March 16, 1948. R. GUYER 2,437,952

METHOD AND APPARATUS FOR PACKING CONTAINERS

Filed March 3, 1945 3 Sheets-Sheet 1

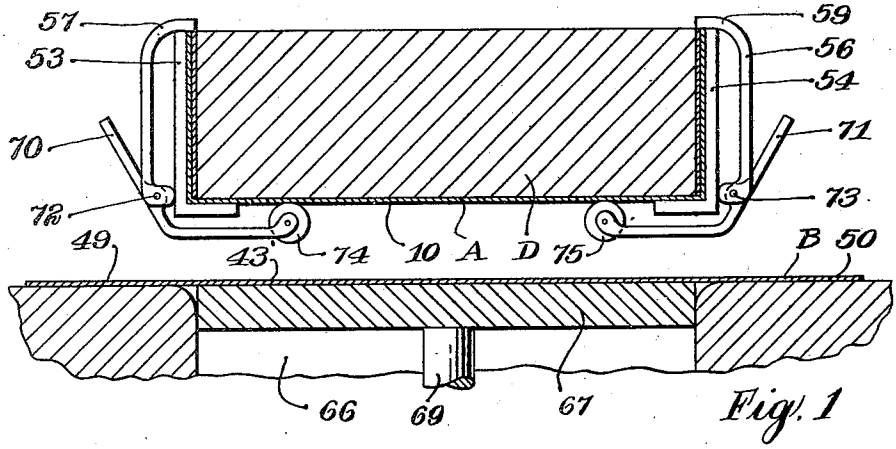


Fig. 1

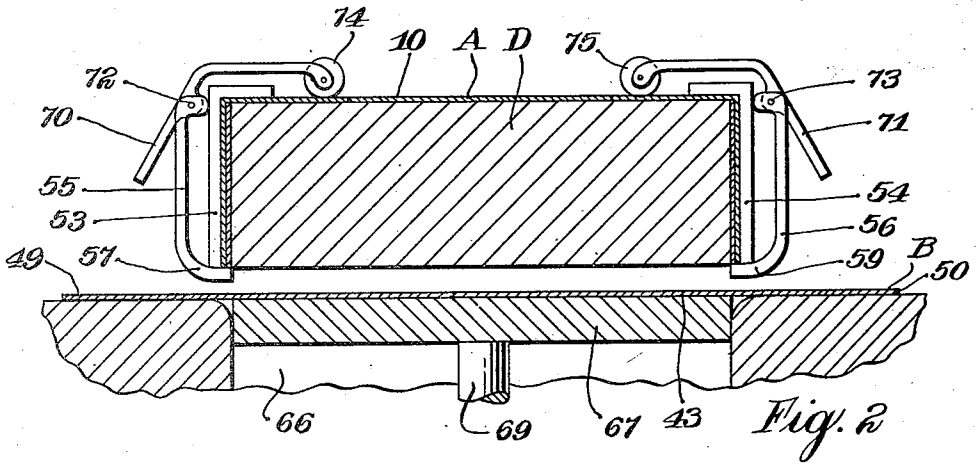


Fig. 2

