provided to facilitate the manual manipulation of said stop.

By means of the can positioning mechanism hereinbefore described, the cans may be delivered to the crimping mechanism without submitting them to undue jarring or shaking and hence liability of spilling the contents of the cans is reduced to a minimum.

The upper framework is made with an arm 93 (Fig. 3), to which the tubular shaft 94 of the crimping mechanism is secured and through which said shaft passes. The tubular shaft 94 depends from the arm 93 and is provided near its lower end with a collar 95. A head or plunger 96 is applied to the lower end of the shaft 94 and is of suitable configuration to engage the upper face of the can cap. A spider 97 is mounted on the tubular shaft 94 between the collar 95 and the head 96, and said spider and head are secured in place by screws 98 which pass through the same and enter threaded holes in the collar,—thus securing said spider and head to the shaft 94. The spider 97 serves to pivotally support the arms 99 of a plurality of crimping jaws 100. The crimping jaws are so formed that the flange of the cap will not be bent closely throughout the full extent of its peripheral edge, and hence the crimping of the cap to the can body is such as not to hermetically seal the cap to the can body.

When a can reaches the crimping devices, it will become disposed upon a platform 101 having a groove 102 for the accommodation of the conveyer belt 46, said groove having sufficient depth to permit the platform to move vertically and raise the can off the belt. The platform 101 is also provided with a lug 103 to engage the bottom flange of the can and insure descent of the latter with the platform. The purpose of the vertically movable platform 101 is to provide means for raising the can to the crimping devices and for removing a capped can from the latter, and to accomplish such vertical movement, the devices now to be described may be employed: A tubular arm 104 is secured to and depends from the platform 101 and passes through a guide 105 rigid with the framework. The shank 106 enters and is movable a limited distance in the lower end of the tubular arm 104 and the lower end of said shank is connected with a bifurcated pivoted lever 107. A spring 108 (housed in said tubular arm) bears at one end against the shank and at the other end against a screw 109, by means of which latter, the tension of the spring 108 may be adjusted. In this manner, yielding connecting means will be afforded between the platform 101 and a cam 110 on the shaft 30,—the lever 107 being provided with roller pins 111 to coöperate with said cam to effect the raising and lowering of the can. When the can has been raised by the operation of the cam 110, said can will engage the cap and move the same upwardly until said cap engages the head 96 and the peripheral edge of said cap will be in position to be engaged by the crimping jaws, to crimp the cap to the can body.

A plunger 112 is located in the tubular shaft 94 and the head of this plunger is engaged by the can cap when the latter is

raised with the can, to raise said plunger against the resistance of a spring 113 housed within the tubular shaft 94. The tension of this spring may be adjusted by means of the screw 114 in the upper end of the tubular shaft 94.

The crimping jaws are operated to crimp the cap to the can, by means of a cone 115 mounted to slide on the shaft 94 and engage the upper ends of the arms of said crimping jaws. The cone 115 is engaged by pins at the lower ends of the arms of a yoke 116 and this yoke is pivotally connected with one arm of a lever 117, the other arm of said lever being adjustably connected with the upper end of shaft 39. The cone 115 has secured to its upper end, a plurality of fingers 118, which are so disposed that their inner faces will be engaged by pins 119 projecting from the arms of the crimping jaws, when the cone is moved upwardly, for the purpose of withdrawing said jaws. When the shaft is moved upwardly by the cam 45 as previously explained, motion will be imparted, through the medium of the lever 117 and the yoke 116 to the cone 115 for operating the jaws 100 to crimp the edge of the cap to the flange of the can. During the downward movement of the shaft 39 motion will be imparted to the cone 115 to raise the same and cause the withdrawal of the crimping jaws.

