June 30, 1964 D. C. ELLINGER 3,138,905

METHOD OF APPLYING COVERS TO COMMODITY PACKED TRAYS

Filed July 20, 1961 4 Sheets-Sheet 1

Fig. 1.

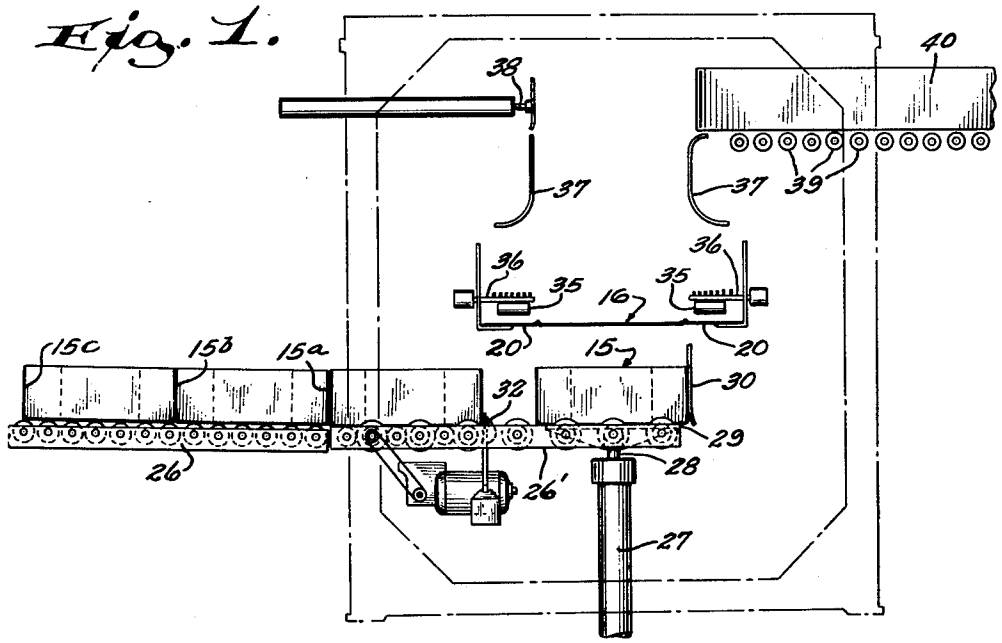
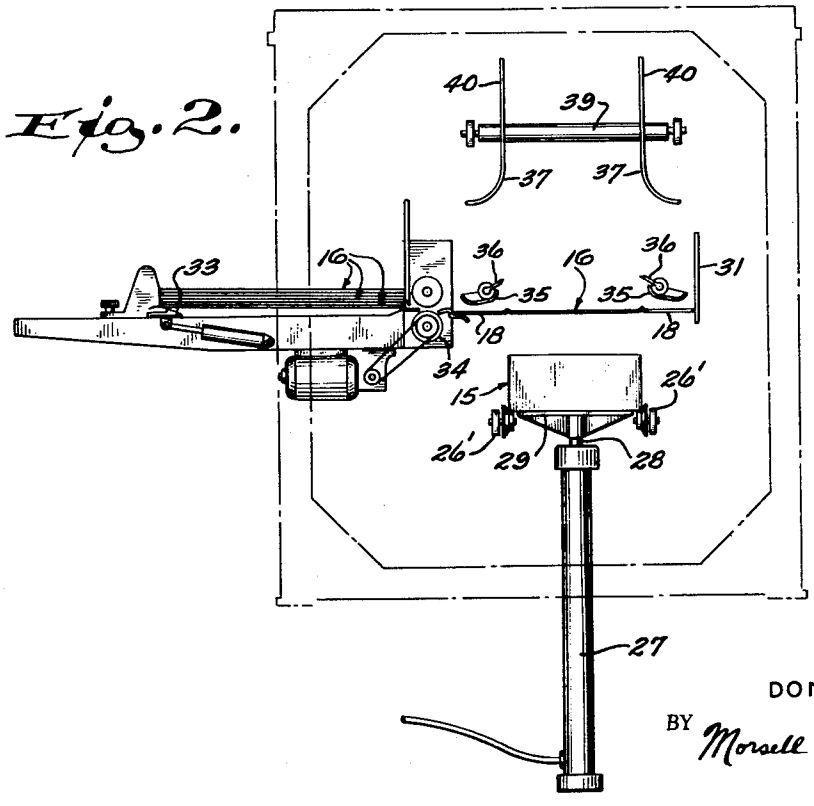


Fig. 2.



