March 4, 1941. H. CAREW 2,234,108

PAPER DISH AND METHOD OF MAKING THE SAME

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Fig. 1.

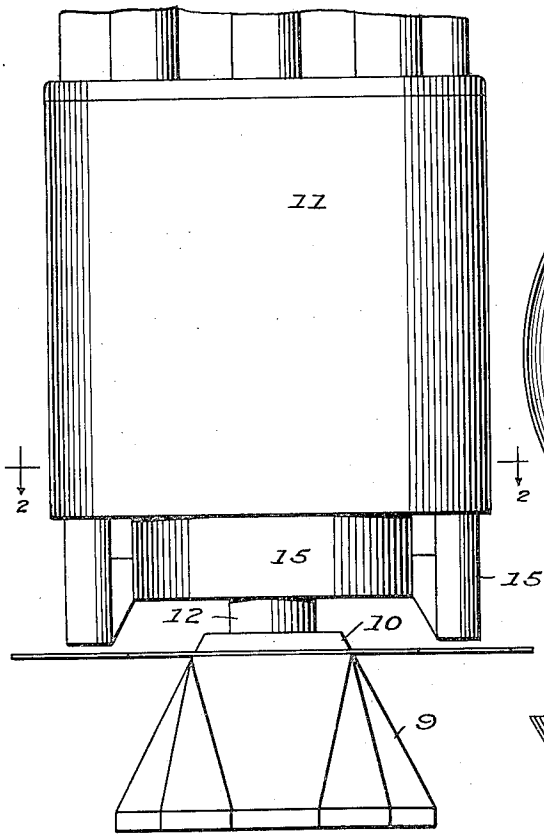
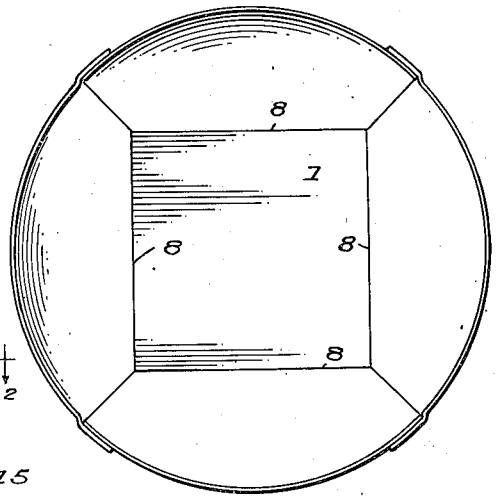


Fig. 7.



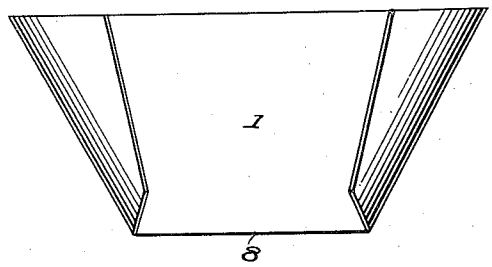


Fig. 8.

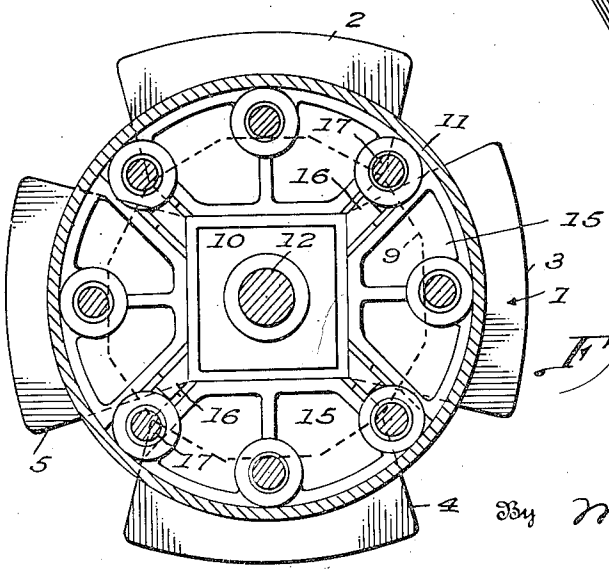


Fig. 2.

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Fig. 5.

