April 15, 1941. J. F. PRICE 2,238,372

MACHINE FOR SEAMING END CLOSURES TO CONTAINER BARRELS

Filed Oct. 5, 1939 3 Sheets-Sheet 1

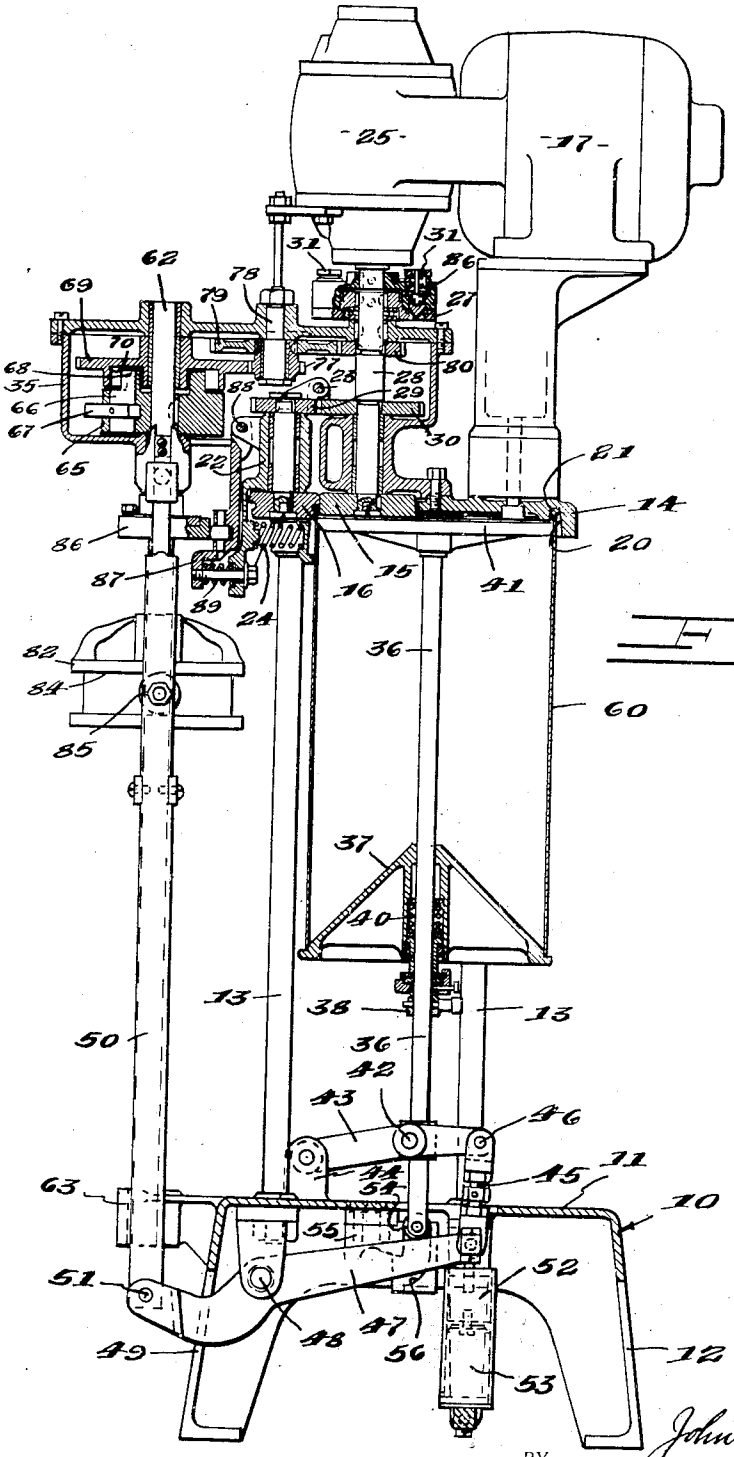


Fig-1

INVENTOR.
John F. Price

BY

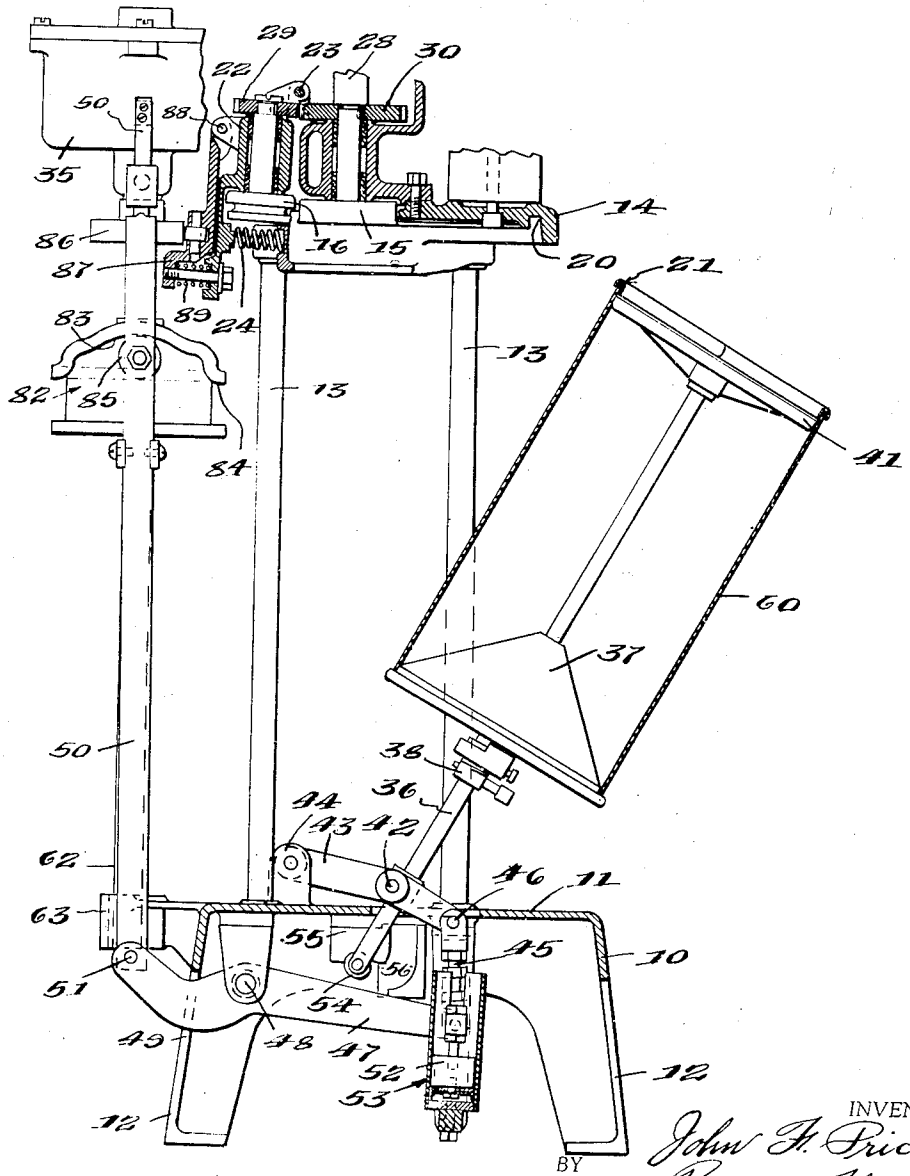
Bodell & Thompson.
ATTORNEYS.

April 15, 1941. J. F. PRICE 2,238,372

MACHINE FOR SEAMING END CLOSURES TO CONTAINER BARRELS

Filed Oct. 5, 1939 3 Sheets-Sheet 2

Fig-2



INVENTOR.
John F. Price
BY
Bodell & Thompson.
ATTORNEYS.

