

March 10, 1936.

L. E. LA BOMBARD

2,033,888

METHOD OF FABRICATING CONTAINERS

Filed Feb. 14, 1934

3 Sheets-Sheet 1

FIG. 1.

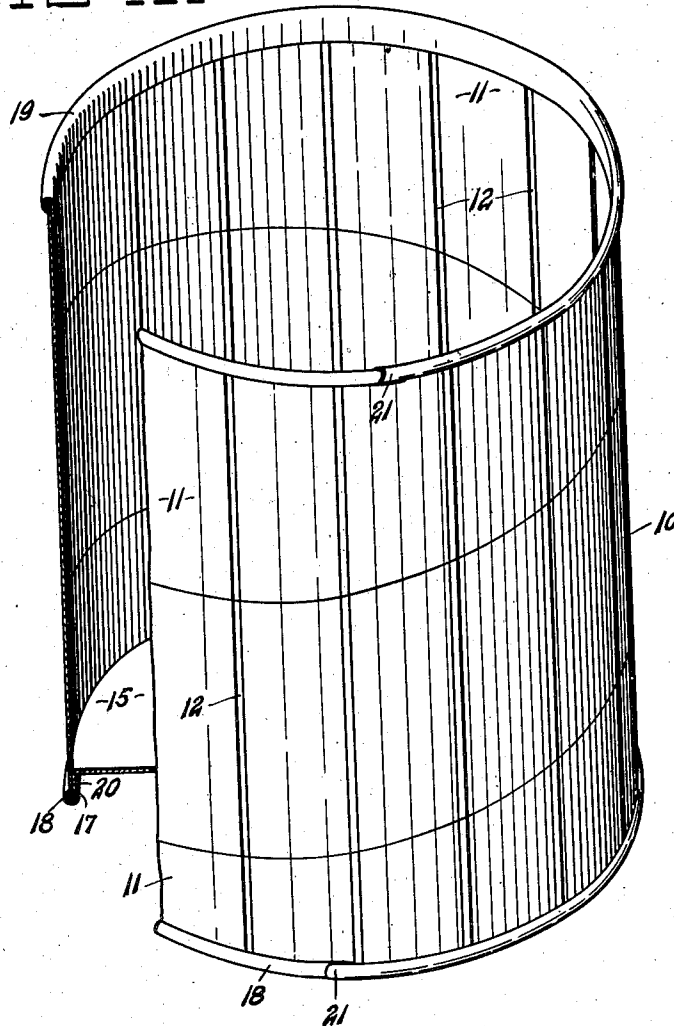
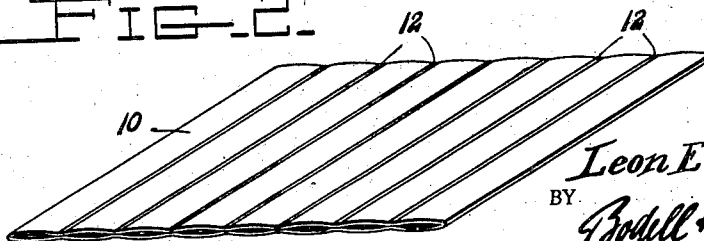


FIG. 2.



INVENTOR:

Leon E. LaBombard

BY

Bodell + Thompson

ATTORNEYS.

