Feb. 15, 1938. J. M. HOTHERSALL 2,108,064

METHOD OF MAKING CONTAINER CLOSURES

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Fig. 1

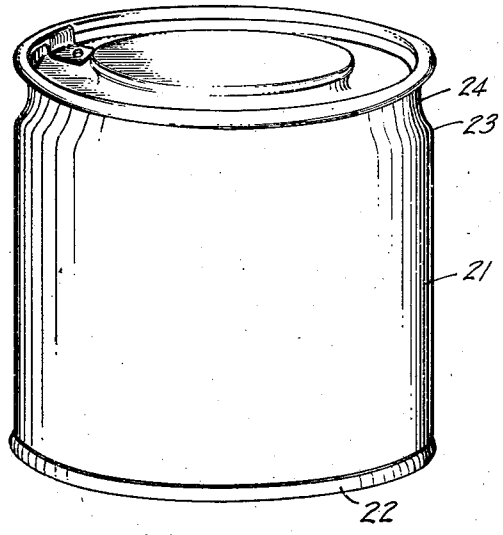


Fig. 2

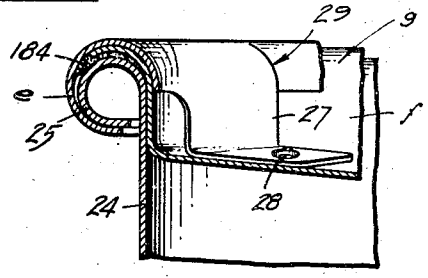
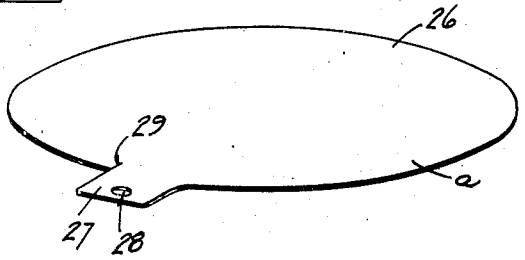


Fig. 3



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METHOD OF MAKING CONTAINER CLOSURES

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Fig. 4

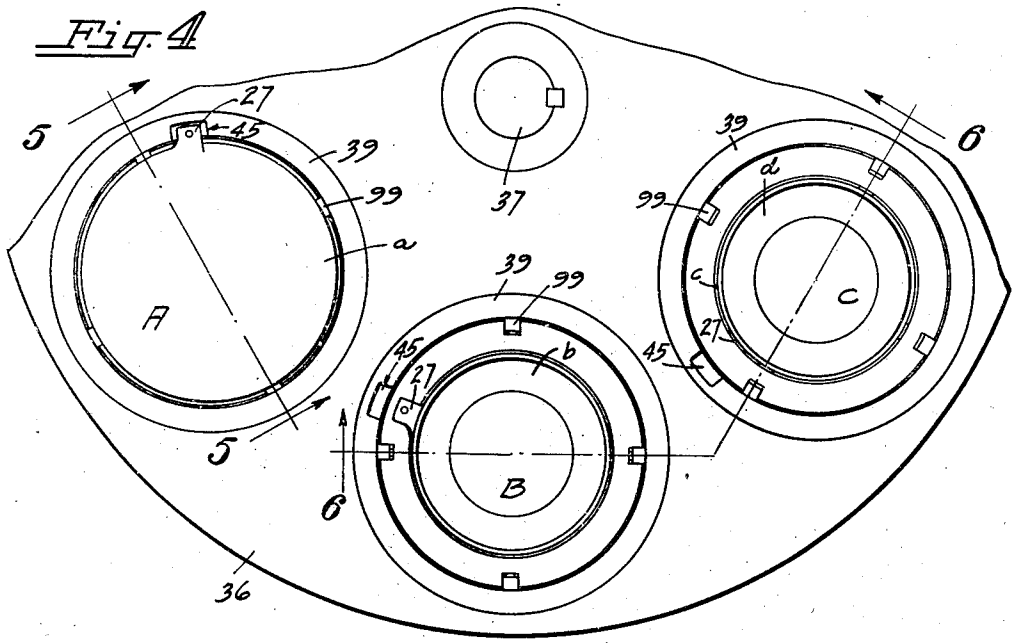
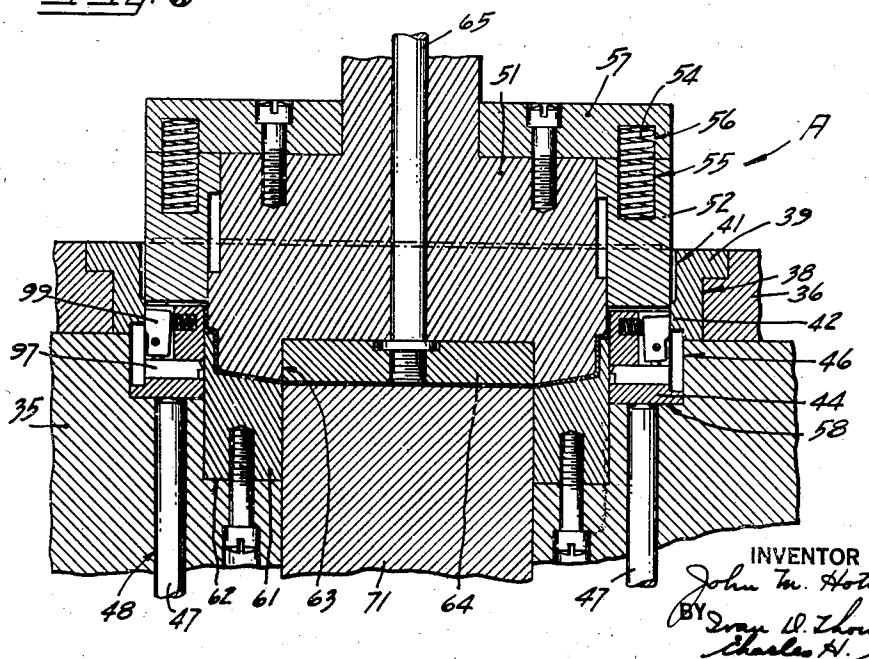


