

July 19, 1966

O. R. WEBER
APPARATUS FOR CRIMPING A COVER TO AN OPEN
END OF A CONTAINER OR THE LIKE

3,261,144

Filed Jan. 31, 1962

3 Sheets-Sheet 2

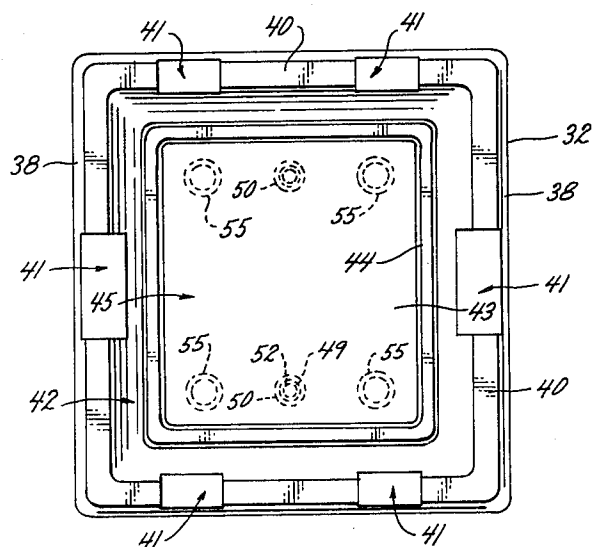


FIG. 5

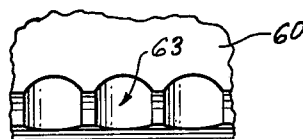


FIG. 6

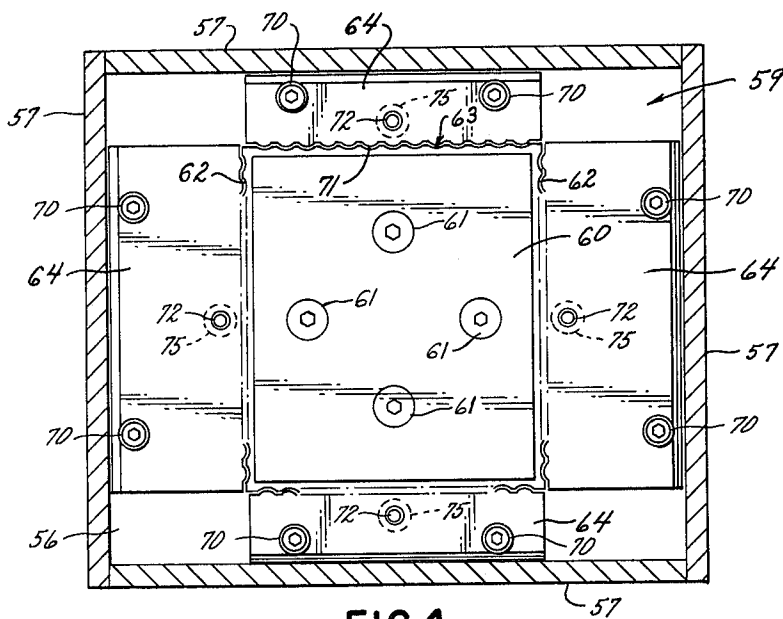


FIG. 4

FIG. 9

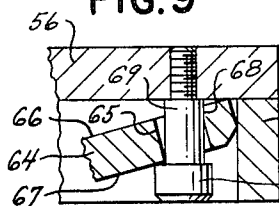
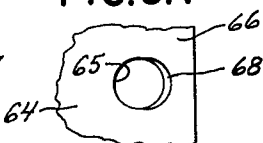