April 15, 1941. J. F. PRICE 2,238,372

MACHINE FOR SEAMING END CLOSURES TO CONTAINER BARRELS

Filed Oct. 5, 1939 3 Sheets-Sheet 3

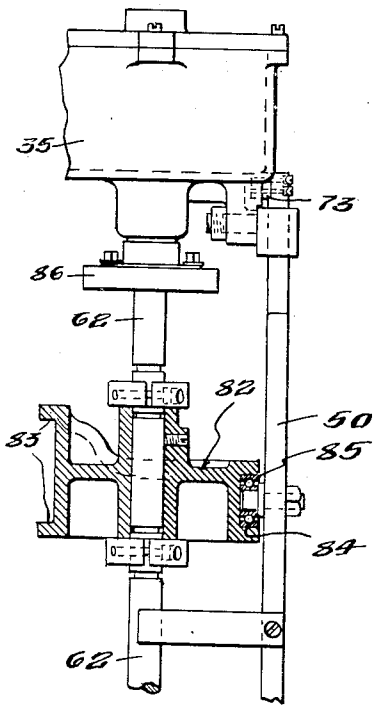


Fig-3

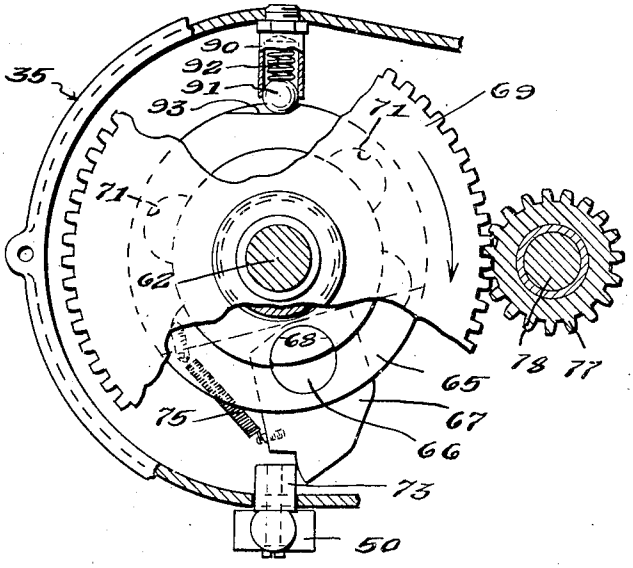


Fig-4

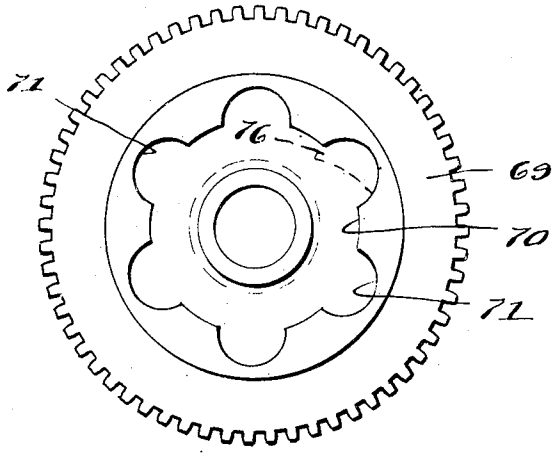


Fig-5

INVENTOR.
BY John F. Price
Bodell & Thompson
ATTORNEYS.

Patented Apr. 15, 1941

2,238,372

UNITED STATES PATENT OFFICE

2,238,372

MACHINE FOR SEAMING END CLOSURES TO CONTAINER BARRELS

John F. Price, Fulton, N. Y., assignor to Oswego Falls Corporation, Fulton, N. Y., a corporation of New York

Application October 5, 1939, Serial No. 298,079

9 Claims. (Cl. 153—1)

This invention relates to a machine for securing an end closure to a container barrel. The end closure is secured to the barrel by crimping a channel shaped ring member into engagement with the end closure and the end of the barrel. A machine of this type is described in Patent No. 2,113,699 issued April 12, 1938, to Edward N. Lowry, and more specifically this invention consists of certain improvements in the machine shown in the Lowry patent.