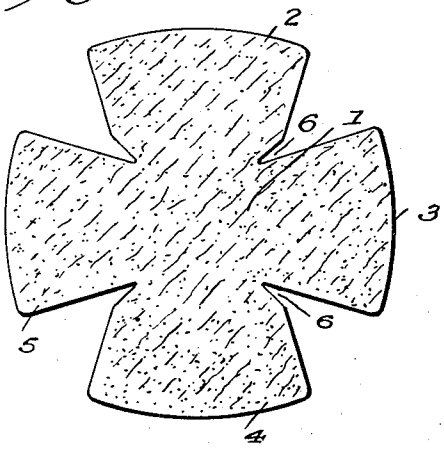


Fig. 6.

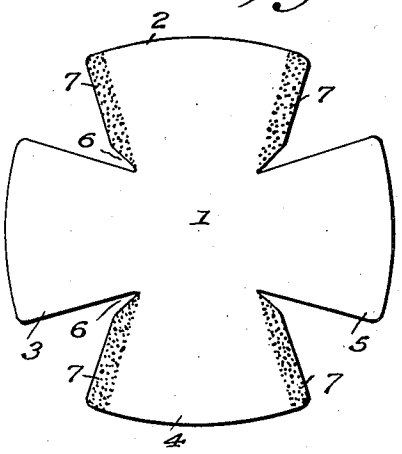


Fig. 3.

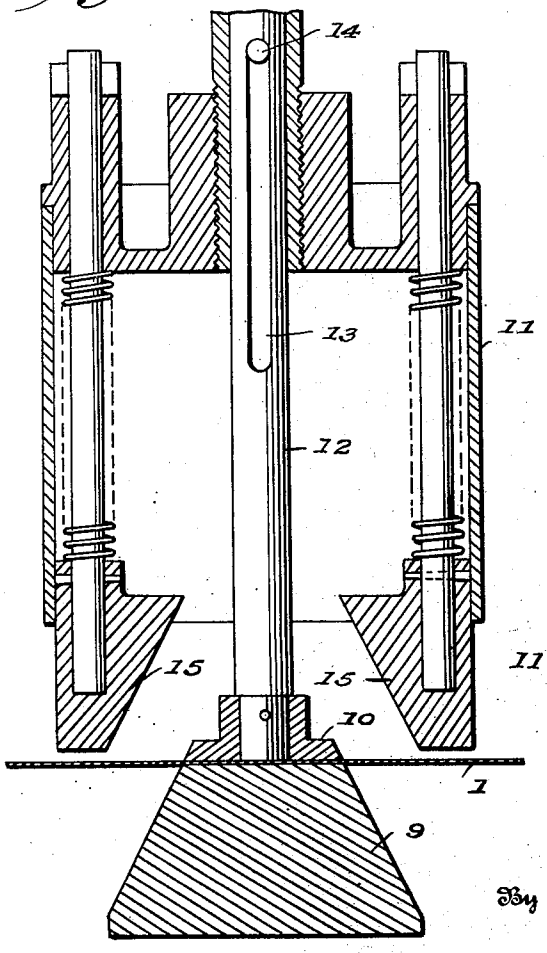
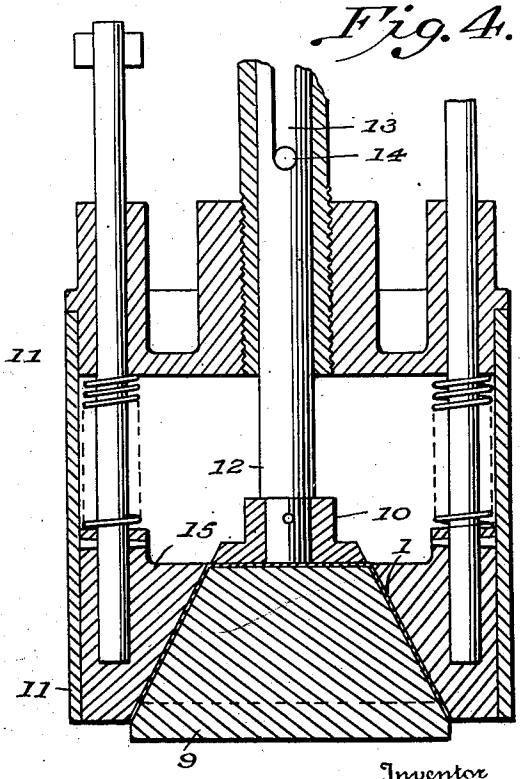


Fig. 4.



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Fig. 9.