FIG. 9A



INVENTOR
OTTO. R. WEBER

BY *Glen Palmer*
+ *Matthew*
HIS ATTORNEYS

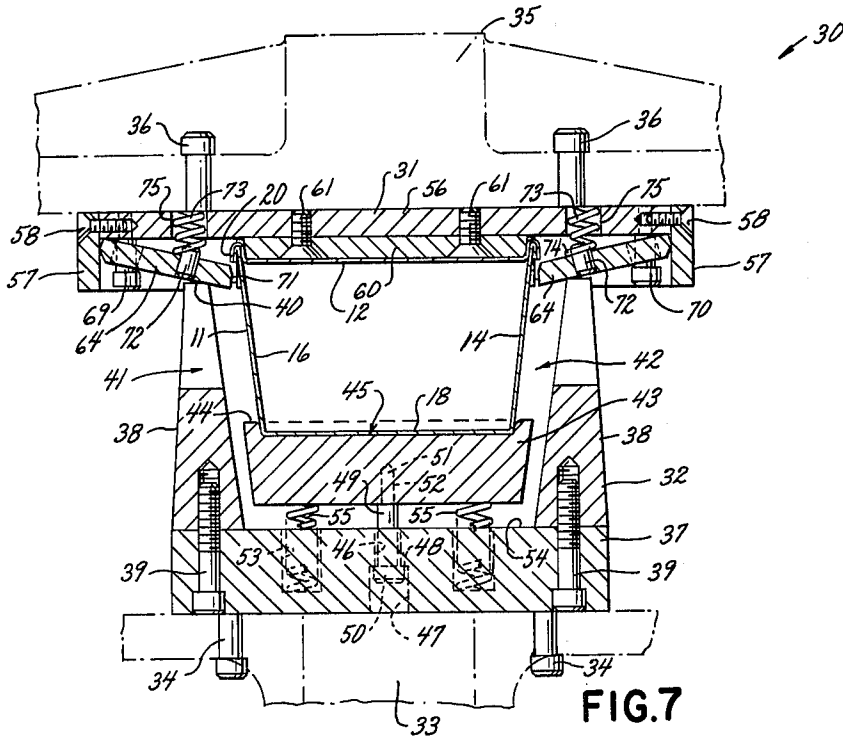
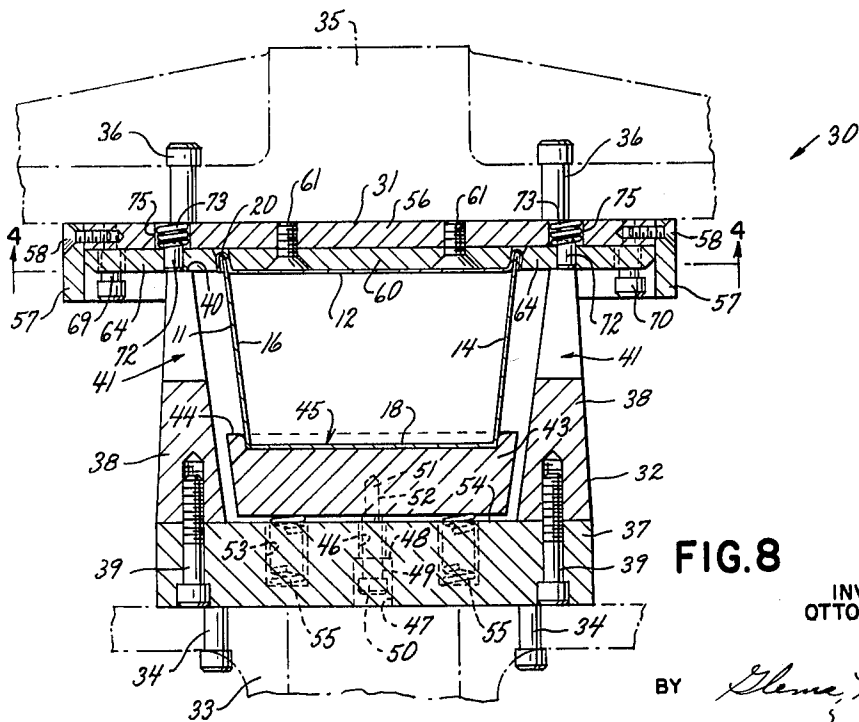
July 19, 1966

O. R. WEBER
APPARATUS FOR CRIMPING A COVER TO AN OPEN
END OF A CONTAINER OR THE LIKE

3,261,144

Filed Jan. 31, 1962

3 Sheets-Sheet 3



INVENTOR
OTTO R. WEBER

BY *Glema, Palmer*
& Matthews
HIS ATTORNEYS

1

2

3,261,144

APPARATUS FOR CRIMPING A COVER TO AN OPEN END OF A CONTAINER OR THE LIKE

Otto R. Weber, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va., a corporation of Delaware

Filed Jan. 31, 1962, Ser. No. 170,193

14 Claims. (Cl. 53-344)

This invention relates to an improved method and apparatus for crimping a cover to open end of a container body or the like.

