

March 6, 1945.

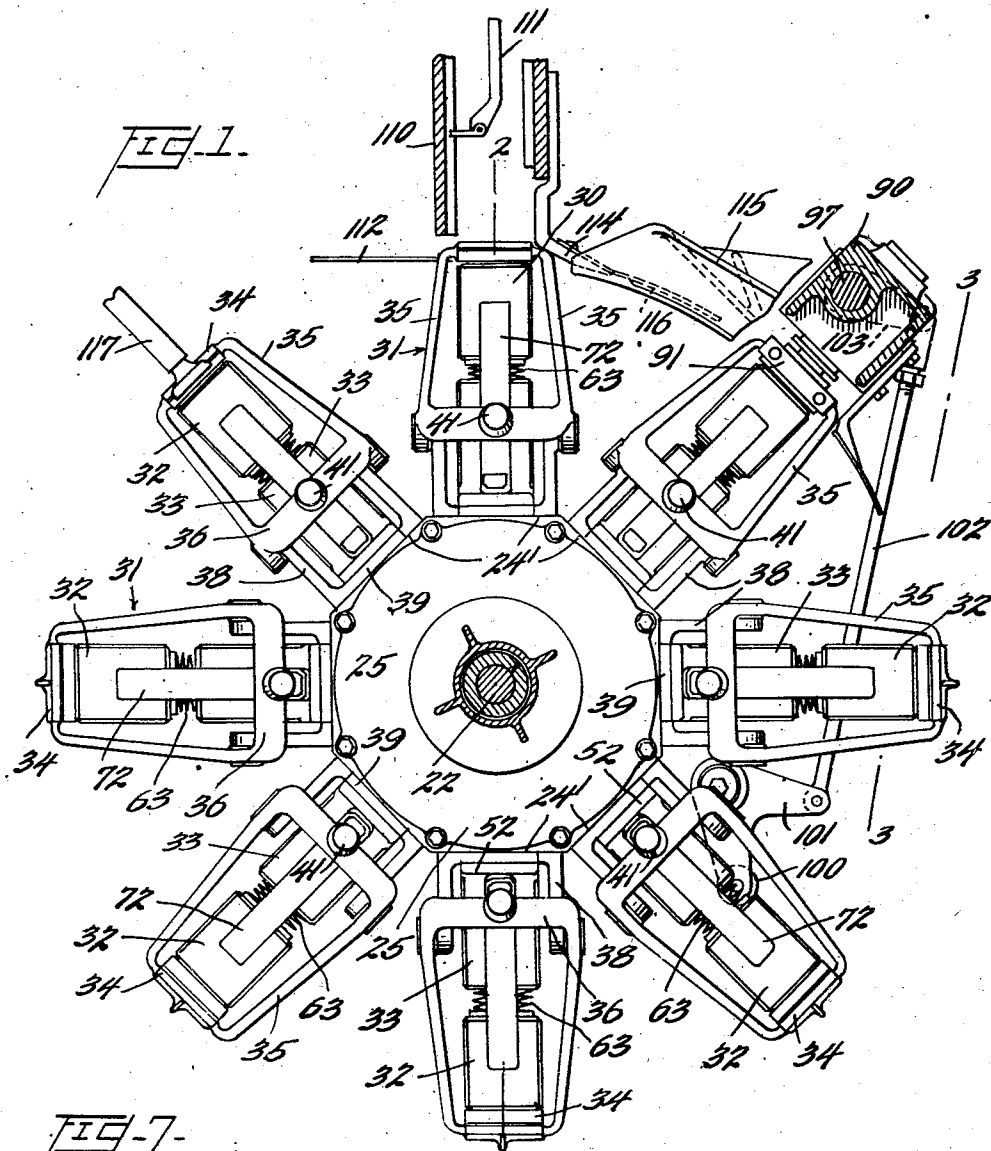
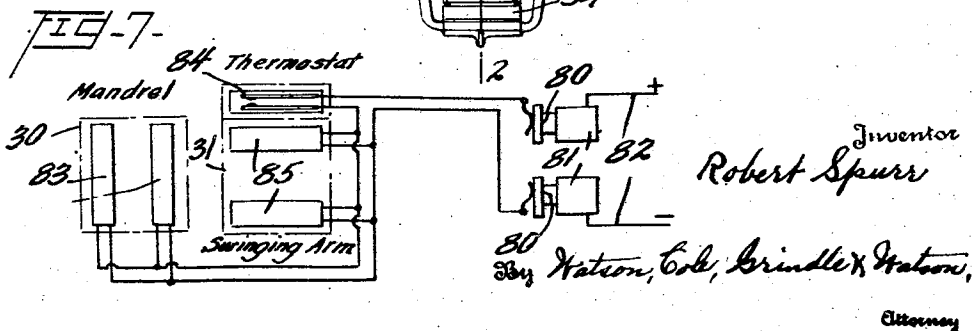
R. SPURR

2,370,757

CONTAINER FABRICATING MACHINE

Filed June 3, 1941

5 Sheets-Sheet 1



March 6, 1945.