Fig. 5



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METHOD OF MAKING CONTAINER CLOSURES

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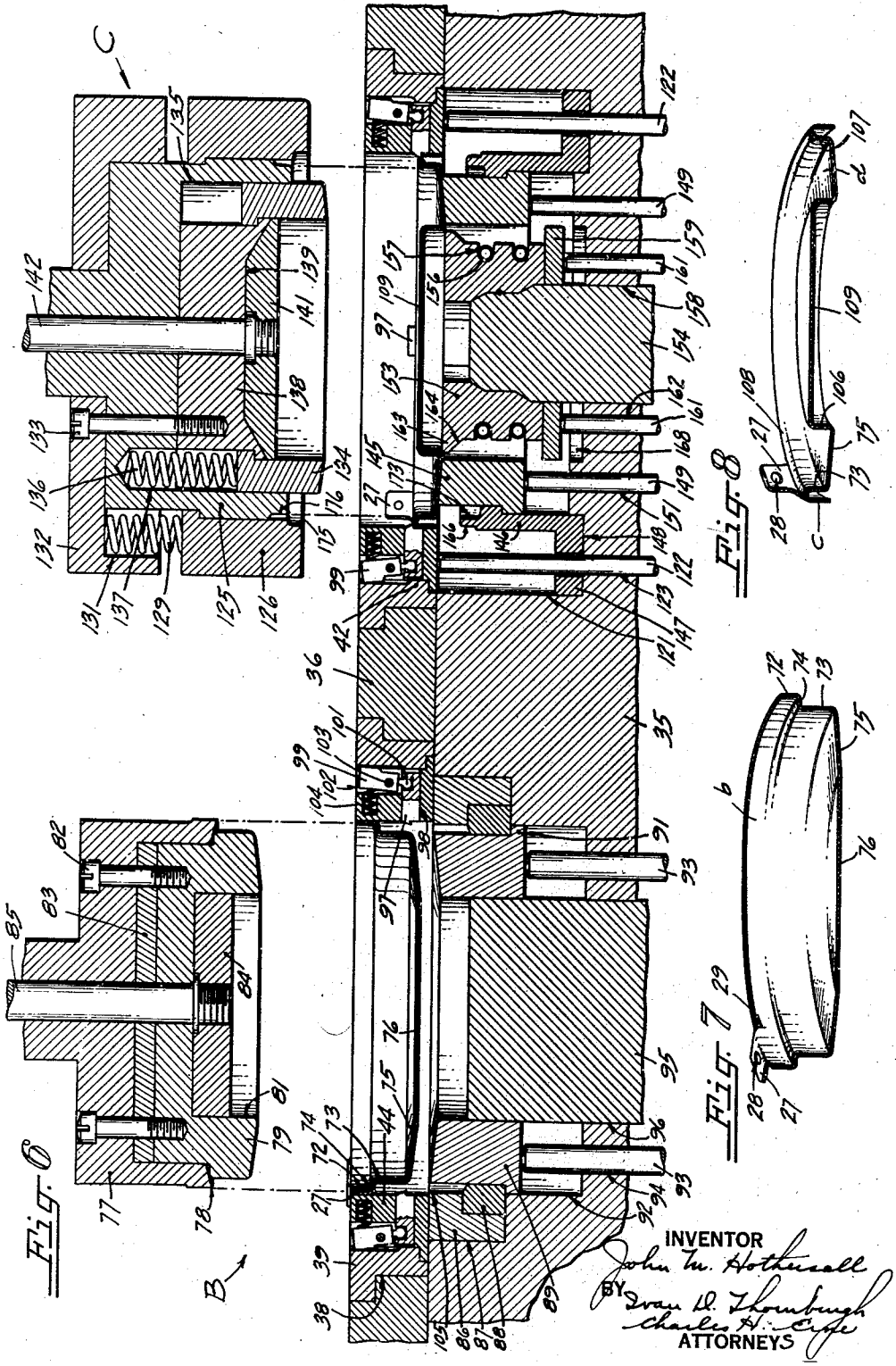