More specifically, this invention provides an improved method and apparatus for crimping a cover to an open end of a container body or the like wherein the open end of the container has an outwardly disposed and downwardly extending peripheral flange and the cover member has an inverted, substantially V-shaped peripheral flange adapted to be telescoped over the peripheral edge of the container body in such a manner that the major portion of the cover member is disposed in the container body below the peripheral edge thereof.

The method and apparatus of this invention crimps the opposed legs of the V-shaped flange of the cover member together whereby the peripheral edge of the container body is crimped between the opposed legs of the peripheral flange of the cover member to fully secure the cover member to the container body.

Accordingly, it is an object of this invention to provide an improved apparatus for crimping a cover member to an open end of a container body or the like.

Another object of this invention is to provide an improved method for crimping a cover member to an open end of a container body of the like.

Other objects, uses and advantages of this invention are apparent from a reading of this description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is an exploded perspective view illustrating the cover member and container body of this invention before the same have been acted upon by the method and apparatus of this invention.

FIGURE 2 is a view similar to FIGURE 1 illustrating the cover member fully secured to the open end of the container body by the method and apparatus of this invention.

FIGURE 3 is an axial, cross-sectional view of the apparatus of this invention disposed in one of the operating positions thereof.

FIGURE 4 is a cross-sectional view taken on line 4-4 of FIGURE 8.

FIGURE 5 is a top plan view of part of the apparatus of FIGURE 3 and is taken on 5-5 thereof with the container body and cover member removed.

FIGURE 6 is an enlarged, fragmentary, perspective view of the central die means of the apparatus of FIGURE 3.

FIGURE 7 is a view similar to FIGURE 3 illustrating the apparatus in another operating position thereof.

FIGURE 8 is a view similar to FIGURE 3 illustrating the apparatus in its crimping position.

FIGURE 9 is an enlarged, fragmentary, cross-sectional view of one of the peripheral die members of this invention.

FIGURE 9A is an enlarged, fragmentary, top view of one of the peripheral die members of this invention.

While the various features of this invention are hereinafter described as being particularly adaptable to crimp a cover member to open end of a container or the like, it is to be understood that the various features of this invention may be utilized singly or in any combination thereof to provide other functions, as desired.

Therefore, this invention is not to be limited to only the embodiment illustrated in the drawings, because the drawings are merely utilized to illustrate one of the wide variety of uses of this invention.

Referring now to FIGURE 1, one type of a container construction that can be utilized with the method and apparatus of this invention is generally indicated by the reference numeral 10 and comprises a container body 11 and a cover member 12 adapted to be disposed over the open end 13 of the container body 11 and be secured thereto in a manner hereinafter described.

The container body 11 has a plurality of sides 14, 15, 16, and 17 interconnected together and to a bottom member 18, the upper edges of the sides 14-17 having reversely turned and downwardly directed flanges 14', 15', 16', and 17' which cooperate with the sides 14-17 to define a peripheral edge having an inverted V-shaped cross-sectional configuration around the open end 13 of the container body 11.

The cover member 12 comprises a substantially flat central section 19 bounded by a peripheral, inverted, substantially V-shaped flange 20 that is adapted to be telescoped over the peripheral flanges 14'-17' of the container body 11 in the manner illustrated in FIGURE 2, the peripheral flange 20 of the cover member 12 defining a central recess 21 in the upper exposed surface of the cover member 12 for a purpose hereinafter described.

