May 12, 1959 A. C. BOITEL 2,885,842

PACKAGING OF BOOKS AND THE LIKE

Filed June 15, 1953

3 Sheets-Sheet 1

FIG. 1.

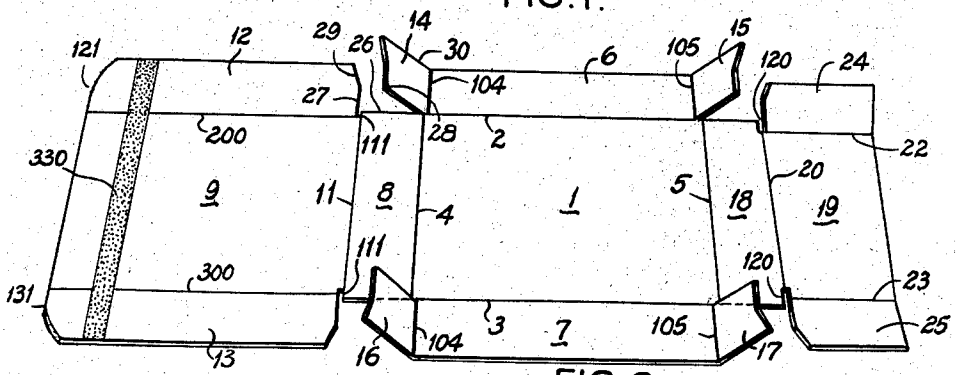


FIG. 2.

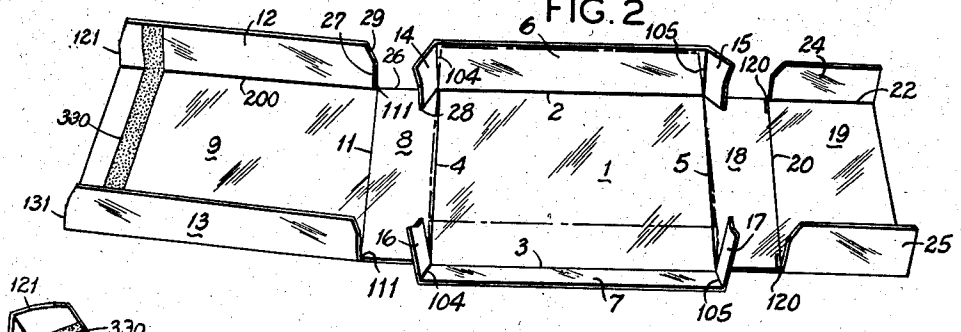


FIG. 3.

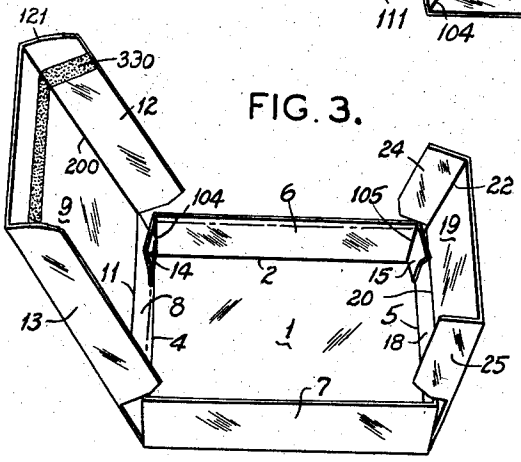


FIG. 4.

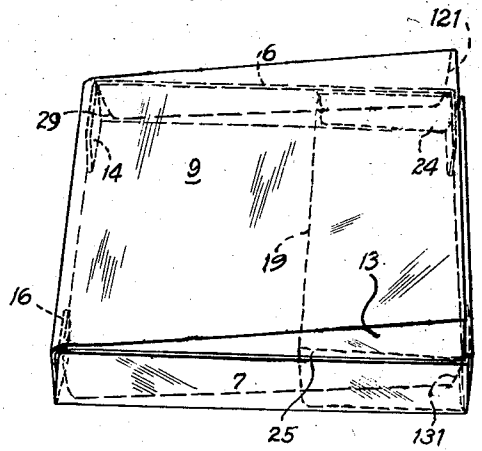
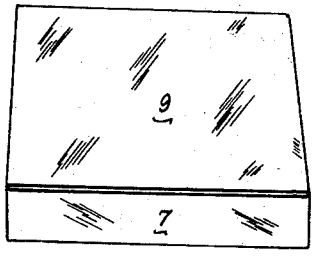


FIG. 5.



