Jan. 20, 1959 H. ZERLIN ET AL 2,869,440

METHOD OF AND APPARATUS FOR MAKING POLYGONAL CONTAINERS OF PAPER CARDBOARD OR THE LIKE

Filed July 19, 1955 2 Sheets-Sheet 1

Fig.1

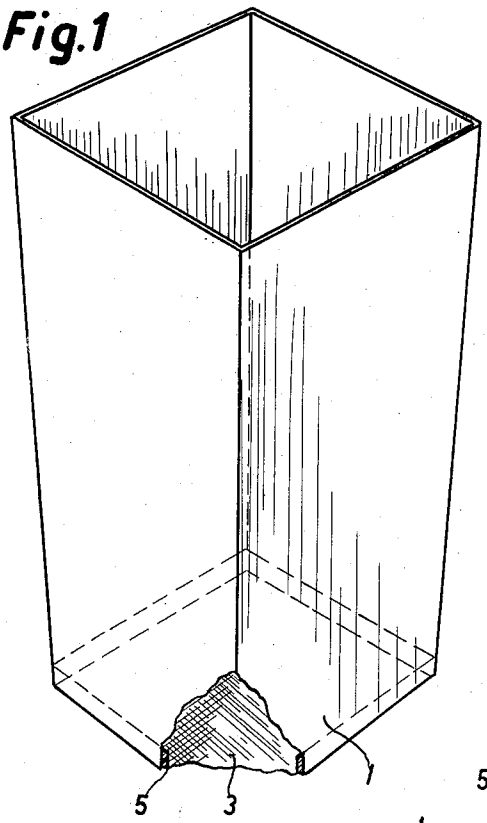


Fig.1A

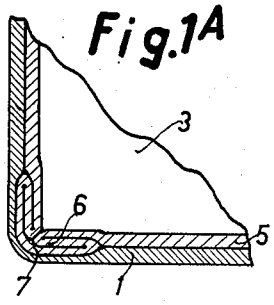


Fig.3

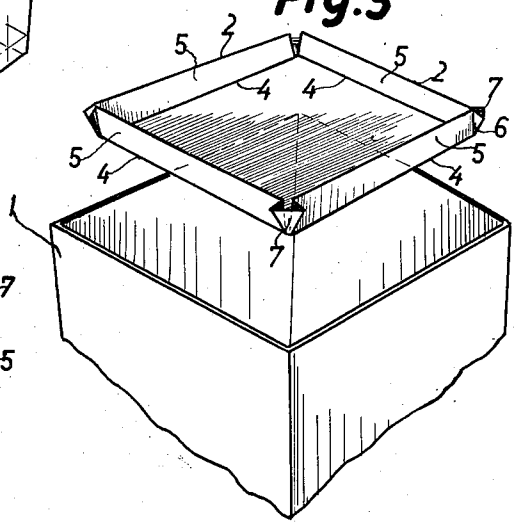
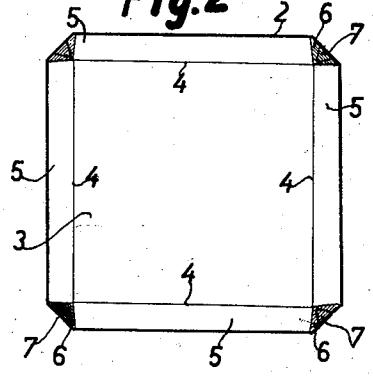


Fig.2



Inventors
H. Zerlin
H. Michaelis
By Glascock Downing & Seibold
Attys.

