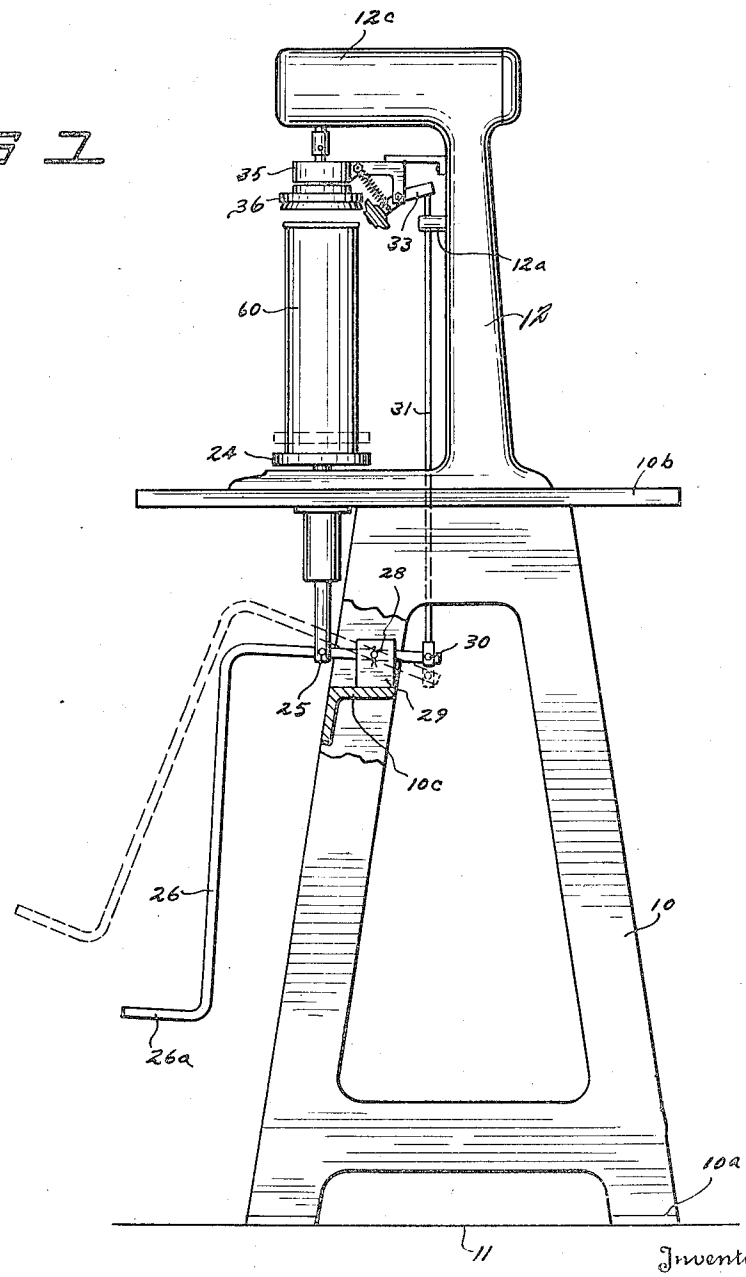
Nov. 29, 1955 J. G. O'NEIL 2,725,000

METHOD AND APPARATUS FOR SEALING CONTAINER

Filed April 1, 1950 3 Sheets-Sheet 1

FIG 1