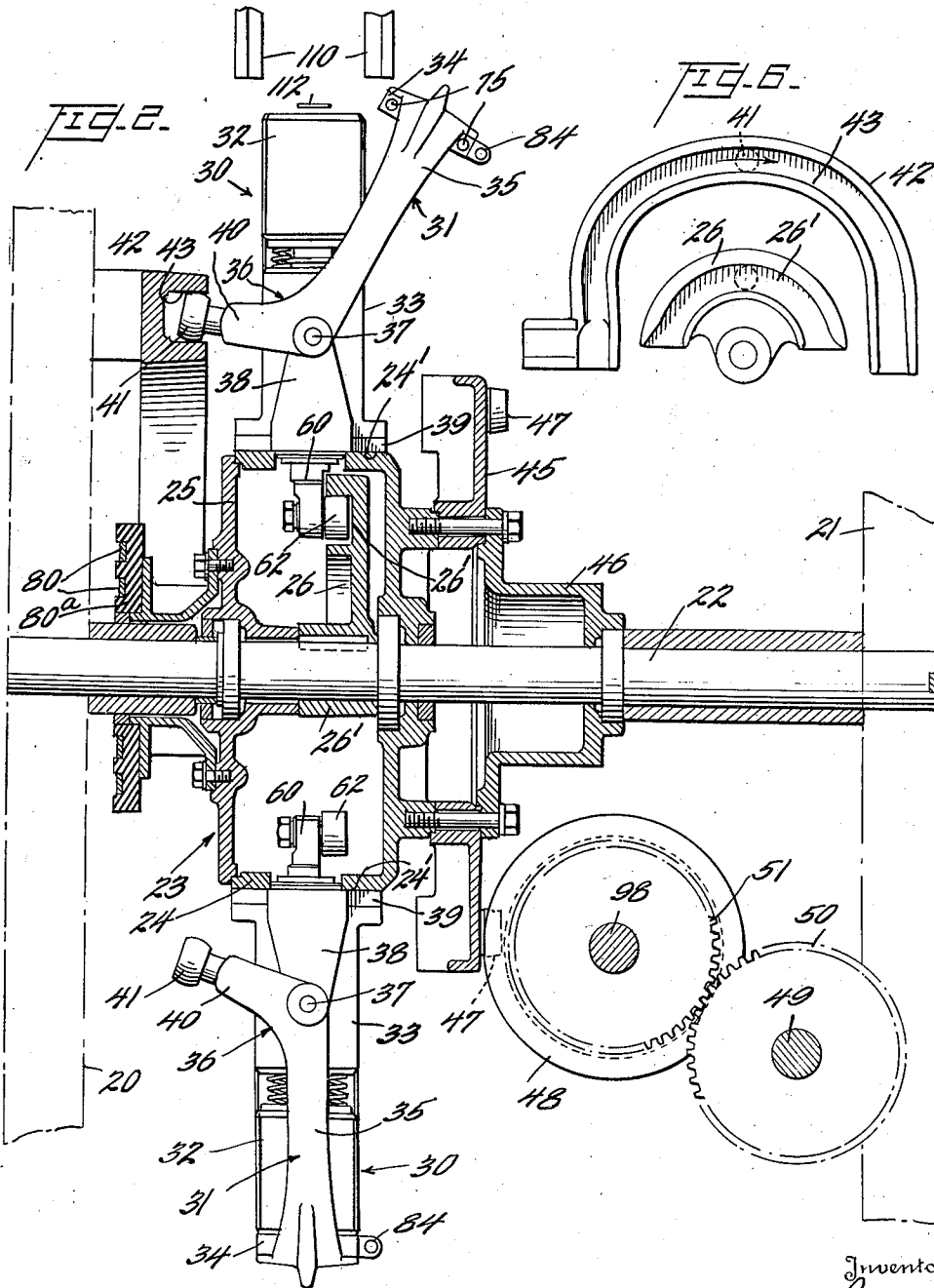
R. SPURR

2,370,757

CONTAINER FABRICATING MACHINE

Filed June 3, 1941

5 Sheets-Sheet 2



Inventor
Robert Spurr

By Watson, Cole, Grindle & Watson

Attorney

March 6, 1945.