Jan. 20, 1959 H. ZERLIN ET AL 2,869,440

METHOD OF AND APPARATUS FOR MAKING POLYGONAL CONTAINERS OF PAPER CARDBOARD OR THE LIKE

Filed July 19, 1955 2 Sheets-Sheet 2

Fig. 4

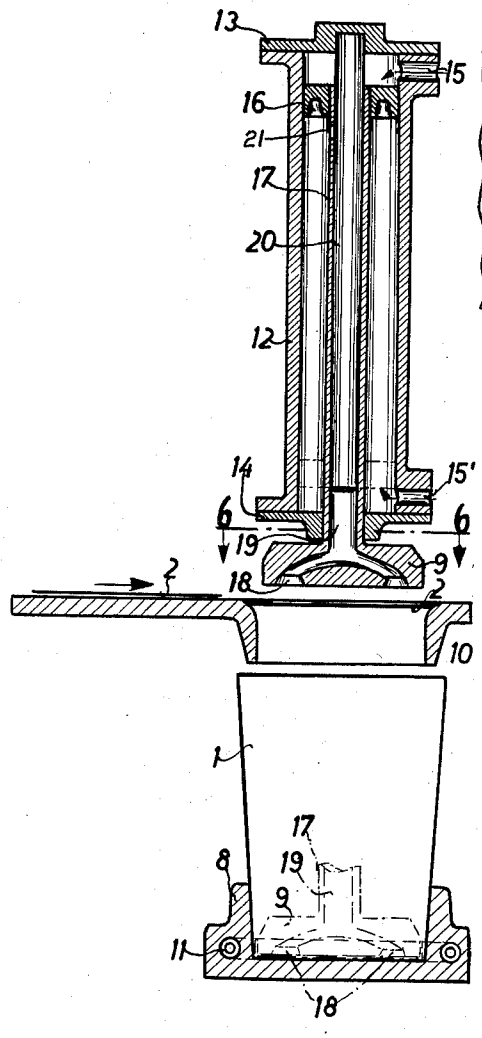


Fig. 6

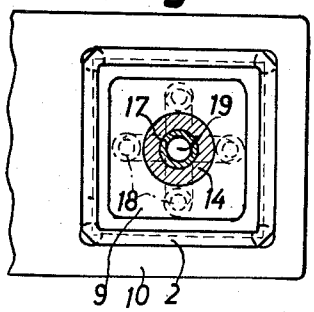
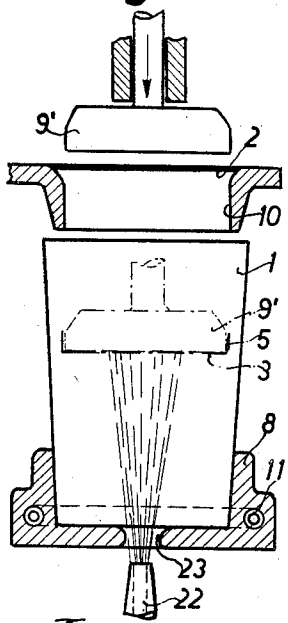


Fig. 5



Inventors
H. Zerlin
H. Michaelis
By Glascock Downing Seebold
Attys.

United States Patent Office 2,869,440 Patented Jan. 20, 1959

2,869,440

METHOD OF AND APPARATUS FOR MAKING POLYGONAL CONTAINERS OF PAPER, CARDBOARD OR THE LIKE

Hans Zerlin and Heinz Michaelis, Dusseldorf, Germany, assignors to Jagen-Werke Akt.-Ges., Dusseldorf, Germany

Application July 19, 1955, Serial No. 522,986

11 Claims. (Cl. 93—55.1)

The present invention relates broadly to the art of paper manufacture. More particularly, this invention relates to a method and apparatus for producing polygonal containers of paper, cardboard or the like carton-forming material.

Still more particularly, this invention relates to a method and apparatus for producing polygonal containers of the aforestated materials having an external downwardly tapering shape including a bottom closure inserted within the body and secured to the lower marginal edges of the body.

Specifically, the invention relates to a method and apparatus for producing polygonal containers of downwardly tapering shape in which the end closure is inserted through the large open end of the body.

In producing paper or cardboard containers of the type which are preferably utilized for receiving liquids such as milk or the like and which containers include an inserted end closure, considerable difficulties are encountered in inserting the end closure and effecting its connection with the container body. This is particularly true as regards container bodies having corner constructions, since the juncture of the end closure with the container body adjacent the corners is difficult to effect properly due to the fact that the material of the closure has a tendency to form channels at the corners of the container due to overlapping and accumulations of material in the corners. These channels enhance the possibility of leakage in the finished containers.

