

Nov. 18, 1941.

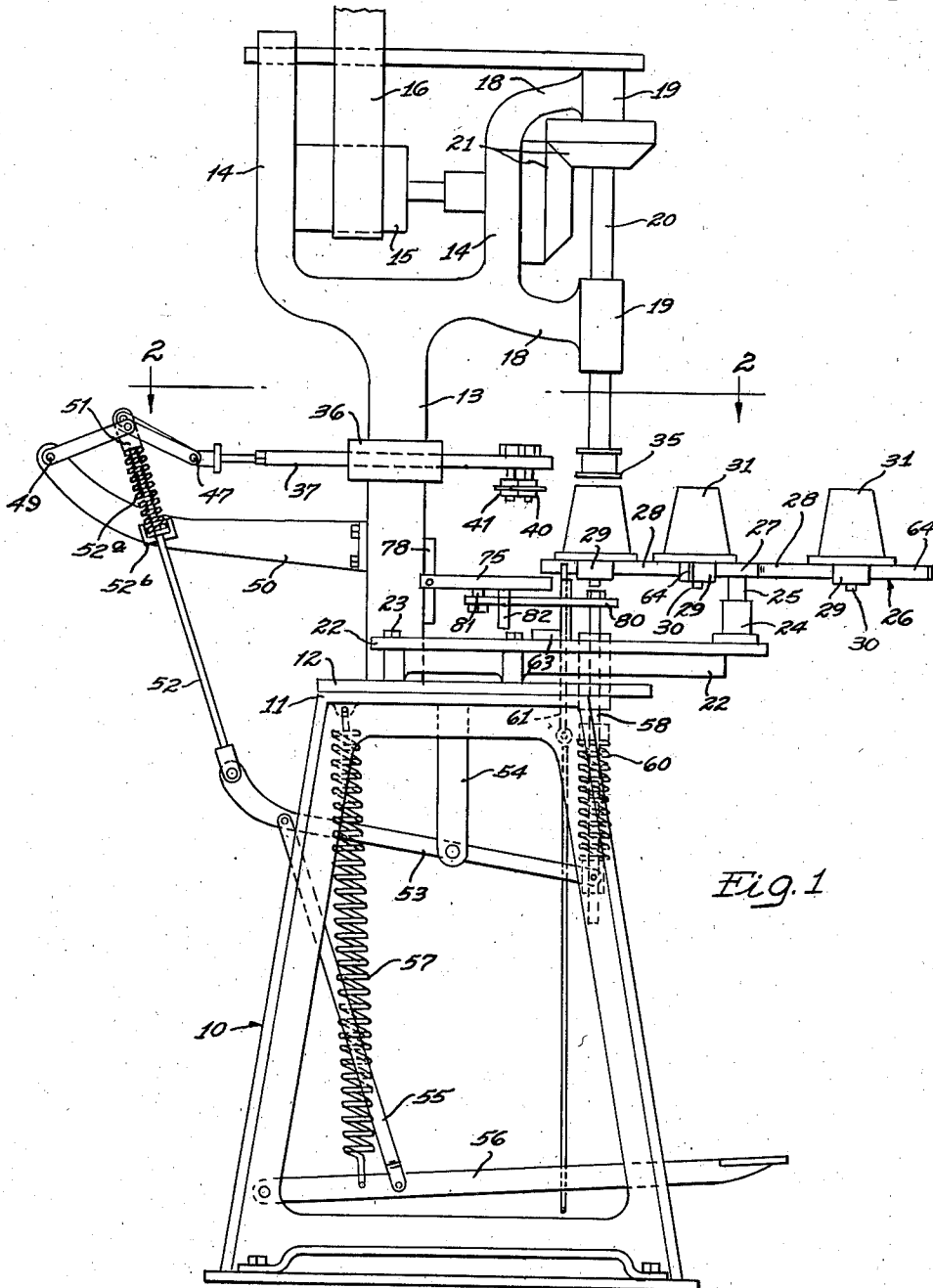
E. N. BURROWS

2,263,288

CRIMPING MACHINE

Filed Sept. 27, 1940

3 Sheets-Sheet 1



Inventor
EDWIN N. BURROWS.