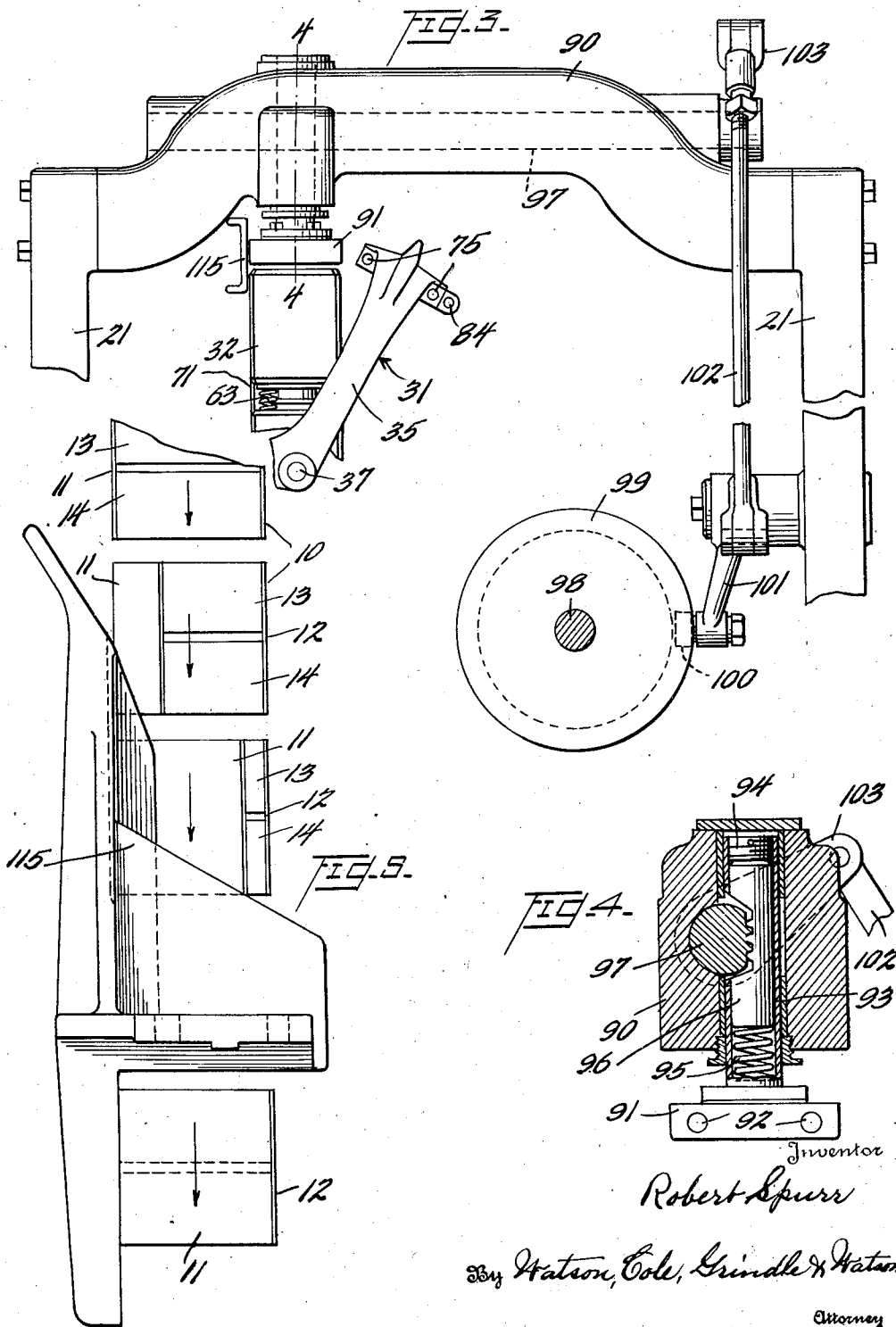
R. SPURR

2,370,757

CONTAINER FABRICATING MACHINE

Filed June 3, 1941

5 Sheets-Sheet 3



March 6, 1945.

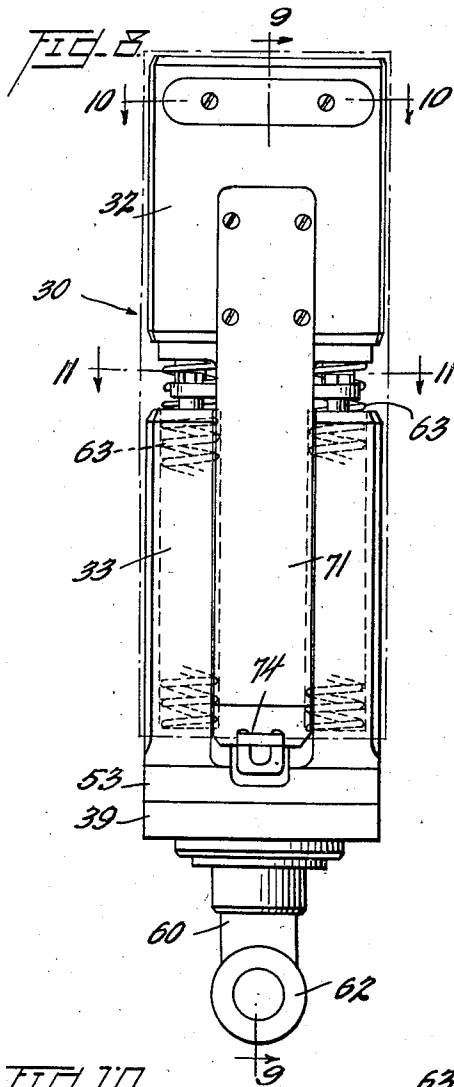
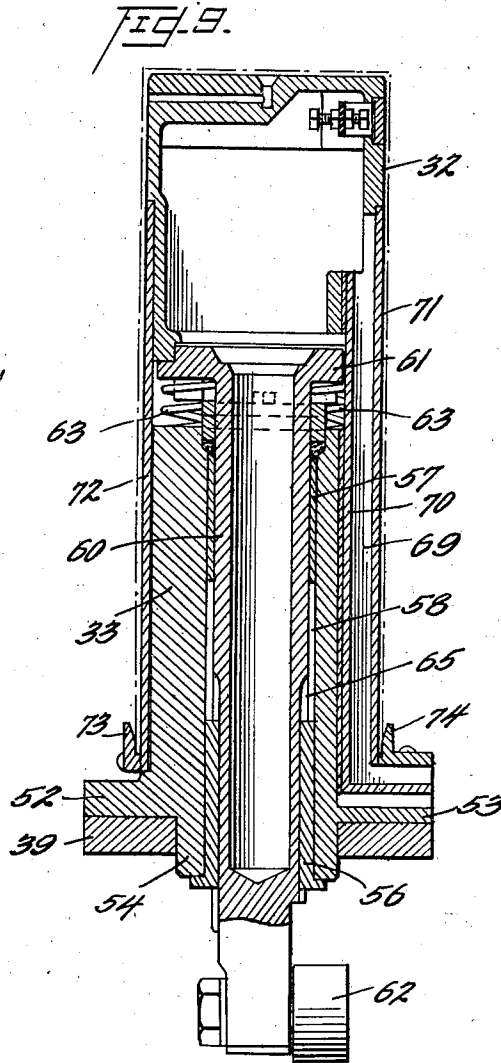
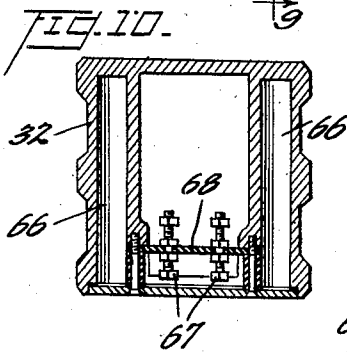
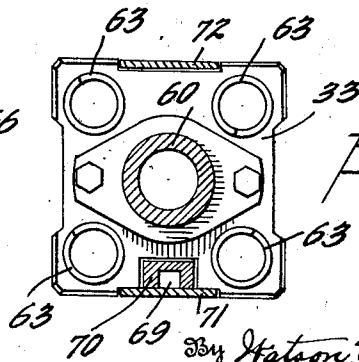
R. SPURR

2,370,757

CONTAINER FABRICATING MACHINE

Filed June 3, 1941

5 Sheets-Sheet 4



Inventor

Robert Spurr

3344 Hutton, Cole, Grindle & Hutton

Attorney

March 6, 1945.