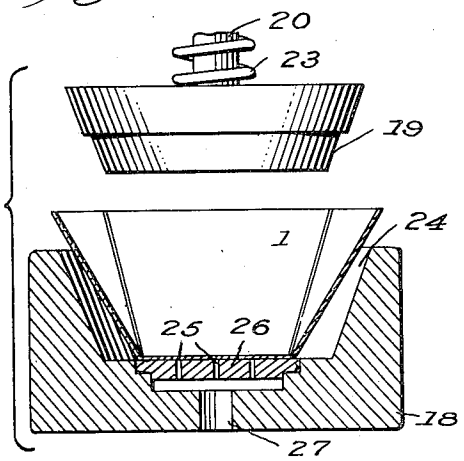
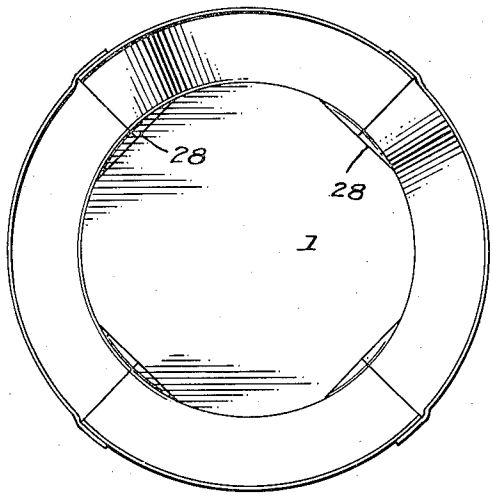


Fig. 12.



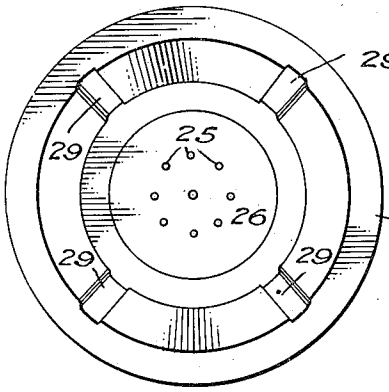


Fig. 10.

Fig. 13.

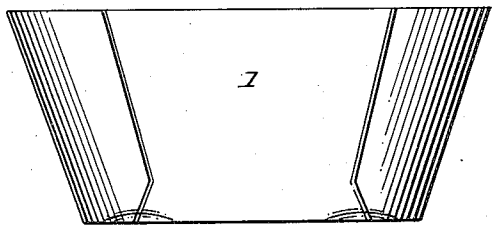
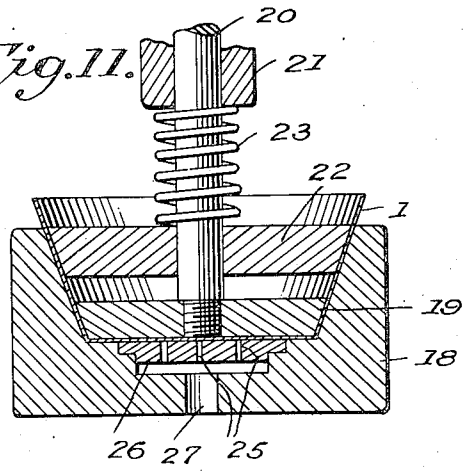


Fig. 11.



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Fig. 14.

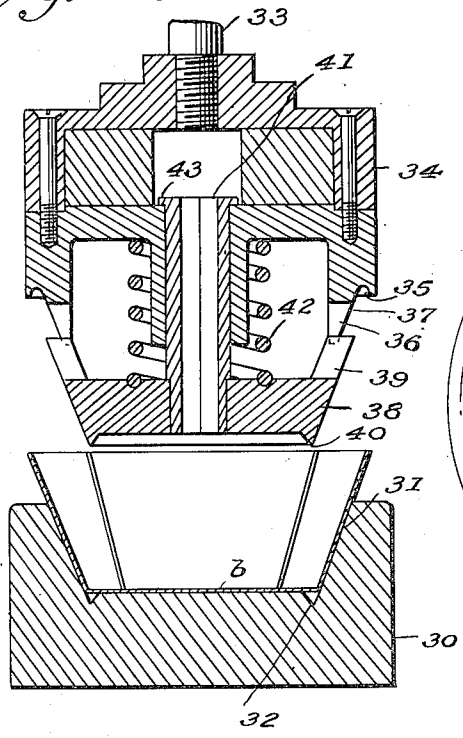


Fig. 16.