 $\mathfrak{Z}_y$

Bartholmew Hughes

Attorneys

Nov. 18, 1941.

E. N. BURROWS

2,263,288

CRIMPING MACHINE

Filed Sept. 27, 1940

3 Sheets-Sheet 2

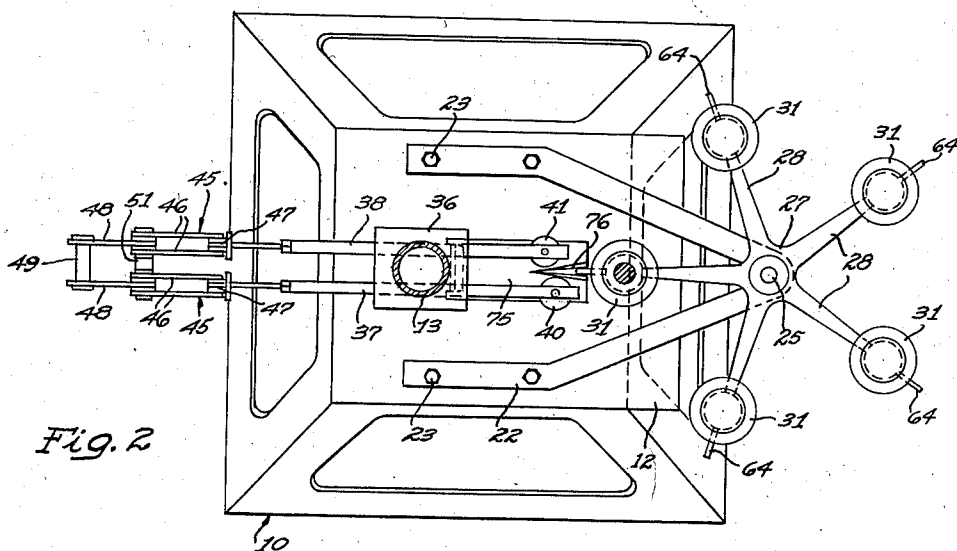


Fig. 2

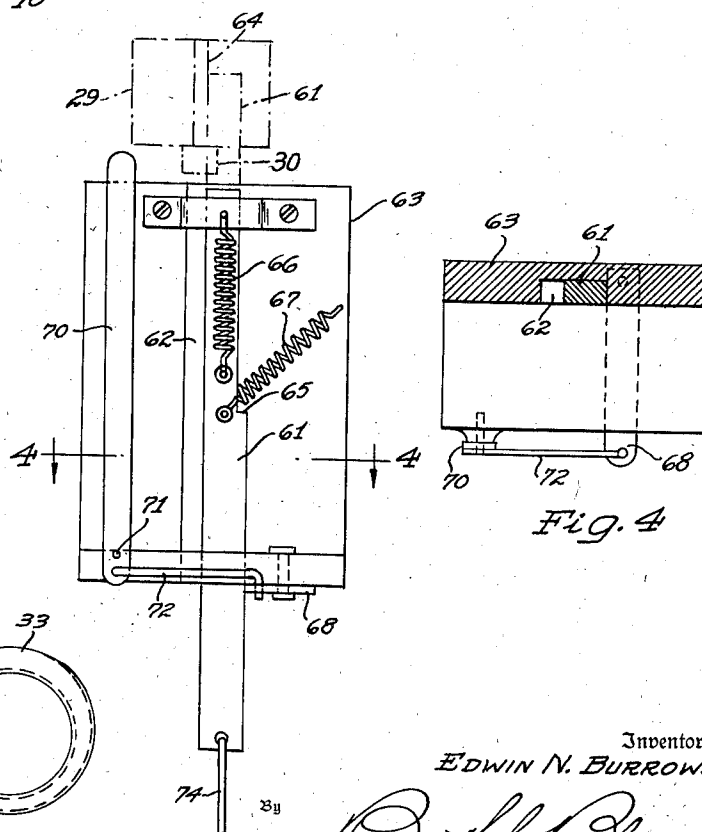


Fig. 3

Fig. 4

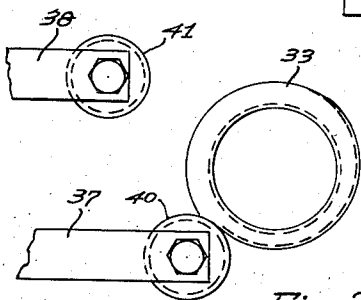


Fig. 7

Inventor
EDWIN N. BURROWS.