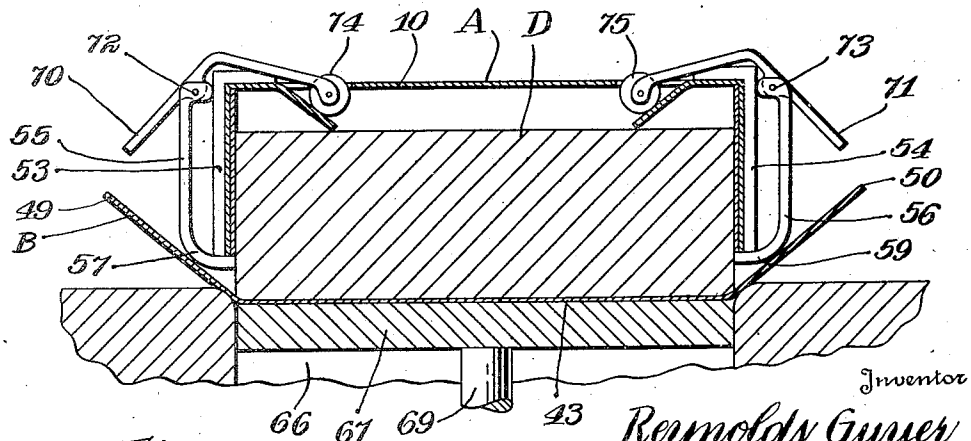


Fig. 3

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METHOD AND APPARATUS FOR PACKING CONTAINERS

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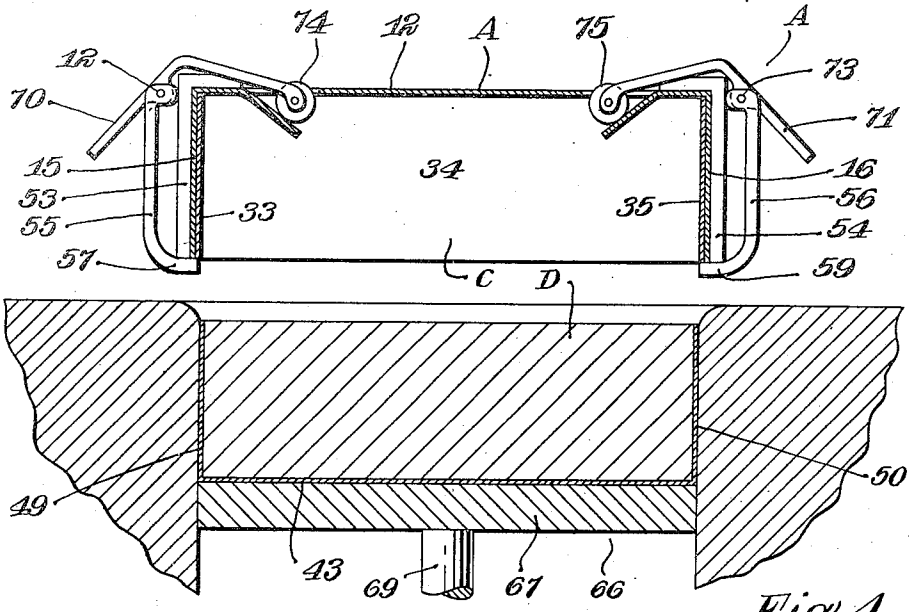