As a general measure in producing containers with inserted closure parts, the closure is inserted into the smallest of the open ends of the container body and this method of insertion presupposes the fact that the closure part prior to insertion, has a shape which conforms to the smallest open end of the container body. Disregarding the difficulties encountered in the insertion of the closure in this fashion, the arrangement provides a further drawback in that the exterior periphery or rim of the inserted closure part does not completely fit the inner dimensions of the opening so that a satisfactory and tight juncture between container and closure parts is not always assured.

It is known to insert a round closure into a conical container and in which the closure prior to insertion has its final shape. The present invention is not concerned with such container but provides a method and apparatus for economically and efficaciously inserting a closure into a polygonal container of downwardly tapering shape in a fashion to ensure proper formation of a rim on the closure, correlation of this rim with the lower portion of the interior of the container and elimination of undue material accumulations at the corners of the container body.

It is also known in the production of cardboard or paper containers to insert a closure part into an open container blank that has not yet been longitudinally seamed. In this arrangement, the closure is inserted perpendicular to the longitudinal axis of the container. Therefore during insertion, the closure is not introduced through the largest open end of the container body and is not subjected to any change in shape during insertion.

In order to avoid difficulties resulting with the known methods, the present invention has for an object to provide a method of producing polygonal containers having downwardly tapering shape and an inserted end closure in which a closure blank is preshaped by partially setting up a rim thereon and prefolding the corners, and then inserted into the largest open end of the container body and during insertion shaped to final form by the cooperation of the interior of the downwardly tapering container body with the partially set up rim or flanges.

It is a further object to provide compact apparatus for effecting preshaping and final shaping of the closure part during the inserting step.

One advantage of the insertion of the closure into the larger open end of the container body resides in the fact that during preshaping it is only necessary to partially set up the flanges or rim of the closure blank and prefold the corners to such an extent to facilitate easy insertion in the open large end of the body. The final shaping with complete conformation of the closure flange or rim structure to the interior of the container body is effected by sliding the closure along the interior of the container body. This method assures that adaptation of the closure rim or flange structure to the container walls proceeds gradually during insertion, yet the conformation of this flange or rim structure to the interior shape of the smaller end of the container body is unconditionally effected by the abutting relation between the flanges and the interior of the container body. This is particularly true as regards the formation of proper corner constructions on the closure part and thus is established an absolute tight-fit between the inserted closure and the container body.

The fact that the closure part during insertion is individually fitted to the respective smaller opening of the container body is especially significant in the manufacture of multi-cornered containers. The manufacture of such containers creates particular difficulties in producing a tight joint between the container body and the closure adjacent the corners.

Accordingly, the invention has for a further object to preliminarily shape the corners of the closure blank prior to engagement thereof with the interior of the container body so that the material of the rim of the closure during insertion and upon engagement of the interior of the container body is constrained to abut the corner constructions of the container body in coplanar relation in order to achieve a tight corner joint.

As a specific object, the invention provides apparatus for effecting the method of inserting the end closure in the container body which includes a reciprocal plunger having an end face substantially corresponding to the dimensions of the closure forming face of the end closure, a forming channel supported between the plunger and the larger open end of the container and cooperable with the flat blank during movement thereof through the channel to preshape the blank by setting up the flange or rim structure and folding the corners of the closure blank so that during further motion of the plunger the preshaped closure part is carried through the large open end of the body to a position adjacent the small open end thereof. During insertion, the partially set up flange or rim structure of the closure has abutted against the interior of the container body. The invention further provides a stationary counter-pressure abutment surrounding the opposite and smaller end of the container body, the abutment cooperating with the plunger during the insertion.

It is a specific object of the invention to provide an apparatus for inserting a rimmed closure into a container body of polygonal cross section and downwardly tapering

shape which includes a cup-like supporting means for receiving the lower and smaller end of the container body, a preshaping die supported in spaced relation and in alignment with the larger end of the container body and reciprocal means for forcing a closure blank through the die and into the larger end of the body to conform the flange or rim structure of the blank to the interior shape of the body.