During the operation of the crimping mechanism, the portion 62 of the cam will be moving in contact with the can, and when the capping operation shall have been completed, one of the arms 61 on chain 58 will approach the can for removing the latter. During the removal of the can from the crimping mechanism, by the traveling conveyer arm 61, the spacer 70 will recede to permit such removal of the can and the latter will be moved over the table, guided by the curved portion of a guide 120. As the capped can leaves the crimping mechanism, as shown at 121, the portion 64 of the cam 53 will arrive in position to engage the next can (indicated at 89, Fig. 10) and temporarily hold the same back as previously explained.

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope and hence I do not wish to restrict myself to the precise details herein set forth.

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is:—

1. In a can capping mechanism, the combination with crimping mechanism and means for feeding cans to be capped thereto, of a rotary cap carrier, means for feeding can caps to said carrier, marking means for the caps located between said cap feeding means and the crimping mechanism, means for operating the crimping mechanism and the marking means, and means operatively associated with the cap carrier for rotating the same step-by-step to feed caps successively to the marking means and the capping mechanism.

2. In a can capping mechanism, the combination with crimping mechanism, means for feeding can caps thereto, and feeding means for cans, of means operating automatically independently of the feeding means for positioning and holding a can in operative relation to the crimping mechanism to receive a cap, and for simultaneously stopping the progressive movement of following cans.

3. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to be capped to said crimping mechanism, of means for positioning a can in operative relation to said crimping mechanism, means for removing a capped can from the crimping mechanism, and a cam operating to prevent the positioning of another can at the crimping mechanism while the capped can is being removed therefrom.

4. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to be capped to said crimping mechanism, of means for positioning and holding a can in operative relation to the crimping mechanism, a cam having operative relation to the cans approaching the crimping mechanism, said cam having three concentric peripheral edges disposed different distances from its axis.

5. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to the crimping mechanism, of a fixed stop device to receive a can at the crimping mechanism, a spacer opposite said stop device and coöperating therewith to hold a can, said spacer having a part to enter between such can and a following can, and means for reciprocating said spacer.

6. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to the crimping mechanism, of stop arms to receive a can at the crimping mechanism, a spacer opposite said stop arms, means for reciprocating said spacer, a cam to engage a can during the movements of the spacer, said cam having three concentric edges disposed different distances from its axis, and means for rotating the cam.

7. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to the crimping mechanism, of means for positioning a can in operative re-

lation to the crimping mechanism, a cam having a part to engage a can and retaining it back of the crimping mechanism while another can is being discharged from the crimping mechanism, and means for discharging capped cans from the crimping mechanism.

8. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to said crimping mechanism, of a stop device to receive a can at the crimping mechanism, a spacer opposite said stop device and adapted to partially embrace the can, said spacer having an arm provided with a beveled end, and means for reciprocating said spacer and causing its arm to enter between two cans and position one of them in operative relation to the crimping mechanism and space such can from the following can.

9. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to said crimping mechanism, of a stop device to receive a can at the crimping mechanism, a fixed bracket, a slide supported by said bracket, a device carried by said slide and movable between two cans and operating to separate them, and means for reciprocating the slide.

10. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to said crimping mechanism, of a stop device at the crimping mechanism, a fixed bracket, a slide supported thereon, a can spacer having a shank mounted in said slide, a yielding connection between said shank and the slide, and means for reciprocating said slide.

11. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to said crimping mechanism, of a stop device to receive a can at the crimping mechanism, of a fixed bracket, a slide supported by said bracket, a can spacer carried by said slide, a drive shaft, a cam thereon, a lever having a bifurcated arm having operative relation to said cam, and a link connecting the other arm of said lever with the slide which carries the spacer.

12. In a can capping mechanism, the combination with crimping mechanism, means for feeding caps thereto, and means for feeding cans to said crimping mechanism, of a shaft adjacent to said crimping mechanism, a wheel on said shaft, means for driving said shaft, a cam on said shaft and adjustably connected with said wheel, said cam having three concentric edges to engage a can, said edges being disposed different distances from the axis of the shaft.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ADOLPH MALMQUIST.

Witnesses:
E. B. DEMING,
H. B. DRISKO.