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Filed July 20, 1961 4 Sheets-Sheet 2

Fig. 3.

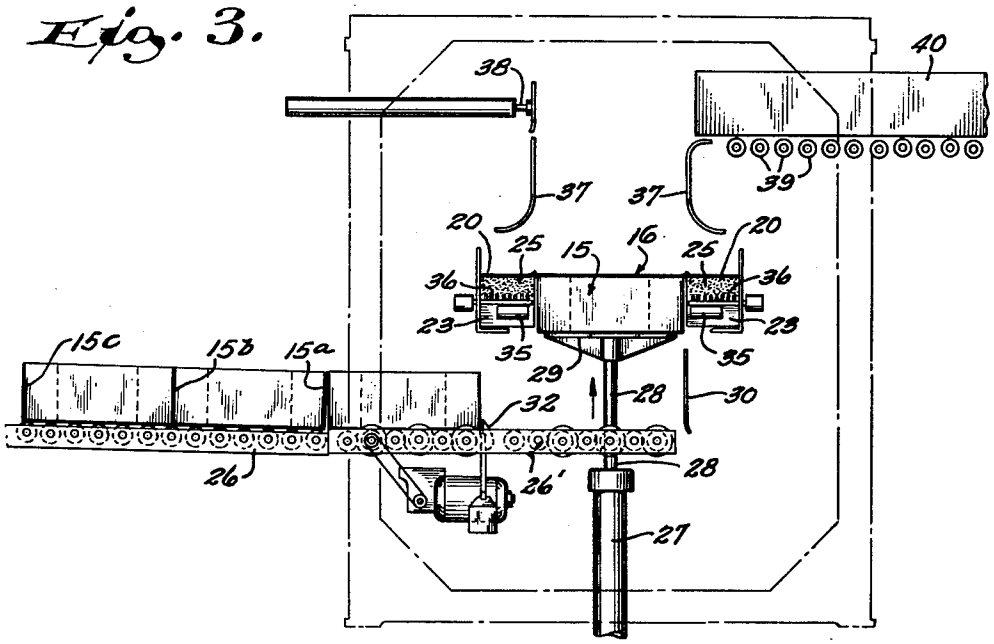
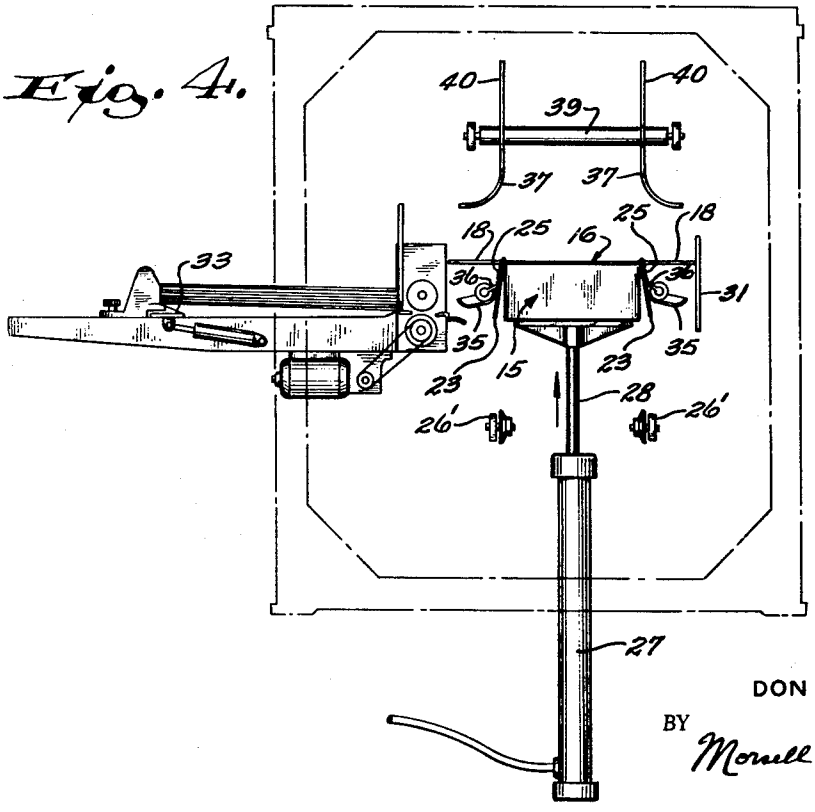


Fig. 4.