While the cover member 12 and container body member 11 can be formed of any suitable material, the embodiment thereof illustrated in the drawings is formed from metallic foil, such as aluminum-containing metallic foil or the like, either utilized by itself or in combination with other laminations, such as paper or the like, as desired.

The container body 11 has the interior thereof filled with the desired product, such as food or the like, through the open end 13 thereof.

Thereafter, the cover member 12 is placed over the open end 13 of the container body 11 with the peripheral flange 20 of the cover member 12 telescopically receiving the upper portions of the side walls 14-17 and the peripheral flanges 14'-17' thereof in the manner illustrated in FIGURE 2.

Subsequently, the method and apparatus of this invention is utilized in a manner hereinafter described to fully crimp together the opposed legs of the peripheral flange 20 of the cover member 12 toward each other to crimp the side walls 14-17 and peripheral flanges 14'-17' of the container body 11 therebetween to fully secure the cover member 12 to the container body 11 in the manner illustrated in FIGURE 2 and form the completed container construction 10.

The particular details of the apparatus of this invention for crimping the cover member 12 to the container body 11 will now be described and reference is made to FIGURE 3 wherein the apparatus of this invention is generally indicated by the reference numeral 30.

The apparatus 30 comprises a pair of relatively movable members 31 and 32. In the embodiment of the apparatus 30 illustrated in the drawings, the member 32 is secured to a stationary support member 33 by a plurality of threaded fastening members 34 while the member 31 is interconnected to a movable support 35 by a plurality of threaded fastening members 36.

For example, the support 33 can rest on the floor or the like with support 35 being disposed vertically above the support 33 and movable toward and away from the same in any suitable manner, such as by ram press means or by mechanical foot operated means, as desired.

The lower member 32 comprises a base plate 37 interconnected to an upwardly extending peripheral member 38 by a plurality of threaded fastening members 39, the peripheral member 38 having a substantially trun-

cated triangular cross-sectional configuration and having the upper end 40 thereof relieved at 41 to provide access to a chamber 42 defined by the members 37 and 38.

A container support 43 is disposed in the chamber 42 and is movable relative to the member 32 in a manner hereinafter described, the support 43 having an upper surface 44 provided with a central recess 45 adapted to snugly receive the bottom portion of a container body 11 as illustrated in FIGURE 3 to properly position the container body 11 relative to the apparatus 30.

The member 32 has bores 46 passing vertically therethrough and is counter-bored at 47 to define shoulders 48. A pair of pins 49 are respectively disposed in the bores 46 and have enlarged heads 50 adapted to abut the respective shoulders 48 to limit upward movement of the pins 49 relative to the member 32.

The pins 49 respectively have threaded portions 51 threadedly received in threaded bores 52 formed in the support 43 whereby the pins 49 interconnect the support 43 to the member 32 and limit movement of the support 43 in an upward direction relative to the support 32.

The support 32 has a plurality of bores 53 interrupting the upper surface 54 thereof and respectively receiving a plurality of compression springs 55 engaging the member 32 and the support 43 to tend to hold the support 43 in the position illustrated in FIGURE 3.

However, the support 43 can be moved vertically downwardly from the position illustrated in FIGURE 3 to the position illustrated in FIGURE 8 in opposition to the force of the compression springs 55 for a purpose hereinafter described.

The member 31 includes a flat plate 56 bounded by a downwardly directed peripheral means 57 interconnected thereto by a plurality of threaded fastening members 58 to define a chamber 59 in the member 31.

A substantially flat, central die means 60 is disposed in the chamber 59 and is interconnected to the plate 56 by a plurality of threaded fastening members 61, the central die means 60 having a beveled peripheral edge 62 that is serrated in the manner illustrated in the FIGURES 4 and 6. In particular, the peripheral edge 62 of the central die means 60 is provided with a plurality of concave recesses 63 for a purpose hereinafter described.

While the central die means 60 is illustrated as having four sides to be complementary to the four sides of the container body 11, it is to be understood that the central die means 60 can have any configuration to conform to the desired configuration of a container body to be utilized therewith.