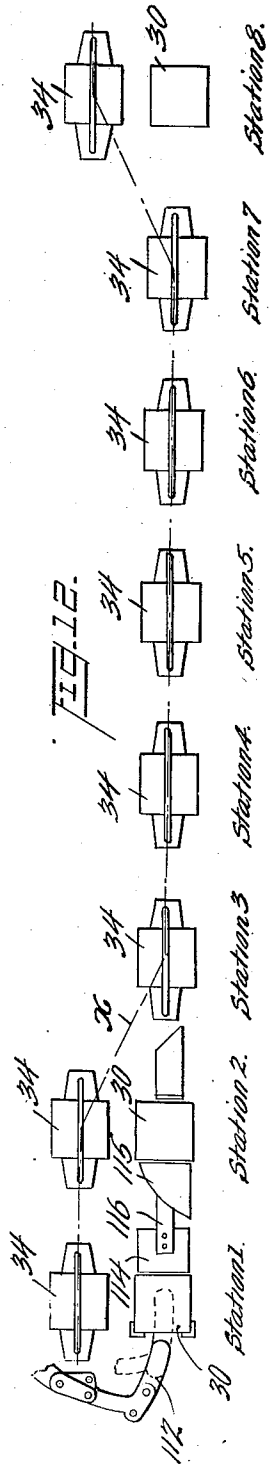
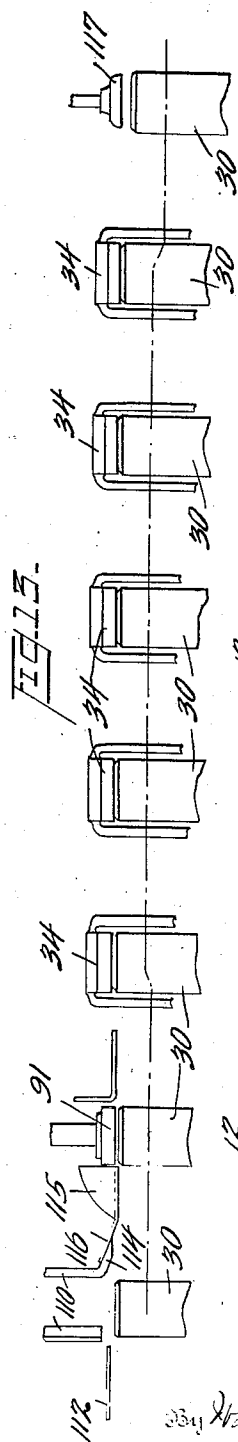
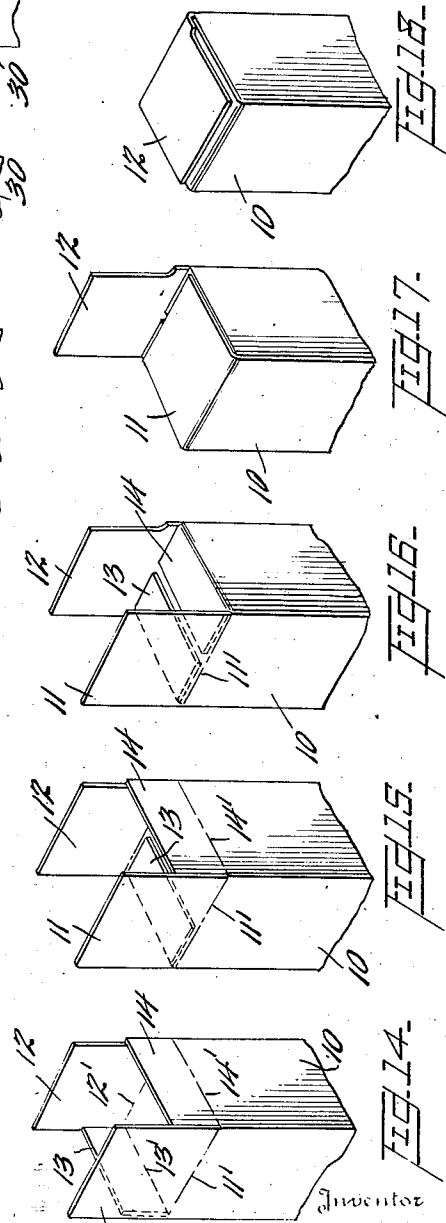
R. SPURR

2,370,757

CONTAINER FABRICATING MACHINE

Filed June 3, 1941

5 Sheets-Sheet 5



UNITED STATES PATENT OFFICE

2,370,757

CONTAINER FABRICATING MACHINE

Robert Spurr, Detroit, Mich., assignor to The American Paper Bottle Company, Toledo, Ohio, a corporation of Ohio

Application June 3, 1941, Serial No. 396,456

9 Claims. (Cl. 93—44.1)

The present invention relates to container fabricating machines and particularly to machines for performing certain steps in the fabrication of paper containers of the type disclosed in Patent 2,047,891, granted to Henry Scott, which container is now widely used for the storage and transportation of liquid commodities.

In Patent 2,117,784 granted October 15, 1940, to Racy D. Bennett and Charles Z. Monroe there is described and claimed a container fabricating machine of novel character comprising, broadly speaking, means for squaring out collapsed tubular containers, placing each such successively squared out container upon a mandrel, and thereafter applying glue to the bottom closure flaps, folding these flaps into bottom closing position, and applying pressure and heat to the multi-ply bottom thus built up to set the adhesive and thus permanently secure the bottom flaps together. The container fabricating machine of the patent referred to has been proven to be eminently satisfactory in actual use, functioning rapidly to turn out partially completed containers, tubular in form and with one end closed, ready for coating, charging with a commodity to be dispensed, and sealing.