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Filed July 20, 1961 4 Sheets-Sheet 3

Fig. 5.

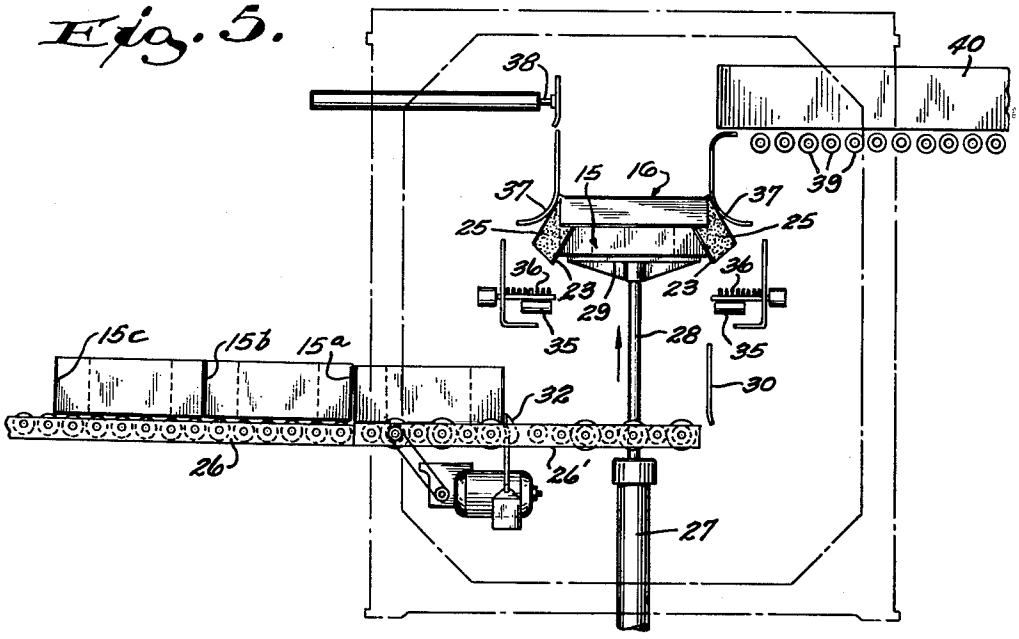
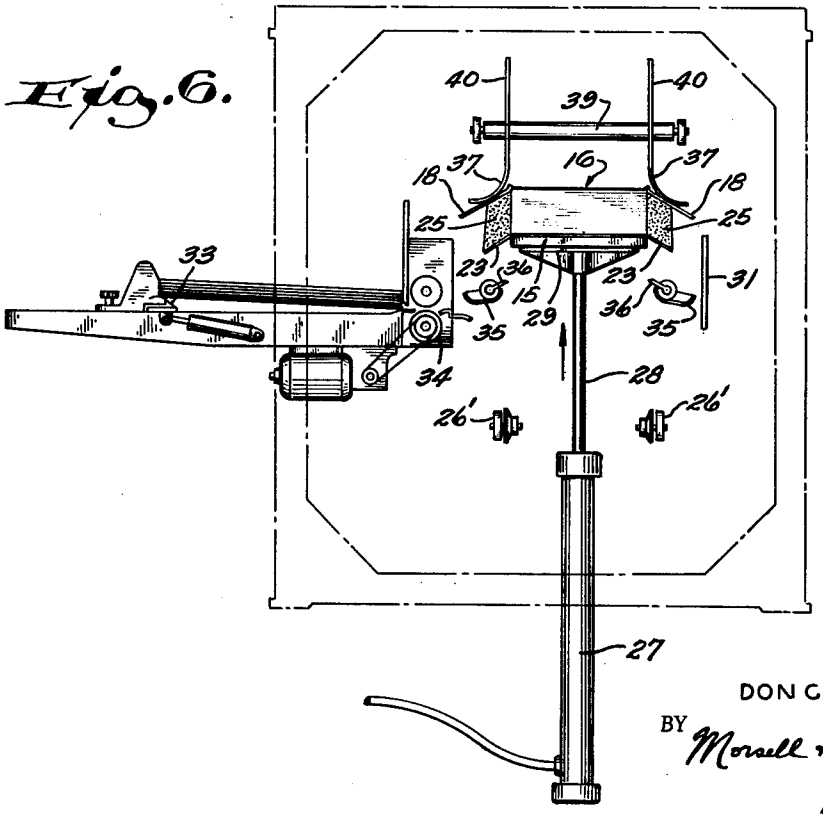


Fig. 6.