Barth's Ledger

Attorneys

Nov. 18, 1941.

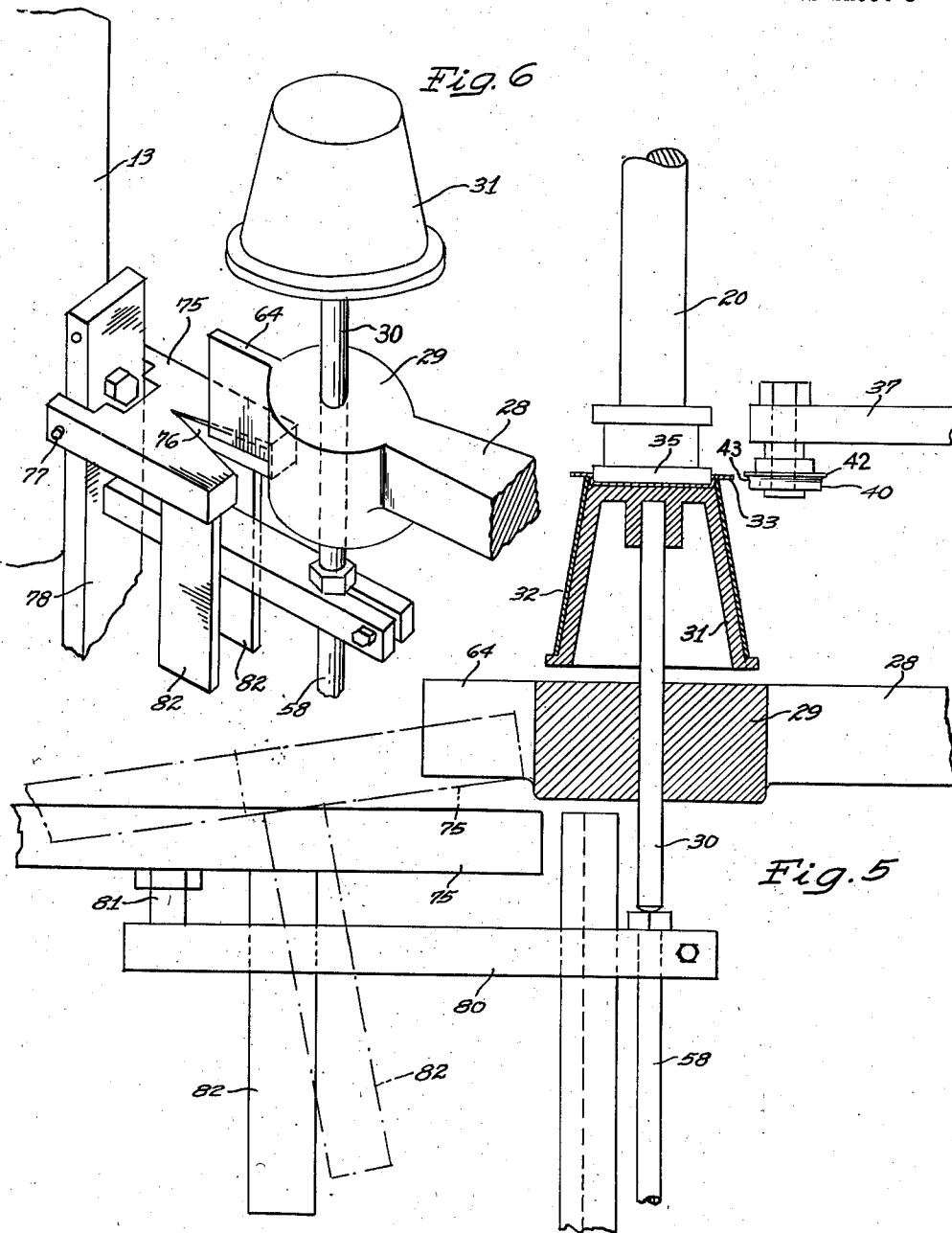
E. N. BURROWS

2,263,288

CRIMPING MACHINE

Filed Sept. 27, 1940

3 Sheets-Sheet 3



Inventor
EDWIN N. BURROWS.

By

Bartholomew

Attorneys

UNITED STATES PATENT OFFICE

2,263,288

CRIMPING MACHINE

Edwin N. Burrows, Royal Oak, Mich.

Application September 27, 1940, Serial No. 358,690

7 Claims. (Cl. 113—23)

This invention relates generally to spinning or crimping machines and more particularly to machines for spinning on or attaching a metallic bottom to a cardboard side wall in the making of containers.

It is an object of the present invention to provide a new and improved spinning or crimping machine by means of which container bottom walls and side walls may be easily and quickly attached together.

Another object of the invention is to provide a spinning or crimping machine having a plurality of mandrels for successive presentation to a rotor or drive member and to provide for automatic alignment of the mandrels with the drive member.

Another object of the invention resides in the provision of a rotatable mandrel support and stop means operable in accordance with operation of the machine for intermittently limiting rotation of the mandrel support for successively presenting the mandrels to a drive member therefor.

Other objects of the invention will become apparent from the following detailed description and from the accompanying drawings in which:

Figure 1 is a view in side elevation of the machine;

Fig. 2 is a view of the machine, taken along the line and in the direction of the arrows 2—2 of Fig. 1;

Fig. 3 is an enlarged view of certain details of the machine;

Fig. 4 is a view partly in elevation and partly in section taken along the line and in the direction of the arrows 4—4 of Fig. 3;

Fig. 5 is an enlarged fragmentary view including one of the mandrels shown in vertical section;

Fig. 6 is a fragmentary and perspective view of the machine; and

Fig. 7 is a fragmentary top plan view of certain parts of the machine to illustrate the crimping operation.