In the Lowry machine, the container barrel was placed upon the container barrel support with the end closure placed on the end of the barrel. Thereupon, the operator applied pressure to a foot pedal. The movement of the foot pedal effected movement of the container in alinement with the seaming apparatus and subsequently effected relative axial movement between the container and the seaming apparatus to effect the crimping operation. Upon removal of the pressure on the foot pedal, a reverse series of movements were effected to return the container to initial position. The Lowry machine has proven to be most satisfactory in operation, with the exception that the operator becomes fatigued if it is necessary to operate the machine continuously over long periods of time.

This invention has as an object a machine of the type referred to embodying a construction which operates automatically to effect the seaming or crimping operation. In accordance with this invention, it is only necessary for the operator to slip the container barrel onto the container support, place the end closure or crimping ring on the end of the container barrel, and swing the barrel into alinement with the crimping mechanism. Thereafter, the machine operates automatically under power to effect relative axial movement between the container and the head of the machine to properly position the crimping ring with respect to the crimping rolls, and to move the rolls into operative engagement with the ring. When the crimping operation is completed, the parts are moved automatically in reverse order and the container support returned to initial positon. With this construction, the operator may operate two machines over long periods of time with less fatigue than formerly with the foot operated machine, with the result that the production of assembled containers is materially increased, and with the further advantage that the crimping operation is uniform on all containers.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a vertical, sectional view of a machine involving my invention with parts shown in elevation, and with the container support shifted to bring the end of the container into operative relationship to the crimping mechanism.

Figure 2 is a view, similar to Figure 1, with parts omitted, showing the container support shifted in normal position to receive a container, or to permit removal of the assembled container.

Figure 3 is a fragmentary, elevational view, looking from left to right Figure 2, of the cam mechanism for effecting relative axial movement between the container support and the head of the machine with the cam shown in section.

Figure 4 is a top, plan view with parts broken away of the driving clutch mechanism for operatively connecting the cam mechanism to the driving motor.

Figure 5 is an inverted plan view of the driven gear associated with the clutch mechanism of Figure 4.

The frame of the machine consists of a base 10 formed with a flat top wall 11 and depending legs 12. A plurality of rods 13 are secured at their lower ends to the base 10 and extend upwardly to support a head 14. A pair of crimping rolls 15, 16 are journalled in the head and are operatively connected to a motor 17 which effects continuous rotation of the rolls. The head 14 is formed with a circular groove 20 to receive and guide the upper end of the container barrel and the ring which is crimped thereto. The roll 15 is journalled within the groove 20 with the periphery of the roll positioned to engage the inner side of the ring 21. The roll 16 is journalled in a housing 22 pivotally mounted in the head, as at 23. The roll 16 is normally spaced radially from the periphery of the roll 15 by a spring 24 acting between the head and the lower end of the housing 22.

The motor here shown is supplied with a reduction unit 25, the driven shaft of which is secured to a driving clutch member 26 which, in turn, coacts with a driven clutch member 27 keyed to a shaft 28, to the lower end of which is secured the inner roll 15. The rolls 15, 16 are operatively connected by gears 29, 30, the gear 30 being keyed to the shaft 28, and the gear 29 keyed to the spindle of roll 16. The gears 29, 30 are in constant mesh in both the in and out positions of the housing 22.

The driving clutch section 26 is provided with

a plurality of spring pressed pins adjustable as at 31, and which act as a slip clutch to prevent injury to the seaming mechanism should it in any way become jammed.

The construction of the head 14, the arrangement of the rolls 15, 16, and the driving motor 17, is substantially the same as that shown in the Lowry patent referred to, with the exception that the head is provided with a rearwardly extending gear housing 35 in which driving gears and clutch mechanism are arranged to effect operation of the machine, as will be hereinafter described.

The container support consists of a shaft 36 pivotally mounted at its lower end to the base 10 and provided intermediate its ends with a conical support member 37. The support 37 is rotatably mounted upon the shaft 36 and is supported by a collar 38 adjustable axially of the shaft 36 to accommodate different lengths of containers. A helical compression spring 40 is arranged between the support member 37 and the collar 38, whereby the container is yieldingly supported on the shaft 36. A wheel or disk 41 is rotatably mounted upon the upper end of the shaft 36 to properly guide and position the upper end of the container barrel.