Fig. 4

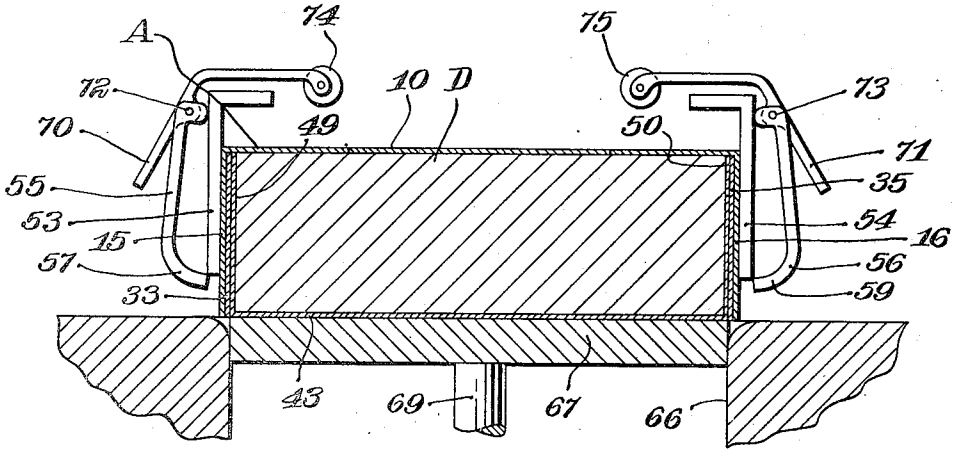


Fig. 5

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METHOD AND APPARATUS FOR PACKING CONTAINERS

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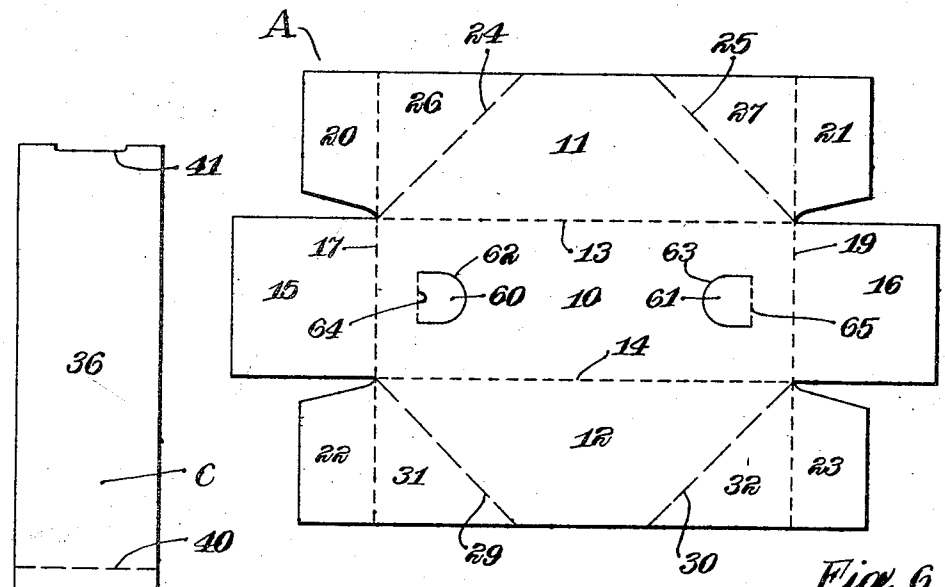


Fig. 6

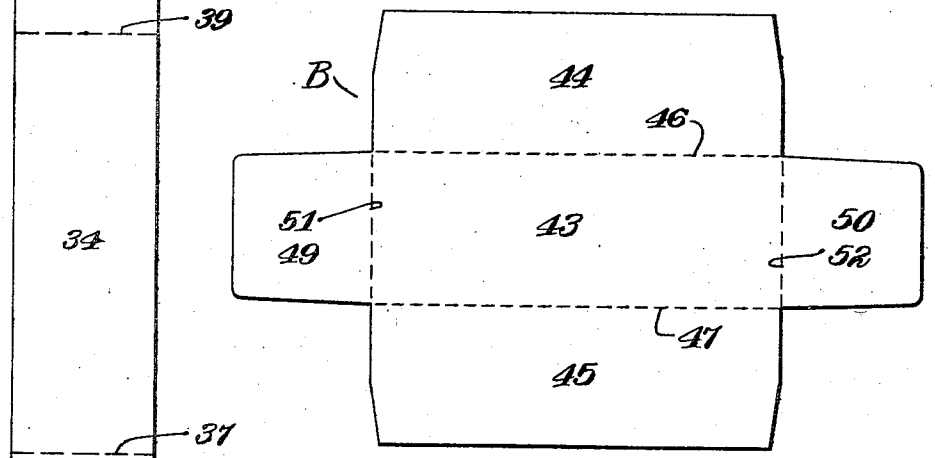


Fig. 7

Fig. 8

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METHOD AND APPARATUS FOR PACKING CONTAINERS

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Application March 3, 1945, Serial No. 580,808

20 Claims. (Cl. 93—3)

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My invention relates to an improvement in method and apparatus for packing containers wherein it is desired to package material between the two parts of a telescoping container.

In my previous application, Patent No. 2,323,467, issued July 6, 1943, for "Method of packing containers," I described a process whereby material such as cheese could be packaged in a telescoping container. This method describes the manner in which a material such as cheese could be poured into a liner within the cover portion of a container and the liner folded so as to enclose the product. When thus wrapped the contained material is inverted upon a tray including a bottom and side walls foldably connected thereto. This tray bearing the contents of the package is depressed into a recess which acts to fold the side walls of the tray against the sides of the packaged material. The tray and the contents resting thereupon are then reinserted into the top portion of the carton to complete the packaging operation.