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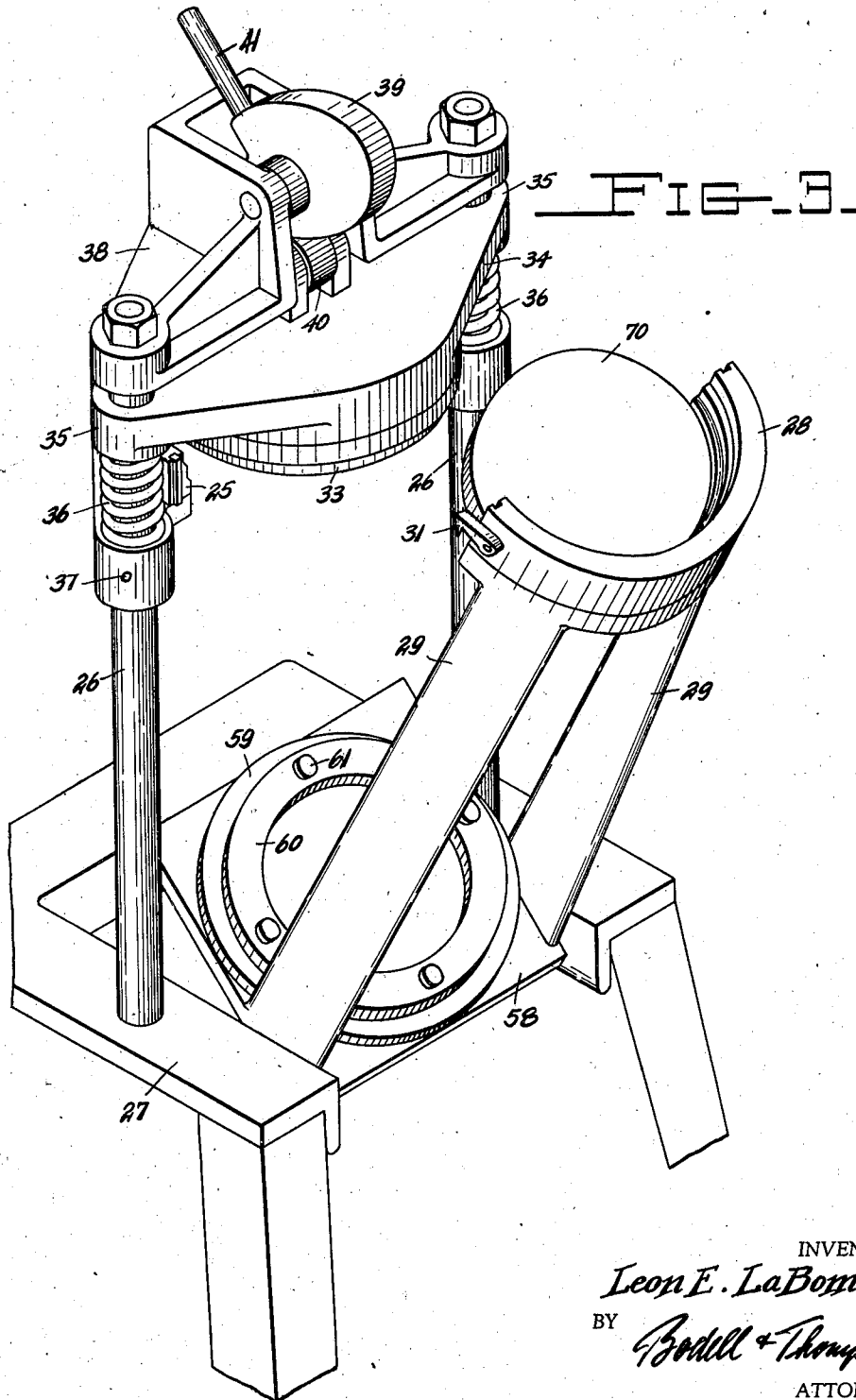
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3 Sheets-Sheet 2



INVENTOR:
Leon E. LaBombard,
BY *Bodell & Thompson*
ATTORNEYS.

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3 Sheets-Sheet 3

FIG. 4.