A plurality of peripheral die members 64 are pivotally connected to the member 31 in a manner hereinafter described and are respectively adapted to cooperate with the sides of the central die means 60 to crimp the cover member 12 to the container body 11 when the peripheral die members 64 are pivoted into the same plane as the central die means 60 in a manner hereinafter described, the number of peripheral die means 64 corresponding to the number of sides of the central die means 60 as will be obvious hereinafter.

Each peripheral die member 64 has a plurality of apertures 65 passing vertically therethrough, each aperture 65 having a substantially elliptical configuration at the top surface 66 of the respective die member 64 and a substantially circular configuration at the bottom surface 67 thereof as is fully illustrated in FIGURES 9 and 9A to define a sloping wall portion 68 for a purpose hereinafter described.

A plurality of pin means 69 are carried by the member 31 and have enlarged heads 70 disposed remote from the plate 56, the pins means 69 respectively passing through the apertures 65 of the peripheral die members 64 to pivotally interconnect the die members 64 to the support member 31 while the heads 70 of the pin means 69 limit pivotal movement of the die members 64 in one

direction and hold the peripheral die members 64 to the member 31.

The peripheral die members 64 are adapted to be pivoted to the downward position illustrated in FIGURE 3 because of the sloping walls 68 of the aperture 65 in the manner illustrated in FIGURE 9.

Each peripheral die member 64 has an inner edge 71 that is reversely beveled relative to the central die means 60 and is serrated in the manner illustrated in FIGURES 3 and 4 to define a plurality of outwardly directed convex projections 71 adapted to be respectively received in the recesses 63 of the central die means 60 when the peripheral die members 64 are pivoted into the same plane as the central die means 60 in the manner illustrated in FIGURE 8.

Each peripheral die member 64 carries one or more pins 72 each having a portion thereof projecting above the upper surface 56 of the respective peripheral die member 64.

A plurality of compression springs 73 respectively have ends 74 thereof telescoped over the projecting portions of the pins 72 and the other ends thereof received in suitable apertures 75 formed in the member 31 whereby the force of the compression springs 73 normally tends to hold the peripheral die members 64 in the downward pivoted position illustrated in FIGURE 3 away from the central die means 60.

However, the peripheral die members 64 are engageable with the upper end 40 of the member 32 and are adapted to be pivoted into the same plane as the central die means 60 in opposition to the force of the compression springs 73 when the member 31 is moved toward the member 32 in the manner illustrated in FIGURES 7 and 8.

The operation of the method and apparatus of this invention will now be described.

As illustrated in FIGURE 3, the filled container body 11 is placed in the recess 45 of the support 43 when the member 31 is in a position away from the member 32, the filled container body 11 either having the cover member 12 already placed thereon in the manner illustrated in FIGURE 3 or subsequently having the cover member 12 placed thereon after the container body 11 has been placed on the support 43.

In either event, the support 43 properly positions the container body 11 and cover member 12 relative to the member 31 so that subsequent lowering of the member 31 by the support 35 causes the central die means 60 to be received in the recess 21 in the cover member 12 in the manner illustrated in FIGURE 7.

As the member 31 is lowered from the position illustrated in FIGURE 3 to the position illustrated in FIGURE 7, the peripheral die members 64 make contact with the upper end 40 of the lower member 32 whereby further movement of the member 31 downwardly relative to the member 32 causes the peripheral die members 64 to be moved into the same plane as the central die means 60 to cooperate with the central die means 60 and crimp the peripheral flange 20 of the cover member 12 to the container body 11 in the manner illustrated in FIGURES 2 and 8.

As the peripheral die members 64 are being pivoted into the same plane as the central die means 60 by the continuous lowering of the member 31, the central die means 60 pushes against the central portion 19 of the cover member 12 to move the cover member 12 and container body 11 downwardly in opposition to the force of the compression springs 55 whereby the central die means 60 has the peripheral edge 62 thereof always in contact with the peripheral flange 20 of the cover member 12 as the peripheral die members 64 are being pivoted from the position illustrated in FIGURE 7 to the position illustrated in FIGURE 8 to fully crimp the peripheral flange 20 of the cover member 12 to the container body 11.