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Filed July 20, 1961 4 Sheets-Sheet 4

Fig. 7.

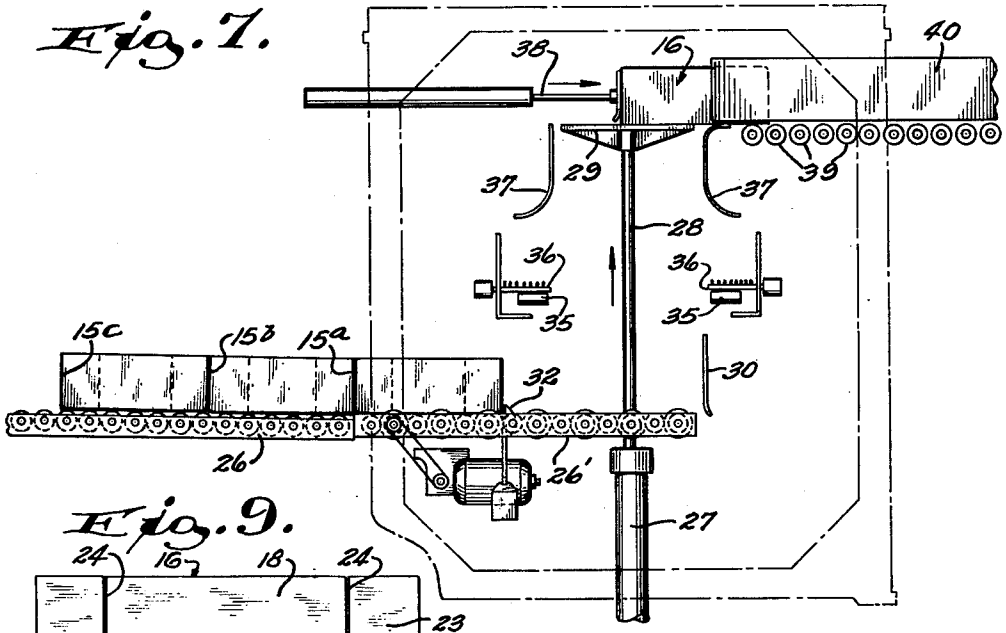
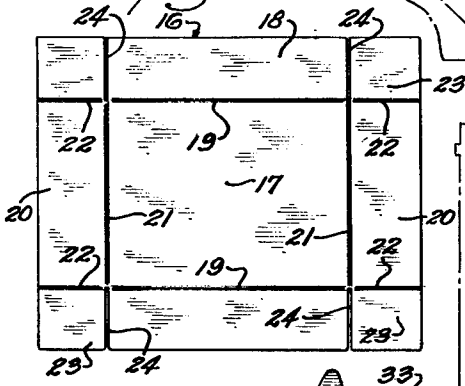


Fig. 9.