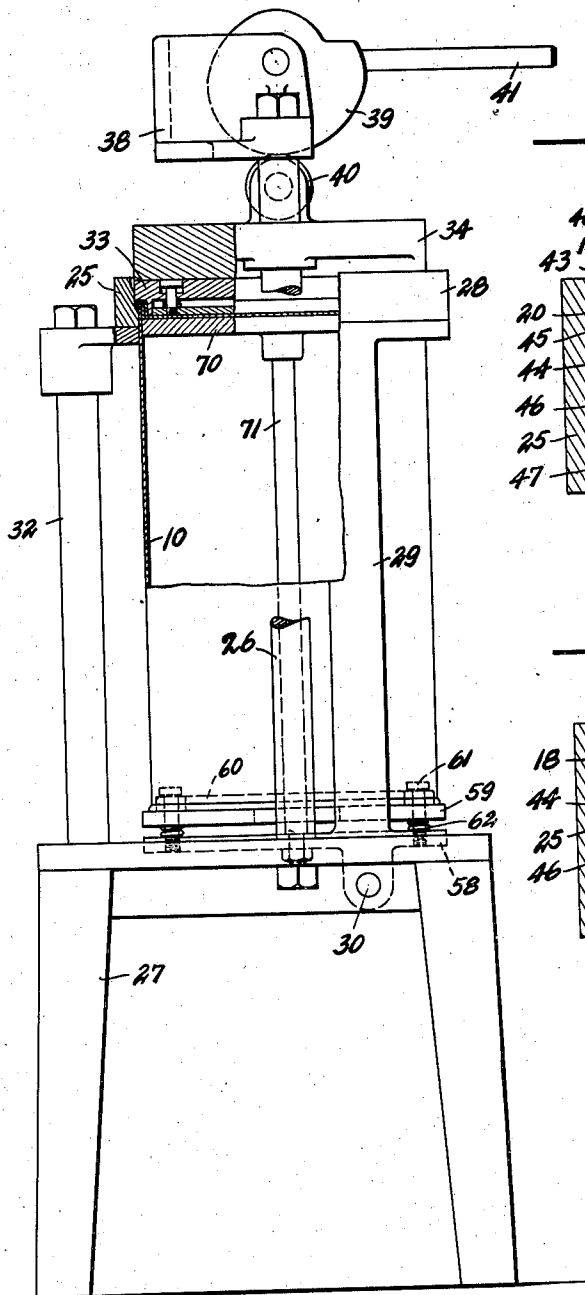


FIG. 5.

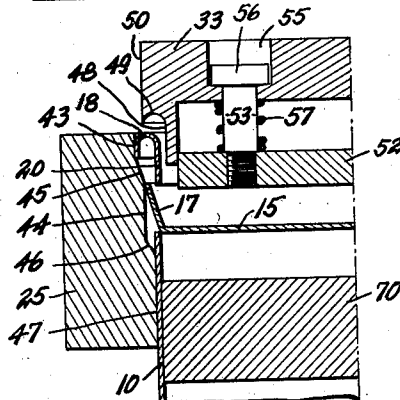
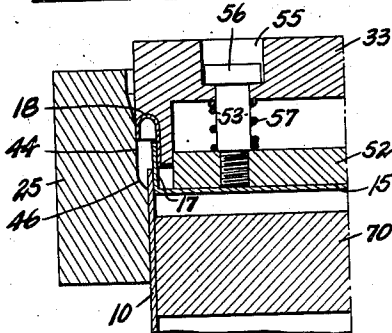


FIG. 6.



INVENTOR:

Leon E. LaBombard,

BY

Bodell & Thompson

ATTORNEYS.

UNITED STATES PATENT OFFICE

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METHOD OF FABRICATING CONTAINERS

Leon E. La Bombard, Fulton, N. Y., assignor to
Oswego Falls Corporation, Fulton, N. Y., a corporation of New York

Application February 14, 1934, Serial No. 711,282

4 Claims. (Cl. 153—1)

This invention relates in general to containers for semi-liquid products such as ice cream, which containers are shipped in knock down condition and assembled at the place where the contents is put into the container.

The invention relates further to a container fabricated from comparatively light weight paper material in such manner that the container, when assembled, is liquid tight and particularly strong and durable in use.

The invention relates further to a container the body portion of which is shipped to the user in a knock down or collapsed form, and which is expanded and fabricated into a complete article with a minimum expenditure of time and energy, and when assembled is neat in appearance and sanitary in use.

The invention relates further to a collapsible container which, when assembled, is of sufficient strength and durability to be handled when filled in the same manner and by the same means as metallic containers used for the same purpose.

The invention has for its object a method by which the knock down container may be assembled with the minimum expenditure of time and money, and by comparatively simple apparatus which may be operated by unskilled labor. More particularly, it is a method of securing a head of paper, or similar material, having an annular flange, to one end of a tubular fibrous barrel of a container, with the annular flange lying against the inner face of the margin of the barrel, and with its edge toward the outer edge of the barrel.