This method has been successfully operated for some time. In the packaging of certain types of products such as processed cheese, it has been found that the cheese remains in a liquid state for a considerable period of time. Thus when the cover portion of the container is inverted the inner wrapper containing the contents is forced against the side walls of the cover creating virtually an air tight seal between the container cover and the packaged material. As a result the dropping of the contents onto the tray and into the recess is sometimes considerably delayed by the formation of a partial vacuum within the cover of the container. This partial vacuum threatened to delay the packaging operation to a point where it could be more economically accomplished manually.

In order to solve the difficulty I have evolved the present method which prevents the formation of partial vacuum and assists the packaged material in dropping into the recess so that the speed of the packaging operation may be greatly increased.

In carrying out the present method I first prepare the covers of the cartons with tabs or flaps partially cut therefrom. These tabs or flaps normally lie coplanar with the top surface of the cartons and do not detract materially from the appearance of the carton or the design imprinted thereupon. When the carton covers containing the packaged material are inverted these flaps are urged downwardly by roller bearing fingers which press the flaps against the material packaged. This action serves both to push the contents of the material downwardly and simultaneously to provide an opening through which air may be admitted to prevent the formation of a partial vacuum above the packaged material. As a result this material is quickly depressed into the registering recess. The side walls of the cutting board or tray are folded up against the sides of the packaged material, and the tray and its contents are telescoped with the cover of the carton.

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A feature of the present invention resides in the forcing of the contents downwardly so as to initiate the dropping of the material into its registering recess. By speeding this action I not only greatly increase the speed with which the products may be packaged, but also permit the packaged material to be enclosed in the bottom portion of the carton before this material has a chance to leak out or spread to an undesirable extent. As previously explained when cheese is packaged the action described takes place while the cheese is approximately the consistency of heavy cream or buttermilk. The top of the liner is often merely folded over the contents and is not sealed. Under such conditions if a delay is incurred before the packaged product drops into the recess the product begins to leak from the unsealed wrapper and to spread laterally in all directions upon the tray. Such leakage and spreading is prevented if the dropping action is immediate, as the wrapper and its contents drop flatly upon the tray and the sides of the tray are quickly folded about this body.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a sectional view through the top part of a telescoping carton and a carton holding apparatus, the view showing diagrammatically the packaged contents as a block of material.

Figure 2 is a view similar to Figure 1 showing the carton immediately after it has been inverted.

Figure 3 shows the next step in the process and illustrates the manner in which the contents are mechanically forced downwardly and openings are produced for admitting air into the top of the carton.

Figure 4 illustrates the carton supported over the aperture and the packaged goods contained in the recess, the walls of the tray-shaped bottom of the carton enclosing the sides of the packaged product.

Figure 5 illustrates a subsequent step in the operation wherein the packaged product, together with the bottom of the carton is forced upwardly into the top of the carton and the top has been released by its holding apparatus.

Figure 6 is a diagrammatic view of the top part of the carton showing the construction thereof.

Figure 7 is a view of the bottom part of the carton showing the construction thereof.

Figure 8 shows diagrammatically a reinforcing sleeve which may be employed in the cover of the carton to reinforce the side walls thereof.

The carton illustrated includes the carton cover A, the carton bottom which forms a tray or cutting board illustrated at B, and a reinforcing sleeve for the top of the carton which is indicated in general by the letter C. The top of the carton is adhered in set up form with the side walls depending from the top and in secured relation as illustrated in Figures 1 to 5 of the drawings.

The carton cover A includes a top panel 10, to which are secured side wall panels 11 and 12 connected to the top panel 10 along parallel fold lines 13 and 14. End wall panels 15 and 16 are connected to the top panel 10 along parallel fold lines 17 and 19. End flaps 20 and 21 are connected to the side wall panel 11 along continuations of the fold lines 17 and 19. Similar end flaps 22 and 23 are connected to the ends of the side wall 12 along continuations of these same fold lines 17 and 19.

For convenience in the gluing operation diagonal fold lines 24 and 25 emanate from the juncture of the fold lines 17 and 13, and form the juncture of the fold lines 13 and 19 respectively. This permits the triangular portion 26 of the panel 11, together with the end flap 20 to be folded to underlie portions of the panels 11 and 10, respectively. It also permits the triangular portion 27 of the panel 11 to be folded along the fold line 25 to underlie a portion of the panel 11, the end flap 21 underlying part of the panel 10.

