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FOLDING DEVICE FOR CONTAINER CLOSURES

Filed Jan. 26, 1953

2 Sheets-Sheet 1

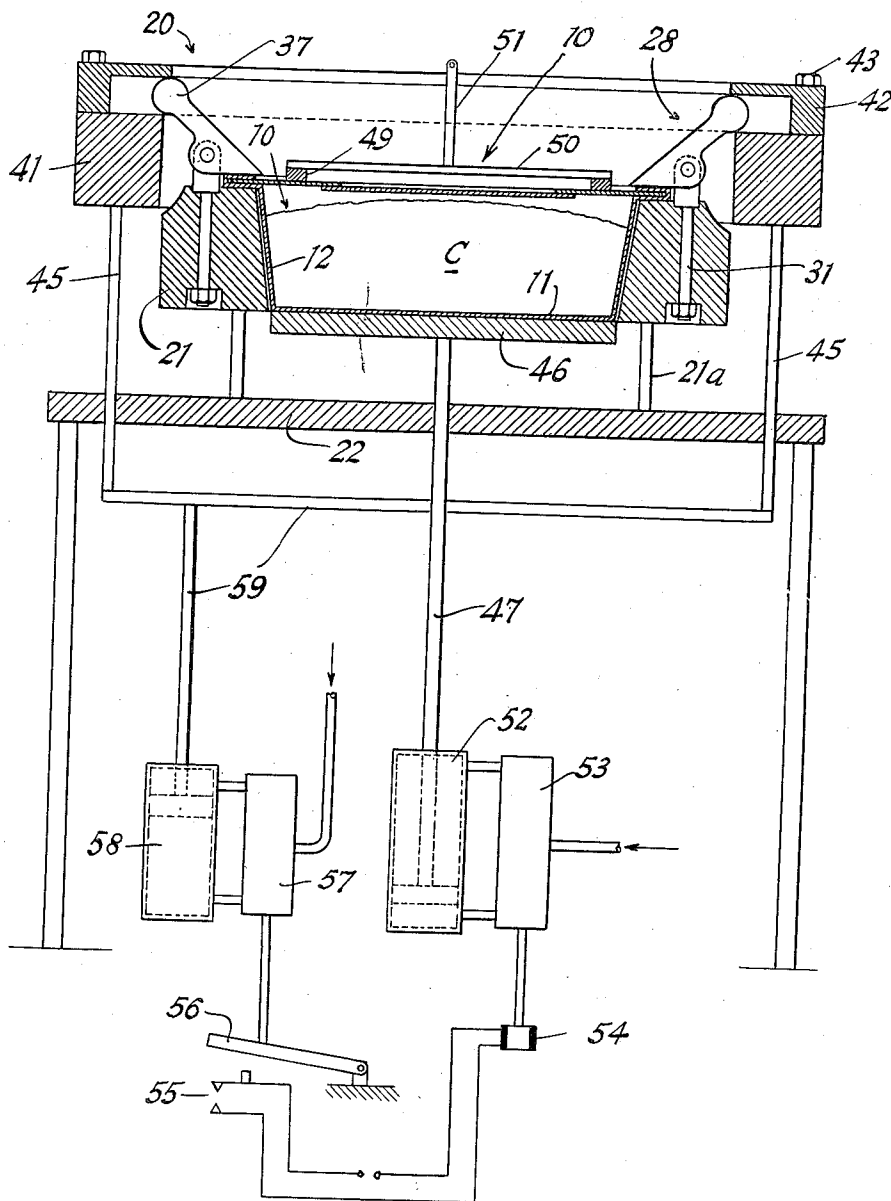


FIG. 1

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FIG. 3

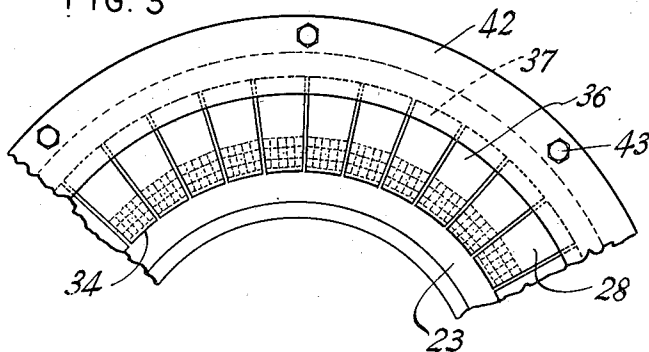


FIG. 2

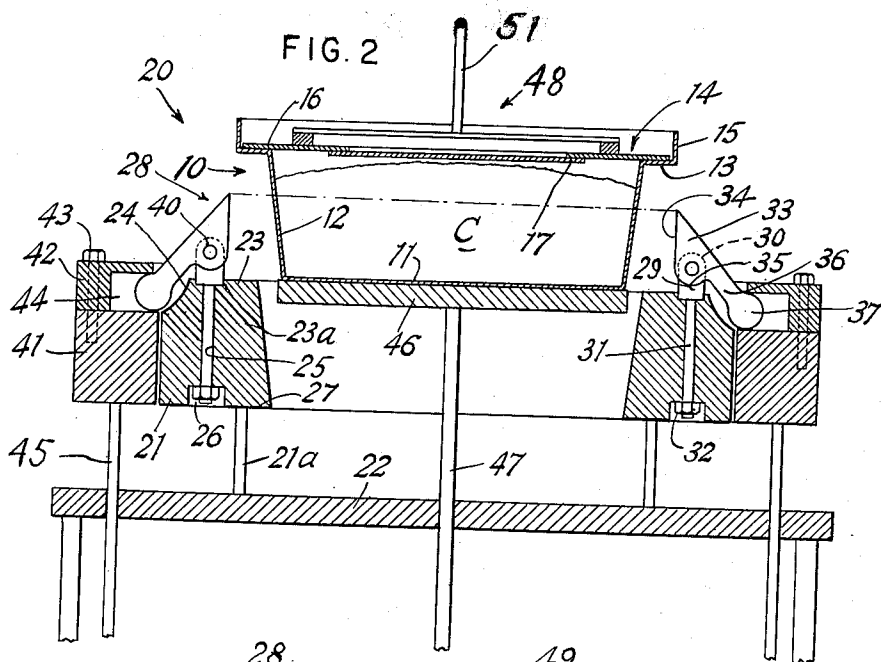


FIG. 4

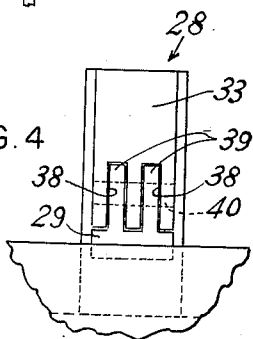
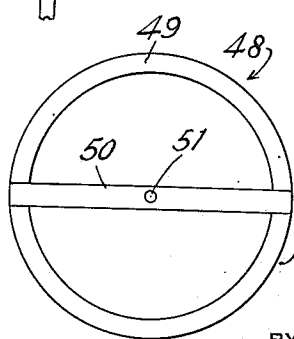


FIG. 5



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FOLDING DEVICE FOR CONTAINER CLOSURES

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Application January 26, 1953, Serial No. 333,144

2 Claims. (Cl. 53—366)

This invention relates to a folding device. More particularly, the invention concerns means for folding and crimping the rim portion of a container about the marginal edge of a lid or cover inserted in the open end of the container.

Packages for foodstuffs such as baked goods or the like, are provided in the form of open ended containers shouldered to seat a cover, the rim of the container being adapted to be folded and crimped about the cover, to complete the package.