The lower end of the shaft 36 is pivotally mounted at 42 to the end of a link 43, the opposite end of which is pivotally mounted to a boss 44 extending upwardly from the top 11 of the base. A second link extending forwardly is also pivotally connected at one end at 42, and its opposite end is pivotally connected to a link 45, as at 46.

The lower end of the link 45 is pivotally connected to a lever 47 extending rearwardly and pivoted intermediate its ends as at 48 to the under side of the base. The rear portion of the lever 47 extends through a slot 49 in the rear of the base and is pivotally connected to a vertically extending bar 50, as at 51. The lower end of the link 45 is also pivotally connected to a piston 52 slidably mounted in a cylinder 53 pivotally mounted at its lower end to the under side of the base 10. The piston 52 and cylinder 53 act as a dash pot to control the pivotal movement of the shaft 36. The lower end of the shaft 36 is provided with a roller 54 arranged to engage a block 55 secured to the under side of the base. The block 55 is provided with a slot 56 which coacts with the roller 54 to guide the shaft 36 vertically when the same has been moved in axial alinement with the head 14. The arrangement is such that when the shaft 36 is moved to lowered position, as shown in Figure 2, the shaft extends forwardly in angular relationship to the axis of the head 14 to permit a container barrel 60 to be placed on the container support and removed therefrom. Upon upward movement of the link 45, the shaft 36 is first moved into vertical position and subsequently moved vertically to bring the upper end of the barrel 60, or the ring 21 placed thereon, into the slot 20 of the head 14.

In the machine shown in the Lowry patent referred to, the pivotal and vertical movement of the shaft 36 was effected by operation of the foot pedal extending forwardly of the base of the machine. In the present construction, the container support, including the shaft 36, is moved from the container receiving position in Figure 2 to vertical position, as shown in Figure 1, by the operator pushing the container inwardly toward the axis of the machine. As soon as the container and container support approach vertical position, power is applied to the shaft 36 by the motor 17. The shaft is elevated to position the top of the container in proper relation with the rollers 15, 16. The roller 16 is then moved radially toward the roll 15, the crimping operation performed, the roll 16 released and subsequently the shaft 36 lowered and permitted to swing outwardly, as shown in Figure 2.

The mechanism for effecting these movements consists of a power shaft 62 journalled at its upper end in the rearwardly extending gear casing 35 and at its lower end in a bracket 63 extending rearwardly from the base 10. The driven member 65 is of cylindrical formation and is formed with an aperture arranged at one side of the shaft 62 to receive a clutch pin 66. The clutch pin 66 is rotatably mounted in the member 65 and has secured to it a jaw member 67 extending radially through a slot formed in the periphery of the member 65. That portion 68 of the pin 66 extending above the top surface of the member 65 is of semi-circular formation. A driving clutch member, in the form of a gear 69, is rotatably mounted upon the shaft 62 immediately above the driven member 65. The under side of the gear 69 is formed with an annular recess 70, and a plurality of semi-circular apertures 71 spaced apart circumferentially of the gear 69. The arrangement is such that the semi-circular top portion 68 of the pin 66 is normally in the position shown in Figure 4. This is accomplished by the outer end of the jaw 67 engaging a stop 73. The gear 69 and the driven member 65 are rotated clockwise, as indicated by the arrow in Figure 4. Accordingly, when the jaw 67 engages the stop 73, the pin 66 is rotated to move the semi-circular top portion 68 of the pin out of any of the semi-circular recesses 71 in the gear 69 and accordingly, the member 65 becomes unclutched from the gear 69.