Referring to the drawings by characters of reference, the machine includes a frame or base 10 having a top 11 on which a supporting plate 12 is mounted and rigidly secured thereto. Rigid with the plate 12 and extending upwardly therefrom is a supporting post 13 having branched vertically extending uprights 14 for supporting therebetween a pulley 15 which may be driven by a belt 16 from any suitable source of power. Also, the support 13 is provided with forwardly extending, vertically spaced branches 18 having vertically aligned, hollow bosses 19 in which a shaft 20 is journaled and which shaft is driven

from the pulley shaft through bevel gears 21 mounted on said shafts.

An extension support 22 is mounted on the plate 12 and is rigidly secured thereto by bolts 23, the support 22 overhanging the edge of said plate and having a bearing 24 to receive a vertical shaft 25 of a rotatable mandrel support 26. The mandrel support 26 comprises a hub 27 from which extend integral, radially spaced arms 28 each of which is provided adjacent its outer end with a hollow boss 29 to receive a shaft 30 of a mandrel 31, there being five such mandrels in the present instance. The mandrels 31 are rotatable relative to their support and the mandrel shafts 30 are slidably mounted in their respective bosses so that the mandrels may be raised and lowered. As shown, the mandrel support 26 is arranged so that it may be rotated for successively presenting the mandrels 31 to or in alignment with the lower end of the shaft 20. In Fig. 5 there is shown one of the mandrels 31 having fitted thereon a cardboard container side wall 32 and a metallic bottom wall 33 seated on the mandrel in position to be attached thereto. The metallic bottom wall 33 of the container is preformed with a central depression in which a disc 35 carried on the lower end portion of the shaft 20 fits snugly, as shown in Fig. 5, the bottom wall 33 having an outer border portion to be bent down and crimped to the cardboard side wall 32.