It is a further specific object to provide compressed air operated reciprocal means to effect the movement of the blank through the shaping die and into the container body. Specifically the invention provides a vertically reciprocal compressed air actuated plunger. By actuating the plunger by compressed air, the invention provides a reciprocal structure having a relatively long working stroke in which the masses moving to and fro are of light weight construction. In this connection, the invention provides a hollow guide rod with a plunger so that particularly favorable conditions result from the small masses that have to be accelerated.

It is a further and more particular object of the invention to provide a method and apparatus for inserting a rimmed closure into a polygonal container which includes the steps of and means for moving a flat blank through a forming die to partially set up a rim on the blank, continuing the movement of the blank into the larger open end of a polygonal container body of downwardly tapering shape while maintaining the blank in supported relation and during such continued movement into the container body and forming the shape of the rim to the interior shape of the smaller end of the container body.

Further and more specific objects will be apparent from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view with parts broken away illustrating a container constructed in accordance with the invention,

Figure 1A is a horizontal sectional view on an enlarged scale taken through one of the corners of a container as seen from above the plane of the bottom closure and illustrating the corner structure,

Figure 2 is a plan view of a blank for forming the end closure for the container of Figure 1,

Figure 3 is a partial perspective view illustrating the larger end of the container with the closure blank partially set up and ready for insertion.

Figure 4 is a diagrammatic longitudinal sectional view illustrating an apparatus for inserting a closure part in the container body,

Figure 5 is a fragmentary diagrammatic view partly in section illustrating a modified form of apparatus,

Figure 6 is a fragmentary view taken along lines 6—6 of Figure 4.

As illustrated in Figure 1, the polygonal container which is produced in a known manner from a flat blank is formed about score lines into a tubular body 1. The body 1 has four sides, thus its top and bottom are square and it has a slight downward taper from top to bottom so that the top opening is larger than the bottom opening. The blank for the closure for the small end of the body is shown in Figure 2. The blank 2 includes a closure face 3 and a flange or rim structure 5 jointed to the closure face along score lines 4 extending along all four sides. The corner forming parts 6 of the closure blank, shown as hatched in Figure 2, are provided with score lines at 7. Further the four ends of the blank are cut off diagonally at the corners so that when the flanges 5 are set up the corners are not higher than the remainder of the flanges. Upon the setting up of the corner forming parts 6, a fold line is formed similar to a pointed bag so that during insertion of a blank into the container body there is a uniform distribution of material at the corners of the closure blank and thus a tight corner joint is effected.

Closure blank 2 preshaped as illustrated diagrammatically in Figure 3 is introduced through the larger opening of the container body 1 until as shown in Figure 4, the closure face 3 is disposed in the plane of the lower marginal edges bounding the smaller opening of the container body. The set up or erected flange structure 5 abuts the inner sides of the container body at the lower end thereof, see Figure 1A. The connection of the flanges with the lower marginal edge of the interior of the container body is effected by heat and pressure. A thermoplastic material is utilized as a binder. Layers of thermoplastic material not shown are coated on one or both of the parts to be joined. In other words, the layer of adhesive can be applied to the interior of the lower portion of the container body or a layer of adhesive can be applied to the lower face of the blank 2 along the flange forming portions thereof. If desired, the closure blank and the container body can be coated with adhesive.