The present invention in reality comprises a further development of certain portions of the mechanism disclosed in the Bennett and Monroe patent, relating particularly to the means for relatively folding the container bottom flaps into bottom closing position and uniting these bottom flaps to form an integral bottom. In the patent referred to, the adhesive applied to the bottom flaps of the container was of the ordinary type, liquid at room temperatures, and which solidifies and develops its binding qualities as it dries. The adhesive, the use of which is contemplated in the fabrication of containers upon the machine of the present invention, however, is of thermo-plastic nature, being solid and dry at room temperatures, and plastic or liquid only at elevated temperatures. Such adhesive is placed upon the foldable bottom flaps of each paper container at the plant where the blank is cut and made into the form of a collapsed tube and the container fabricating machine is provided with means for softening such adhesive by the application of heat. Hence the machine of the present invention contains no mechanism for the application of glue or other adhesive to the container end flaps, simplified in this respect. It does necessarily embody however means for rapidly heating to the necessary temperature the thermoplastic glue which has previously been applied to the container end flaps.

Likewise it includes novel and improved means for relatively folding these flaps into bottom closing position and novel and improved means for applying pressure to the end flaps while they are being heated. The flap holding and pressure applying mechanisms of the present invention, while rugged and durable in construction are easily manipulated and are extremely simple in design.

As a result of the changes which have been made, a container end closing machine of the simplest and most practical nature is provided, one costing considerably less to construct in the first instance, and which is less costly to operate and maintain in working condition than any similar mechanism heretofore designed or suggested. The invention may have various embodiments, and that which is shown in the accompanying drawings is illustrated by way of example. As will be apparent to one skilled in the art, the design and arrangement of the various elements of the mechanism may be considerably modified in adapting the same to the fabrication of containers which vary in size and shape without departure from the invention.

In the drawings:

Figure 1 is a side elevation of the major assembly of the improved mechanism, portions however being shown in section and portions having been broken away for the sake of clarity;

Figure 2 is a section on line 2—2 of Figure 1;

Figure 3 is a view of portion of the mechanism shown in Figure 1, as it appears when viewed from a position such as indicated by the line 3—3 in Figure 1;

Figure 4 is a section on line 4—4 of Figure 3;

Figure 5 is a top plan view of a portion of the container end flap folding means;

Figure 6 is a rather diagrammatic view showing the relative positions of two cams which function simultaneously in the operation of the mechanism in a manner hereinafter to be more fully explained;

Figure 7 is a diagram of the electric circuits for conducting electric current through the electric heating devices of the mechanism;

Figure 8 is a side elevation of one of the mandrels for supporting a container blank during the bottom folding and sealing operation;

Figure 9 is a section on line 9—9 of Figure 8;

Figure 10 is a section on line 10—10 of Figure 8;

Figure 11 is a section on line 11—11 of Figure 8;

Figure 12 is a rather diagrammatic figure showing the several stages through which each mandrel and the associated pressure applying means pass during their cycles of operation.

Figure 13 is a similar view, various mandrels and associated pressure applying devices diagrammatically illustrated being seen from the side however, instead of from above, as in Figure 12, and

Figures 14 to 18 inclusive are a series of views showing, in perspective, several containers, as they appear at various stages during the bottom closing operation.

While it is true that the invention which comprises the subject-matter of the present application is one of general utility, it is particularly suitable for use in association with other means in the fabrication of tubular containers which are square or rectangular in transverse section, and which have flat bottoms formed by relatively folding a plurality of flaps which comprise foldable extensions of the side panels or walls of the container body. Mechanism for squaring out collapsed tubular blanks is not disclosed herein, comprising no portion of the present invention. One such mechanism, which may be used in association with the present invention, is disclosed in the Bennett and Monroe patent heretofore mentioned and it need only be said here that the squared out containers with projecting bottom flaps which pass into the mechanism of the present invention have the appearance of that shown in Figure 14. The tubular container body is generally indicated at 10, the major bottom flaps at 11 and 12 respectively, and the minor bottom flaps at 13 and 14 respectively.

The first step accomplished with the aid of the present invention consists in the down-folding of the minor bottom flap 13 to the position in which it is shown in Figure 15, the flap being disposed at right angles to the axis of the container body 10. It will be appreciated that the several container end flaps are integral portions of the blank from which the body 10 is formed, being hingedly connected to the container body by elongated scored portions of the paper sheet such scored portions being indicated for instance at 11', 12', 13', and 14' respectively.

Following the turning of minor bottom flap 13, the sole remaining or opposed minor bottom flap 14 is downfolded or intumed to the position in which it is shown in Figure 16. Following this, one major bottom flap i. e., flap 11, is folded downwardly and a substantial pressure applied to its outer surface, the flap 11 in downfolded position being clearly shown in Figure 17. The last step comprises the in or downfolding of the remaining major bottom flap 12, the fully closed container bottom being shown in Figure 18.

The mechanism for performing these several functions is simple. It has previously been explained that each container blank before being placed on the mandrel has the inner surfaces of its end flaps coated with thermo-plastic glue. The function of the mechanism then is to fold these end flaps and to apply sufficient heat and pressure to cause them to adhere to each other and to thereby obtain the completely closed bottom shown in Figure 18. In order to accomplish this it is necessary to provide a mandrel to interiorly support the container during the flap folding, heat applying and pressure operations. One such mandrel is indicated in Figures 8 to 11, and the manner in which this mandrel and seven other identical mandrels are supported for movement in a closed path about a horizontal axis, is illustrated clearly in Figures 1 and 2.

A supporting frame for the moving parts of the mechanism includes parallel side frame members

20 and 21. A non-rotatable horizontally disposed shaft 22 has its ends fixed in the frame members just referred to and rotatably mounted upon shaft 22 is the mandrel carrying hub 23. Hub 23 comprises a drum 24 and a closure plate 25. Within the drum is a cam member 26, the hub 26' of this cam being keyed to shaft 22. The mandrel supporting portion or flange of the drum 23 is octagonal, comprising a series of 8 flat portions 24' each of which supports a mandrel assembly now to be described.