Aside from the general objects, above recited, further objects will appear as the description proceeds.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

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 perspective view of the container, partly in section, showing the top and bottom structure.

Figure 2 is a perspective view of the barrel of the container in folded or flat position.

Figure 3 is a perspective view of the mechanism for securing the top and bottom rings to the barrel of the container.

Figure 4 is an elevation of the assembly mechanism, partly in section, showing the bottom secured to the barrel of the container.

Figure 5 is a partial sectional view of the ring

crimping dies in spaced apart relationship, the bottom of the container resting upon the end of the barrel.

Figure 6 is a view, similar to Figure 5, with the movable die partially actuated toward the stationary die, and the bottom entering the barrel of the container.

This container comprises generally, a barrel or body 10 which is made up of a plurality of plies of paper material 11, each ply being wound spirally one upon the other so that the barrel consists of a section of a tube. Due to the fact that this tube is formed of a plurality of spiral wound layers of material, it possesses comparatively great strength due to the fact that it is a portion of a continuous tube, and has no seams or joints. Also, due to the fact that the barrel is formed of wound layers, each layer being wound with uniform tension, the strength of the barrel is materially increased. Where the barrels are formed of a single thickness of stock, an initial strain, or stress, is created when the flat strip is rolled into circular form, and this results in materially decreasing the strength of the barrel, as is well known to those skilled in the art.

The body 10 is provided with a plurality of scores 12 extending longitudinally thereof, there being several such scores about the periphery of the body. These scores serve a two-fold purpose. They increase the strength and rigidity of the body, and further these scores, or corrugations, provide folding creases whereby the body may be folded flat, and due to the fact that there are a plurality of scores, the body will fold substantially flat in the form of a series of small arcs (Figure 2), whereby the folded bodies may be packed in a pressed condition without placing any undue strain upon the material from which the barrel is made.

These containers are intended for use by manufacturers of liquid, or semi-liquid, products, such as ice cream, and the general object is to replace the commonly used heavy metallic containers which require a substantial initial investment, and which must be returned, and cleaned, and sterilized, before they can be refilled.

The bodies 10 are furnished to the ice cream manufacturer in folded or collapsed condition, and are expanded into a tubular form, and the ends secured thereto at the manufacturer's plant, according to the demands of his needs.

I am aware of the fact that attempts have been previously made to provide a collapsible container which is fabricated, or assembled, at

the manufacturer's plant, but these containers have possessed generally such disadvantages that they have not been accepted and adopted by the general trade. Such disadvantages are, in brief, the fabrication, or assembly, of containers at the manufacturer's plant consumes a considerable amount of time and energy and, unless the fabrication is done by an expert, a liquid tight container was not produced. Also, the containers so fabricated were not of sufficient durability, particularly when they were filled and stored three and four deep in storage rooms. Very often, the weight of the contents would crush, or damage, the containers in the lower rows. Also, it is, and has been, common practice to handle the metallic containers with tongs, or hooks, due to the fact that it is impractical to provide the containers with integral handles, because of the fact that they are placed, by the retailer, in refrigerator cabinets provided with a cylindrical recess substantially the size of the containers. I have been able to perfect my container to the point where all of these disadvantages have been overcome.

My container, when fabricated, or assembled, consists of the body 10 and a bottom 15. The bottom is secured, in a liquid tight manner, to the body by a simple crimping process whereby a split metallic ring is crimped onto the lower end of the body in such manner that a liquid tight joint is established between the bottom and the body. A similar ring is provided at the upper, or top end of the body, and over which is secured a suitable cover.

Referring to Figure 1 of the drawings, 15 indicates the bottom which is formed from a disk of paper material, and when secured in position has an integral depending annular flange 17 which snugly fits the bore of the body. This annular flange 17 spaces the bottom of the container from the lower end of the body, whereby the container, when filled, rests upon the lower annular edge of the body. This is important due to the fact that the ice cream is poured into the container in liquid, or semi-liquid, form, and the container is then placed in storage over a period of time during which the ice cream is frozen solid, and seasoned until it has the proper palatable qualities. In this freezing process, the bottom of the container is bulged downwardly, and unless it is spaced apart from the surface, upon which the container rests, it will contact with said surface, and provide a rocking support for the container which causes considerable trouble in stacking and handling the containers thereafter.