The jaw 67 is urged in a clockwise direction (Figure 4) by a helical tension spring 75, one end of which is secured to the jaw and the opposite end to the driven member 65. Accordingly, when the stop 73 is moved out of engagement with the jaw 67, the jaw is moved about the axis of the pin 66 and the top portion 68 of the pin is moved into one of the semi-circular recesses 71, as indicated in dotted outline at 76, Figure 5. The driven member 65 is then clutched to the gear 69.

The gear 69 meshes with a pinion 77 mounted on a stud 78 in the head 14. The pinion 77 is arranged in combination with a gear 79 arranged in mesh with a gear 80 mounted on the shaft 28. Accordingly, the gear 69 is continually rotated, and movement of the stop 73 effects engagement and disengagement of the power shaft 62 with the motor 17.

The stop 73 is secured to the upper end of the bar 50. Accordingly, when the container and the container support is swung inwardly from the position shown in Figure 2, the bar 50 is moved downwardly by the link 45 and lever 47 a sufficient distance to move the stop 73 out of engagement with the jaw 67.

The power shaft 62 is provided with cam means cooperable with the bar 50 to effect further downward movement of the bar and accordingly, further upward movement of the shaft 36 to move the container axially into the head 14. A cam 82 is adjustably secured to the shaft 62. The periphery of the cam 82 is formed with a slot having a portion 83 of appreciable width and a narrow portion 84.

When the machine is in the position shown in Figure 2, the stop 73 is in engagement with the

jaw 67 and the wide portion 83 of the peripheral cam is arranged adjacent the bar 50. The bar 50 is provided with a roller 85 arranged in the slot of the cam. With the parts in this position, partial downward movement of the bar 50 by swinging the container support inwardly is permitted because of the wide portion 83 of the cam. When the bar 50 has been moved downwardly by the initial inward movement of the container and container support, and power has been applied to the shaft 62, the cam 82 is rotated and the bar 50 is moved downwardly by the narrow portion 84 of the cam slot. This portion 84 is of appreciable length and maintains the bar 50 in lowered position during the crimping operation.

Means is also provided for moving the housing 22 inwardly to press the roller 16 into engagement with the outer surface of the ring 21 to effect the crimping thereof. A second cam 86 is adjustably secured to the shaft 62 above the cam 82. This cam is arranged to engage a bracket 87 pivotally mounted at it upper end to the housing 22, as at 88. The lower end of the bracket 87 is urged outwardly from the housing 22 by a helical compression spring 89. Engagement of the bracket 87 by the cam 86 effects inward movement of the bracket 87 and housing 22 and accordingly maintains the roll 16 in engagement with the ring 21.

The arrangement is such that when the container and container support are moved inwardly toward vertical position, the bar 50 is moved downward sufficiently to move the stop 73 out of engagement with the jaw 67. Thereupon, the shaft 62 is clutched to the gear 69 and the cams 82, 86 rotated. The cam 82 causes further downward movement of the bar 50 effecting elevation of the shaft 36 to position the container in the head 14. When the container is thus positioned, the cam 86 engages the bracket 87 moving the roll 16 into engagement with the outer side of the ring 21. The container is rotated on the shaft 38 by the rolls 15, 16, and the ring 21 securely crimped into engagement with the barrel of the container. Eventually the wide portion 83 of the cam 82 is moved in juxtaposition to the bar 50, permitting the bar 50 to move upwardly and at this time the cam 86 has moved out of engagement with the bracket 87 permitting the springs 24, 89 to move the roller 16 out of engagement with the ring 21. Inasmuch as the roller 85 is now positioned in the wide portion 83 of the cam 82, the bar 50 is permitted to move upwardly, permitting the container and container support to move downwardly, and to swing outwardly, as shown in Figure 2. At this time, the bar 50 has moved the stop 73 upwardly, and the stop is engaged by the outer end of the jaw 67 unclutching the driven member 65 from the gear 69.