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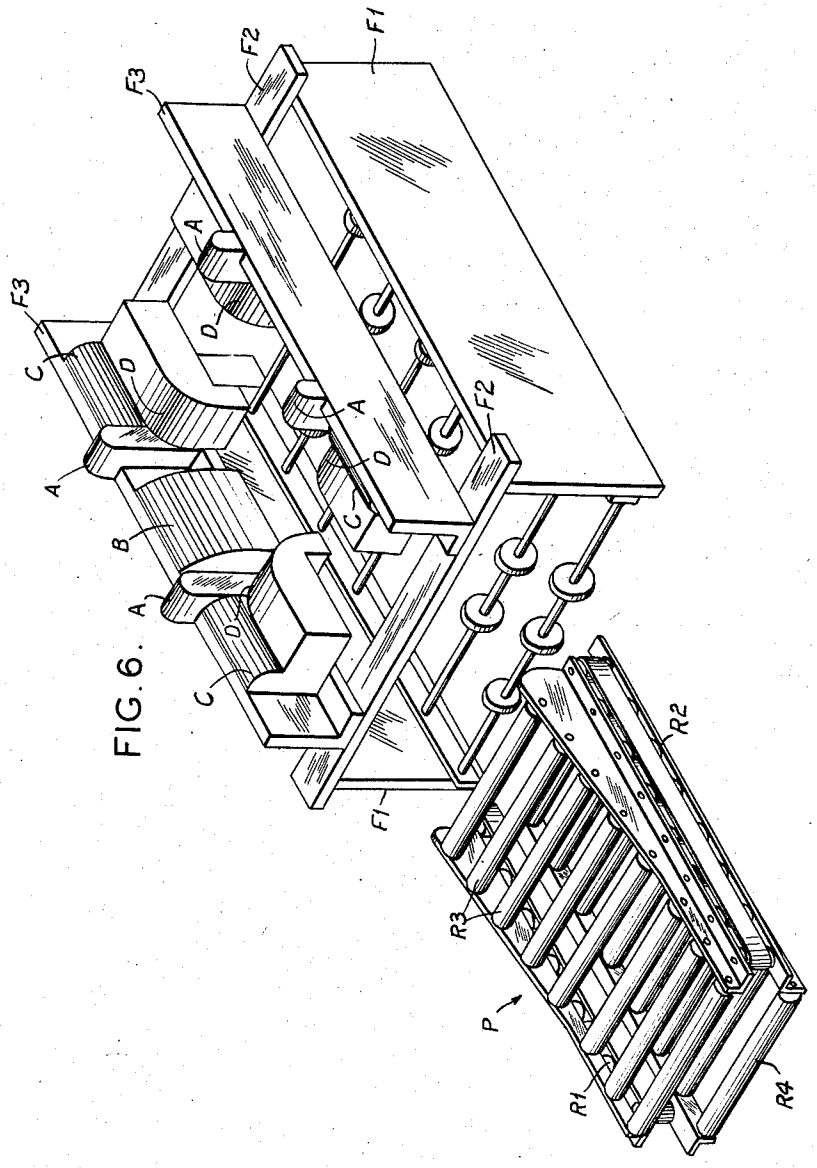


FIG. 6.

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PACKAGING OF BOOKS AND THE LIKE

Filed June 15, 1953

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FIG. 7.