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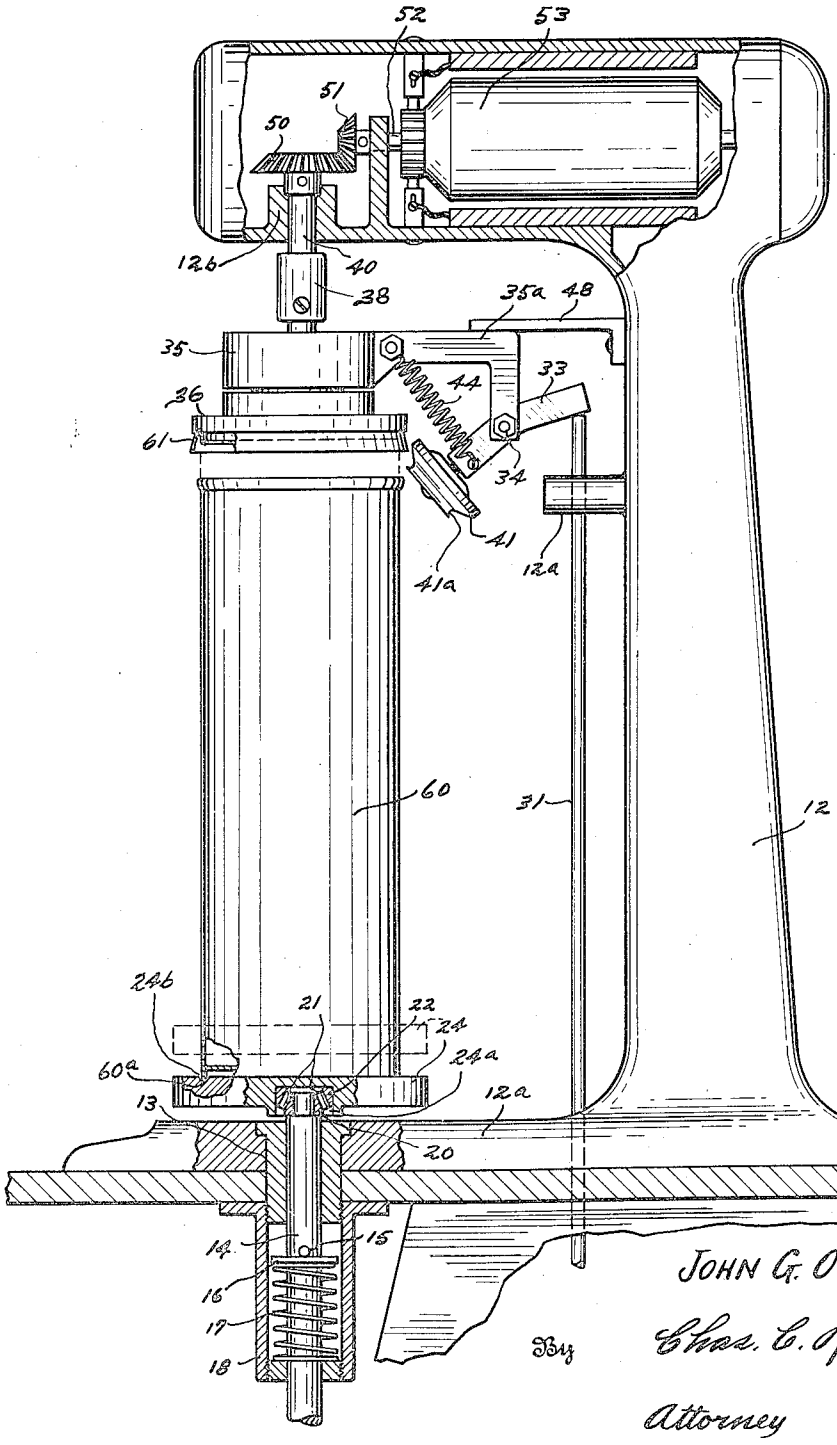
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METHOD AND APPARATUS FOR SEALING CONTAINER