After the member 31 has been moved to the position illustrated in FIGURE 8, further downward movement

5

6

thereof is prevented by the peripheral die members 64 abutting against the plate 56 of the member 31, at which time, the peripheral die members 64 have completed the crimping function in cooperation with the central die means 60.

Thereafter, the member 31 is moved vertically upwardly by the support 35 back to the position illustrated in FIGURE 3 whereby the compression springs 73 maintain the peripheral die members 64 in contact with the end 40 of the member 32 while the member 31 is being initially raised relative to the member 32 so that the container 10 can be released from between the peripheral die members 64 and the central die means 60.

As the member 31 is being initially raised, the compression springs 55 move the support 43 vertically upwardly to raise the container construction 10 in unison with the central die means 60 to free the crimped edge 20 of the container construction 10 from the peripheral die members 64 because the peripheral die members 64 remain in contact with the upper end 40 of the member 31 until the peripheral die members 64 have been pivoted to the position illustrated in FIGURE 7. Also, the rising support 43 moves the container construction 10 above the upper end 40 of the member 32 so that the same can be readily grasped and removed therefrom in order to permit another container construction 10 to be crimped in the manner previously described.

Therefore, it can be seen that the support 43 not only permits the container construction 11 to be moved vertically downwardly as the peripheral die members 64 are being pivoted into the same plane as the central die means 60, but also the support 43 permits the container construction 10 to be readily removed from the apparatus 30 after the container construction has been crimped in the above manner.

Further, the compression spring means 73 cause the peripheral die members 64 to operate in such a manner that after the same have completed the crimping operation, the peripheral die members 64 can be moved back to the position illustrated in FIGURE 7 to release the container construction 10 from the crimping structure of the apparatus 30.

Accordingly, it can be seen that an improved method and apparatus have been provided by this invention to crimp a cover member to a container body or the like in a relatively simple and effective manner without requiring expensive parts or operating procedures.

While the form of the invention now preferred has been disclosed as required by the statutes, other forms may be used, all coming within the scope of the claims which follow.

What is claimed is:

1. In combination, a pair of relatively movable support members, one of said support members being adapted to carry a container having a recessed cover disposed over an open end thereof, the other of said support members carrying a central die means adapted to be received in said recess of said cover, means for moving said other support member toward and away from said one support member, peripheral die means attached to said other support member and being movable relative to said other support member, said peripheral die means being engageable with said one support member and cooperable with said central die means to crimp said cover to said container when said peripheral die means is in one position thereof and said central die means is in one position thereof, said peripheral die means normally being in another position thereof, said die means being so constructed and arranged that said peripheral die means and said central die means are simultaneously moved to said one positions thereof by said moving means moving said other support member to crimp said cover to said container when said other support member is moved toward said one support member by said moving means to cause said central die means to be received in said recess of said cover.

2. A combination as set forth in claim 1 wherein said central die means has a plurality of sides and said peripheral die means comprises a plurality of die members respectively cooperable with said sides of said central die means.

3. A combination as set forth in claim 2 wherein said central die means has a serrated outer edge and said peripheral die means has a cooperating serrated inner edge.

4. In combination, a pair of relatively movable support members, one of said support members carrying a container support that is movable relative to said one support member and is adapted to support a container having a recessed cover disposed over an open end thereof, means carried by said one support member to tend to maintain said support in one position thereof, the other of said support members carrying a central die means adapted to be received in said recess of said cover, moving means for moving said other support member toward and away from said one support member, peripheral die means attached to said other support member and being movable relative to said other support member, said peripheral die means being engageable with said one support member and cooperable with said central die means to crimp said cover to said container when said peripheral die means is in one position thereof and said central die means is in one position thereof, and means carried by said other support member to tend to maintain said peripheral die means in another position thereof, said die means being so constructed and arranged that said peripheral die means and said central die means are simultaneously moved to said one positions thereof to crimp said cover to said container when said other support member is moved toward said one support member by said moving means to cause said central die means to be received in said recess of said cover and move said support relative to said one support member while said peripheral die means is moved from said other position thereof to said one position thereof by said one support member.