The bottom 15, or the flange 17 thereof, is secured to the body or barrel 10 by means of a crimped ring 18. The bottom ring 18 and top ring 19 are the same in cross section, and formed from a strip of apparently thin metal, and are substantially U shaped in cross section, with one side or leg 20 of the U of greater length than the other. These rings are not continuous, but split at one point, and the ends overlap and telescope as at 21.

In assembled condition, the bottom 15 is located in one end of the barrel 10 with the flange 17 coacting with the bore of the barrel, and the edge being substantially flush with the end of the barrel. The longer side 20, of the ring 18, coacts with the inner side of the flange 17, and the shorter side with the outside of the barrel, and is crimped tightly against the same, so that when the ring 18 is in position, it forms a round-

ed bead at the bottom of the container. The top ring 19 is secured to the opposite end of the barrel in a similar manner. Any suitable cover may be employed with this container, such as a stiff paper slip cover.

Due to the fact that the rings 18, 19, are split, these rings may be secured to either the top, or bottom, of the container. Due to the fact that the ring is split, the difference in thickness of the flanges 17 is compensated for by the overlapping ends of the rings, which have a relative sliding motion during the operation of the crimping dies.

As above stated, the barrels 10 of the containers are shipped in flat, or folded, condition. Obviously, it would be impractical to ship the containers in expanded, or completed, condition, due to the fact that they are bulky, and require considerable space. Due to the fact that these containers are not returned by the retailer to the manufacturer of the contents of the container, it is necessary for the manufacturer to maintain a substantial inventory of the containers on hand, which, if in expanded condition, would require considerable storage and special handling. Accordingly, the method used in fabricating the container, at the manufacturer's plant, is of great importance, and a liquid tight container must be fabricated, at the manufacturer's plant, without the aid of intricate mechanism, and skilled labor.

In my invention, the rings 18, 19, are secured, or crimped, in place by a simple die mechanism consisting of a stationary and a movable die, the operation of which is exceedingly simple, and does require skilled operators.

The particular mechanism here shown for fabricating the container forms no part of this invention, but constitutes the subject matter of an additional application. This mechanism consists of a stationary die 25, which is annular in general form, and split diametrically, the rear half being supported by any suitable means, such as rods 26, which in turn are carried by the base structure 27. The forward half 28, of the die 25, is carried by the supports 29 which are pivoted at their lower ends at 30 in such manner that the front half 28 of the die may be swung into and out of juxtaposition with the stationary half of the die. Suitable means 31 is provided for locking the pivoted section 28 of the die into engagement with the stationary portion of the same. The rear, or stationary, half of the die 25 is rigidly supported in the rear by the rod 32.

The die 33 is mounted above the die 25, and is movable toward and from the same. It is carried by a suitable support 34 provided with end portions 35 which are formed with passages to slidably receive the rods 26. Springs 36 are mounted upon the rods 26 between the ends 35 of the supporting member 34 for the upper die 33 and the support for the lower die, which is secured to the rods 26 by means of pins 37. A cross member 38 is rigidly secured to the upper ends of the rods 26, and carries the rotatable cam 39, the surface of which coacts with a roller 40 secured to the support 34 of the upper die. The cam 39 is provided with a handle 41, and upon clockwise rotation of the handle 41 and cam 39 (Figure 4), the upper die is caused to move toward the lower die 25. As here shown, the lower die 25 is formed with a plurality of bores, the upper bore 43 and lower bore 44 extending substantially parallel with the axis of the die. The lower bore 44 is of less diameter than the upper bore 43. The inter-

mediate portion 45, between the bores 43, 44, is tapered, or formed at an angle, to form a connecting surface between the bores 43, 44. The bottom 46 of the bore 44 is curved inwardly to meet the straight bore 47. The upper die 33 comprises a straight periphery 48, and a curved ledge 49, connecting the surfaces 48, 50. The diameter of the surface 48 is equal to the bore 47 of the die 25, less the thickness of the barrel 10 and flange 17. The outer surface of the die 33 is of such diameter that it slidably fits the bore 44 of the die 25. The upper die 33 is provided with a plunger 52, carried by the screws 53, the ends of which are threaded into the plunger 52 and the stems extending through the inner face of the die 33. The upper face of the die 33 is counter-bored at 55 to receive the heads 56 of the screws 53.