Filed April 1, 1950 3 Sheets-Sheet 2

FIG 2



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METHOD AND APPARATUS FOR SEALING CONTAINER

Filed April 1, 1950 3 Sheets-Sheet 3

FIG 3

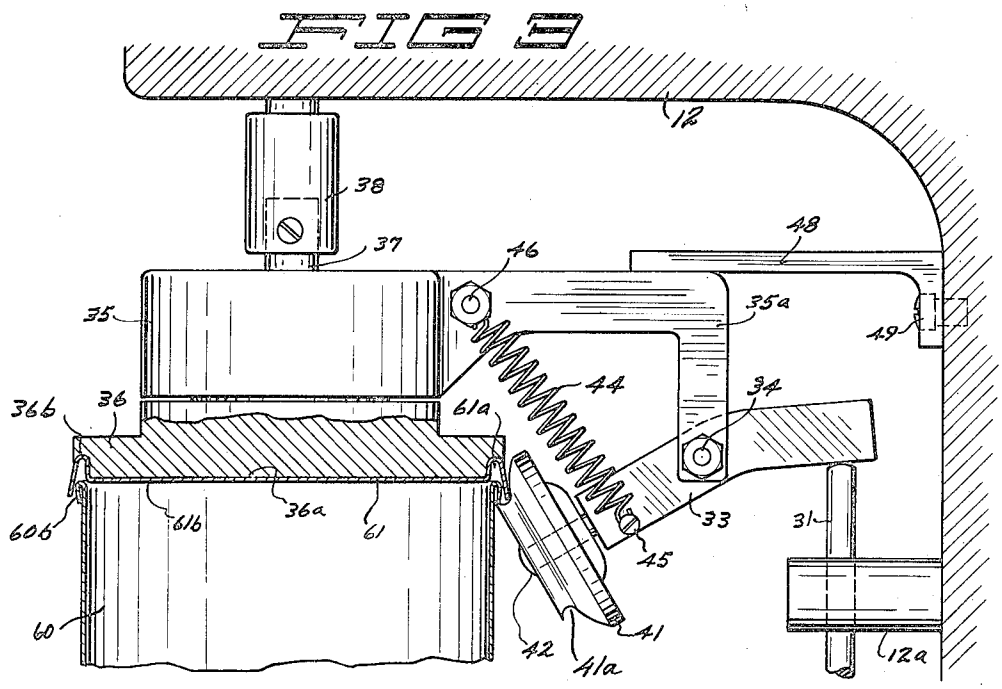


FIG 4

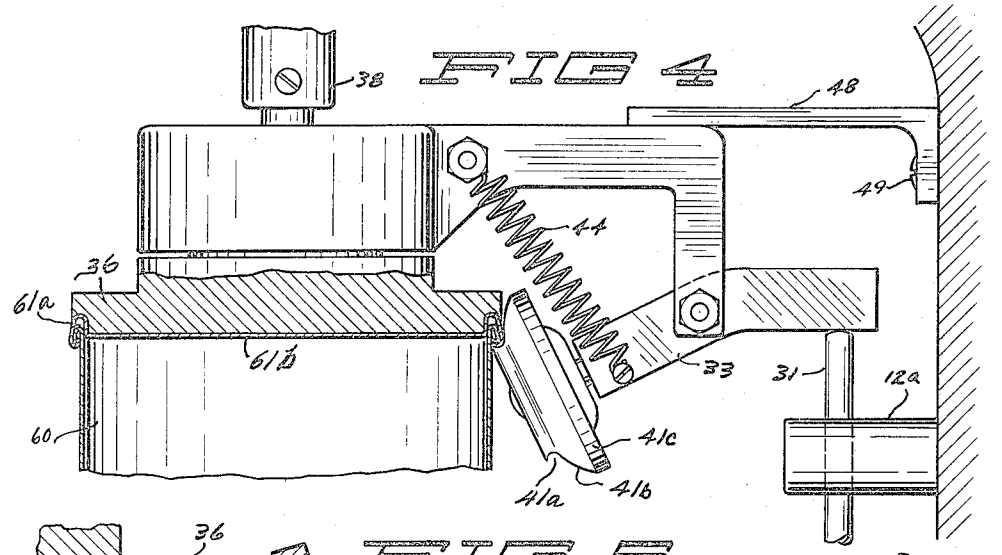
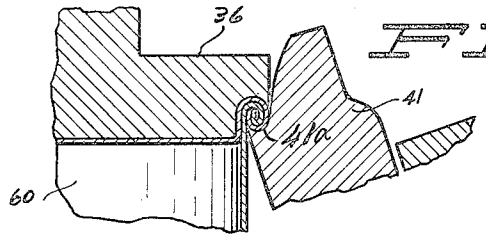


FIG 5



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United States Patent Office 2,725,000 Patented Nov. 29, 1955

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METHOD AND APPARATUS FOR SEALING CONTAINER

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Application April 1, 1950, Serial No. 153,467

5 Claims. (Cl. 93—36.5)

This invention relates to a method and apparatus for closing and sealing a container. While the invention is applicable to containers made of various materials, it has been practiced and used principally with a container made of comparatively heavy paper or thin cardboard preferably lacquered or waxed.

It is an object of this invention to provide a method and apparatus for covering and tightly sealing one end of a container, which container is preferably cylindrical in form.

It is another object of the invention to provide a method for closing and sealing a container which consists in providing a container, reversely bending the top portion thereof outwardly, providing a cover in the form of a disk the edge of which is bent upwardly and then reversely to form a downwardly directed groove or channel, placing said cover on said container with the reversely bent portion of the container within said channel, then bending and disposing the outer depending edge of said cover within said reversely bent portion of the container, then rolling said reversely bent portions together inwardly and compressing the same.