Fig. 6

Fig. 8

Fig. 7

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Fig 12

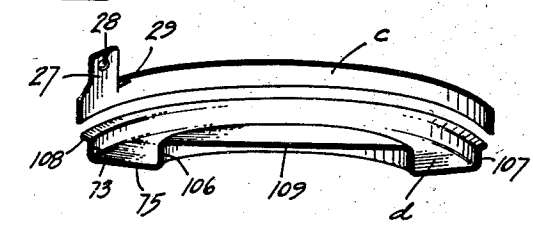


Fig 9

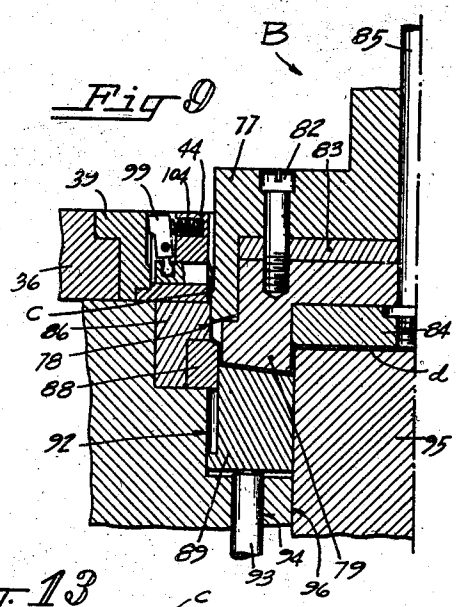


Fig 10

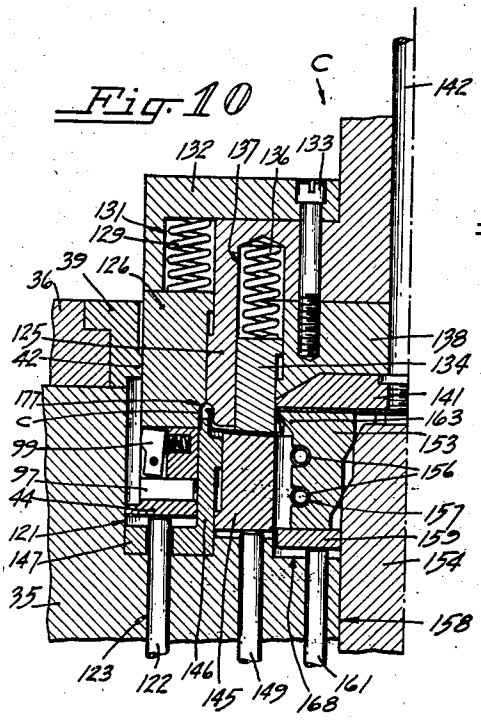


Fig 13

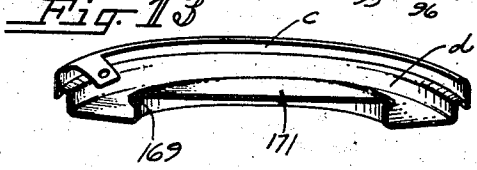


Fig 11

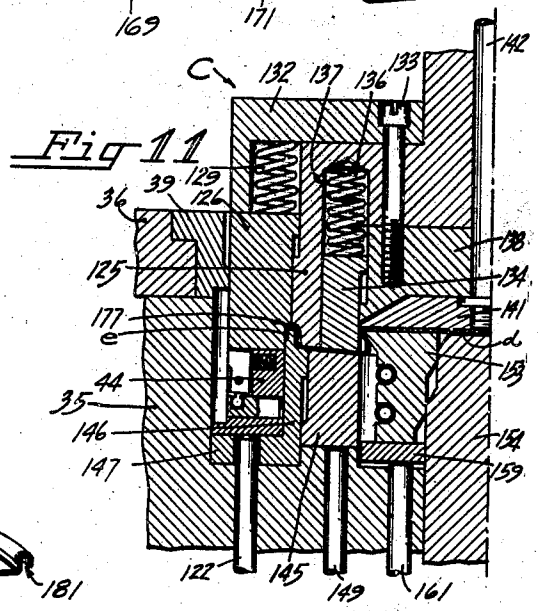
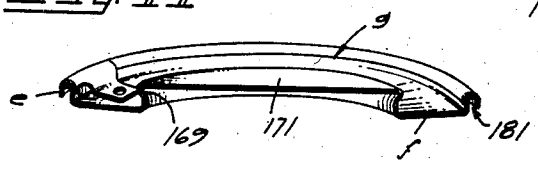


Fig 14



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Fig. 15

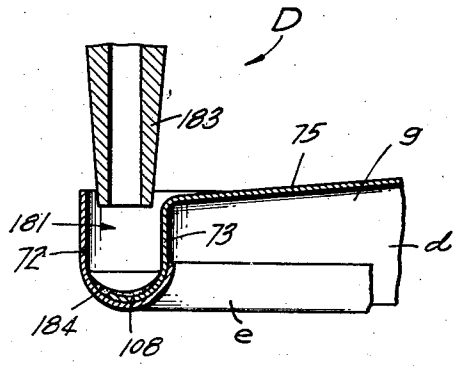
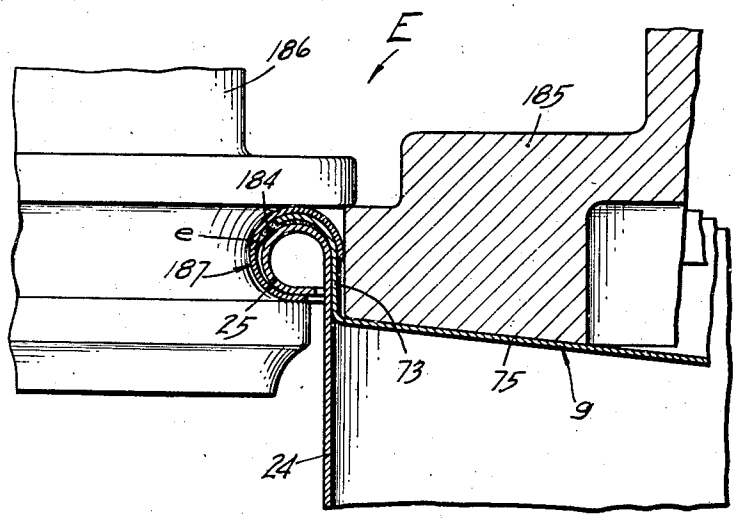


Fig. 16



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UNITED STATES PATENT OFFICE

2,108,064

METHOD OF MAKING CONTAINER CLOSURES

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Application June 29, 1934, Serial No. 733,147

9 Claims. (Cl. 113—121)

The present invention relates to a method of producing container closures and is particularly directed to producing a multipart closure from a one piece blank including a cover and a tearable sealing band which has no projecting parts outside of the container walls when applied in container sealing position.

In my United States Patent No. 1,821,157 issued September 1, 1931, I have disclosed a multipart container closure which is produced from a one piece blank and which includes a cover and a tearable sealing band, the latter having a tearing tongue on the outside of the container side wall by means of which the sealing band is severed and the cover is released from sealing position when the container is opened.