Containers of the type described, are formed of paper, paperboard, metal foil, plastic sheeting, thin metal or the like. Such materials are capable of being folded and crimped and holding the crimped form. The covers for the containers may be formed from similar materials or combinations thereof. Thus, in one instance, the cover comprises a thin sheet of paperboard having a central opening therein which is covered with transparent material such as cellophane, plastic or the like. The cover is flexible in nature in order to accommodate any irregularities in the top surface of the baked goods or the like, packaged in the container.

An object of this invention is to provide improved means for folding and crimping a container rim about the marginal edge of a cover therefor.

Inasmuch as containers of the character described may be provided with their rims in somewhat deformed condition and the covers therefor may be in a somewhat distorted condition, a further object of this invention is to provide improved edge folding means operative to form a smoothly folded and crimped edge about the cover.

Another object of this invention is to provide improved folding means which comprises a plurality of folding elements in side by side relation and actuated simultaneously to smoothly fold successive and closely adjacent portions of a container edge.

Still another object of this invention is to provide in a device of the character described, improved container edge folding means and means for flattening a distorted cover about which the edge of a container is to be folded and crimped so as to insure a smooth fold of all portions of said container edge.

Still a further object of this invention is to provide improved means for receiving a container and cover therefor, together with means for folding the rim of the container about the cover and means for supporting the container in a folding position and in an ejection position in correlation to the operation of the folding means.

Yet another object of this invention is to provide hold down means for the container cover which is moved to an operative position for the folding operation and which is moved to an inoperative position after such folding operation.

Yet a further object of this invention is to provide a compact folding device for closing a container, which comprises a minimum number of parts, which is readily disassembled to replace worn parts, which requires a minimum amount of power for operation, which lends

itself to simple control and which is rugged and well adapted to meet the conditions of practical use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists of the elements of construction and arrangement of parts as will be exemplified in the embodiment hereinafter shown and described, the scope of the invention being indicated in the claims following.

In the drawing:

Fig. 1 is a diagrammatic showing of a folding device embodying the invention, with the folding fingers in their operative position;

Fig. 2 shows the device with the fingers in their normal, inoperative position;

Fig. 3 is a partial plan view of the device;

Fig. 4 is a front elevational view of one of the folding fingers;

Fig. 5 is a plan view of the cover flattening means.

Referring in detail to the drawing, and particularly, Fig. 2, 10 designates one form of container which may be processed by the device of the instant invention. Such a container, which is open at one end, may be of circular shape and is formed of heavy metal foil, or the like. The container comprises a bottom wall 11, a side wall 12 having a shoulder 13 at its upper end to seat a cover 14. Extending upwardly from shoulder 13 is a circular rim 15 which is adapted to be folded inwardly about the marginal edge of the cover, by means of the device hereinafter described. The material of which the container is formed is sufficiently stiff to maintain the container shape and to hold its folded form at rim 15.

The cover 14 comprises a thin paperboard portion 16 having a central cutout portion which is covered with a transparent sheet 17, such as cellophane or the like. Such a cover is flexible and will readily accommodate itself to any irregularities in the top surface of the material packaged in the container, such as, by way of example, the cake C.

While the covers 14 may be substantially flat when originally manufactured, atmospheric changes tend to distort the covers somewhat from their truly planar condition. Also, the containers 10 may become slightly deformed in handling, particularly about the rim 15 thereof, so that circumferential portions of the rim may be deflected inwardly or outwardly from the true vertical. Such non-uniformity in both containers and covers, make it rather difficult to fold the rim 15 about the marginal edge of the seated cover uniformly about the entire circumference thereof by devices known in the art and frequently it becomes necessary to perform such folding operations by hand which is not only tedious but uneconomical.

Accordingly, there is provided a folding device 20 embodying the invention. Such device, which for the purpose of illustration is in a form to process containers of the type described above, comprises a ring shaped member 21 which is mounted in raised relation to a table 22 or other suitable support, by means of brackets 21a.