It is another object of the invention to provide an apparatus for covering and sealing a container comprising a rotatable mandrel on which the container is placed with the upper portion of the container reversely bent outwardly, a die above said mandrel having a flat central portion and a downwardly directed groove at its edge, said die being adapted to receive a cover having a flat central portion and having a downwardly directed groove at its edge adapted to fit into said groove in said die, means for moving said die toward said mandrel and container to dispose the reversely bent portion of the latter within said channel of said cover, together with means for disposing the outer depending edge of said cover within said reversely bent portion of said container, rolling said portions inwardly and then compressing the same.

It is more specifically an object of the invention to provide such an apparatus as set forth in the preceding paragraph in which said last mentioned means comprises a rotatable wheel having a groove adjacent one side thereof, said wheel being disposed adjacent the top of said mandrel, and means for moving said wheel toward said mandrel.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a view in side elevation of the apparatus of this invention, a portion thereof being broken away and another portion shown in vertical section;

Fig. 2 is a view principally in side elevation of the upper portion of said apparatus, some parts being broken away and others shown in vertical section;

Fig. 3 is a view in side elevation showing a portion of the said apparatus on an enlarged scale;

Fig. 4 is a view similar to Fig. 3 showing the parts in different positions; and

Fig. 5 is a partial view similar to Figs. 3 and 4 showing the parts in still another position.

Referring to the drawings, a device or machine is shown comprising a frame or base **10** having spaced sides of trapezoidal shape in elevation, the larger and lower portions of said frames having spaced flanges **10***a* adapted to rest on a suitable support or floor **11**. Frame **10** at its upper end supports a horizontal plate **10***b*. A standard **12** has a base portion **12***a* with a lower flat surface resting on the top of plate **10***b*. Portion **10***b* is provided with an opening in which is disposed a bushing **13** in which is rotatably mounted a shaft **14**. Shaft **14** has secured therein a pin below which is a washer **16** surrounding shaft **14** and adapted to engage the lower side of pin **15**. A compression coiled spring **17** surrounds shaft **14** the same engaging washer **16** at its upper end and engaging the bottom of a cup member **18** having a flange at its top engaging the bottom of plate **10***b*. The lower end of bushing **13** is threaded into the top of member **18**. Shaft **14** has a reduced upper end to which is secured a member **20** having a frusto conical upwardly tapering surface forming one race or bearing for bearing rollers **21** also engaging a surface of an annular member **22** secured in a cylindrical recess **24***a* of a plate **24**. Plate **24** can thus rotate on the bearing comprising rollers **21**. Plate **24** has an annular groove **24***b* in its top surface concentric with shaft **14**. The shaft **14** extends downwardly below member **18** and is pivotally connected by a pivot pin **25** to a lever **26**, which lever is pivoted by a pivot pin **28** to a bracket **29** supported upon a flange **10***c* extending between the sides of frame member **10**. The lower outer end of lever **26** has a horizontally projecting portion **26***a* forming a pedal or treadle. The inner end of lever **26** is pivotally connected by a pin **30** to the lower end of a rod **31** guided in a projection or boss **12***a* on one side of standard **12**. The top of rod **31** is adapted to engage the under side of one end of a lever **33** which is pivoted on a headed and nutted bolt **34** secured in a bracket **35***a* projecting from one side of a member **35**. A shaft **37** has a bearing in member **35** and carries at its lower end a die **36**. Shaft **37** is coaxial with shaft **14** and is secured to a coupling **38** secured to a shaft **40** in turn journaled in a bearing in a boss **12***b* in a horizontally projecting portion **12***c* of standard **12**.

The die **36** has a lower flat central surface **36***a* and has formed therein at its edge and some distance above surface **36***a* a downwardly directed annular groove **36***b*. A wheel **41** is rotatable on a headed shaft **42** secured in one end of lever **33**. A tensile coiled spring **44** is secured at one end to a screw **45** in the outer end of lever **33** and at its other end is secured to a bolt **46** secured in bracket **35***a*. Bracket **35***a* is supported by being secured to the projecting bar-like end of a bracket **48** secured by one or more screws **49** to the front side of standard **12**. Wheel **41** has an annular groove **41***a* adjacent one side which is the side nearest die **36**. Groove **41***a* forms a rather sharp annular edge or flange at said side of wheel **41**. In the rear of groove **41***a* wheel **41** has an outwardly extending concave surface **41***b* which extends to a cylindrical portion **41***c*.