In some instances a container having a tearing tongue which extends outside of the container side walls has been found to be unsatisfactory and is liable to be inadvertently engaged and the container prematurely opened and it is an object, therefore, of the present invention to provide in a series of method steps a closure of this general type but one having a tearing tongue fully confined within the cover and with no projecting parts outside of the container walls.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Fig. 1 is a perspective view of one form of container sealed by a closure made and applied according to the method steps of the present invention;

Fig. 2 is an enlarged fragmentary sectional detail showing the container and closure in part and in fully sealed position;

Fig. 3 is a perspective view of a blank from which the multipart closure is formed;

Fig. 4 is a fragmentary top plan view of one form of apparatus for carrying out the method steps of the present invention;

Fig. 5 is a sectional view taken substantially along the line 5—5 in Fig. 4;

Fig. 6 is a sectional view taken substantially along the broken line 6—6 in Fig. 4, showing cutting and assembling die units in detail;

Fig. 7 is a perspective view of a cup member containing the closure parts, this member being produced in the forming die unit shown in Fig. 5;

Fig. 8 is a similar view showing a further step in the production of the closure parts as produced in the die unit shown at the left in Fig. 6;

Fig. 9 is a fragmentary sectional view of the cutting die unit illustrated at the left of Fig. 6 showing the parts in a different position;

Figs. 10 and 11 are fragmentary sectional views of the assembling die unit illustrated at the right of Fig. 6, and showing different positions of its operating parts;

Fig. 12 is a perspective view of the cup member after it has been cut and reshaped on the die unit of Fig. 9;

Fig. 13 is a similar view showing the relation of the severed parts at an intermediate step during the assembling operation as performed in the die unit of Fig. 10;

Fig. 14 is a similar view showing the assembled parts after operation of the die unit illustrated in Fig. 11;

Fig. 15 is a fragmentary sectional detail of the assembled parts on an enlarged scale and further showing the application of a sealing compound thereto; and

Fig. 16 is a fragmentary sectional view of the completely sealed container showing parts of a chuck and a seaming roller in cooperative relation as they operate to effect such sealing.

In the method steps of the present invention a pre-cut flat blank of sheet material *a* (Fig. 3) preferably circular in shape and having a laterally projecting tearing tongue is positioned over a pocket of an intermittently revolving dial of a punch press or the like (Fig. 4). This dial carries the blank and its subsequently altered forms through a series of stations where various operations are performed on it.

The blank is first presented to a forming station A where it is drawn into a stepped cup member *b* (Fig. 7) having its tearing tongue projecting outwardly and substantially at right angles to its exterior side wall.

This cup member, within the pocket of the dial, is carried to a cutting station B. Here a cutting element descends from above and first cuts through the stepped wall section of the cup producing two parts after which one of them is at once partly reshaped. The combined final operations performed at this station divide the cup member into an outer ring *c* having a vertical wall section, and an inner formed cover part *d* having an outwardly bent flange (Fig. 12). This action also bends the tearing tongue, attached to the ring *c*, into vertical position.

With parts *c* and *d* still within the pocket, the dial now carries them to an assembling station C. At the assembling station the raised panel in the center of the cover part *d* is expanded into a handle grip. The ring *c* is also reshaped by bending a portion of it inwardly into a flange and compressing an edge into smaller diameter where it projects over the flange of the cover part *d* (Fig. 13). Further action brings these parts together and produces an inverted U-shaped channel in the combined members (Fig. 14).

The ring *c* is thus converted into a sealing band *e* and the cover part *d* into a container cover *f* and the two temporarily united now form

a multipart closure *g*. It will be observed by reference to Fig. 14 that the tearing tongue extends in and down, where it conforms to the shape of the channel, and then extends horizontally against the top of the cover wall being wholly confined within the boundaries of the closure. The closure *g* is now ejected from the dial pocket of the punch press.

If a hermetic seal is desired any suitable lining or packing material may be used in the channel of the closure. For the lining step the closure is inverted and passed into a station D (Fig. 15) of a lining machine or the like at which a sealing compound or its equivalent is deposited in the U-shaped channel.

The closure with or without a packing material is now applied to the top of a container and may then be passed into a closing station E (Fig. 16) of a seaming machine or the like. Here the exterior wall section of the sealing band *e* is bent around the top edge of the mouth of the container where it holds the cover in container closing position.

To illustrate a preferred use for a multipart closure provided by the method steps of the invention there is illustrated in the drawings a conventional type of container having a cylindrical or other form of tubular body 21 (Fig. 1) suitably connected with a closed bottom 22. The upper part of the body wall is necked-in at 23 to provide a smaller top end 24 (see also Fig. 2) which terminates in an outer curled edge 25. It is this open end of the container that is closed by the application of closure parts formed from the one piece blank *a* (Fig. 3) as will now be fully described.

The blank, of suitable size and dimension, is cut or blanked from sheet material, this being a well known step in the manufacture of can ends and the like. This blank comprises a flat circular disc 26 having a tongue extension 27 which is perforated at 28 and having a tearing slit 29 at the juncture of its periphery and one side of the tongue extension 27.

Such a blank is subjected to a series of operations as has already been suggested which are carried out by die mechanisms the principal parts of which are shown in the drawings. These mechanisms are in part embodied in a stationary bolster plate 35 (Figs. 5 and 6) which may rest on the frame or bed of a suitable punch press or the like. A dial 36 (see also Fig. 4) has movement over the top of this bolster plate and is keyed to a central vertical shaft 37 which is journaled in the frame of the press. This shaft is connected to any suitable source of power for rotating the dial in an intermittent step by step movement.

The dial 36 is provided with a series of spaced cylindrical openings 38 each of which is lined with a tight fitting bushing 39. Each bushing has two inside diameters, the upper part 41 being the larger and its wall curving inwardly to join with an annular shoulder 42 of the smaller diameter. A blank holding ring 44 is slidably disposed within each bushing and during movement of the dial 36 its top surface is flush with the top of the dial. The wall of the opening 41 of each bushing 39 is cut back in one place into a vertical notch 45 (Fig. 4) and when a blank *a* is first placed into the dial it is centered over the holding ring 44 with its tongue 27 aligned over the vertical notch.