Similar diagonal fold lines 29 and 30 are provided in the panel 12 extending from the juncture of the fold lines 14 and 17 and from the juncture of the fold lines 14 and 19 respectively. As a result the triangular portion 31 of the panel 12 may be folded to underlie part of the panel 12, the end flap 22 underlying a portion of the panel 10. The triangular portion 32 may also be folded along the fold line 30 to underlie portions of the panel 12, the end flap 23 underlying portions of the panel 10. Adhesive may be applied to the end flaps 20, 21, 22 and 23 and the end flaps 15 and 16 may then be folded to underlie these various end flaps and to be secured thereto. This infolded box may then be folded into rectangular shape having a solid top panel and depending connecting side walls.

In Figure 8 of the drawings I disclose a reinforcing sleeve designed for insertion into the top A of the carton. This reinforcing sleeve is an elongated strip of paper board or the like including panels 33, 34, 35, and 36 connected along parallel fold lines 37, 39 and 40. If preferred the sleeve thus formed may be taped at its ends so as to form a rectangular open ended reinforcing sleeve. The sleeve is considerably easier to insert, however, if it is formed in the manner illustrated. A notch 41 is provided in one end of the strip, being illustrated in the free end of the panel 36. The other end of the strip is provided with a short projection 42 designed to extend into the notch 41. This tongue and notch formation

holds the sleeve assembled when once in place and permits the collapse of the sleeve during insertion.

The bottom portion of the container is best illustrated in Figure 7 of the drawings. This bottom portion forms a cutting board and is provided with foldable side walls which are designed to fold into coplanar relationship with the bottom panel when the top of the carton is removed. This structure permits the cheese or other product to be sliced without removing the same from the bottom of the carton.

The carton bottom member B includes a bottom panel 43 having connected thereto side wall panels 44 and 45, joining the panel 43 along score lines or cut lines 46 and 47. The ends of the panel 43 are attached to end wall panels 49 and 50 along score lines or cut score lines 51 and 52. The various panels 44, 45, 49 and 50 are foldable upwardly from the bottom panel 43 to form separate side walls which act to properly confine the product when held in upstanding position, but which may fold flat when unconfined.

Diagrammatically illustrated in Figures 1 through 5 of the drawings I disclose a holder for the top A of the carton. This top holder is shown as comprising L-shaped brackets or end plates 53 and 54 which overlie portions of the end walls 15 and 16 of the upper carton portion A and also enclose a portion of the top panel 10 thereof. Obviously means are provided for supporting these carton supports 53 and 54 in proper relationship, this means being capable of inverting the carton. The actual structure involved in inverting the box forms no part of the present invention and the carton supports 53 and 54 may be supported in any desirable manner so as to permit inversion of the top portions of the carton together with the contained products.

In order to hold the cartons in supported position I provide a pair of arms 55 and 56 which are provided with inturned ends 57 and 59 respectively. These hook shaped ends extend inwardly from the end supports 53 and 54 engaging the end walls 15 and 16 of the carton top A and also engaging the reinforcing sleeve C within the carton. These arms 55 and 56 hold the carton in place in its support even while in inverted position so that the contents of the carton may be withdrawn from the carton top.

As best illustrated in Figure 6 of the drawings, flaps 60 and 61 are partially cut from the top panel 10, being defined in the form shown by a U-shaped cut line 62 and 63, respectively, and fold lines 64 and 65, respectively. The flaps 60 and 61 normally remain coplanar with the panel 10, but these flaps may be bent out of the plane of the top panel 10 if it is so desired.

In Figure 1 of the drawings the carton top A is illustrated containing the product D. This product is shown in a solid block, but it will be understood that this block may be of material such as processed cheese in a liquid state contained in a sack or wrapper of material such as Cellophane, Pliofilm, or a similar product.