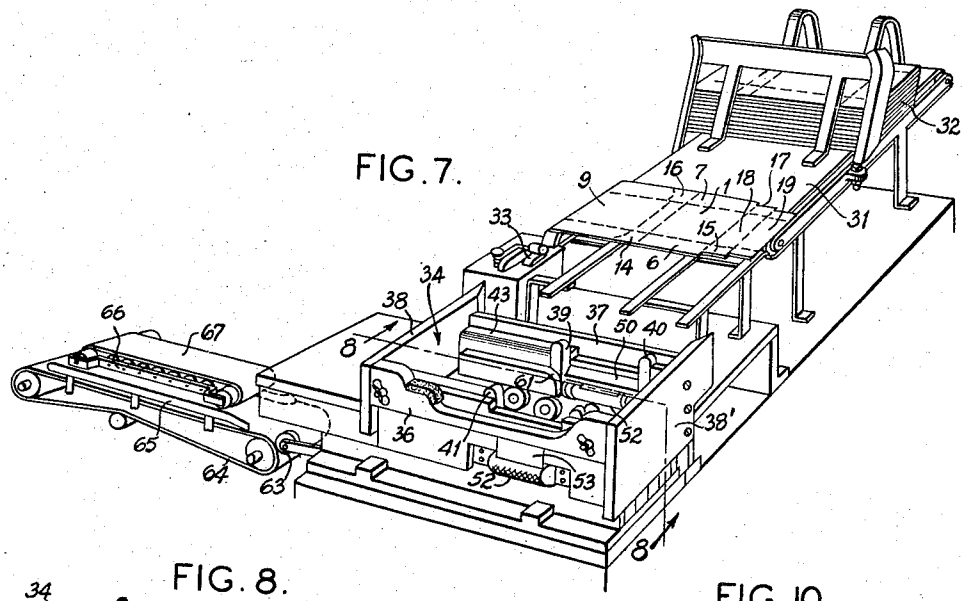


FIG. 8.

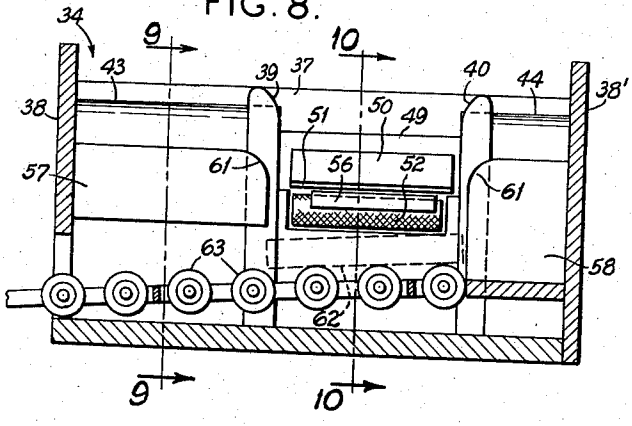


FIG. 10.

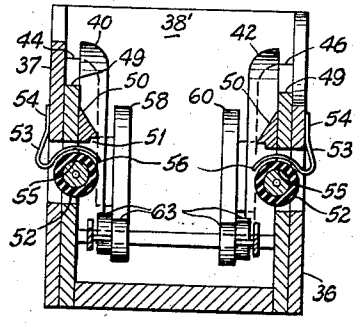


FIG. 9.

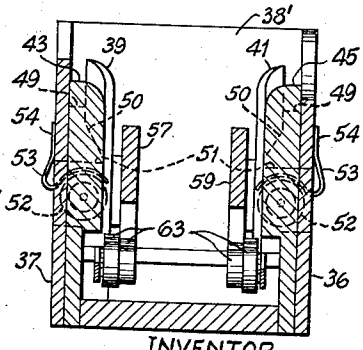
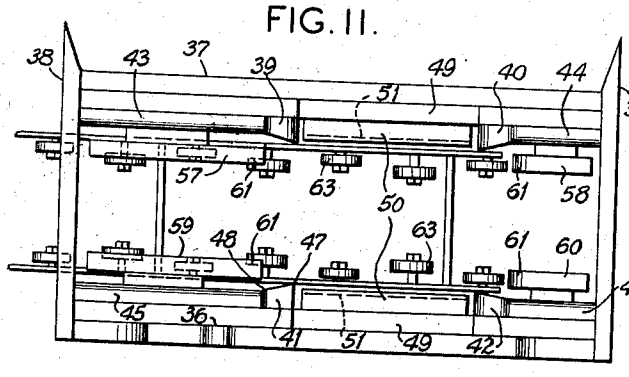


FIG. 11.



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United States Patent Office 2,885,842 Patented May 12, 1959

2,885,842

PACKAGING OF BOOKS AND THE LIKE

Arwed C. Boitel, Evanston, Ill., assignor to Alton Box Board Company, a corporation of Delaware

Application June 15, 1953, Serial No. 361,673

17 Claims. (Cl. 53—34)

This invention relates to methods of and apparatus for wrapping books and the like, the invention having particular reference to the subject matter of my co-pending application, Serial No. 287,282, filed May 12, 1952, now U.S. Patent No. 2,778,559, of which this application is a continuation-in-part.