The first step which will now be explained is with the blank at the drawing station A. Here it is subjected to a drawing operation by means of a punch and die mechanism, the principal parts of which are illustrated in Fig. 5. The ring 44 which holds the blank now being considered is directly over die elements disposed in an opening 46 formed in the bolster plate. In this position the ring is directly over sliding pins 47 which are located in vertical bores 48 formed in the bolster plate 35.

A punch element 51 is directly above the holding ring. The punch element carries a pressure ring 52 which normally projects below the face of the punch. These parts 51, 52 are shouldered for cooperation in limiting the relative movement between them. Compression springs 54 are located in spring pockets 55 which are formed in the upper part of the pressure ring and the springs also extend up into pockets 56 which are formed in a punch plate 57 which is secured to the top of the punch and which encircles its shank.

The punch element and parts carried thereby descend for the drawing operation, the pressure ring 52 first engaging the blank *a* adjacent its periphery and then pressing it against the top of the holding ring while both blank and pressure ring move down into the bushing opening 41. The holding ring 44 moves down into the die opening 46. A shoulder 58 which constitutes the bottom wall of the opening 46 limits this movement of the rings and the blank.

Continued downward travel of the punch is thereafter taken up in the pressure ring by compression of the springs 54. The face of the punch engages the unsupported central part of the blank and presses it into a stationary die ring 61 which is secured in a recess 62 formed in the bolster plate 35.

The punch and die ring faces are correspondingly shaped to cooperate in drawing the blank into its first drawn form, that of the stepped cup member *b* best shown in Fig. 7. The central lower face of the punch is recessed at 63 (Fig. 5) and a knockout pad 64 is seated in the recess in the lower face of the pad, during the drawing action now being considered, providing a continuation of the lower face of the punch. Knockout pad 64 is mounted on the lower end of a stem 65 and both pad and stem move down as a unit with the punch.

In like manner the upper drawing face of the ring 61 is continued across its center opening by the upper face of a plunger 71 which is mounted for sliding movement within the ring but during the drawing action on the blank *a* this plunger is held stationary with the ring. At the completion of the drawing stroke when the cup member *b* is fully formed, the latter is held between the punch 51 and pad 64 from above and the ring 61 and plunger 71 from below. This is the position of Fig. 5.

Considering the different parts of the newly formed cup member *b* it will be observed that it is of stepped construction having concentric walls 72, 73 joined by a right angled connecting wall 74. The smaller wall 73 merges into an angular section 75 inside of which is a center panel 76. The various parts will be again referred to in the description that follows.

As the punch 51 returns on its upward stroke the cup member *b* remains in the holding ring 44 and after the springs 54 have expanded and the pressure ring 52 has been picked up with the punch, the holding ring 44 with its member *b* follows up and returns into its place in the dial

36. At the same time the plunger 71 moves up and these combined actions strip the cup *b* from the die ring 61. The knockout pad 64 thereupon operates (moves down from its recess within the punch 51) and frees punch and cup *b* leaving the latter in its pocket within the holding ring 44.

The dial is now rotated in a second step of movement and conveys the cup member *b* in its holding ring to the station B where the cup member is positioned over an opening in a die part of a punch and die mechanism shown at the left in Fig. 6.

The punch mechanism comprises a punch element 77 which has an annular cut edge 78 and is located directly above the die mechanism. The punch element carries an annular pilot plate 79 the outer wall of which is set back from the cut edge in a smaller diameter and has a central inner recess 81 formed in its bottom face. It is bolted at 82 to the punch a washer 83 being interposed between the parts.

The punch element 77 and plate 79 also carry a knockout pad 84 which is threadedly secured to the lower end of a stem 85 which extends up through the punch element, the pad being seated in the recess 81.

The die mechanism comprises a die ring 86 which is seated in an annular recess 87 formed in the bolster plate 35 and this ring holds an inner ring 88 in place within the recess.

A draw ring 89 is slidably located inside of the inner ring 88 and is formed with a projecting lower ridge 91 which engages against the bottom edge of the inner ring when the draw ring is in its raised position (Fig. 6) the inner ring thus forming a limit stop for the draw ring. The bolster plate is counter-bored at 92 and provides a recess for the draw ring when depressed.

Draw ring 89 is supported on the upper ends of spring or rubber held pins 93 which slide in vertical bores 94 formed in the bolster plate, this being a usual construction for dies of this nature. A stationary anvil 95 is located inside of the draw ring and is rigidly supported at 96 in the bolster plate 35.

With the punch and die parts in the position shown on the left of Fig. 6 and the cup member *b* resting in its holding ring 44 cutting or severing and further forming operations take place as the punch mechanism moves down and cooperates with the die mechanism.

The pilot plate 79 first enters the cup member *b*, its lower surface engaging the angular face 75 of the cup and the bottom of the cut edge 78 coming against the wall 74. The pilot plate is thus centered inside the wall 73 and the punch element is inside of the wall 72.

The cup member accordingly moves down with the descending punch parts leaving its place within the holding ring and sliding down in its pocket until the cup wall 75 is clamped between the pilot plate 79 and the die draw ring 89. During this initial lowering of the cup its tongue 27 is wiped down over the edge of the holding ring and is bent up into a vertical position in alignment with the cup wall 72.

Continued descent of the punch parts next depresses the draw ring 89 as the cup wall 74 is brought down against the die ring 86 and its center wall engages the stationary anvil 95. This constitutes a second step movement in the descent of the cup member at which time its upper edge snaps under the notched ends of holding fingers 97 which are carried in the holding ring 44.