The post 13 is provided with a bearing member 36 having therethrough parallel, substantially horizontal slideways for slidably receiving a pair of rod-like, horizontally reciprocal carrier members 37 and 38. The carrier members 37 and 38 have like ends thereof, disposed toward the mandrels, and adjacent these ends the members 37 and 38 each carry a rotatable wheel-like crimping member 40 and 41 respectively. As shown more clearly in Fig. 5, the crimping member 40 is provided with a lip 42 and an inwardly and downwardly curved surface 43 which surface, upon contacting the flange of the container bottom 33, bends the flange downwardly, the other crimping member 41 completing the crimping operation, as will later be seen.

Preferably, the crimping members 40 and 41 are moved against the flange of the container bottom wall 33 by the operation of a pair of toggle devices 45. Each of the toggle devices 45 includes a pair of spaced apart toggle arms 46 having ends thereof pivoted, as at 47, to the adjacent ends of the carrier members 37 and 38 and include toggle arms 48 which have ends thereof pivoted, as at 49, to a bracket 50 which

is rigidly secured to the post 13. The inner adjacent ends of the toggle arms 46 and 48 are pivotally connected to a yoke 51 to which is connected one end of a connecting link 52. Surrounding the connecting link 52, a helical coil spring 52^a acts through the toggle devices 45 to retract or move the crimping members 40 and 41 away from the mandrel, the spring 52^a having one end abutting an abutment 52^b which is rigidly secured to the arm or bracket 50. At its lower end, the connecting link 52 is pivotally connected to one end of a lever 53 which is pivoted intermediate its ends to a support 54 which may be integral with and depend from the top 11 of the base 10. A connecting link 55 connects the lever 53 to a treadle 56 which is drawn up by a helical coil spring 57.

Slidably supported in the base 10, in vertical alignment with the shaft 20, a vertically movable push rod 58 is provided for engaging the lower end of the shaft 30 of the mandrel which is immediately below said shaft 20, and for raising the mandrel to bring the container bottom wall 33 thereon against the lower end of the rotating shaft portion or disc 35. Adjacent its lower end, the push rod 58 is pivotally connected to the lever 53 and is raised by pressing down the treadle 56, the rod 58 being yieldingly urged downwardly by a helical coil spring 60.

A retractable stop member 61, which is slidably mounted in a vertically extending groove 62 in an L-shaped supporting plate 63, is provided for abutment with extended end portions 64 of the mandrel support 26 to limit rotation of the mandrel support 26 on presenting the mandrels to the rotating shaft 20. As shown in Fig. 3, the groove 62 is provided in one side thereof with an offset providing a downwardly facing abutment 65, and the opposed edge of the stop member 61 is provided with a complementary offset to provide for latching the stop member 61 in its down or retracted position, shown in full lines. A helical coil spring 66 acts, when released, to move the stop member 61 upwardly, and a second helical coil spring 67 acts to pull the stop member toward the offset side of the groove so that the stop member 61 will engage the abutment 65 when drawn down to the retracted position. A lever 68, pivoted to the underside of the L-shaped support 63, is provided for moving the stop member 61 laterally out of latching relation with the abutment 65, whereby the spring 66 will be free to raise the stop member 61. A second or operating lever 70 is pivoted, as at 71, to the support 63, and the lower end of the lever 70 is connected by a wire 72 to the free end of the lever 68. At its upper end, the operating lever 70 projects above its support 63 for engagement by the lower ends of the mandrel shafts 30, as the mandrel support 26 is rotated to position another mandrel immediately beneath the shaft 20. Connected to the lower end of the stop member 61 is a wire 74 which has a lower loop over the treadle 56 providing a lost motion connection with the treadle for retracting the stop member 61 after the mandrel has been raised up against the lower end of the shaft portion 35.