The cheese or other product is packed into the upper portion of the carton and the carton is then engaged in the supporting mechanism previously described. Obviously the filling operation may take place while the carton is thus supported if it is so desired, but such action requires more time and slows the speed of operation of the packaging apparatus.

When the material to be packaged has been properly placed in the carton top as best illus-

trated in Figure 1, the carton supporting mechanism is inverted into the position shown in Figure 2 overlying the carton bottom blank or tray B. This blank overlies a recess 66 having a piston or plunger 67 therein operated by any suitable means such as by the piston or plunger rod 69. The aperture 66 is of approximately the same size as the bottom panel 43 of the carton so that when the tray B and the cheese thereon drop into this recess or aperture 66, the side walls 44, 45, 49, and 50 of the container bottom portion B are folded upwardly into right angular relation to the bottom.

With the carton top A in invented position, means are supplied to pivot a pair of oppositely disposed levers 70 and 71. These levers 70 and 71 are pivoted to the carton support at the pivotal points 72 and 73 respectively. The levers 70 and 71 support rollers 74 and 75 which are preferably positioned to engage the outer surface of the tabs 60 and 61. By pivoting the arms 70 and 71 the rollers 74 and 75 engage these tabs bending them inwardly as illustrated in Figure 3 of the drawings. This action has the double effect of applying pressure to the top of the bag or sack containing the packaged product and secondly of providing openings in the top of the carton through which air may be admitted into the interior of the carton.

If processed cheese in a liquid state is being packaged this cheese has a tendency to force the wrapper into tight engagement with the walls of the upper portion of the carton. As the cheese drops by gravity when the upper portion of the box is inverted the portion of the liner suspended below the carton has a tendency to spread out. This also tends to provide a tight seal between the walls of the carton and the product tending to create a partial vacuum in the upper portion of the carton.

By use of the arms 70 and 71 and the rollers 74 and 75 supported thereby the product is quickly started on its downward path and air is admitted to fill the upper portion of the carton to prevent delay in operation.

As noted in Figure 3 of the drawings the plunger 67 begins its descent as soon as the packaged product D drops upon the same. During this descent the wall flaps 44, 45, 49 and 50 fold upwardly to enclose the side walls of the packaged product. Often these flaps must bend in order to enter the recess 66, but as these elements are merely free panels, such bending may take place without difficulty.

Figure 4 of the drawings illustrates the packaged product D entirely removed from the upper portion of the container and the side walls 44, 45, 49 and 50 of the bottom portion B of the container folded upwardly to enclose the sides of the product. While in this condition the plunger 67 begins to raise forcing the product D in its contained condition into the upper portion C of the carton. The side and end walls of the bottom portion of the container enter inwardly of the reinforcing sleeve C during this operation. As the plunger 67 nears the upper extremity of its stroke or reaches this upper extremity the upper portion A of the carton is released by the ends 57 and 59 of the arms 55 and 56 allowing the carton to drop into telescoping position. The carton supporting members 53 and 54 are then inverted into the position shown in Figure 1 of the drawings and the process is ready to start over.

From the foregoing explanation the method and apparatus which I employ for packaging

materials is believed obvious. The tabs 60 and 61 permit air to enter the top of the container during the downward movement of the contents and similarly allow air to leave the container as the contents are forced back into the carton. As the packaged contents D near the upper extremity of their stroke the contents engages the flaps 60 and 61, which by this time have been disengaged by the rollers 74 and 75. The flaps are forced back into coplanar relationship with the remainder of the panel 10 by the packaged contents.

In accordance with the patent statutes, I have described the principles of construction and operation of my method and apparatus for packaging containers, and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. The method of packing a container having two box-like sections designed to engage in telescoping relation with the side walls of one section enclosing the side walls of the other section, the method consisting of placing in the larger section a plastic mass of a size to substantially fill the larger section, removing the plastic mass from the larger section and simultaneously admitting air between the plastic mass and the larger portion of the container, compressing the mass and inserting the same within the smaller of the sections, and telescoping the sections.