Each finger 97 is slidably mounted in a horizontal slideway 98 cut through the wall of the holding ring. A vertically disposed lever 99 is provided for each finger, its lower end loosely engaging the finger in a ball and socket joint 101. Each lever has slight rocking movement in a slot 102 cut in the holding ring and this slot merges at its bottom end with the finger slideway 98.

The lever 99 is also pivotally mounted on a pin 103 held in the ring and a spring 104 which is housed in a suitable horizontal pocket presses out on the upper end of the lever normally holding the finger in the position shown in Fig. 6, the upper and outer end of the lever striking against the inside wall of the bushing 39. The springs 104 yield when the upper part of the cup member *b* snaps past the notched finger ends as just described.

Immediately following this stage in the descent of the punch parts the cutting and severing action takes place, the cup member *b* being divided into two parts as the cut edge 78 of the punch element 77 passes through the cup wall 74 and cooperates with an inner cutting surface 105 of the die ring 86. The ring *c* (Fig. 12) is one of the parts resulting from the severing action and is not further altered at this station B. An uncompleted cover part *d* is the other part resulting and this is further drawn and shaped as the punch mechanism continues into the final stages of its descent. This will now be considered.

At the time the preceding cutting step takes place, the panel wall 76 of the cup member has reached the stationary anvil 95. This anvil now holds the cup wall against further movement as the punch plate 79 pressing down on the cup wall 75 further depresses the draw ring 89. The inner part of the wall 75 thereupon is drawn into a vertical wall 106 (Fig. 12) as the metal pulls over between the parts 79, 89 and this draws the lower part of the cup wall 73 into a new outer wall 107, this reshaping taking place within the punch recess 81.

The final shaping action in this series of movements at station B on the cover *d* is completed as the punch mechanism reaches the bottom of its stroke, the parts then being in the position of Fig. 9. What was the horizontal wall 74 has now been altered into a flange 108 (Fig. 12) as this section of the closure member is drawn into an inclined position by being pulled against the upper inner corner of the inner ring 88. The old panel wall 76 merging into the right angled wall 107 now constitutes a central panel wall 109. This completes the operations at station B.

The punch on its return stroke carries with it the formed cover part *d*. At the same time the fingers 97 hold the ring *c* in place adjacent to and inside of the cutting surface 105. The knockout device now comes into operation the pad 84 being lowered to eject the cover part *d* from the punch and leave it within the holding ring pocket where it is just inside of and adjacent to the ring *c* (Fig. 8).

The dial is now rotated through a third step movement which conveys the members *c* and *d* in their holding ring 44 to the station C where they are positioned in alignment with a punch and die mechanism shown at the right of Fig. 6. The holding ring is directly over die elements disposed in an opening 121 formed in the bolster plate 35. In this position the holding ring is directly over sliding support pins 122 which are

located in vertical bores 123 formed in the bolster plate.

The punch mechanism comprises a punch element 125 which is located directly above the die mechanism and which carries an annular outer pressure ring 126 which normally projects below the face of the punch. These parts are shouldered for cooperation in limiting relative movement between them. Compression springs 129 are located on top of the outer pressure ring and extend up into spring pockets 131 formed in the bottom of a recessed plate 132 which fits over the top of the punch and around its shank, being held in position by screws 133.

The punch element 125 also carries an annular inner pressure ring 134 which is disposed in a central bore 135 formed in the bottom of the punch. The inner pressure ring normally projects below the face of the punch and also below the bottom of the outer pressure ring 126. Compression springs 136 are located on top of the inner pressure ring and extend up into pockets 137 which are formed in the punch.

The inside of the inner pressure ring is shouldered and slidingly cooperates with a shouldered plate 138 which is also centrally located in the punch bore 135 and is also held in place by the screws 133. The bottom of the plate is formed with a recess 139 which houses a knockout pad 141 threadedly secured to the lower end of a stem 142 which extends up through the pad and the punch element.

The die mechanism comprises a draw ring 145 which is centrally confined within the opening 121 by a die ring 146. These two rings are shouldered for cooperation in limiting relative movement between them. The bottom of the die ring is formed with an annular base 147 which is secured in an annular groove 148 formed in the bolster plate 35 at the bottom of the opening 121. The ring base is provided with clearance holes for the support pins 122. The draw ring is also supported on yieldable pins 149 located in vertical bores 151 formed in the bolster plate.

An expanding die unit is located inside of the draw ring 145. The unit comprises a plurality of die sectors 153 which are grouped in a circle around the upper end of a vertical cam plug 154, and are yieldingly held together by a pair of encircling coiled springs 156 which are located in annular spaced grooves 157 cut in the exterior surfaces of the sectors.

The cam plug is rigidly held in a drive fit opening 158 in the bolster plate 35. The sectors rest on top of a ring plate 159 which is supported on yieldable pins 161 located in vertical bores 162 formed in the bolster plate.

The top of each sector 153 is enlarged in cross section and extends out in an overhanging arcuated projection 163 having a sloping bottom wall 164. The inner surface of each sector in section is formed with cam steps having alternate vertical and sloping wedge surfaces which correspond with like vertical and sloping surfaces formed on the upper end of the cam plug 154. This cam construction is common in expanding dies of this type.

With the punch and die parts in the position shown on the right of Fig. 6, with the ring *c* held in the holding ring 44 and the cover part *d* supported on the draw ring 145 further bending operations take place on both closure parts *c*, *d* as the punch mechanism moves down and cooperates with the die mechanism.

The outer pressure ring 126 first engages the top of the holding ring 44 and moves it down into the opening 121. The ring *c* still held from above by the holding fingers 97 accordingly moves down with the holding ring and moves over the top edge of the die ring 146 engaging in an annular groove 166 cut in its outer upper wall.