As explained in the earlier application, efforts to provide a satisfactory wrap for shipping books have not met with complete success. Known book-wraps are either difficult to apply, or they are deficient in providing but scant protection for the corners, which are the most vulnerable part of the contained book. The invention accordingly is directed to the provision of improved packages and paperboard blanks, and to methods and apparatus for conforming blanks about books and the like, the present application being particularly directed to such methods and apparatus.

Briefly, a rectangular blank is scored so as to define an intermediate panel, a pair of end panels extending from the intermediate panel, and a pair of cover panels extending from the end panels, one of which cover panels is preferably of a length approximating that of the intermediate panel. Scores are also made along the sides of the blank to form side flaps extending from both the intermediate panel and the cover panels, but the side portions opposite the end panels are severed therefrom and from the cover flaps, so as to provide corner flaps which hinge at the ends of the intermediate flaps.

According to the method herein disclosed, the book is placed on the intermediate panel, and folding operations are carried out in a certain sequence. First, the corner flaps are swung upwardly and inwardly. Next, the three sets of side flaps are swung upwardly and inwardly, but the cover flaps are moved toward one another more quickly than are the intermediate flaps. As the intermediate flaps swing up, the attached corner flaps are carried down, and the end panels are then swung up around the corner flaps. The cover panels are then folded over and their side flaps enter between the intermediate side flaps, which are spread apart more than the cover flaps. Pressure is then applied to the sides of the package and to the top, whereupon the side flaps move to their innermost positions and are secured as the cover flaps bite into the corner flaps. It will be understood that the long cover panel has side flaps, which are dimensionally proportioned, and that their ends are rounded in such fashion as to produce a wedging action with the corner flaps as the long cover panel is closed.

Although the above process might be carried out in various ways, the invention also contemplates certain apparatus for facilitating the operations. Briefly, the apparatus comprises an open-bottom mold through which the blank and book are moved to conform the blank about the book. At the top of the mold are spaced post members which engage and effect folding of the corner flaps. At a lower level are members for engaging the various side flaps, these members being arranged

so as to provide the desired variation in the rate of inward movement of the cover flaps and the intermediate side flaps. Finally, there are members which engage and fold the end panels. Sealing apparatus includes means for applying pressure to the sides of the container before pressure is applied at the top.

Other features of the invention will be in part apparent from and in part pointed out in the following detail description taken in connection with the accompanying drawings, in which:

Fig. 1 is an oblique view of the blank illustrating a first step in the folding operation;

Fig. 2 is a view similar to that of Fig. 1 illustrating a next step in the folding operation;

Fig. 3 is a view similar to that of Fig. 2 illustrating a third step;

Fig. 4 is a view similar to that of Fig. 3 showing a fourth step;

Fig. 5 is an oblique view of the completed package;

Fig. 6 is an oblique view of certain mold apparatus for facilitating the desired folding operation;

Fig. 7 is a perspective view of an apparatus for feeding and applying glue to blanks, molding the blank about a book or the like, and sealing the package;

Fig. 8 is a longitudinal sectional view of the mold, taken along line 8—8 of Fig. 7;

Fig. 9 is a sectional view of the mold taken along line 9—9 of Fig. 8;

Fig. 10 is a sectional view of the mold taken along line 10—10 of Fig. 8; and,

Fig. 11 is a plan view of the mold.

Referring to Figs. 1–5, a blank is shown (inside up) which is proportioned to wrap a book whose cover area is approximately the same as, but somewhat less in each direction than intermediate panel 1, which is defined by score lines 2, 3, 4 and 5. The blank is preferably made from corrugated paperboard, and is cut so that the corrugations extend lengthwise thereof. Score lines 2 and 3 then lie at the sides of the blank to form intermediate side flaps 6 and 7, whereas scores 4 and 5 extend transversely of the corrugations. The ends of the side flaps 6 and 7 are defined by score lines 104 and 105, which are parallel to lines 4 and 5, but offset therefrom by the thickness of the blank.