In order to prevent rotation of the driven member 65 after the stop 73 has been moved out of engagement with jaw 67, and before the upper portion 68 of the pin 66 has been moved into one of the recesses 71, a tubular member 90 is secured in the inner side of the gear casing 35 and is provided with a ball 91 pressed inwardly by compression spring 92. The member 65 is provided with a flat 93 positioned relative to the stop 73 so that the ball 91 engages the flat 93 when the driving and driven elements have been unclutched. The ball 91 acts as a yielding means to prevent rotation of the member 65 until it has been positively clutched to the gear 69 through the pin 66.

It will be observed that I have provided a simple and efficient mechanism for rendering the crimping operation of the machine automatic.

What I claim is:

1. A machine for securing a ring member to the end of a container barrel comprising a frame, a head mounted on the frame, a pair of seaming rolls journalled in said head, one of said rolls being movable toward and from the other, a container support movably mounted in the frame and extending in angular relation to said head when in initial position and being movable into axial alinement with said head, a motor operatively connected to said rolls to effect rotation thereof, and means operable by said motor, upon movement of the container support into alinement with the head, to effect axial movement of said support toward the head and to move said movable roller into engagement with the ring member and to subsequently return said movable roller and container support to normal position.

2. A machine for securing a ring member to the end of a container barrel comprising a frame, a head carried by the frame, a pair of seaming rolls journalled in said head and being normally arranged in spaced apart relation, one of said rolls being radially movable relative to the other, a container support carried by the frame, said support normally extending in angular relation to the axis of said head for the reception of the container barrel with the ring member thereon, and said container support being movable into axial alinement with said head, a motor operatively connected to said seaming rolls to effect rotation thereof, and means operable by the motor upon movement of the container support in alinement with said head to effect relative axial movement between said head and said container support to position the ring member between said seaming rolls, and to move said movable roll into engagement with the ring member and to subsequently move said roll out of engagement with the ring member and return said container support to normal position.

3. A machine for crimping a metallic ring into engagement with the end of a container barrel comprising a frame, a head mounted on the frame, a pair of crimping rolls journalled in said head, one of said rolls being movable radially toward and from the other, means yieldingly maintaining said rolls in spaced apart relation, a container support pivotally mounted in the frame and normally extending in angular relationship to the axis of said head for the reception of the container barrel, and being movable about its pivot in axial alinement with said head, a motor mounted on the head and operatively connected to said rolls to effect rotation thereof, and means operable by said motor upon movement of said container support in alinement with said head to effect relative axial movement between said head and the container support to position said ring member between said rolls and to move said movable roll into engagement with said ring, and said means being subsequently operable to move said roll out of engagement with said ring and to return said container support to normal position.

4. A machine for securing a channel shaped ring member to the end of a container barrel comprising a base, a head mounted on said base in spaced apart relationship thereto, a container support pivotally mounted on the base and normally extending in angular relationship to the axis of the head for the reception of a con-

tainer barrel and being movable into axial alinement with said head, a pair of seaming rolls journalled in said head, a motor mounted on the head and operatively connected to said seaming rolls to effect rotation thereof, cam means operable when actuated to effect movement of one of said rolls toward and from the other, and a second cam means operable when actuated to effect relative axial movement between said container support and said head, and motion transmitting means cooperable with said container support upon movement of the same in alinement with said head to operatively connect said cam means with said motor for actuation thereby.

5. A machine for crimping a metallic ring into engagement with the end of a container barrel comprising a frame, a head mounted on the frame, a pair of crimping rolls journalled in said head, one of said rolls being movable radially toward and from the other, and means yieldingly maintaining said rolls in spaced apart relation, a container support pivotally mounted in the frame and normally extending in angular relationship to the axis of said head for the reception of the container barrel and being movable about its pivot in axial alinement with said head, a motor mounted on the head and operatively connected to said rolls to effect rotation thereof, a power shaft journalled in the frame, cam means mounted on said shaft and operable, upon rotation of said shaft, to move said movable roll toward and from said other roll and to effect axial movement of said container support toward and from said head to move the end of the container barrel into and out of crimping position relative to said rolls, and clutch means operable, upon movement of said container support into alinement with said head, to connect said power shaft to the motor.