By this time the levers 99 of the holding fingers 97 engage the annular shoulder 42 of the bushing 39 and as the holding ring continues to descend the levers pivot on their pins 103. This draws the holding fingers back and out of engagement with the ring *c* leaving it resting on the die ring 146. In this position of the ring *c* an upper part and also the tongue 27 project up above the top of the die ring.

Continued descent of the punch parts first brings the face of the inner pressure ring 134 against the angular wall 75 of the cover part *d*, with its raised central panel 109 extending inside of the pressure ring, and then both the cover part *d* and the draw ring 145 move down with the descending punch. The panel wall 109 strikes against the top of the expanding die mechanism and the cover part *d*, the draw ring 145 and the inner pressure ring 134 come to a momentary halt while the other punch parts continue to descend, the relative movement between stationary and moving parts being taken up by the springs 136.

Immediately following and during the continued downward punch movements, the expanding of the central panel section 109 of the cover part takes place. By this time the knockout pad 141 has engaged the top of the cover panel and the downward pressure effective on the cover part and draw ring causes resumption of their descent and at the same time the sectors 153 are depressed, the plate 159 moving down into a recess 168 formed in the bolster plate 35.

This action causes the vertical and sloping cam surfaces of the sectors 153 to slide over the corresponding surfaces of the sationary cam plug 154. The sectors spread out as a result pressing their projections 163 into the vertical wall 106 of the cover. This vertical wall is accordingly transformed into a reversed curved and inwardly bent side wall 169 which provides a handle grip 171, as shown in Fig. 13.

The draw ring and its associated parts have now reached the position shown in Fig. 10, and the cover part *d* has moved down to where its outer wall section 73 and a portion of its angular wall 75 are partially within an annular recess 173 formed in the top of the die ring 146. In this position the wall 73 engages the vertical wall of the recess and is parallel with and slightly lower than the ring *c* then resting in the outside groove 166 of the die ring. The flange 108 of the cover part overhangs the top of the die ring. The punch parts are not yet at the end of their descent.

During this time and while the panel section is being reformed as just described the positions of the holding ring 44 and the outer pressure ring 126 have changed. This will first be considered before taking up the final actions of the punch and die mechanisms.

When the ring *c* was deposited in the groove 166 of the die ring 146 during the descent of the holding ring 44, the latter together with the pressure ring 126 of the descending punch continued their downward movement. The springs 129 backing up the outer pressure ring are weaker than the springs or rubber acting through the supporting pins 122 which back up the holding

ring 44 and accordingly the springs 129 yield at this stage of operation permitting the punch plate 132 to catch up with the pressure ring. This closes the gap between the top of the pressure ring and the bottom of the plate.

After this is done the descending punch parts force the holding ring 44 down further into the die opening 121 bringing the parts into the position shown in Fig. 10. In reaching this position the pressure ring 126 moves over the ring *c* resting on the die ring 146.

The inner lower corner of the pressure ring is cut back in an annular groove 175 (Figs. 6 and 10) and the outer lower corner of the punch element 125 is also cut away and an annular groove 176 is formed adjacent this corner. The grooves 175, 176 align when the pressure ring 126 seats against the plate 132 and an inverted U-shaped annular channel 177 (Fig. 6) results.

Descent of the aligned punch parts 125, 126 in coming into the position of Fig. 10 causes the upstanding tongue 27 of the stationary support ring *c* to move around and bend over as it follows the curved upper wall of the channel 177. This is followed and accompanied by an inward curling of the upper edge of the ring *c* which also starts moving around the curved top wall of the U-shaped channel. By the time the parts have reached the position of Fig. 10 tongue 27 has been bent into the shape illustrated in Fig. 13 and the upper edge of the ring has been inwardly flanged as shown.

The final operation at station C is completed as the punch parts and certain of the die parts move from the position illustrated in Fig. 10 into that shown in Fig. 11, both the ring *c* and the cover part *d* at such time being further reformed, shaped and connected.

In this final descent of the punch and die parts the former move as a unit since all springs have been fully compressed and the parts have been brought into solid cooperation. The holding ring 44 is moved down with its support rods 122 until it bottoms on the annular base 147 of the die ring 146. Both draw ring 146 and the die sectors 153 together with the supporting rods 149 and the ring plate 159 and its yielding pins 161 move down until the draw ring bottoms on the bolster plate 35.

The tongue 27 of the ring *c* and its inner flanged edge are caused to further flow along the upper walls of the descending channel 177 as the punch parts 125, 126 move down over the ring. This also fully seats that portion of the cover parts within the die groove 173 which heretofore partially entered the groove. This is followed by a bending of the cover flange 108 outwardly as it moves inside of the flange curl of the ring *c*.

At the bottom of the stroke the adjacent parts of ring *c* and cover part *d* are tightly compressed between the upper edge of the die ring 146 and the upper wall of the channel 177. This provides the finally formed sealing band *e* and container cover *f* which are temporarily united into the resulting multipart closure *g*. This closure has an annular channel 181 formed by the curved cooperating walls of the parts *e*, *f* (Fig. 14). At the same time the tongue 27 is finally altered in shape so that it rests against the upper surface of the cover part, as shown in Fig, 14, being completely contained within the closure.

On the return stroke of the punch parts, the knockout pad 141 holds the closure *g* in the position shown in Fig. 11 until the pressure ring springs 129, 136 are fully expanded. The knockout pad then also raises while the die sectors 153 are pushed up and off of the wedge and cam surfaces of the stationary cam plug 154. The springs 156 thereupon contact the sections which action withdraws the projections 163 from the handle grip 171 of the cover thus freeing the closure *g*.

The formed closure clings to the inside diameter of the pressure ring 134 and as the punch further lifts the knockout pad is moved down relative to the punch and strips off the closure leaving it in the holding ring above the notched fingers 97.