A spring 57 surrounds the stems of the screws 53, and normally holds the plunger 52 in spaced apart relationship from the die 33. The lower ends of the supports 29, for the movable half 28 of the die 25, are provided with a rectangular base 58 on which are mounted the concentric rings 59, 60. The rings 59, 60, are secured together, and mounted on the base 58 so as to have relative movement with the base 58.

As here shown, the rings 59, 60, are slidably mounted on the studs 61, the ends of which are threaded into the base 58, and springs 62 surround the studs 61 and interposed between the ring 59 and the base 58, so that the rings 59, 60, are normally spaced apart from the base 58. The purpose of the rings 59, 60, is to provide a rigid support for the barrel 10 of the container, when the top and bottom rings are being clamped to the ends thereof.

A plate 70 is supported within the lower portion of the lower die 25, and is of the diameter of the bore of the barrel 10 of the container. The plate 70 is rigidly secured to the base 58 by means of the stud 71. The plate 70 is held in a predetermined spaced relationship with the base 58 and the die 25.

In operation, the forward half 28 of the die 25, together with the base 58, is swung outward, as shown in Figure 3. The barrel is expanded from flat position (Figure 2) to expanded position, and passed over the plate 70 with its end resting on the ring 59, and being positioned by the ring 60. The forward portion 28 of the die 25 is then swung inwardly and locked into engagement with the stationary portion of the die 25 forming a solid die. The ring 19 is then placed in the die, and the handle 41 is moved in clockwise direction (Figure 4), and as the cam 39 rotates, the upper die 33 is caused to move downwardly toward the stationary die 25. The outer, or shorter, side of the ring 19 coacts with the tapered bore 45 of the die 25, whereupon the ring 19 is constricted to the proper diameter with the inner, or longer, side 20 sliding into the bore of the barrel 10. Further downward movement of the die 33 causes the outer, or shorter, side of the ring 19 to be crimped into tight engagement with the outer side of the barrel. This, because of the curved surfaces 46, 49. The handle 41 is then rotated in a counter-clockwise direction (Figure 4) raising the upper die 33. The front portion 28 of the die 25 is then unlocked from the rear portion, and swung outwardly, and the barrel removed from the machine. The upper end of the barrel, with the ring 19 crimped in position, is now passed over the plate 70 and seated upon the ring 59. The die 25 is closed

and, as here shown, the bottom 15 placed in the die 25 on the upper edge of the barrel 10. The bottom 15, in this case, is formed with the flange 17 extending at an angle greater than a right angle to the disk, or center portion of the bottom, and the edge of the flange 17 coacts with the upper portion of the bore 45 of the die 25. This aids in positioning the bottom relatively to the dies and the barrel. The ring 18 is then placed in the die 25, and the upper die moved downwardly in the manner described concerning the crimping of the ring 19. A slight downward movement of the die is shown in Figure 5, and upon further downward movement, the plunger 52 coacts with the bottom 15 forcing it into the barrel 10 at which time the flange 17 is swung to a right angle with the bottom, and the ring 19 contracted to the proper diameter, by action of the tapered bore surface 45, and arranged in alignment with flange 17. The plunger 52 is so spaced normally, relative to the die 33, that the die coacts with the upper surface of the ring 18 before the plunger 52 coacts with the bottom 15, so that the ring 18 is moved slightly toward the bottom 15. Then, as the plunger 52 coacts with the bottom, and forces it into the barrel of the container, the flange 17 is swung at a right angle and coacts with the outer surface of the leg 20 of the ring 18, at which time the parts have assumed the position shown in Figure 6.