The member 21 is formed on its top wall 23 with a shallow annular groove 23a and an annular cutaway portion 24 at its outer top edge. The member 21 is also formed with a plurality of vertically extending, small diameter bores 25 which are circumferentially spaced equidistantly. The bores open at their upper ends in groove 23a and are counterbored at their lower ends as at 26 and extending inwardly of the bottom wall 27.

Rim folding means is mounted on the top wall of member 21 and takes the form of a plurality of similar, folding fingers 28 which are arranged circumferentially in adjacent relationship in groove 23a. Each finger 28 is mounted for pivotal movement about a horizontal axis by

3 means of a member 29 of generally rectangular shape having a semi-circular top wall 30. The members 29 are seated in groove 23a with the corners of the members engaging the arcuate edges of the groove to prevent rotation of the members about a vertical axis. A threaded stem 31 extends from the bottom of each member 29, passing through the respective bores 25 and a nut 32 screwed on the lower end thereof in recess 26, locks each member in place, yet allowing ready removal thereof.

As shown in Figs. 2, 4, each folding finger 28 comprises a triangular shaped portion 33 having a forwardly disposed planar folding surface 34, an arcuate edge 35 extending from the lower edge of the folding surface, a linear portion 36 terminating in a part cylindrical portion 37. The fingers 28 are milled inwardly from the lower portion of surface 34 and edge 35 to form a pair of parallel, spaced grooves 38. The members 29 are milled from the top wall 30 thereof downwardly to form a pair of parallel, spaced ears 39 which are received in grooves 38 of ears 28. A pivot pin 40 interconnects the finger 28 to member 29, allowing pivoted movement of the fingers.

Means is provided for simultaneously moving the circumferentially arranged fingers 28 between the positions shown in Figs. 1 and 2, as from the normal inoperative position wherein the folding surface 34 of the fingers is vertically disposed, Fig. 2, to the folding position wherein finger surfaces 34 are horizontally disposed, Fig. 1. Such means takes the form of a ring shaped member 41 encircling member 21 and slidable relative thereto in a vertical plane. An annular member 42 of inverted L-shaped section, is removably mounted on the top surface of member 41, as by bolts 43 screwed into threaded recesses in member 41, thus providing an annular recess 44 opening inwardly and adapted to receive the rear end portions 37 of fingers 28. Movement is imparted to member 41, through circumferentially spaced connecting rods 45 extending from the bottom of the member through openings in the table 22 and actuated as hereinafter described.

The container 10 with a cake C or the like, disposed therein, is adapted to be located within member 21, being supported on a disc 46, from which extends a rod 47 passing through an opening in table 22 and adapted to be actuated, as hereinafter described, in correlated relation to the movement of member 41.

Inasmuch as the cover 14 may be somewhat distorted from its truly flat condition, a hold down or flattening member 48 is provided, the same comprising a flat ring 49 having an outside diameter somewhat less than the diameter of the cover 14, a diametral strip 50 secured to the ring and a handle 51 extending upwardly from strip 50 to locate the flattening member and to remove the same. The member 48 is of sufficient weight to flatten the cover without unduly pressing the same against the contents of the container.

In using the folding device, a container 10 filled with a cake C or the like, and having a cover 14 located on shoulder 13, is placed on supporting disc 46, which is normally maintained in an elevated position, as shown in Fig. 1, by means of a pneumatic cylinder 52 having a piston therein connected to rod 47. A valve 53, controlling air under pressure admitted into said cylinder, is operable by a solenoid 54 in circuit with a source of energy and a normally open switch 55. Switch 55 is adapted to be operated by a pivoted pedal 56.

After placing the flattening means 48 on the cover 14, the operator steps on pedal 56 and initially closes switch 55 to energize solenoid 54 and thereby actuate valve 53, causing the piston in cylinder 52 to move downwardly and to thus bring disc 46 to its depressed position wherein the container shoulder 13 rests on surface 23 of member 21 and the rim 15 is brought into juxtaposed relation to the surface 34 of fingers 28.