5. A combination as set forth in claim 4 wherein said central die means has a plurality of sides and said peripheral die means comprises a plurality of die members respectively cooperable with said sides of said central die means.

6. A combination as set forth in claim 4 wherein said means carried by said one support member to tend to maintain said support in one position thereof comprises biasing means.

7. A combination as set forth in claim 4 wherein said means carried by said other support member to tend to maintain said peripheral die means in said other position thereof comprises biasing means.

8. In combination, a pair of relatively movable support members, one of said support members being adapted to carry a container having a recessed cover disposed over an open end thereof, the other of said support members carrying a central die means adapted to be received in said recess of said cover, moving means for moving said other support member toward and away from said one support member, a plurality of peripheral die members pivotally attached to said other support member and being movable relative to said other support member, said peripheral die members being engageable with said one support member and cooperable with said central die means to crimp said cover to said container when said peripheral die members are pivoted into the same plane as said central die means, said peripheral die members being pivoted into said same plane simultaneously with the movement of said central die means toward said one support member, said peripheral die members normally being pivoted out of said plane whereby said peripheral die members are pivoted into said plane by said one support member to crimp said cover to said container when said other support member is moved relative to said one support member by said moving means to cause said

7

central die means to be received in said recess of said cover.

9. A combination as set forth in claim 8 wherein each of said peripheral die members has an aperture passing therethrough and said other support member has a plurality of pin means respectively passing through said apertures to pivotally interconnect said peripheral die members to said other support member.

10. A combination as set forth in claim 8 wherein biasing means are disposed between said other support member and said peripheral die members to tend to hold said peripheral die members out of said plane of said central die means.

11. In combination, a pair of relatively movable support members, one of said support members carrying a container support that is movable relative to said one support member and is adapted to support a container having a recessed cover disposed over an open end thereof, means carried by said one support member to tend to maintain said support in one position thereof, the other of said support members carrying a central die means adapted to be received in said recess of said cover, moving means for moving said other support member toward and away from said one support member, a plurality of peripheral die members pivotally attached to said other support member and being movable relative to said other support member, said peripheral die members being engageable with said one support member and cooperable with said central die means to crimp said cover to said container when said peripheral die members are pivoted into the same plane as said central die means, said peripheral die members being pivoted into said same plane simultaneously with the movement of said central die means toward said one support member, and means carried by said other support member to tend to maintain said peripheral die members pivoted out of said plane whereby said peripheral die members are pivoted into said plane by said one support member to crimp said cover to said container when said other support member is moved toward said one support member by said moving means

8

to cause said central die means to be received in said recess of said cover and move said support relative to said one support member while said peripheral die members are pivoted into said plane.

12. A combination as set forth in claim 11 wherein each of said peripheral die members has an aperture passing therethrough and said other support member has a plurality of pin means respectively passing through said apertures to pivotally interconnect said peripheral die members to said other support members.

13. A combination as set forth in claim 11 wherein each of said peripheral die members carries a pin, and a plurality of biasing means respectively disposed between said other support member and said peripheral die members, said biasing means respectively encompassing said pins.

14. A combination as set forth in claim 11 wherein means is carried by said one support member to limit movement of said support in one direction relative to said one support member and said means to tend to maintain said support in one position relative to said one support member includes biasing means disposed between said one support member and said support and tending to move said support in said one direction.

References Cited by the Examiner

UNITED STATES PATENTS

2,241,711	5/1941	Lowey	53—344
2,409,788	10/1946	Osborne	53—42
2,409,789	10/1946	Osborne	53—42
2,704,628	3/1955	Stanton et al.	53—344
2,732,116	1/1956	Merrill	53—42
2,830,419	4/1958	Annen	53—344
2,974,459	3/1961	Kinney	53—342
3,060,661	10/1952	Bruun	53—342

TRAVIS S. McGEHEE, *Primary Examiner.*

ROBERT E. PULFREY, *Examiner.*