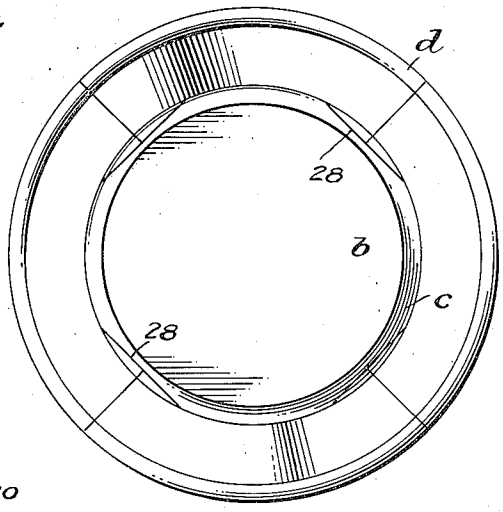


Fig. 15.

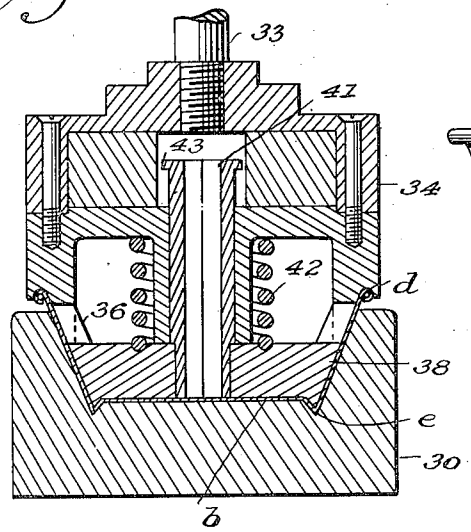
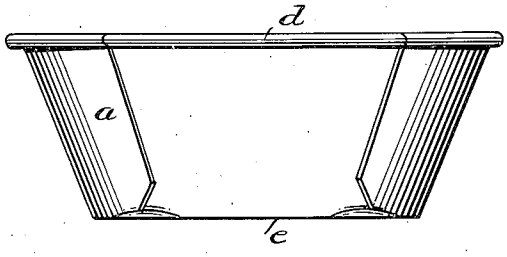


Fig. 17.



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Patented Mar. 4, 1941 2,234,108

UNITED STATES PATENT OFFICE

2,234,108

PAPER DISH AND METHOD OF MAKING THE SAME

Herman Carew, Easton, Pa., assignor to Dixie-Vortex Company, Easton, Pa., a corporation of Delaware

Application November 21, 1938, Serial No. 241,665

8 Claims. (Cl. 93—51)

My invention relates to new and useful improvements in a paper dish and the method of making the same and has for its principal object the provision of a dish formed from a single piece of material, the blank from which the dish is formed being cut with the minimum amount of waste and providing four flaps which are adapted to be folded with their adjacent or overlapped edge portions secured together.

Another object of the invention resides in the method of forming a paper dish from a blank of the character described in which the flaps of the blank are initially folded with overlapped edge portions secured together to provide an angular bottom portion and a rounded body portion and upper edge, the angular bottom portion then being pressed into circular shape to provide a completed dish of circular tapered contour.

A still further object of the invention resides in so cutting the blanks, from which the dishes are to be formed, that the grain of the paper will extend through all of the flaps alike at approximately a 45° angle to the center line of the flaps. This cutting of the blank permits the grain to run uniformly through all of the flaps thus permitting the flaps to be more readily bent and permitting a better curling of the edge portion of the dish with an uniform pressure in curling.

With the above and other objects in view, which will appear as the description proceeds, my invention consists in the novel details of construction, and arrangement of parts, described in the following specification and illustrated in the accompanying drawings, and while I have illustrated and described the preferred embodiments of the invention, as they now appear to me, it will be understood that such changes may be made as will fall within the scope of the appended claims.

In the drawings forming a part of this application I have merely illustrated certain mechanism by which the method of forming the dishes may be carried out and it will be understood that other mechanism may be equally as well used and I have not attempted to show any complete structure for forming the dishes. I have merely shown sufficient structure whereby the blanks may be folded to form the completed dishes and I have shown no mechanism whatever for feeding the blanks into position to be operated upon, I have shown no means for cutting the blanks, and have shown no means for applying adhesive to the edge portions of the flaps whereby the edge portions of adjacent flaps may be secured together in over-lapped relation. I am well aware that paper dishes have in some instances been formed of two pieces of material and in other instances from a single piece of material, but it is the object of my invention, as previously stated, to fold or form a dish from a single piece of material with the minimum amount of waste and without the formation of circumferentially spaced pleats or the like. In carrying forward my method the dish is formed from a single piece of material by folding as distinguished from forming the dish by a pressing or expansion of the paper.