When the pedal 56 is further depressed, a valve 57 controlling the operation of a second pneumatic cylinder 58,

will be operated in a manner to raise a linkage indicated at 59 which connects rods 45 and a piston in said cylinder, thereby raising member 41 to its elevated position as shown in Fig. 1. In this manner all the fingers 28 will be pivoted simultaneously to uniformly fold the container rim 15 circumferentially into engagement with the marginal portions of cover 14.

On releasing the pedal 56, the valve 57 will be first operated to cause downward movement of the member 41 and thus pivoting the fingers 28 back to their normal position, and thereafter switch 55 will be opened to deenergize solenoid 54 to operate valve 53 and restore disc 46 to its normal elevated position, thus allowing the container to be removed and replaced by another container ready for the folding operation. The flattening means 48 may be manually or otherwise removed after the folding operation is completed.

As shown in Fig. 3, the fingers 28 are closely arranged in circumferential arrangement, the sides of the fingers being tapered somewhat to insure proper side by side relation in their folding position. The recess 44 in the finger pivoting means allows free movement of the finger portions 37, during the movement of said means. The cutaway portion 24 on member 21 allows fingers 28 to assume their proper normal position with the folding surfaces 34 thereof properly located to allow the container rim 15 to assume its proper position relative to said surfaces preparatory for the folding operation.

Fingers 28 may be readily replaced, by first removing member 42 and then unscrewing nut 32 from the stem of the finger mounting means.

It is understood that the shape of members 21, 41 may be modified to accommodate the periphery of a selected container, which may have straight as well as curved rims or combinations thereof. The fingers will then be arranged about the top wall of the inner member and actuated by the outer member, as previously described. Thus, heart or crescent shaped containers as well as those having rectilinear edges, may be processed in folding devices embodying the invention.

It will thus be seen that there is provided a folding device, in which the several objects of the invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above described invention and as various changes might be made in the embodiment set forth, it is understood that all matter herein set forth or shown in the drawings, is to be interpreted as illustrative and not in a limiting sense.

Having thus disclosed our invention, we claim as new and desire to protect by Letters Patent:

1. A device for folding the upstanding rim of a shouldered metallic foil container about a semi-rigid cover of paper board or the like seated on the shoulder thereof comprising a stationary ring shaped open bottom member presenting a flat upper marginal surface against which the surface of the shoulder opposite the cover seating surface is downwardly engageable to support said container, a second ring member of such diameter as to externally telescope said stationary ring in one position and mounted for movement toward and away from said position in a path coaxial with said stationary ring member, a plurality of circumferentially arranged and closely adjacent folding members mounted on said stationary ring member for pivotal movement in a path radially of the latter and each having a folding face at one end thereof, engageable with the upstanding rim of the container to fold the latter inwardly in overlying relation to the edge of the cover seated on said shoulder upon movement of the folding face from vertical to horizontal position, and said folding face of each folding member when in said horizontal position and said marginal surface of the stationary ring member cooperating to provide opposed flat clamping surfaces between which the inwardly turned

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flange is clamped against the cover, a cylindrically shaped head at the other end of each folding member, said movable ring having an annular recess facing the stationary ring defined by opposed axial surfaces between which said head of each folding finger is engaged to move the folding face of said finger from vertical to horizontal position in response to movement of the second ring toward a position externally telescoping said first ring, a bottom member supported for movement within the first ring member between an elevated position and a depressed position, and occupying a depressed position when the container shoulder engages the upper marginal surface of the stationary ring, said bottom member providing an upper surface engaging the bottom of said container when said bottom member is in depressed position. 15

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2. A device as claimed in claim 1 including means for moving the second ring member relative to said first ring member, and means for moving the bottom member between depressed and elevated positions in timed relationship to movement of said second ring member relative to said first ring member.

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