Each such mandrel assembly includes a container supporting mandrel and a swinging abutment device between which, and the head of the mandrel, the several container bottom flaps may be compressed and by means of which these container bottom flaps may be heated while undergoing pressure. In the drawings the mandrel is generally indicated by the numeral 30 and the swinging abutment member by the numeral 31. The mandrel in turn comprises a hollow substantially cubical head portion 32 and a supporting or base portion 33, the head portion 32 being movably mounted with respect to the base.

The swinging abutment member which comprises a portion of each mandrel assembly includes a pressure pad 34, the inner face of which is of substantially the same area as the outer or end face of the head portion 32 of the mandrel, and which face is adapted to be brought into and out of registry with the mandrel outer end surface. Pressure pad 34 is rigidly connected to, and is preferably integral with, the outer ends of the long arms 35 of the parallel bell crank levers generally indicated at 36. Bell crank levers 36 are pivotally mounted at 37, 37 to the outer ends of outwardly projecting arms 38 of a bracket member, the inner ends of the arms 38 of each pair of such arms being connected by a web or base portion of the bracket, indicated at 39, which lies flush against the associated flat outer surface of the mandrel assembly supporting drum.

The relatively short arms 40 of bell crank levers 36 project laterally of the mandrel and each is provided with a cam follower 41 which is adapted to operatively engage the cam 42, being received within cam track 43 of that cam. During the movement of each mandrel assembly about the axis of shaft 22, cooperation of the cam and cam follower causes swinging movements of the associated bell crank lever 36 from the position in which it is shown at the top in Figure 2 to the position in which it is shown at the bottom of this figure, and vice versa, the pressure pad being moved into and out of registry with the mandrel at predetermined points in its travel, by the co-action of the cam and cam follower as just described.

Movement of the mandrel supporting hub and the several mandrel assemblies about the axis of shaft 22 is intermittent or proceeds in a step-by-step manner and may be produced by any suitable mechanism. A mandrel actuating means which has proven to be eminently satisfactory in its operation includes the indexing wheel 45 rigidly connected to the mandrel supporting hub 24 and also in part supported upon shaft 22 by the hub-like member 46, indexing wheel 45 being provided with frusto-conical pins 47 adapted to be successively engaged and advanced by an indexing cam indicated at 48, the cam being driven by power derived from a driven shaft 49 through intermeshing gears 50 and 51.

The several mandrels are of identical construction and the details of one are clearly disclosed in

Figures 8 to 11 inclusive. The base 33 of the mandrel is substantially square in transverse section, is provided with opposed bottom flanges 52 and 53 which rest snugly against outwardly facing surfaces of the base or web 39 which connects the bracket arms 38, and is likewise provided with a hollow cylindrical extension 54 which snugly fits within a cylindrical aperture formed in the bracket base member 39. A cylindrical recess formed in the mandrel base 33 extends throughout the same from end to end, there being positioned in the lower end of this bore a cylindrical sleeve 56 having elongated parallel internal ribs and being fixed against rotation with respect to mandrel base 33 and a sleeve like bearing member 57 being positioned within the upper end of the bore 58. Slidably fitting within the bearing sleeves 56 and 57 and being supported for axial movement by these members, is a hollow stem 60, the upper or outer end of which is enlarged as at 61 and comprises a support for the hollow cubical outer end portion 32 of the mandrel.

The inner end of the stem 60 has rotatably mounted thereon a cam follower 62 adapted to enter the cam track 26' of the cam 26, previously referred to, which cam is fixed on shaft 22. Coiled compression springs 63, of which there are four, located in elongated recesses formed within the mandrel base portion 33, have their upper ends in constant engagement with the undersurface of the enlargement 61 of the stem 60 and normally tend to thrust stem 60, with the mandrel head 32 mounted thereon, radially outwardly or away from the axis of shaft 22 at all times. Cam 26, when engaged by the cam follower 62, functions to draw the stem 60 and head 32 inwardly against the action of these springs. The exterior surface of the stem 60, toward the lower end thereof, is provided with ribs 65 which are slidably received between the inwardly projecting ribs of the lower sleeve 56, the stem thus being prevented from rotating about its own axis, and it being assured that the cam follower 62 will always enter the cam track 26' as the mandrel support revolves. It may be said that the cams 26 and 42 are so disposed with respect to each other, and so shaped, that the cam 26 is effective to prevent expansion of the springs and outward projection of the mandrel head 32, when the pressure pad 34 is in its inoperative position or out of registry with the outer end surface of the associated mandrel, as shown at the top of Fig. 2, and ceases to be effective to restrain spring expansion as soon as the pressure pad 34 has been moved to its operative position, as illustrated at the bottom of Figure 2, so that the springs are at no time free to expand fully and to project the mandrel outwardly to an extent not desired.

The substantially cubical hollow mandrel outer end 32 is provided with cylindrical recesses 66 for the reception of electric heating elements (which are not illustrated, save diagrammatically in Figure 7). These elements are wired to binding posts 67 mounted upon insulating member 68, and binding posts 67 are connected by means of electric conductors to a suitable source of current supply, these wires or conductors lying within elongated recess 69 formed in the tubular member 70, the outer end of which is connected to head 32 and which lies within a recess formed in the mandrel base member 33 and in rear of a container guide plate 71 secured to and movable with the mandrel head 32.

The outer surface of guide plate 71 is flush with the mandrel supporting surfaces of both

mandrel head and mandrel base and a similar guide strip is indicated at 72, being also secured to the head 32 and having its outer surface flush with the container supporting surfaces of the head and base portions of the mandrel. The guide strips 71 and 72 serve to prevent the lower edges of a container being placed on the mandrel from striking the upper end of the mandrel base 33 as it is moved downwardly. Upon its lower end, container guide strip 72 is provided with a stop 73 to limit the downward movement of a container and a similar stop 74 is affixed to the lower end of the container guide plate 71.