Shaft **40** has secured to its upper end a beveled gear **50** which meshes with a beveled pinion **51** carried on a shaft **52** journaled in a bearing in portion **12***c* and connected to the driving shaft of an electric motor **53** which is supported in portion **12***c*. Motor **53** will be controlled by a suitable switch not shown.

In carrying out the method of the invention a container **60** is formed the lower end of which has a projecting lip or flange **60***a*. A small top portion **60***b* of the container will be reversely bent outwardly so as to lie alongside of the container at the top thereof. A cover **61** is

provided which preferably is made of a flat disk of heavy paper or cardboard which is circular in form. The outer edge of the disk is bent upwardly and then is bent reversely downwardly so that a downwardly directed channel 61*a* of general U-shape is formed at the outer edge of said cover. The outer portion of the disk is formed so that it projects somewhat below the central portion 61*b*. Said cover can be very quickly so formed between dies one of the general shape of die 36 and the other having mating portions. The container will be placed on member 24 with the flange 60*a* pressed into the groove 24*b*. Groove 24*b* is formed so that the flange 60*a* fits snugly or tightly into said groove so that container 60 is quite firmly held in a vertical position. The operator now steps on pedal portion 26*a*, swinging lever 26 which depresses shaft 14 and member 24. This swinging of lever 26 also moves rod 31 upwardly also moving up the outer end of lever 33 which swings wheel 41 away from the container against the tension of spring 44. The cover 61 can be placed directly on the container with the reversely bent portion 60*b* disposed in the channel 61*a*. Alternately the cover can be placed in the die 36, as shown in Figs. 2 and 3. The operator now permits lever 26 to be swung back toward its normal position under the influence of springs 17 and 44. The cover 61 is placed on the container and wheel 41 moves toward the container so that the sharp flange at its outer side engages the depending outer portion of the cover and bends the same inwardly. The said flange gets under the downturned edge of portion 60*b* so that it is somewhat opened up. The outer portion of the cover is pushed in and is bent upwardly so that its edge is tucked or disposed between the downturned portion 60*b* and the outer side of the container. As the wheel 41 continues to approach the container and the container is moved firmly against die 36, the groove 41*a* rolls the edges of the cover and the downturned portion 60*b* together inwardly, as shown in Fig. 5. The wheel approaches die 36 very closely and the rolled inwardly portions are finally compressed between the surface of groove 41*a* and the convex portion of wheel 41, as shown in Fig. 5. A very tight rolled bead is thus formed which tightly seals the container and holds the cover very firmly in place. The die 36 is rapidly rotated during the described operation and this rotates the container 60 and member 24, which latter rotates very easily on the bearings 21. This rotation of the die 36 and container 60 also rotates wheel 41. When the seal is completed the operator again presses on pedal portion 26*a* so that the member 24 is lowered and wheel 41 is swung away from the container. The container is then removed from member 24.

From the above description it will be seen that I have provided a comparatively simple method and apparatus for very effectively and quickly sealing a container. One use of the container is for containing milk. Such a seal as shown can be unrolled by the housewife by gripping the top of the container or the bead at the top thereof and pressing inwardly on the same. An opening can then thus be made for dispensing the milk without completely removing the cover. The method and apparatus have been demonstrated in actual practice, found to be very successful and efficient and are being commercially used.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the apparatus and in the steps and sequence of steps of the method without departing from the scope of applicant's invention, which, generally stated, consists in a method and apparatus capable of carrying out the objects above set forth, such as disclosed and defined in the appended claims.

What is claimed is:

1. An apparatus for sealing a container having in combination, a rotatable member adapted to carry said container, said container having its upper edge portion reversely bent outwardly and downwardly along and substantially parallel to the outer side of said container a die above said member having an annular downwardly directed groove therein at its outer edge and heaving a flat bottom within and below said groove, said die having a vertical axis and being adapted to receive a cover having an outer channel portion formed to fit in said groove and having an outer depending edge portion, means for relatively moving said die with said cover therein and said member to move said cover over said container with a reversely bent portion of said container disposed in said channel in said cover, a rotatable wheel having an annular groove therein at one side forming a comparatively sharp upwardly and inwardly directed lip at said side, means for rotating said die, and means for moving said wheel upwardly and toward said container simultaneously, said wheel constituting means cooperating with said die for engaging the depending edge portion of said cover for bending the same inwardly and disposing it under the reversely bent portion of said container, and between said bent portion and said container, then rolling said portions inwardly together and compressing the same against said die.