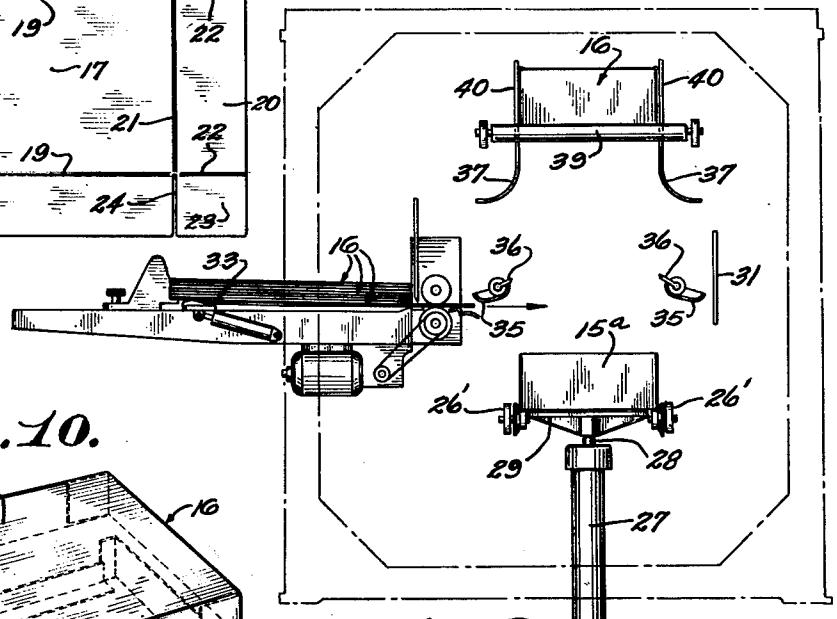


Fig. 10.

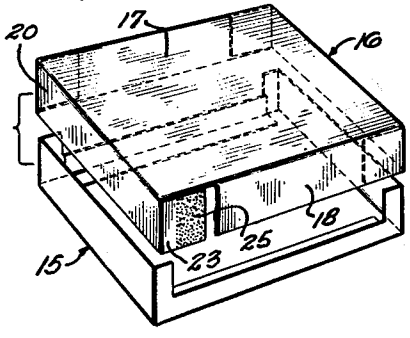


Fig. 8.

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METHOD OF APPLYING COVERS TO COMMODITY PACKED TRAYS

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Filed July 20, 1961, Ser. No. 125,586
5 Claims. (Cl. 53—47)

This invention relates to improvements in the method of applying covers to commodity packed trays.

Trays or box-like containers, customarily formed of corrugated board, fiberboard, and like fibrous materials, are in common usage for the packing and shipping of commodities or products of various types. It is customary for the packer or shipper to have a succession of such commodity packed trays or containers, in open or uncovered condition, progress forwardly along a production line and it is necessary, to complete the same for storage or shipment, to apply tight fitting covers thereto. Each cover is customarily folded from scored and die-cut, corrugated, or fiberboard sheet material and has down-turned end and side walls and securing die-cut flaps, the latter having portions of certain of the down-turned walls stapled or otherwise secured thereto to hold the cover in its finally formed condition. Previously it was the practice to manually fold and hand stitch the cover wall flanges and flaps, and the operators would find it expedient to form the covers loose and sloppy for easy application to the trays or containers, which was objectionable. Furthermore, the hand manipulations of folding and stitching the covers was time-consuming and retarded the progress of the commodity filled and cover applied containers through the production line.

With the foregoing in mind, it is the primary object of the present invention to provide a method of applying covers to commodity packed trays which eliminates the objections above mentioned and which involves a practical, expeditious, production line method of automatically folding, gluing, and applying a cover to each commodity packed tray or container progressing along a production line, and which, furthermore, insures a quickly formed and applied, well fitting cover.

A further object of the invention is to provide a method of applying covers to commodity packed trays wherein each tray in a succession of the same has its open face projected into engagement with the surface of a cover blank and moves the latter with it, and during the movement being folded, formed and secured and telescoped onto the open end of the tray or container.

A further object of the invention is to provide a method of applying covers to commodity packed trays adaptable to production lines and wherein each packed tray is moved into contact with a cover forming member which is shaped, secured and mounted on the packed tray and ejected onto an outgoing conveyor for delivery to a collection station.

A further object of the invention is to provide a method of applying covers to commodity packed trays wherein each tray in a succession of trays is mounted on and moved by a platen which actuates a cover feeding mechanism.

A further object of the invention is to provide a method of applying covers to commodity packed trays which is automatic and expeditious and which is well adapted for the purposes described.

With the above and other objects in view, the invention consists of the improved method of applying covers to commodity packed trays, including all of the steps thereof, as set forth in the claims, and all equivalents thereof.

In the accompanying drawings, in which the same reference numerals indicate the same parts in all of the views:

FIG. 1 is a diagrammatic side view illustrating the initial step in the application of a cover to one of a succession of commodity packed trays or containers;

FIG. 2 is a diagrammatic end view of the showing in FIG. 1;

FIG. 3 is a diagrammatic side view illustrating the step in the method after the packed tray has been projected into engagement with a cover forming blank and the die-cut corner flaps of the cover are projected downwardly;

FIG. 4 is a similar diagrammatic view at right angles to the showing in FIG. 3, showing the step of applying an adhesive to the outer faces of the down-turned die-cut corner flaps of the cover;