In Figure 4 is illustrated a device for inserting and connecting the end closure with the container body 1. An open ended container body 1 is formed by a known mechanism and conveyed by any suitable means preferably operating intermittently to the inserting station. During this operation, the container body is carried by a cup shaped counter pressure abutment member 8 which encompasses the lower and smaller end of the container body. In Figure 4, the abutment is a closed cup including upstanding walls that extend above the lower end of the container body. At the inserting station is mounted a reciprocal plunger 9. The face of this plunger which is directed toward the container body corresponds in size substantially to the inner dimensions of the closure forming face 3 of the closure blank. Between the uppermost position of the plunger 9 and the open upper and larger end of the container body 1 is formed a supporting die or channel 10. A flat closure forming blank 2 is fed forward across the top blade of this die by suitable means not shown to such an extent that the closure forming face 3 registers with the confronting face of plunger 9. Downward movement of the plunger 9 is now initiated and the closure blank 2 is pressed through the channel 10. This channel is so shaped that during the motion of the blank therethrough the flanges 5 are set up about score lines 4 and the corner parts of the closure blank are prefolded so that the closure attains the shape shown in Figure 3. During continued downward movement of the plunger 9, the flanges and corners of the closure make contact with the walls of the container body 1 due to the fact that the walls are of downwardly decreasing cross section. The walls are backed up by the tapered cup-shaped abutment 8 so that the the inserting movement of the plunger 9 conforms the rim or flange structure of the closure to the interior shape of the container of the body. By the time the plunger has reached its lower end position and the closure forming face 3 has abutted against the upper surface of the bottom of abutment 8, the closure has reached its final shape. During this insertion, the flanges 5 and the container body are pressed together under the influence of counter-pressure abutment means 8 cooperating with the plunger 9. A heating element 11 is mounted in the abutment 8 so that during this pressing of the flanges against the walls of the container the adhesive on one or both parts is rendered active and the parts are firmly joined together.

In order to pneumatically operate the plunger 9, the invention provides a pressure cylinder 12 having an upper closure 13 and an apertured lower closure 14. Upper and lower inlet and outlet openings are provided respectively at 15 and 15'. These alternatively serve for entrance and exit of air under pressure. Within the interior of the cylinder 12 is mounted a piston structure including the piston head 16 and a hollow piston rod 17. The hollow piston rod protrudes through the opening in the lower closure 14 and carries the plunger head 9.

A plurality of suction openings and passages 18 are formed on the lower face of plunger 9. These passages communicate with the interior of the hollow stem or rod 17. The suction openings are operable to hold the blank 2 to the face of the plunger during the preshaping and inserting steps. As indicated, the suction passages 18 communicate with the interior 19 of the piston rod 17. This piston rod constitutes a hollow cylinder. Within the interior of the piston rod is mounted a stationary guide rod 20 that is secured to upper closure cap 13. This guide rod 20 functions as a suction piston. The downward motion of the piston rod under pressure of air flowing through opening 15 generating a pressure less that atmospheric in the interior of the hollow piston rod 17 and in that space below the lower end of stationary rod 20 so that the closure blank is held onto the face of the plunger 9. A vent opening 21 is arranged in the wall of piston rod 17 below piston 16. In the lowermost position of the plunger 9, this vent opening is disposed beneath the lower end of guide rod 20. This destroys the partial vacuum existing in space 19 and releases the blank just prior to the return of plunger 9 to its starting position.

It is therefore clear that in the arrangement of Figure 4 the blank 2 is pushed through the forming channel 10 by plunger 9, the downward motion of the plunger establishing a suction condition which causes the face 3 of the blank to remain in contact with the front face of the plunger. The continued motion of the plunger moves the partially erected blank into the larger open end of the body 1 and as the cross sectional dimensions of the body diminishes the continued downward motion of the plunger causes gradual and progressive frictional engagement between the flanges 5 and the partially folded corner portions of the closure blank with the inner walls of the container body 1. The arrangement is such that by the time the plunger has pushed the blank into the container body until the face 3 of the blank abuts the bottom of the abutment cup 8 the closure flanges and corner structure have conformed to the interior shape of the bottom edge of the container body. During the final portion of this downward stroke the lower marginal portion of the container body and the abutting portions of the closure blank are subjected to pressure and heat due to the cooperation between the heated counter-pressure abutment 8 and the perimeter of plunger 9, thus assuring tight connection between the closure part and the container body.

Figure 5 illustrates diagrammatically a modified arrangement which includes means separate from the plunger for holding the face 3 of the closure blank against the front face of the plunger during the inserting operation. In Figure 5 the plunger 9' does not include suction means. In this modification, the base of the counter-pressure abutment 8 has an opening 23 in the central part thereof. An air nozzle 22 directs a jet of air under pressure through this opening in the direction opposite to the movement of the downward stroke of plunger 9'. The jet of air applies against the face 3 of the blank and holds it against plunger 9.