In the drawings:

Fig. 1 is a side elevation showing a folding mechanism which may be employed in carrying forward my method.

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a transverse vertical section through the mechanism shown in Fig. 1 with parts shown in elevation.

Fig. 4 is an enlarged section similar to Fig. 3 with the folding mechanism shown in lowered position.

Figs. 5 and 6 are plans showing opposite face portions of the blank from which the dish is to be formed.

Fig. 7 is a top plan of a dish formed by the mechanism shown in Figs. 1, 2, 3 and 4 of the drawings it being noted that the flap portions of the blank have been folded, with their overlapped edge portions secured together, to provide an angular bottom portion and a rounded body.

Fig. 8 is a side elevation of the dish shown in Fig. 7.

Fig. 9 shows a transverse vertical section through a female forming die and dish of the formation shown in Fig. 7 with a male forming plunger shown in side elevation and in raised position.

Fig. 10 is a top plan of the female forming die shown in Fig. 9 with the dish removed.

Fig. 11 is a transverse vertical section through the female forming die and male forming plunger, with parts shown in elevation, the male forming plunger being shown in lowered position within the female forming die and having pressed the angular bottom of the dish, shown in Fig. 7 of the drawings, into circular shape.

Fig. 12 is a top plan of the dish after having been pressed into shape by the male forming plunger within the female forming die.

Fig. 13 is a side elevation of the dish shown in Fig. 12.

Fig. 14 shows a transverse vertical section through a dish of the formation shown in Figs. 12 and 13 and through the male and female members for forming a bead around the edge portion of the dish and a groove in the bottom of the dish, the male member being shown in raised position.

Fig. 15 is a view similar to Fig. 14 with the male beading member shown in lowered position with the bead formed around the edge of the dish and a groove formed in the bottom of the dish.

Figs. 16 and 17 are respectively top plan and side elevation of the completed dish.

I wish it understood that not only will the completed dish be of circular formation but the body portion will be tapered so that a plurality of the dishes may be nested into stack formation for ready removal of a terminal receptacle from a suitable carton or dispensing mechanism

In Figs. 16 and 17 of the drawings I have shown a completed dish including a tapered side or wall portion *a* and a bottom *b*, a circumferentially extending V-shaped groove *c* being formed around the bottom at its juncture with the side wall *a*, and a bead *d* being formed around the upper edge of the side wall. As shown more particularly in Fig. 15 of the drawings when the groove *c* is formed around the bottom it provides a supporting edge portion *e* which is on a plane lower than the bottom.

The dish is formed from a single piece of material or blank of the shape shown more particularly in Figs. 5 and 6 of the drawings, the blank including what might be termed a central portion 1 and the flaps 2, 3, 4 and 5. The flaps 2 and 4 have their edges notched as shown at 6, adjacent the edges of the flaps 3 and 5, to facilitate over-lapping of the edge portions of the blanks 2 and 4, supplied with the lines of adhesive 7 over the edges or face portions of the flaps 5 and 6, as shown quite clearly in the drawings. In Fig. 5 of the drawings I have illustrated that the blanks are cut with the grain extending through all of the flaps alike at approximately a 45° angle to facilitate the folding of flaps and the forming of the bead around the mouth portion of the dish.