2. An apparatus for sealing a container having in combination, a rotatable member having means for holding said container concentrically therewith and upstanding therefrom, said container having its top edge portion bent reversely outwardly and downwardly to extend along and substantially parallel to the outer side of said container, a die disposed above said member concentrically therewith having a vertical axis and a lower surface with an annular groove at its edge adapted to receive a disk cover having a channel of inverted U-shape in its outer portion adapted to fit in said groove, said cover having a depending portion at its edge extending below said lower surface, a rotatable wheel at one side of said die with its axis at an acute angle to the axis of said member and having an annular groove at its side adjacent said die forming a comparatively sharp edge directed inwardly and upwardly, means for rotating said die, means for moving said member and die toward each other to bring said cover over said container with said top of said container in said channel and for rotating said container and member, and means for moving said wheel toward said container to move said edge portion against said depending portion said wheel constituting means cooperating with said die for bending and disposing the edge of said depending portion under said reversely bent portion and between the same and said container, then rolling said depending portion and reversely bent portion together and compressing the same into a tight bead, said wheel being rotated by engagement with said cover.

3. An apparatus for sealing a container having in combination, a freely revoluble plate having means for holding a container thereon axially alined therewith, said container having its top edge portion reversely bent outwardly and downwardly to extend substantially parallel with the outer side of said container, a rotatable die above said plate adapted to receive a disk cover for said container having a channel of inverted U-shaped formed therein adjacent its edge and having a depending edge portion, a resilient means urging said plate upwardly to normal position, a wheel at one side of said die having its axis inclined to the axis of said container and having an annular groove adjacent its outer side forming a rather sharp inwardly and upwardly directed edge, a spring urging said wheel toward said die, means for depressing said plate and moving said wheel away from said die whereby said die and plate may be moved toward each other by said resilient means to place said cover on said container with said reversely bent portion disposed in said channel, and said wheel can be moved toward said container by said spring to engage said depending edge portion of said cover, said wheel constituting means cooperating with said die for disposing said edge portion under said reversely bent portion and between the same

and said container, rolling said edge portion and top edge portion inwardly and compressing the same.

4. The method of forming a sealed container which consists in forming a cylindrical container having an open top, reversely bending a small portion of said container at the top thereof outwardly and downwardly so as to extend along the outer side of said container, providing a cover for said container in the form of a disk, bending the edge portion of said cover upwardly and then reversely to form an inverted U-shaped channel about the edge thereof with the edge portion extending some distance below said channel, placing said cover on said container with the bead of said bent portion of the latter disposed in said channel, engaging said cover with a die having a channel therein fitting over the top of said channel in said cover, rotating said container and pressing a wheel against the outer portion of said cover, said wheel having an annular groove therein terminating in a comparatively sharp lip, holding said wheel with its axis making an acute angle with the axis of said container, moving said wheel upwardly and toward said container so that said lip moves said outer portion of said cover inwardly and said lip moves under the downwardly turned portion of said container, rolling said downwardly turned portion and the outer turned portion of said cover together and compressing the same between said groove in said wheel and said die into a tight bead by the upward movement of said wheel.

5. The method of forming a sealed container which consists in forming a cylindrical container having an open top, reversely bending a small portion of said container at the top thereof outwardly and downwardly so as to extend along the outer side of said container, providing a cover for said container in the form of a disk,

bending the edge portion of said cover upwardly and then reversely to form an inverted U-shaped channel about the edge thereof with the edge portion extending some distance below said channel, placing said cover on said container with the bead of said bent portion of the latter disposed in said channel, engaging said cover with a die having a channel therein fitting over the top of said chanel in said cover, engaging the bottom of said container with a rotatable support, moving a wheel against the outer side of said cover, said wheel having an annular groove therein with a comparatively sharp lip at the side thereof adjacent said container, said wheel being disposed at a decidedly acute angle to the axis of said container, rotating said die and said container, moving said wheel inwardly and upwardly on an arc against said cover and container to bring said lip under the downturned portion of said container and rolling said downturned portion and said outer portion of said cover together and continuing the movement of said wheel to compress said rolled portions into a tight bead between said wheel and said die.

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