Following the aforedescribed manner of producing a container, depending on its intended use, it can be impregnated by immersion, for example, in a paraffin bath. After the container has been filled, unless it is to be used as an open tub or cup, the upper open end thereof can be closed by folding over portions of the upper part of the container body or by securing thereto any conventional upper closure means.

It is clear that the present invention provides a method of producing polygonal containers made of cardboard, paper or other carton forming material which consists in supporting an open ended, polygonal, downwardly tapering container body with its larger end exposed, preshaping a scored closure blank to partially erected condition in which a perimetrical flange and prefolded corner structure extends outwardly from the face of the blank, inserting the preshaped partially erected blank into the exposed larger open end of the body and moving the blank through the body to a position substantially flush with the opposite smaller end of the body so that the closure is forced into final shape in conformation with the interior of the body by gradual and progressive frictional engagement between the partially erected portions of the closure blank and the tapered walls of the body.

The invention further comprehends the application of pressure to the interior of the partially erected flange and corner structure during the final phase of the inserting movement by the cooperation between the periphery of the inserting plunger and the downwardly tapered walls of the counter-pressure abutment. The counter-pressure abutment is heated so that the mutually contacting portions of closure part and container body part at the bottom of the latter are subjected to heat and pressure to effect adhesion between the parts, the same having been provided with an adhesive coating.

What is claimed is:

1. Apparatus for producing tapered, polygonal containers from paper, cardboard or like carton forming material comprising cup-shaped supporting means for supporting an open ended downwardly tapered container body portion with the larger end exposed, said supporting means having a tapered wall structure bracing the smaller end of a container means defining a forming channel supported in spaced relation to and in alignment with the exposed end, said forming channel having surfaces for supporting a closure blank, said forming channel having a downwardly and inwardly tapered mouth and straight walls having interior dimensions substantially corresponding to the interior dimensions of the smaller end of the body, said closure blank having flange-forming portions and triangular shaped corner portions between the flanges, a plunger means having face dimensions substantially corresponding to the dimensions of the smaller end of the body and mounting means for the plunger means in alignment with the forming channel and container body portion whereby movement of the plunger means toward the body forces a closure blank through the forming channel to partially erect a flange and corner structure thereon and continued movement of the plunger means forces the partially erected blank into the container body portion to progressively engage the flange and corner structure of the blank with the braced interior of the body, the tapered wall structure of the supporting means extending axially of the body a distance substantially in excess of the axial extent of the flange and corner structure, and said plunger means having a length of movement such as to move the blank to a position substantially flush with the smaller end of the body whereby the flange and corner structure of the blank are pressed into conforming engagement with the braced interior of the smaller end of the body by the cooperation of the plunger with the tapered wall structure of the supporting means.

2. Apparatus for producing tapered, polygonal containers of paper, cardboard or the like carton forming material comprising the combination of means defining a forming channel adapted to support a scored closure blank and at least partially erect a perimetrical flange and corner structure thereon when the blank is moved therethrough, means in alignment with the channel and on the side thereof opposite the blank supporting side for supporting an erected, downwardly tapered, open ended container body with the smaller end and adjacent tapered wall structure encompassed and braced and the larger end exposed, said last-mentioned means including an uninterruptedly, downwardly and inwardly tapered wall structure and plunger means mounted for reciprocable movement through said channel and into the larger end of the body to a position substantially flush with the smaller end of the body whereby movement of the plunger toward the body forces a blank through the forming channel to at least partially erect a flange and corner structure thereon and continued movement of the plunger progressively engages the flange and corner structure of the braced

blank with the tapered interior of the body and finally presses the said structure into substantial conformation with the interior of the body at the smaller end thereof.

3. Apparatus as claimed in claim 2, in which at least one of said blank flange and corner structure and the interior of the smaller end of the body have heat and pressure activatable adhesive thereon and said second mentioned means includes means for heating the same whereby during the final phase of movement of the plunger means the interengaged flange and corner structure and body interior are subjected to heat and pressure to activate the adhesive to bind them together.