6. A machine for crimping a metallic ring into engagement with the end of a container barrel comprising a frame, a head mounted on the frame, a pair of crimping rolls journalled in said head, one of said rolls being movable radially toward and from the other, and means yieldingly maintaining said rolls in spaced apart relation, a container support pivotally mounted in the frame and normally extending in angular relationship to the axis of said head for the reception of the container barrel and being movable about its pivot in axial alinement with said head, a motor mounted on the head and operatively connected to said rolls to effect rotation thereof, a power shaft journalled in the frame, cam means mounted on said shaft and operable upon a single revolution thereof to successively move said container support toward said head to position the end of the container in crimping relation to the rolls, move said movable roll into engagement with the end of the container, move said roll out of engagement with the container, and subsequently move said container support from said head, clutch means operable, upon movement of said container support into alinement with the head, to connect said shaft to the motor, and means operable to automatically disconnect said shaft from the motor when said shaft has rotated one revolution.

7. A machine for crimping a metallic ring into engagement with the end of a container barrel comprising a frame, a head mounted on the frame, a pair of crimping rolls journalled in said head, one of said rolls being movable radially toward and from the other, and means yieldingly maintaining said rolls in spaced apart relation, a container support pivotally mounted in the frame and normally extending in angular relationship to the axis of said head for the reception of the container barrel and being movable about its pivot in axial alinement with said head, a motor mounted on the head and operatively connected to said rolls to effect rotation thereof, a power shaft journalled in the frame, cam means carried by said shaft and cooperable upon a single revolution of said shaft to successively move said container support toward said head to position the end of the container in crimping relation to the rolls, move said movable roll into engagement with the end of the container, move said roll out of engagement with the container, and subsequently move said container support from said head, a driving member journalled in the frame and being operatively connected to said motor, a driven member mounted on said power shaft and clutch means operable, upon movement of said container support into alinement with the head, to connect said driving and driven members, and means operable to automatically disengage said clutch when said power shaft has rotated one revolution.

8. A machine for crimping a metallic ring into engagement with the end of a container barrel comprising a frame, a head mounted on the frame, a pair of crimping rolls journalled in said head, one of said rolls being movable radially toward and from the other, and means yieldingly maintaining said rolls in spaced apart relation, a container support pivotally mounted in the frame and normally extending in angular relationship to the axis of said head for the reception of the container barrel and being movable about its pivot in axial alinement with said head, a motor mounted on the head and operatively connected to said rolls to effect rotation thereof, a power shaft journalled in the frame, clutch means operable upon engagement to connect said power shaft to said motor, linkage associated with said container support and operable to maintain said clutch in disengaged position while said container support is in normal position and being operable to move said clutch into engagement upon movement of the container support in alinement with said head, a cam carried by said power shaft and cooperable upon one revolution thereof to move said movable roller toward and from said other roller, a second cam carried by said power shaft and cooperable upon one revolution of said shaft to move the container support toward and from said head, and said second cam being cooperable with said linkage to effect movement of the same to disengage said clutch.

9. A machine for crimping a metallic ring into engagement with the end of a container barrel comprising a frame, a head mounted on the frame, a pair of crimping rolls journalled in said head, one of said rolls being movable radially toward and from the other, and means yieldingly maintaining said rolls in spaced apart relation, a container support pivotally mounted in the frame and normally extending in angular relationship to the axis of said head for the reception of the container barrel and being movable about its pivot in axial alinement with said head, a motor mounted on the head and operatively connected to said rolls to effect rotation thereof, a power shaft journalled in the frame, clutch means operable upon engagement to connect said power shaft to said motor, linkage associated with said container support and operable to

maintain said clutch in disengaged position while said container support is in normal position and being operable to move said clutch into engagement upon movement of the container support in alinement with said head, a cam carried by said power shaft and cooperable upon one revolution thereof to move said movable roller toward and from said other roller, a second cam carried by said power shaft and cooperable upon one revolution of said shaft to move the clutch when said power shaft has rotated one revolution, and to permit said container support to return to normal position.

JOHN F. PRICE.