FIG. 5 is a diagrammatic side view showing the tray and superimposed cover projected beyond the position of FIG. 4 into contact with instrumentalities which fold and secure the wall forming flaps of the cover;

FIG. 6 is a similar diagrammatic view at right angles to the showing at FIG. 5, illustrating the down folding and securement of the cover flaps;

FIG. 7 is a view showing the fully projected position of the tray with the formed and applied cover thereon engaged by an instrumentality to eject the completed package onto an outgoing conveyor equipped with pressure devices reacting on the flaps of the cover to hold the same securely in folded position while the adhesive sets;

FIG. 8 is a diagrammatic view at right angles to the showing in FIG. 7, with the platen retracted and having thereon another tray ready to be brought into engagement with a cover blank to be projected thereover.

FIG. 9 is a plan view of a scored and die-cut cover blank such as is superimposed on a commodity packed tray and folded and secured thereon to complete the package; and

FIG. 10 is an exploded perspective view of a tray and cover, the latter having been formed and folded from the blank shown in FIG. 9 and which in the finished package is telescoped onto the tray.

There is illustrated in FIG. 10 a typical tray or container of the type which is adapted to be packed with a commodity and advanced in uncovered form to a station for the application of a cover thereto. In said view the tray or container is generally indicated by the numeral 15 and the formed and secured cover, to be associated therewith, is indicated generally by the numeral 16. Said cover 16 is, however, formed from a flat scored and die-cut blank shown in FIG. 9, the tray 15 and the cover 16 preferably being formed of corrugated fiberboard or like material.

The flat cover blank 16 includes a rectangular mid-section 17 and along the opposite longitudinal margins thereof are foldable side wall flanges 18 separated from the margins of the mid-section 17 by scored lines 19. Also at the ends of the mid-section 17 are end wall forming flanges 20 which fold downwardly from the end margins of the mid-section 17 on scored lines 21. At the extremities of the end wall flanges 20 and separated therefrom by scored lines 22 are corner flaps 23 which are separated from the ends of the side wall flanges 18 by die-cut slots 24.

As will appear hereinafter, according to the present method, the finished cover 16 of FIG. 10 is formed from the flat blank of FIG. 9 by folding the die-cut corner flaps 23 and the side wall flanges 18 and the end wall flanges 20 downwardly at right angles to the plane of the mid-section 17 of the cover. The corner flaps 23, which assume positions at right angles to the plane of the cover mid-section 17, are also folded at right

angles to the end wall flanges 20 which carry the same and are overlapped by the end portions of the side wall flanges 18. Securing means such as an adhesive 25 is applied to the outermost faces of the corner flaps 23 and the same are caused to adhere to the overlapping portions of the side walls 18, whereby the cover 16 is maintained in the folded and formed condition shown in FIG. 10 which permits it to be snugly telescoped over the tray or container 15 to thus provide a closure therefor.

In carrying out the method of the present invention a succession of packed and uncovered trays 15, 15*a*, 15*b*, 15*c*, etc. are advanced in single file by a gravity conveyor 26 and motor driven incoming conveyor 26' toward a station which, as shown in FIGS. 1 to 8 inclusive, includes a pneumatic cylinder 27 whose piston 28 is adapted to be projected at right angles to the path of travel of the trays 15, 15*a*, 15*b*, 15*c*, etc., on the conveyor 26'. The outer end of the projectable piston 28 carries a platen 29 which, in the retracted position of the pneumatic cylinder 27 assumes a position on a level with the conveyor 26' so that, during the method procedure the forwardmost tray 15 in the advancing succession is projected onto the surface of the piston carried platen 29 against a tray stop 30. The tray 15*a* next in line is engaged by a solenoid operated stop 32.

It will also be observed from FIG. 2 that the cover forming and applying station includes a magazine holding in superimposed relation a plurality of the flat cover forming blanks 16. The holding means for the stack of cover blanks 16, is positioned above the lowered position of the platen 29 and laterally thereof. Installed in the magazine is a pneumatically operated kicker bar 33 which is electrically controlled and timed so as to project the lowermost cover blank 16 from the stack to a position spacedly over the forward tray 15 on the platen 29 of the retracted pneumatic cylinder 27, against a cover stop 31 which so locates the projected cover blank that the mid-section 17 thereof will coincide with the open top of the tray 15 on the platen 29 with the various wall forming flanges and flaps 18, 20 and 23 projecting horizontally beyond the margins of the tray 15 therebelow. The cover blanks 16 when engaged by the kicker bar 33 are advanced by motor driven feed rollers 34.