2. The method of packing a container having one section including a base and connected side walls thereto, and a second section including a base and side walls foldably connected thereto; the method consisting of placing a plastic mass of material within one section, placing said one section containing said plastic mass above the second section while said second section is normally flat, dropping the plastic mass and said second section away from said one section, simultaneously admitting air into the first section, folding the side walls of the second section about said plastic mass, compressing said plastic mass and elevating said plastic mass and said second section into telescoping relation with said one section.

3. The method of packing a container having one section including a base and connected side walls secured thereto, and a second section including a base and side walls foldably connected thereto; the method consisting of placing the material to be packaged in said one section, placing said one section above said second section while the second section is substantially flat, dropping the second section and material to be packaged away from said one section, simultaneously admitting air into said one section, folding the side walls of the second section about the material, compressing the material to be packaged and elevating the second section and the material to be packaged into telescoping relation with said one section.

4. The method of packing a telescopic container including one section having a base and adjacent side walls, and a second section having a base and side walls foldably connected thereto; the method consisting of placing the materials within said one section, transferring the materials onto the other section, simultaneously introducing air into said one section, folding the side walls of the other section about said mate-

rials and compressing the materials, and telescoping the two sections.

5. The method of packing a telescopic container having one section including a base and connected side walls secured thereto, and a second section including a base and side walls foldably connected thereto; the method consisting of molding the material to be packaged within said one section, transferring the molded material onto the second section, simultaneously introducing air into said one section, folding the side walls of the second section about the material and compressing the molded material, and telescoping the two sections.

6. The method of packing a telescoping container having an upper section having a top and depending connected side walls thereupon, and a lower section including a base and side walls foldably connected thereto; the method consisting of placing material within the upper section, transferring the material onto the lower section and simultaneously introducing air into the upper section, folding the side walls of the lower section about the materials and compressing the molded material, and telescoping the two sections.

7. The method of packing a container including an upper section having a top and depending connected side walls thereupon, and a lower section having a base and side walls foldably connected thereto; the method consisting of placing material within the upper section, inverting the upper section and the material, transferring the material onto the lower section, simultaneously introducing air into the upper section, folding the side walls of the lower section about the material compressing the material, and telescoping the two sections.

8. The method of packing a telescoping container having an upper section having a top and depending connected side walls thereupon, and flap means normally coplanar with a panel of the upper section but foldable out of coplanar relation and a lower section having a base and side walls foldably connected thereto; the method consisting of placing material within the upper section, transferring the material onto the lower section and simultaneously bending said flap means out of coplanar relation with its connected panel to admit air into the upper section, folding the side walls of the lower section about the material compressing the material, and telescoping the two sections.

9. The method of packing a container including an upper section having a top and depending connected side walls thereupon, and flap means in one of the panels thereof normally coplanar with its associated panel, but foldable out of coplanar relationship, and a lower section including a base and side walls foldably connected thereto; the method consisting of placing material within the upper section, inverting the upper section and the material, transferring the material onto the lower section while the flap means is folded out of coplanar relation with its associated panel to admit air into the upper section, folding the side walls of the lower section about the material compressing the material, and telescoping the two sections.

10. The method of packing a telescopic container having one section including a series of panels comprising a base and connected side walls secured thereto, and flap means in one of said panels normally coplanar with the remainder of the panel but foldable out of coplanar relationship, and a second section including a base and side walls foldably connected thereto; the method consisting of molding the material to be packaged within said one section, transferring the molded material onto the second section while the flap means are out of coplanar relation with the remainder of the associated panel, folding the side walls of the second section about the material compressing the material, and telescoping the two sections.

11. The method of packing a telescopic container including one section comprising a series of panels including a base and connecting side walls secured thereto, and a second section including a base and side walls foldably connected thereto, one of said panels of said one section having flap means therein normally coplanar with the remainder of said one panel, but foldable out of coplanar relation; the method consisting of placing the materials to be packaged in said one section, folding said flap means out of coplanar relation to urge the materials out of said one section and to simultaneously admit air into said one section, transferring the material onto the second section, folding the side walls of the second section about the material compressing the material, and telescoping the two sections.