The pressure block 34 associated with each mandrel assembly is likewise provided with recesses, indicated rather diagrammatically at 75, for the reception of electrical heating elements and these elements are also maintained in electrical connection with a suitable source of current during the operation of the apparatus. The several mandrel assemblies of course revolve around the axis of the fixed shaft 22 but the several heating elements are at all times connected to a stationary source of current. In Figure 2 of the drawings, contact rings 80 are indicated, these contact rings being mounted upon an annular block of insulating material 80a, and indicated by the numerals 80 in Figure 7. Stationary brushes which maintain contact with the rings are indicated at 81 in this figure and electric conductors leading to a source of current supply are indicated at 82. The heating elements 83 carried by the outer end of each mandrel are electrically connected to the brushes 80 through a thermostatic device 84 mounted upon the associated pressure pad 34 and likewise the heating elements 85 associated with each pressure pad are electrically connected to the brushes 80 through the thermostat 84, as will be clearly perceived from an inspection of Figure 7. By this means the temperature of the pressure pads in the ends of the several mandrels may be closely controlled.

At one stage of the operation i. e. after the two minor bottom flaps and the major flap 11 have been folded downwardly, as indicated in Figure 17, pressure is applied momentarily by means not heretofore described, and which is quite independent of the several mandrel assemblies. This pressure applying means may be more clearly perceived from an inspection of Figures 3 and 4. It is supported upon a frame member 90 which bridges the side frame members 20 and 21 referred to previously and includes, in addition to the pressure pad 91 with its heating elements 92, a hollow stem 93, one end of which is connected to the pad 91, and the other end of which is closed by a plug 94, stem 93 comprising a housing for the helical compression spring 95 and a plunger member 96 provided with teeth which engage and interlock with mating teeth formed upon a rock shaft 97. Rock shaft 97 is supported for rocking movement in a horizontally extending bore formed in the frame members 90 and when rocked about its axis in one direction will cause the plunger 96 to engage plug 94 and lift the pressure pad 91 or, when rotated in the opposite direction, will cause this plunger to move downwardly against the upper end of spring 95 to resiliently urge the pressure pad 91 downwardly, the spring 95 being compressed when the lower surface of the pad contacts, for instance, with the upper surface of the major flap 11 of a container mounted upon a mandrel 11 aligned with pad 91. As will be perceived in Fig. 1, the pressure pad 91 is mounted

for movement radially of the axis of the shaft 22 and its lower surface will be parallel to the outer surface of a mandrel lying between it and the shaft.

Rocking movement of shaft 97 may be effected by means of a mechanism which connects this shaft to a power driven shaft 98, this mechanism including the cam 99 fixed on shaft 98, cam follower 100 positioned to be actuated by cam 99 when the cam 99 is revolved, the bell crank lever 101, upon one end of which the cam follower 100 is mounted, and the link 102, connecting the other arm of the bell crank lever 101 to the outer end of arm 103 fixed on shaft 97. By means thus described each successive container, as it reaches that station which is designated "Station 2" of Figures 12 and 13, is subjected to heavy pressure, causing major flap 11 to be tightly pressed against the minor flaps 13 and 14 and secured thereto, the pressure pad 91 being heated and likewise the mandrel, so that the thermo-plastic glue is made plastic by the heat and pressure.

By referring to Figures 5 and 12 to 18 inclusive, the means for folding downwardly upon the outer end surface of each successive mandrel 14 the end flaps of a container placed on that mandrel may be more clearly perceived. A chute is diagrammatically indicated at 110 and a pusher is indicated at 111 in Figure 1, the pusher being designed and intended to force a squared out container downwardly through the chute and onto a mandrel which is positioned to receive it, the associated swinging abutment of the mandrel assembly being of course swung to the side at the time in order to permit the application of the container blank to the mandrel. No claim is made herein for the chute or pusher which, per se, do not comprise portions of the present invention. The mandrel loading operation occurs when the mandrel occupies the position indicated by the legend "Station 1" in Figures 12 and 13, and while each mandrel assembly is at this station the swinging associated pressure pad 34 is to one side, as shown. When the container is pushed onto the mandrel, as indicated in chain lines in Figure 9, the four end flaps will project upwardly above the mandrel surface.

Prior to movement of the mandrel from "Station 1" to "Station 2" the minor end flap 13 is forced downwardly upon the mandrel end surface by a bladeflike device 112, the details of which, together with the details of means for operating the same at the proper time, are disclosed in the previously mentioned Bennett and Monroe patent, 2,217,784. While the device 112 remains in contact with the minor flap 13, thus holding this flap in its folded position, movement of the mandrel assembly from "Station 1" to "Station 2" commences and on the way from "Station 1" to "Station 2," stationary means, including the folders diagrammatically indicated at 114 and 115 in Figure 13 (folder 115 being shown in plan in Figure 5) function to successively fold down the second minor bottom flap 14 and the major bottom flap 11, flap 14 going down first and flap 11 being then folded down on top of flaps 13 and 14. The holding down tongue 116, supported upon the stationary folder 114, serves to retain the minor flaps 13 and 14 in their downfolded positions while flap 11 is being itself downwardly folded.

When the container reaches "Station 2" therefore three bottom flaps have been finally positioned and, as has previously been explained, the pressure pad 91 is caused to descend upon the

flap 11 and to exert a heavy pressure while also transmitting a substantial amount of heat.

The associated swinging pressure pad 34 occupies at this time a lateral position as shown in Figure 12. The mandrel next advances from "Station 2" to "Station 3," pressure pad 91 having been released just prior to the commencement of this further movement and it is while the mandrel assembly is passing from "Station 2" to "Station 3" that the swinging pressure pad 34 is drawn inwardly by its cam so as to move along the dotted line of Figure 12 until it directly overlies the outer end surface of the associated mandrel. In such movement the edge of the pressure pad 34 engages the remaining container end flap 12 and functions to bend this flap downwardly over the previously folded end flaps 11, 13 and 14 so that, at "Station 3," the container bottom is fully formed, as indicated in Figure 3.