The arrangement of the forward tray 15 on the platen 29 of the retracted piston 28 in spaced relation to a projected cover blank 16 thereabove is illustrated in FIGS. 1 and 2. Thereafter the pneumatic cylinder 27 is operated so as to project the piston 28 and the tray 15 carried by the platen 29 into contact and registration with the mid-portion 17 of the flat cover blank 16 thereabove and a slight additional projection of the pneumatic cylinder piston will cause the die-cut corner flaps 23 to engage flap-folding shoes 35 which cause said corner flaps 23 to break or fold downwardly along their scored lines 22. Immediately beyond said shoes 23 the outer faces of said folded corner flaps 23 are engaged by glue-applying guns 36 which are actuated by electrically controlled means so that the application of glue or adhesive to said flaps 23 will occur at the proper time. The piston 28 then projects the tray 16 beyond the position of FIGS. 3 and 4 and, as is shown in FIGS. 5 and 6, the ends walls 20 and side walls 18 of the cover blank 16 are engaged by wall-folding shoes 37, one pair of shoes 37 being engageable with the end wall flanges of the cover and the other pair of shoes 37, at right angles to the first-mentioned pair of shoes 37, being engageable with the side wall flanges 18. The side wall and end wall flanges 18 and 20 are caused to fold along their scored lines 19 and 21 respectively. It is, of course, evident that the corner flaps 23 are folded and have adhesive applied thereto slightly before the folding of the wall-forming flanges 18 and 20. This insures the correct positioning of the flaps 23 interiorly of the overlapping ends of the side wall flanges 18. The constricted portions of the various shoes 37, between which the tray 15 with the applied cover 16 passes during further projection of the piston 28, compresses the down-folded side and end walls of the cover to initiate "setting" of the adhesive on the corner flaps 23 and to form a neat, tight-fitting cover enclosing the tray 15 and its contents.

When the piston 28 reaches the limit of its projection, a pneumatically-operated piston 38 is automatically operated to engage the completed and covered package and eject it onto an outgoing conveyor 39, as shown in FIG. 7. This outgoing conveyor is provided with side plates 40 which maintain pressure on the packed container with its applied cover so as to complete the "setting" of the adhesive on the corner flaps 23. As soon as the ejection of a completed package from the elevated platen 29 is completed, the piston 28 of the hydraulic cylinder 27 is retracted to the postion of FIGS. 1 and 8. During descent or retraction of the piston 28, the platen will engage and operate a switch which controls operation of the cover blank kicker bar 33 so as to project another flat cover blank into the position of FIGS. 1 and 2. When the platen reaches its lowered position it trips a switch to release the solenoid-operated stop 32 and permit actuation of the motor-driven incoming conveyor 26 which advances the forwardmost tray onto the retracted platen 29 of the piston 28. When said tray is correctly positioned on the retracted platen 29 against the tray stop 30, the sequence of operations is again repeated, and the cycle continues as long as there are trays on the conveyors 26 and 26' and cover blanks in the magazine to be applied thereto.

While certain of the mechanisms have been described as being pneumatically and electrically operated and controlled, this is merely by way of example and other instrumentality operating means may be used such as hydraulic means or the like. Also it should be understood that only relative projection as between the tray and cover and the instrumentalities which operates on the cover are required. Instead of moving the tray and cover relative to the various cover folding and applying instumentalities, the latter could be moved relative to a stationary tray or container.

From the foregoing description it will be apparent that the present invention provides a commercially practical expeditious method of folding and applying covers to commodity packed trays or containers which is well suited for production line operations and which insures the formation and application of covers to the containers which will be neat and snug fitting.

Various changes and modifications may be made in the method and its steps, without departing from the spirit of invention, and such changes are contemplated as may come within the scope of the appended claims.