In order to insure automatic and proper alignment of the mandrels 31 with the shaft 20, I provide a guide and retainer member in the form of a plate 75 having a V-shaped opening 76 which opens through one edge of the plate to receive successively the extended end portions 64 of the rotatable mandrel support 26, the alignment member 75 being hinged, as at 77, to a plate

78 which is rigidly secured to the post 13. In the lowered position of the alignment member 75, or in the position shown in full lines in Figs. 5 and 6, it will be seen that the extension 64 will clear and pass above the member 75. Preferably, the upper edges of the V-shaped slot 76 are beveled to facilitate entrance of the extension 64 in the slot. Carried by the push rod 58 there is a laterally extending arm 80 having an upwardly extending abutment 81 which abuts the underside of the hinged alignment or centering member 75 to raise the same upon upward movement of the selected mandrel 31, the arm 80 being kept in its proper position between a pair of spaced members 82 which are secured to and depend from the centering member 75.

Operation

In operation of the machine, the container side walls 32 are positioned one over each of the mandrels 31, and the metallic bottom walls 33 are positioned on the upper ends of the mandrels. Assuming that the shaft 20 is rotating, the mandrel immediately beneath the shaft 20 is raised by operating the treadle 56, which through link 55, lever 53 and push rod 58, raises the mandrel, bringing the container bottom wall 33 up against the lower end or disc 35 of the shaft which causes the mandrel to be rotated. When the mandrel is moved upwardly, the alignment member 75 is swung upwardly and straddles the end extension 64 forcing the mandrel support 26 to rotate slightly if necessary to align the adjacent mandrel with the drive shaft 20. Also, when the treadle 56 is depressed, the toggle devices 45 are operated to move the crimping members 40 and 41 toward the flange of the container bottom wall, the crimping member 40 moving in advance of the crimping member 41 because of the greater angle between the toggle arms which move the crimping member 40 than the angle between the toggle arms which move the crimping member 41. The crimping member 40 moves into contact with the edge of the bottom wall 33 and bends the edge over. Continued depressing movement of the treadle 56 advances the crimping member 41 into rolling contact with the bent over flange 33, and the crimping member 40 is moved away from the mandrel by reason of its toggle connection passing below or overcenter which reverses the direction of movement of the crimping member 40 by the toggle device. During the crimping operation the stop member 61 is in its "up" position in contact with one of the extensions 64 but, upon further depression of the treadle 56, the treadle engages and pulls down on the wire 72 which draws the stop member 61 downwardly, permitting the spring 67 to move the stop member 61 into latching engagement with the abutment 65. The mandrel support 26 is then rotated to bring the next mandrel 31 into position beneath the shaft 20, the shaft 30 of this mandrel 31 engaging and operating the lever 70 which operates the lever 68 to pull the stop member 61 out of engagement with its latching abutment 65 which permits the spring 66 to raise the stop member 61 for engagement by the mandrel extension 64. The above operation is repeated for each mandrel, and it will be seen that while a crimping operation is taking place the operator can be positioning another container side wall and bottom wall on a mandrel and also can be removing the previously completed container from a mandrel.

What I claim is:

1. In a machine of the character described, a rotatable support, a plurality of mandrels rotatably mounted on said support outwardly of the axis of rotation thereof for receiving and holding container side and bottom walls to be crimped together, a rotatable drive member having a lower end arranged to seat against the container bottom wall presented thereto and rotate the corresponding mandrel, means for individually moving said mandrels relative to said support to abut the container wall carried thereby with the lower end of said drive member, said support being rotatable for successively presenting said mandrels beneath the lower end of said drive member, movable guide means operable to align the axis of rotation of each mandrel presented to said drive member, and means operatively connecting said mandrel moving means and said guide means.

2. In a machine of the character described, a rotatable drive member, a rotatable support, a plurality of mandrels rotatably mounted on said support for receiving container side and bottom walls to be crimped together, said support being rotatable for successively presenting said mandrels to said drive member, said mandrels being individually movable to engage the container bottom wall with said drive member, means for moving said mandrels to establish a drive connection with said drive member, a crimping member operable to engage the outer edge of the container bottom wall and crimp it to the side wall, retractable stop means for limiting rotation of said support, and means operatively connecting said stop means and said mandrel moving means.