4. Apparatus for producing tapered, polygonal containers of paper, cardboard or the like carton forming material comprising the combination of means defining a forming channel adapted to support a scored closure blank and at least partially erect a perimetrical flange and corner structure thereon when the blank is moved therethrough, supporting means in alignment with the channel and disposed on the side thereof opposite the blank supporting side for supporting an erected, downwardly tapered, open ended container body with the smaller end and adjacent tapered wall structure encompassed and braced and the larger end exposed, plunger means mounted for reciprocable movement through said channel and into the larger end of the body to a position substantially flush with the smaller end of the body, means cooperable with the plunger means for holding the blank against the face of the plunger during insertion comprising an air jet directed toward the face of the plunger and the supporting means in alignment with the channel for supporting the body including a base having an aperture therein permitting passage of the air jet whereby movement of the plunger toward the body forces a blank held against the face of the plunger through the forming channel to at least partially erect a flange and corner structure thereon and continued movement of the plunger progressively engages the flange and corner structure of the blank with the braced, tapered interior of the body and finally presses the said structure into substantial conformation with the interior of the body at the smaller end thereof.

5. Apparatus for producing tapered, polygonal containers of paper, cardboard or the like carton forming material comprising the combination of means defining a forming channel adapted to support a scored closure blank and at least partially erect a perimetrical flange and corner structure thereon when the blank is moved therethrough, supporting means in alignment with the channel and disposed on the side thereof opposite the blank supporting side for supporting an erected, downwardly tapered, open ended container body with the smaller end and adjacent tapered wall structure encompassed and braced and the larger end exposed, plunger means mounted for reciprocable movement through said channel and into the larger end of the body to a position substantially flush with the smaller end of the body, whereby movement of the plunger toward the body forces a blank through the forming channel to at least partially erect a flange and corner structure thereon and continued movement of the plunger progressively engages the flange and corner structure of the blank with the braced tapered interior of the body and finally presses the said structure into substantial conformation with the interior of the body at the smaller end thereof, pneumatic means for actuating said plunger means, suction means for holding the blank against the face of the plunger means during insertion, and said suction means be operable in response to the forward stroke of said plunger means.

6. Apparatus for producing tapered, polygonal containers of paper, cardboard or the like carton forming material comprising the combination of means defining a forming channel adapted to support a scored closure blank and at least partially erect a perimetrical flange and corner structure thereon when the blank is moved therethrough, supporting means in alignment with the channel and disposed on the side thereof opposite the blank supporting side for supporting an erected, downwardly tapered, open ended container body with the smaller end and adjacent tapered wall structure encompassed and braced and the larger end exposed, plunger means mounted for reciprocable movement through said channel and into the larger end of the body to a position substantially flush with the smaller end of the body, whereby movement of the plunger toward the body forces a blank through the forming channel to at least partially erect a flange and corner structure thereon and continued movement of the plunger progressively engages the flange and corner structure of the blank with the braced tapered interior of the body and finally presses the said structure into substantial conformation with the interior of the body at the smaller end thereof, said plunger means includes a hollow stem, a piston mounted on the stem remote from the plunger face, a cylinder surrounding the piston, means for admitting and exhausting air into and out of the cylinder at the opposite ends thereof to reciprocate the piston and thereby the plunger means, said cylinder including a fixed guide rod extending into the cylinder from the end thereof remote from the face of the plunger, said guide rod being received in said hollow stem and being shorter than the stem, conduit means communicating between the face of the plunger and the hollow stem whereby movement of the piston and thus the hollow stem and plunger away from the guide rod establishes suction through said conduit means.

7. Apparatus as claimed in claim 6, and said hollow stem having a vent opening therein adjacent the piston whereby when the plunger means is fully extended said vent opening is beyond the level of the end of the stationary guide rod so as to provide communication between the interior of the stem and the cylinder.