Upon further downward movement of the die 33, the bottom 15 is forced against the plate 70. The plate 70 is so spaced relatively to the rings 59, 60, that the bottom 15 is pressed into the barrel 10 until the edge of the flange 17 is substantially flush with the edge of the barrel. The springs 57 have less tension, or are weaker, than the springs 62 under the rings 59, 60. In the event a particular barrel 10 happens to be longer than the average barrel, whereby the upper edge of the barrel extends upwardly beyond the edge of the flange 17, when the bottom 15 is resting upon the plate 70, the barrel itself will be moved downwardly when the curve portion of the ring 18 coacts with the edge of the barrel, due to the fact that the barrel is composed of a plurality of plies of material wound spirally, and is corrugated lengthwise to be of sufficient strength to compress the springs 62 without collapsing.

When the die 33 has reached the end of its travel, the outer, or shorter, side of the ring 18 is crimped tightly into engagement with the surface of the barrel in the same manner that the top ring was so crimped. The handle 41 is then rotated in a counterclockwise direction, the die 33 raised, the forward half 28 of the die 25 swung outwardly, and the completed container removed.

Instead of the bottom 15 and the ring 18 being placed separately in the die 25, the flange 17 can be formed substantially at right angles to the bottom 15, and the ring 18 placed on the flange 17, and the bottom and ring 18 both placed in the die at the same time. In this case, the tapered surface 45 of the die 25 would not be necessary.

It will be observed that I have provided a most economical and efficient method of securing bottoms to containers, and means for carrying out such method. It has been common practice heretofore, to secure similar bottoms in containers by means of a crimped ring by spinning the outer side of the metallic ring with a rotating head, or tool. The understanding has been that a satisfactory clamp could not be effected by any means other than spinning. The spinning method is

satisfactory in container manufacturing plants, but entirely impractical for the fabrication of containers by the users thereof who are not in the least familiar with the manufacture, or assembling, of containers. Machines heretofore

- 5 used would involve an excessive cost, and involve the services of an expert to operate and maintain them which would more than offset any saving through the use of the knock down container.
 10 It will also be observed that I insert the bottom in the container, and secure it to the container in a single operation. Heretofore, the bottoms have been inserted and secured by separate operations.

What I claim is:

- 15 1. The method of securing a closure having an annular flange in one end of an open tubular barrel consisting of pressing the closure in the barrel with the flange toward the outer edge of the barrel, and simultaneously pressing a channel
 20 shaped metallic ring over the outer edge of the barrel and the flange of the closure, and crimping the outer side of the ring into contact with the outer face of the barrel by such pressing action.
 25 2. The method of securing in one end of a tubular barrel a head having an annular flange whereby the head is cup shaped, with the flange lying against the inner face of the margin of the barrel and its edge toward the outer edge of the
 30 barrel, by means of a ring, channel shape in general form in cross section, consisting in effecting relative axial movement of the ring and the barrel, and bringing one side of the channel formation first into engagement with the flange
 35 when flared outward slightly and while the head is displaced outward slightly from the barrel, and thereby forcing the head and its flange into the

end of the barrel, and in the same operation contracting the margin of the other side of the channel formation onto the outer face of the margin of the barrel.

3. The method of securing a closure, having an
 5 annular flange, in the open end of a fibrous barrel; consisting of placing the closure on the end of the barrel with the flange extending outwardly, placing an inverted U shaped metallic ring over the flange of the closure and concentrically there-
 10 with, with the inner side of the ring arranged on the inner side of the flange of the closure, pressing the ring toward the barrel and the closure into the open end of the barrel with the flange of the closure arranged concentrically within the
 15 barrel and extending at a right angle to the closure and simultaneously, during said pressing action, crimping the outer side of the metallic ring into contact with the outer face of the barrel.

4. The method of securing a fibrous closure
 20 having an annular flange in one end of an open fibrous barrel; consisting of arranging a closure and a metallic ring U shaped in cross section concentrically on the end of the barrel with the
 25 inner side of the ring engaging the inner side of the flange of the closure, pressing the closure into the open end of the barrel with the flange of the closure arranged parallel and concentric with the inner surface of the barrel, and simultaneously
 30 pressing the metallic ring over the end of the barrel and the flange of the closure, and while said closure and ring are so positioned, by such pressing action, crimping the outer side of said
 35 ring into engagement with the outer surface of the barrel of the container.

LEON E. LA BOMBARD.