3. In a machine of the character described, a rotatable support, a plurality of rotatable mandrels for receiving and supporting a container side and bottom wall on each mandrel and carried by said support, a rotatable drive member having a lower end disposed above said mandrels, said support being rotatable for successively positioning the mandrels below the lower end of said drive member, means operable to raise the mandrel which is immediately below said drive member to abut the container bottom wall with the lower end of the drive member to establish a drive connection between the mandrel and said drive member, a crimping member operable to engage the outer edge of the container bottom wall to crimp the same to the container side wall, retractable stop means for limiting rotation of said support to substantially position a mandrel in axial alignment with said drive member and operatively connected to the mandrel raising means, and movable guide means operable for axially aligning a mandrel with said drive member following limiting of rotation of said support by said stop means and operatively connected to said mandrel raising means.

4. In a machine of the character described, a rotatable support, a plurality of mandrels rotatably mounted on said support for supporting on each a container side wall and a bottom wall to be attached to the side wall, a rotatable drive member, said support being rotatable for successively positioning the mandrels immediately below said drive member, said mandrels being individually movable upwardly relatively to said support to abut the container bottom wall with said drive member to establish a drive connection between said drive member and the mandrel, a

crimping member operable to engage and crimp a container bottom wall to the corresponding container side wall, means for individually raising said mandrels, releasable stop means operable to limit rotation of said support for substantially aligning a mandrel axially with said drive member and releasable by said support, and means for retracting said stop means and operatively connected to said mandrel raising means.

5. In a machine of the character described, a rotatable support, a plurality of mandrels rotatably mounted on said support for supporting on each a container side wall and a bottom wall to be attached to the side wall, a rotatable drive member, said support being rotatable for successively positioning the mandrels immediately below said drive member, said mandrels being individually movable upwardly relatively to said support to abut the container bottom wall with said drive member to establish a drive connection between said drive member and the mandrel, a crimping member operable to engage and crimp a container bottom wall to the corresponding container side wall, means for individually raising said mandrels, releasable stop means operable to limit rotation of said support for substantially aligning a mandrel axially with said drive member and releasable by said support, means for retracting said stop means and operatively connected to said mandrel raising means, releasable guide means cooperable with said support for aligning a mandrel with said drive member, and means operatively connecting said guide means and said mandrel raising means.

6. In a machine of the character described, a support, a plurality of mandrels rotatably mounted on said support for receiving and supporting on each a container side wall and a bottom wall to be crimped together, a rotatable drive member having its axis of rotation substantially parallel with the axes of rotation of said mandrels and having a lower end disposed above said mandrels, said support being rotatable for successively positioning said mandrels immediately beneath the lower end of said drive member, said mandrels being movable upwardly, means operable to raise a mandrel upwardly to abut the container bottom wall carried thereby with the lower end of said drive member, a crimping member movable into engagement with the container bottom wall on the driven mandrel to crimp the container bottom and side walls together, movable stop means for limiting rotation of said support for substantially aligning successive mandrels with said drive member, movable guide means for positively aligning successive mandrels with said drive member, and means operatively connecting said crimping member, stop means and guide means.

7. In a machine of the character described, a support having a plurality of spaced extended portions, a plurality of mandrels rotatably mounted on said support for receiving and supporting on each a container side wall and a bottom wall to be crimped together, a rotatable drive member having its axis of rotation substantially parallel with the axes of rotation of said mandrels and having a lower end disposed above said mandrels, said support being rotatable for successively positioning said mandrels immediately beneath the lower end of said drive member, said mandrels being movable upwardly, means operable to raise a mandrel upwardly to

abut the container bottom wall carried thereby with the lower end of said drive member, a crimping member movable into engagement with the container bottom and side walls for crimping same together, movable stop means for limiting rotation of said support for substantially align-
ing successive mandrels with said drive mem-

ber, a hinged guide member having a recess to receive successively said extended portions to align said mandrels successively with said drive member, and means operatively connecting said crimping member, stop means and guide member.

EDWIN N. BURROWS.