8. Apparatus for producing tapered, polygonal containers of paper, cardboard or the like carton forming material comprising a rigid cup-shaped means for supporting and encompassing the smaller end of a tapered, polygonal container body and including a tapered wall structure and a base supporting and bracing the body against outward deflection at the smaller end thereof, said tapered wall structure extending uninterruptedly from the mouth to the base of said cup-shaped means, a deflecting channel supported adjacent the larger end of the body and adapted to partially erect a scored flat blank into a closure cup having perimetrical flange and triangular-shaped corner structure extending outwardly of a closure forming face having dimensions corresponding to the interior dimensions of the smaller end of the body, said deflecting channel means having a lower rim portion having internal dimensions corresponding substantially to the internal dimensions of the smaller end of the body and being spaced above the larger end of the body, a cylinder supported beyond the said channel and including opposite ends, the end adjacent the channel having an aperture therein, a piston means within the cylinder, a stem means extending from the piston means through said aperture, a plunger carried by the stem means having face dimensions substantially corresponding to the internal dimensions of the smaller end of the body, means for supplying fluid under pressure to the cylinder on opposite sides of the piston means to move the same and thus the plunger from an initial position beyond the channel, through the channel and into and through the body to a position substantially flush with the smaller end thereof and against said base and to return the plunger to its initial position and means for maintaining the blank in contact with the plunger during downward movement of the plunger whereby movement of the piston from the initial position with a blank on the channel forces the blank through the channel to partially erect the flange and corner structure during movement through the channel and the continued movement of the piston forces the blank into the body to engage exterior of the partially erected flange and corner structure with the

interior of the body and to finally shape the flange and corner structure in conformation to the interior of the body by progressively increased frictional engagement with the interior of the braced body.

9. A method of producing polygonal containers of paper, cardboard or the like carton forming material and which containers have a downwardly tapering shape and an inserted closure at the smaller end thereof comprising forming a closure blank having a closure face forming portion defined by fold lines and closure flange-forming portions extending outwardly from the respective fold lines and cutting off the corners of the blank diagonally at the corners between the outer edges of adjacent flange-forming portions, supporting an open ended, polygonal, downwardly tapered container body with its larger end exposed, only partially preshaping said scored closure blank by partially erecting the perimetrical flange structure and prefolded corners thereon, allowing the flange and the corner structure to move outwardly and then inserting the still partially preshaped and partially erected blank into the exposed larger open end of the body and moving the inserted blank through the body to a position substantially flush with the opposite smaller end of the body while effecting final shaping of the closure flange structure and prefolded corners in conformation with the interior of the body by sliding engagement of the partially erected blank with the tapered interior of the body while bracing the smaller end of the body and with the movement of the closure blank during preshaping forming fold lines at each corner extending downwardly and inwardly toward one another and the final movement of the blank uniformly distributing the material of the corners against the interior wall structure of the body to effect a tight corner joint.

10. In the production of polygonal containers of paper, cardboard or the like carton forming material, the improvements comprising supporting an open ended polygonal container body of downwardly tapering shape with its larger end exposed and its smaller end braced along planes parallel to the walls thereof, forming a closure blank having a closure face forming portion defined by fold lines and closure flange-forming portions extending outwardly from the respective fold lines and cutting off the corners of the blank diagonally at the corners between the outer edges of adjacent flange-forming portions, preshaping said flat closure blank by partially erecting said flange structure including partially prefolded corners thereon, the bracing of the smaller end extending a distance beyond the end substantially in excess of the height of the flange structure and partially prefolded corners and inserting the preshaped closure blank into the exposed end of the body and moving the blank through the body to a position substantially flush with the opposite smaller end so as to conform the partially erected blank to the interior shape of the smaller end of the body by gradual progressive frictional engagement between the exterior of the blank flange structure and partially prefolded corners and the interior of the body braced wall structure.

11. In the production of polygonal containers as claimed in claim 10, and applying pressure to the interior of the partially erected flange and corner structure of the blank during the final phase of the inserting movement.

References Cited in the file of this patent

UNITED STATES PATENTS

2,415,625	Coker	Feb. 11, 1947
2,558,456	Palmer	June 26, 1951
2,665,616	Jungmayr	Jan. 12, 1954
2,678,591	Fleming et al.	May 18, 1954
2,697,969	Ahlmeyer et al.	Dec. 28, 1954