12. The method of packing a telescopic container having one section including a series of panels comprising a base and connected side walls secured thereto, and flap means in one of said panels normally coplanar with said one panel and foldable out of coplanar relationship, and a second section including a base and side walls foldably connected thereto; the method consisting of placing the material to be packaged within said one section, inverting said one section, folding said flap means inwardly out of coplanar relation to urge the material to be packaged out of said one section, transferring the material onto said second section, folding the side walls of the second section about the material, compressing the material, and telescoping the two sections.

13. The method of packing a telescopic container having one section including a series of panels comprising a base and connected side walls secured thereto, flap means in one of said panels normally coplanar with the remainder of the panel but foldable out of coplanar relationship, and a second section including a base and side walls foldably connected thereto; the method consisting of molding the material to be packaged within said one section, folding said flap means inwardly to urge the material to be packaged out of said one section, transferring the molded material onto said second section, folding the side walls of said second section about the material compressing the material, and telescoping the two sections.

14. The method of packing a telescopic container having one section including a base and connected side walls secured thereto, flap means in said base normally coplanar therewith but foldable out of coplanar relation, and a second section including a base and side walls foldably connected thereto; the method consisting of placing the material to be packaged within said one section, folding said flap means out of coplanar relation with said base to urge the material to be packaged out of said one section, transferring the material onto said second section, folding the side walls of the second section about the material, compressing the material, and telescoping the two sections.

15. The method of packing a telescopic container having one section including a base and connected side walls secured thereto, flap means in said base normally coplanar therewith but foldable out of coplanar relation, and a second section including a base and side walls foldably connected thereto; the method consisting of placing the material to be packaged within said one section, inverting said one section, folding said flap means out of coplanar relation with the base to urge the material to be packaged out of said one section, transferring the material to be packaged onto said second section, folding the side walls of the second section about the material compressing the material, and telescoping the two sections.

16. The method of packing a telescopic container having one section including a base and connected side walls secured thereto, flap means in said base normally coplanar therewith but foldable out of coplanar relation, and a second section including a base and side walls foldably connected thereto; the method consisting of molding the material to be packaged within said one section, folding the flap means out of coplanar relation with said base to urge the material out of said one section, transferring the molded material onto the second section, folding the side walls of the second section about the material compressing the material, and telescoping the two sections.

17. An apparatus for packaging materials for use in combination with a container having one section including a base and connecting side walls secured thereto, and flap means in said base normally coplanar therewith but foldable out of coplanar relation and a second section including a base and side walls foldably connected thereto, the apparatus comprising means for supporting said one section in inverted position, and means engageable with said flap means to fold said flap means out of coplanar relation with said base.

18. An apparatus for packaging materials for use in combination with a container having one section including a base and connecting side walls secured thereto, and flap means in said base normally coplanar therewith, but foldable out of

coplanar relation and a second section including a base and side walls foldably connected thereto, said apparatus comprising releasable means for releasably supporting said one section in inverted position, and means engageable with said flap means to fold said flap means out of coplanar relation with said base.

19. The steps in the method of packaging which consist in providing a box blank having a bottom-forming panel and side wall-forming panels extending outwardly from the edges of said bottom-forming panel, supporting said blank by engaging only portions of said side wall-forming panels which are spaced substantially from the edges of said bottom-forming panel, and discharging the content of a filled open-topped receptacle on the bottom-forming panel of the blank supported as aforesaid, thereby to effect at least partial folding of the blank around said content as an incident to the weight and momentum thereof upon being discharged from said receptacle.

20. The steps in the method of packaging which consist in providing a box blank having a bottom-forming panel and side wall-forming panels extending outwardly from the edges of said bottom-forming panel, supporting said blank by engaging only portions of said side wall-forming panels which are spaced substantially from the edges of said bottom-forming panel, and discharging the content of a filled open-topped receptacle on the bottom-forming panel of the blank supported as aforesaid, thereby to effect partial folding of the blank around said content as an incident to the weight and momentum thereof upon being discharged from the said receptacle, mechanically completing the folding of said box blank around said content and compressing a portion of said content to dimensions which are smaller than the corresponding dimensions of the open side of a receptacle into which the content is to be inserted, and then effecting relative movement between said compressed content and an open-sided receptacle to effect insertion of the compressed and boxed content into such receptacle.

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