At this point the cam follower 62 disengages cam 26 and the springs of the associated mandrel are released, forcing the mandrel's outer end or head 32 outwardly and pressing the container end flaps tightly against the inner face of the pressure pad 34. The application of heat and pressure to all four bottom flaps of the container is continued through the further stations 4, 5, 6 and 7 and, during this travel, the four bottom flaps are consolidated into one integral, leak-proof, sturdy, container bottom. As the mandrel assembly passes from "Station 7" to "Station 8," however, cam 26 becomes active to cause retraction of the mandrel head 32 against the pressure of the springs, and cam 42 becomes active to effect the lateral displacement of pressure pad 34 so that the container is uncovered and may be removed by any suitable means, as, for instance, a suction element such as diagrammatically indicated at 117 in Figure 13. Thereafter the mandrel will again move to "Station 1" to receive a fresh container driven downward through the chute, and the cycle of operation is repeated.

It is believed that the construction and mode of operation of the container fabricating mechanism which comprises the subject matter of the invention has been fully explained. One skilled in the art will doubtless perceive that in adapting the invention to the fabrication of containers which vary widely in design and size some changes must necessarily be made in the arrangement of the several elements of the mechanism. Numerous such minor changes and rearrangements are contemplated.

I claim:

1. In a machine for fabricating containers, in combination, a mandrel for interiorly supporting a tubular paper container, one end surface of which comprises an abutment surface to support the container end flaps when folded to container end closing position, an arm mounted for swinging movement with respect to the mandrel about an axis parallel to said end surface and intersecting said mandrel, said arm having a surface adapted to be brought into register with the mandrel end surface and to cooperate with said mandrel end surface in pressing together the relatively folded end flaps of a container, means for relatively moving said registering surfaces toward or away from each other to press together and subsequently release the folded end flaps of a container, and means for swinging said arm.

2. The combination set forth in claim 2 in which the mandrel and swinging arm are mount-

ed for bodily movement along a predetermined path and a fixed cam is operatively engaged by the swinging arm, the arm being actuated by said cam as the arm moves along said path.

3. The combination set forth in claim 1 in which the mandrel end surface is spring pressed in an arm engaging direction and a cam is provided for moving said surface inwardly.

4. In a machine for fabricating containers, in combination, a mandrel support revoluble about a fixed axis, a mandrel mounted on said support and the outer end of which is movable radially of said axis, a swinging arm pivotally mounted on said support and having a portion adapted to be brought into register with the outer end surface of the mandrel, means including a stationary cam for moving the end of the mandrel radially, and means including a stationary cam for rocking the swinging arm.

5. The combination set forth in claim 4 in which the mandrel comprises two telescoping portions, the inner portion being rigid with the mandrel support and the outer portion being slidably carried by the inner portion, springs interposed between said portions normally tending to project the outer portion radially outward.

6. In a machine for fabricating containers, in combination, a plurality of mandrels supported for movement along a predetermined endless path, each mandrel having lateral surfaces for supporting the inner side surfaces of a squared-out tubular container and having an outer end surface over which container end flaps may be folded, a flap folding member positioned adjacent the path of movement of the mandrels for folding downwardly upon each mandrel end surface one end flap of each passing container, a movable member associated and movable bodily with each mandrel for downwardly folding upon the previously folded flap a second flap of such container, means for causing said second member to move over the mandrel end surface and fold such second container end flap at a predetermined point in the travel of the mandrel and second means to thereafter cause the second member and mandrel to approach each other to press the downfolded end flaps together.

7. In a machine for fabricating containers, in combination, a plurality of mandrels supported for movement along a predetermined endless path, each mandrel having lateral surfaces for supporting the inner surfaces of a squared-out tubular container and having an outer end sur-

face over which container end flaps may be folded, a flap folding member positioned adjacent the path of movement of the mandrels for folding downwardly upon each mandrel end surface one end flap of each passing container, an arm associated and movable bodily with each mandrel, mounted for swinging movement about an axis passing through the mandrel, said arm having a terminal portion adapted to engage and fold downwardly upon the previously folded flap a second end flap of such container, means for causing said arm to swing upon its flap folding stroke at a predetermined point in the travel of the associated mandrel and second means to thereafter cause the terminal portion of said arm and the adjacent end of the mandrel to approach each other and press the downfolded container end flaps together.

8. In a machine for fabricating paper containers in combination, a movable mandrel for interiorly supporting a tubular paper container with end closure flaps projecting beyond the mandrel end, means for supporting and moving said mandrel along a predetermined path, a device for folding one of said flaps while the mandrel is stationary, and means for folding three flaps: when the mandrel is moving, said last-mentioned means including two stationary flap-engaging and folding elements and a swinging arm, having a flap-engaging portion, said arm being mounted on the mandrel-supporting means for swinging movement about an axis adjacent the base of the mandrel, whereby the flap-engaging portion thereof will move across the mandrel end in a direction substantially normal to the mandrel axis.

9. In a machine for fabricating paper containers, in combination, a movable mandrel for interiorly supporting a tubular paper container with end closure flaps projecting beyond the mandrel end, means for moving the mandrel along a predetermined path with a step-by-step motion, stationary means for folding down two container flaps as the mandrel moves, and movable means for folding the other two container flaps, said last-mentioned means including a swinging arm having a flap-engaging portion, said arm being mounted on the mandrel-supporting means for swinging movement about an axis adjacent the base of the mandrel, whereby the flap-engaging portion thereof will move across the mandrel end in a direction substantially normal to the mandrel axis.

ROBERT SPURR.