In carrying forward my method of forming the improved dish the flaps 2, 3, 4 and 5 of the blank of paper are folded on the transverse lines 8 to provide an angular bottom shown in the drawings as square formed by the central portion 1, as shown more particularly in Fig. 7 of the drawings, the longitudinal edges of the flaps 2 and 3 having the lines of adhesive 7 over-lapping the adjacent edges of the flaps 5 and 6 and secured thereto, the wall or side formed by the folding of the flaps being circular in shape and tapered from the normal upper edge or mouth portion towards the bottom. For folding the flaps initially on the lines 8 I provide the mechanism shown more particularly in Figs. 1, 2, 3 and 4 of the drawings, this mechanism including what might be termed a male die or forming member 9 of the shape shown more particularly in Fig. 1 and on which the blank is initially supported horizontally and held by the clamp 10 forming part of a vertically adjustable folding member including a body portion 11, which may be raised and lowered in any desired manner. The clamping plate 10 is carried by the rod 12, having an elongated opening 13 in which operates a pin 14 carried by the member 11. Also carried by the member 11, and yieldable relative thereto, are the folding heads 15, which are adapted to be engaged with the flaps of the blank, when the member 11 is lowered, to fold the flaps into engagement with the faces or walls of the male die or block 9 with the edges of the flaps 2 and 3 over-lapping the edges of the flaps 5 and 6. It will be noted that those heads 15 which are adapted to engage the flaps 5 and 6 are normally positioned on a somewhat lower plane than those which are adapted to engage the flaps 2 and 3 so that the flaps 5 and 6 will be folded in advance of the flaps 2 and 3 so that the edges of the flaps 2 and 3 will over-lap the edges of the flaps 5 and 6. In Fig. 2 of the drawings I have shown generally slidable seam clamps 16 which are carried by the rods 17 slidably mounted in the member 11 and these seam clamps will engage the seams formed by the over-lapped portions of the flaps to hold the same in tight engagement for proper securing. A further detailed description of the folding mechanism is not thought necessary for, as previously stated, I have just illustrated one form of mechanism which may be used. Suffice to say that the dish, formed by the mechanism shown in Figs. 1, 2, 3 and 4 of the drawings, will be of the shape more particularly illustrated in Figs. 7 and 8 of the drawings with an angular bottom and a circular wall and top portion.

After the dish has been formed in its initial shape shown in Figs. 7 and 8 of the drawings it is then desired to reshape the angular bottom so that it will be of circular shape conforming to the shape of the body or side wall. The dish with the reshaped bottom is shown more particularly in Figs. 12 and 13 of the drawings and while this reshaping may be done through various mechanisms I have shown in Figs. 9, 10 and 11 of the drawings a mechanism including a female forming die 18 and a male forming plunger 19 operable in any desired manner. The male forming plunger is carried on a rod 20 which operates through a guide 21. Slidably mounted on this rod 20, just above the plunger plate 19, is a clamping plate 22, normally held in contact with the plunger 19 through means of the coiled spring 23. As shown the side edges of both the plunger 19 and the clamping plate 22 are tapered for a purpose which will be readily apparent. The female forming die 18 is provided in its upper surface with a tapered recess 24 in which the dish initially formed as shown in Figs. 7 and 8 is positioned and held by suction created through the perforations 25 of the plate 26 and the opening 27 in the bottom of the die. When the dish has been placed in the recess 24, the rod 20 will be lowered until the clamping plate 22 engages the wall of the dish and clamps the same as shown in Fig. 11. A further movement of the rod 20 carries the plunger 19 downwardly into the position shown in Fig. 11 and this movement of the plunger presses the angular bottom of the dish shown in Fig. 7 into the circular shape as shown more particularly in Fig. 12 of the drawings, it being noted that a slight fold or overlap will be formed as shown at 28 at each seam formed by the over-lapped edge portions of the blank. These over-laps or folds 28 take up the excess of material and will be pressed down tightly. The wall of the recess 24, of the female forming die 18, is provided with the vertically extending recesses 29 into which are received the seams formed by the over-lapped edge portions of the flaps of the dish so that the dish may be tightly clamped and shaped in the female forming die 18.

After the dish has been formed in the circular shape shown in Figs. 12 and 13 it is desired to form a bead around the upper edge or mouth portion and to form a groove in the bottom, the forming of the groove in the bottom providing a supporting edge portion on a plane somewhat lower than the bottom. In Figs. 16 and 17 of the drawings I have illustrated the completed dish with the bead *d* around the mouth portion and the groove *c* in the bottom, this groove forming the supporting edge portion *e*. In Figs. 14