The dial is now moved through its next step of rotation which movement may carry the closure *g* to a suitable ejecting station where it is removed from the holding ring and discharged from the forming apparatus or otherwise disposed of.

If a hermetic seal is to be effected when the closure is applied to a container it is desirable that a sealing compound be applied to the channel 181. Accordingly it may be subjected to a lining operation at a station D (Fig. 15). The U-shaped channel 181 of the closure is passed under a spout or nozzle 183 of a suitable compound lining machine or the like and through which a sealing compound or other packing material 184 may be discharged into the channel. This will be suitably dried in the usual manner.

The lined closure *g* is now ready to be applied to the open top of a container 21, one such container being illustrated in Fig. 1. The vertical wall section 73 of the closure is placed within the mouth of the container in engagement with the container wall 24, its curled edge 25 entering into the compound lined channel 181. The parts are then ready for the sealing operation.

Fig. 16 illustrates very briefly the seaming elements of a sealing mechanism which may be considered to be located at a seaming station E. These elements are a chuck 185 and a seaming roller 186. The roller is formed with a groove 187 which engages the outer vertical wall of the sealing band *e* and bends it around the outside of the container curl 25 with the lining 184 tightly engaged on the top of the curl. This insures a tight closure for the container.

The tearing tongue 27 which is utilized in the removal of the sealing band *e* when the container is opened is on the inside of the closure countersink and out of the way of the closing roller during the sealing and is also fully within the container or cover walls. This makes the sealing a simple and ordinary operation which can be performed on any standard closing machine equipment and provides a simple, easily opened closure joint which will not be prematurely opened by inadvertently striking the tongue of the sealing band.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste, which comprises shaping the blank into a cup member having two concentric

walls, cutting between the said concentric walls and dividing said cup member into an outer ring and an inner cover part, and reshaping said ring by drawing a portion thereof into a smaller diameter to produce an annular sealing band, and securing said band to the wall of said inner cover part to form a closure applicable as a unit to a container.

2. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste, which comprises shaping the blank into a cup member having two concentric walls, cutting between the said concentric walls and dividing said cup member into an outer ring and an inner cover part, reshaping said cover part to produce a closure cover and to make it fit the container to be closed, and reshaping said ring by drawing a portion thereof into a smaller diameter to produce an annular sealing band, and securing said band to the wall of said inner cover part to form a closure applicable as a unit to a container.

3. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste, which comprises shaping the blank into a cup member having two concentric walls and with a tearing tongue extending out from the wall having the larger diameter, cutting between the said concentric walls and dividing said cup member into an outer ring containing said tearing tongue and an inner cover part, and reshaping said ring by drawing a portion thereof into a smaller diameter at the same time bending in said tearing tongue to produce an annular sealing band, and securing said band to the wall of said inner cover part to form a closure applicable as a unit to a container.

4. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste, which comprises shaping the blank into a cup member having two concentric walls, cutting between the said concentric walls and dividing said cup member into an outer ring and an inner cover part, reshaping said ring by drawing a portion thereof into a smaller diameter to produce an annular sealing band, engaging said sealing band and said cover part, and reshaping both band and cover part into close fitting relationship and securing them together to form a unit closure separate from and for the container.

5. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste, which comprises shaping the blank into a cup member having two concentric walls, cutting between the said concentric walls and dividing said cup member into an outer ring and an inner cover part while simultaneously drawing the center of the latter into a smaller diameter section, reshaping said ring by drawing a portion thereof into a smaller diameter to produce an annular sealing band, assembling said sealing band and said cover part, and reshaping both band and cover part into close fitting relationship, before the multipart closure is applied to a can body, to form a unit closure for the container and forming the said cover drawn center section with inwardly bent side walls forming a cover handle.

6. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste, which comprises shaping the blank into a cup member having two concentric walls, cutting between the said concentric walls and dividing said cup member into an outer ring and an inner cover part, reshaping said ring by drawing a portion thereof into a smaller diameter to produce an annular sealing band, engaging said sealing band and said cover part, reshaping both band and cover part into close fitting relationship, before the multipart closure is applied to a can body, to form a unit closure for the container, and applying a sealing compound in the channel between said ring and cover parts.

7. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste and applying such closure to the container to seal the latter, which comprises shaping the blank into a cup member, dividing it into an outer ring and an inner cover part, reshaping said ring into an annular sealing band by drawing a portion thereof into a smaller diameter, assembling band and cover parts, bending the two together while shaping them to fit the container to be closed, before the multipart closure is applied to a can body, and sealing the container by applying the assembled closure parts as a unit on an open end thereof and by curling said sealing band into tight engagement with said container.

8. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste and applying such closure to the container to hermetically seal the latter, which comprises shaping the blank into a cup member, dividing it into an outer ring and an inner cover part, reshaping said ring into an annular sealing band by drawing a portion thereof into a smaller diameter, assembling band and cover parts, bending the two together while shaping them to fit the container to be closed, before the multipart closure is applied to a can body, applying a sealing compound to the parts so formed, and hermetically sealing the container by applying the assembled closure parts as a unit to an open end thereof and by curling said sealing band into tight engagement with said container while confining said sealing compound in the joint so formed.

9. The method of producing a multipart closure for containers from a one-piece blank without spoilage or waste and applying such closure to the container to seal the latter, which comprises shaping the blank into a cup member with a tearing tongue extending from its outer edge, dividing it into an outer ring which contains said tearing tongue and into an inner cover part, reshaping said ring into an annular sealing band by drawing a portion thereof including said tearing tongue into a smaller diameter, assembling band and cover parts, bending the two together while shaping them to fit the container to be closed, before the multipart closure is applied to a can body, and sealing the container by applying the assembled closure parts as a unit to an open end thereof and by curling said sealing band into tight engagement with said container, said tearing tongue being then in condition for opening the container by severing said sealing band to free said cover.

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