What is claimed as the invention is:

1. The method of applying a cover to a commodity packed tray to provide a unitary package which comprises, advancing the tray in a linear path to a receiving station, projecting a flat cover blank provided with a mid portion and laterally projecting, foldable wall flanges and corner flaps over the open side of the tray, relatively moving the tray and cover blank in a direction perpendicular to the original path of travel of the tray so as to cause the cover blank to be supported by the walls surrounding the open end of the tray, folding the corner flaps at right angles to the plane of the mid portion of the cover blank, thereafter folding the wall flanges of the cover blank at right angles to the mid portion of the latter and in the manner so that the end portions of certain of said flanges overlap said corner flaps, securing together the lapping portions of said wall flanges and the corner flaps to thereby provide a flanged cover tightly telescopically surrounding the peripheral portion of the open end of the tray, and finally projecting the tray with its applied cover as a unit from said station.

2. The method of applying a cover to a commodity packed tray to provide a complete unitary package which comprises, advancing the tray in a linear path to a receiving station, projecting a flat cover blank provided with a mild portion and laterally projecting, foldable wall flanges and corner flaps over the open side of the tray, relatively moving the tray and cover blank in a direction transverse to the original path of travel of the tray so as to cause the cover blank to be supported only by the walls surrounding the open end of the tray, folding the corner flaps at right angles to the plane of the mid portion of the cover blank, applying an adhesive to face portions of said folded corner flaps, thereafter folding the wall flanges of the cover blank at right angles to the mid portion of the latter and in the manner so that the end portions of certain of said flanges overlap said corner flaps and are engaged by the adhesive thereon, whereby there is provided a flanged cover tightly telescopically surrounding the peripheral portion of the open end of the tray, and finally projecting the packed tray and applied and formed cover as a unit from said station.

3. The continuous method of applying covers to a series of commodity packed trays which comprises, advancing the forward tray in the series and registering its open end with the mid portion of a flat cover blank having laterally projecting, foldable wall flanges and corner flaps, which cover blank was projected over said tray, then moving the tray at right angles to its previous line of movement so as to engage it with the mid portion of the cover blank to thereby carry the cover blank with the tray during continued movement of the latter, then, during the joint movement of the cover blank and supported tray, engaging the flanges and flaps of the cover blank with flange and flap folding and adhesive applying devices projecting into the path of movement of the tray whereby said flanges and flaps are folded and secured together in telescopic relation to the peripheral portion of the tray at right angles to the plane of the mid portion of the cover, next projecting the tray with its applied cover as a unit onto an outgoing conveyor and applying pressure to the flanges and flap of the cover during progression of the cover and tray along said outgoing conveyor, and then repeating the cycle of operations with respect to each forwardmost tray in the series.

4. The method of automatically applying and securing a cover to a commodity packed tray to produce a unitary package which comprises, advancing the tray to a receiving station, projecting a flat cover blank provided with a mid portion and laterally projecting, foldable wall flanges and corner flaps spacedly over the open side of the packed tray, moving the tray upwardly into contact with the mid portion of the cover blank whereby the cover blank is supported by the walls surrounding the open end of the tray, continuing the movement of the tray and the cover blank thereon and folding the corner flaps at right angles to the plane of the mid portion of the cover blank and applying an adhesive to face portions of said folded corner flaps during movement of the tray and applied cover blank, thereafter, while the movement of the tray and cover blank continues, folding the wall flanges of the cover blank at right angles to the mid portion of the latter and in a manner so that the end portions of certain of said flanges overlap said corner flaps and are engaged by the adhesive thereon, whereby there is provided a flanged cover tightly telescopically surrounding the peripheral portion of the open end of the tray and closing the latter, and finally projecting the tray and its applied cover as a unit from said station.

5. The method of automatically applying and securing a cover to a commodity packed tray to produce a unitary package which comprises, advancing the tray to a receiving station, projecting a flat cover blank provided with a mid portion and laterally projecting, foldable wall flange and corner flaps spacedly over the open side of the packed tray, moving the tray at right angles to its previous line of movement into contact with the mid portion of the cover blank whereby the cover blank is supported by the walls surrounding the open end of the tray, continuing the movement of the tray and the cover blank thereon and folding the corner flaps at right angles to the plane of the mid portion of the cover blank and applying an adhesive to face portions of said folded corner flaps during movement of the tray and applied cover blank thereafter, while the movement of the tray and cover blank continues, and folding the wall flanges of the cover blank at right angles to the mid portion of the latter and in a manner so that the end portions of certain of said flanges overlap said corner flaps and are engaged by the adhesive thereon, whereby there is provided a flanged cover tightly telescopically surrounding the peripheral portion of the open end of the tray and closing the latter.

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