and 15 I have shown mechanism for forming the bead and for forming the groove but it will be understood that other mechanism may equally as well be used. In Figs. 14 and 15 a female forming die is shown at 30 and is provided in its upper surface with a tapered recess 31 terminating in a V-shaped groove 32 in the bottom. The dish, formed as shown in Figs. 12 and 13 of the drawings, is placed in the recess 31, of the female forming die 30 as shown more particularly in Fig. 14 of the drawings. Carried on a slidable rod 33 is a head 34 provided on its bottom surface or edge with a groove 35 and depending from the bottom edge of this head is a plurality of circumferentially spaced fingers 36, the outer faces of which, as shown at 37, taper or lead into the groove 35. Carried by the head 34 is a plate 38 having on its upper surface a plurality of upwardly directed fingers 39 alternating with the fingers 36 of the head 34 and preventing rotation of the plate 38 relative to the head although permitting movement relative thereto. On the lower face of the plate 38 is formed a circumferentially extending V-shaped projection 40 for a purpose which will be presently brought out. The plate 38 is supported by the head 34 through the sleeve 41 and surrounding the sleeve between the head 34 and plate 38 is a coiled spring 42 which normally holds the plate in its lowermost position shown in Fig. 14, the downward movement of the plate being limited by the flange 43 formed on the upper end of the sleeve 41. With the parts positioned as shown in Fig. 14, the head 34 may be lowered in any desired manner and this lowers the plate 38 into the position shown in Fig. 15 to securely clamp the dish in the recess 31 of the female forming die 30 and the V-shaped projection 40 cooperating with the V-shaped recess 32 in the female forming die 30 forms in the bottom of the dish the circumferentially extending groove *c* to provide a supporting edge *e* as previously described. When the plate 38 is in its clamping position the movement of the head 34 may be continued downwardly and engaes the upper edge of the dish, the edge of the dish riding over the inclined surfaces 37 of the fingers 36 into the groove 35 to curl the edge and to provide the bead *d*. After this operation takes place the parts are returned to their normal position and the completed dish removed.

From the above detailed description it will be seen that I have provided a paper dish which is formed from a single piece of material formed and adapted to be folded into shape. It can readily be appreciated that it would be hard to fold a single piece of material directly into circular form and in carrying out the method of forming the dish the blank is initially folded to provide the angular bottom and circular body and then the angular bottom is reshaped into circular formation corresponding to the circular formation of the body. At the same time the blank is cut from a suitable strip or piece of material so that the grain extends through all of the flaps alike at approximately a 45° angle and this facilitates the folding and the curling of the edges. As previously stated I am aware that it is not new to form a paper dish of a single piece of material where pleats or the like are formed to take up the surplus material but so far as I am aware it is new with me to fold a dish from a single piece of material without waste and it is new with me to provide a method whereby a blank consisting of flaps may be folded to provide a dish of circular tapered formation. In the drawings I have illustrated the blank as being initially folded to provide a square bottom, but it will be understood that I do not limit myself to this particular shape and the fold may extend from the bottom of any angular shape or the blank may have a different number of flaps.

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

1. The method of forming a container from a single piece of material which consists in initially folding the material to provide an angular bottom and circular side wall, then shaping the bottom to circular formation, and next forming a bead around the edge of the side wall.

2. The method of forming a container from a single piece of material which consists in initially folding the material to provide an angular bottom and circular side wall, then shaping the bottom to circular formation, and next forming a circular groove in the bottom to provide a supporting edge portion.

3. The method of forming a container from a single piece of material which consists in initiailly folding the material to provide an angular bottom and circular side wall, then shaping the bottom to circular formation, and next forming a bead around the edge of the side wall and a groove in the bottom, the groove in the bottom forming a supporting edge portion.

4. The method of forming a container from a single piece of material including a central portion and flaps extending therefrom which consists in initially folding the flaps to provide an angular bottom and circular side wall, then shaping the bottom to circular formation, and next forming a bead around the edge of the side wall.

5. The method of forming a container from a single piece of material including a central portion and flaps extending therefrom which consists in initially folding the flaps to provide an angular bottom and circular side wall, then shaping the bottom to circular formation, and next forming a groove in the bottom.

6. The method of forming a container from a single piece of material including a central portion and flaps extending therefrom which consists in initially folding the flaps to provide an angular bottom and circular side wall, then shaping the bottom to circular formation, and next forming a bead around the edge of the side wall and a groove in the bottom to provide a supporting edge portion.

7. The methor of forming a container from a single piece of material which consists in forming a blank having a central portion and flaps extending therefrom, the grain of the paper extending through all of the flaps alike at approximately a 45° angle to the central lines of the flaps, then folding the flaps to provide an angular bottom and circular side wall, adjacent edges of the flaps being overlapped and secured together, and then shaping the bottom to circular formation.

8. The method of forming a container from a single piece of material which consists in initially forming a blank having a central portion and oppositely disposed flaps extending therefrom, then folding the flaps to provide an angular bottom and circular side wall with adjacent edges of the flaps overlapped and secured together, and then shaping the angular bottom to circular formation.

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