In parallel spaced relatoinship from score line 4 is a score line 11, which terminates short of the margins of the blank at score lines 200 and 300, the latter being parallel to but offset from alignment with the score lines 2 and 3, respectively, by the thickness of the blank. Between the lines 4 and 11 is an end panel 8, and embraced by lines 11, 200 and 300 is a cover panel 9 of length substantially (not quite two thicknesses less than) the length of the panel 1. Outwardly of score lines 200 and 300 side flaps 12 and 13 extend from the cover panel 9. Beyond score lines 104 and 105, corner flaps 14 and 15 extend from the intermediate side flap 6, and corner flaps 16 and 17 extend from the side flap 7. A score line 20 terminating short of the margins of the blank defines the other end panel 18 and another relatively short cover panel 19. The panel 19 is defined between score lines 22 and 23, which are parallel, but inwardly offset (for twice the thickness of the blank) from alignment with scores 2 and 3, respectively. Outwardly of the scores 22 and 23, side flaps 24 and 25 extend from the cover panel 19.

The cover flap 14 is integrally connected for hinging action with the intermediate side flap 6 but is severed from the end flap 8 and side flap 12 by a cut line which includes: a cut 26 immediately outside the score 2 as projected; a cut 27 parallel with the score line 11 but offset from alignment therewith by the thickness of the blank, a well-rounded corner 28 between the cuts 26

and 27; and a flaring cut 29 adjacent the marginal part of the side flap 12. The corner flaps 15, 16 and 17 are similarly severed from all adjacent parts with the exception of the side flaps 6 and 7, to which latter flap the corner flaps are integrally hinged.

Between score lines 200 and cut line 26, a short cut line 111 extends in alignment with score line 11. A like cut is made at the opposite extremity of the score 11. Similarly cut lines 120 (twice the length of 111) are made at the extremities of score line 20.

The outer corners of the cover-attached side flaps 12 and 13 are rounded as shown, but it is advantageous to retain a liberal shoulder perpendicular to the scores 200 and 300 as shown at 121 and 131. The latter, in the completed package, form a secure friction lock against the interior of corner flaps 15 and 17, and retains the package closed even if the contained book is considerably smaller than the interior of the package, and even if no adhesive or other fastening is used. It is important, in this connection, that the side flaps be proportioned so that their lengthwise dimension is sufficient to insure a wedging action upon closure of the cover, such wedging action being achieved by making the side flaps 12 and 13 slightly longer than the side flaps 6 and 7.

In the form illustrated, however, a strip of adhesive 330 is applied to extend across the end of and on the inside of the cover panel 9 and attached side flaps 12 and 13. Although it is preferred that the blank be made of corrugated paperboard, such as the so-called "B" corrugation with double facing, other types of paperboard may be used.

In forming a package from the above blank, it is recommended that a certain sequence of steps be followed. First, the corner flaps 14 and 16 are turned upwardly about lines 104 as a hinge, and the corner flaps 15 and 17 are likewise turned upwardly about lines 105 as a hinge, as shown in Fig. 1. Next the several side flaps are turned up about the scores which constitute their respective hinge connections to the panels 1, 9 and 19, as shown in Fig. 2. It may be noted that the intermediate side flaps 6 and 7 are spread apart an amount greater than the side flaps 12, 13, 24 and 25 on the cover. In other words, the upward movement of the intermediate side flaps lags behind that of the other side flaps. Also, as the intermediate flaps 6 and 7 move upwardly, the attached corner flaps are carried down. Next, the panels 8 and 9 are turned upwardly on score 4 about the corner flaps 14 and 16 (without breaking the hinge at 11), and the panels 18 and 19 likewise hinged upwardly at 5 about the corner flaps 15 and 17 (without breaking the hinge at 20), as shown in Fig. 3.

The cover panels 9 and 19 are then folded over on score lines 11 and 20, respectively, the shorter panel 19 fitting under the longer panel 9. As the cover panels are moved down, the side flaps 12, 13, 24 and 25 attached thereto enter between the intermediate flaps 6 and 7, which are relatively spread to receive them. In the final operation, these outer flaps 6 and 7 are pressed inwardly and pressure is then applied to the cover panel 9. When pressure is applied to the cover panels, the ends of the attached side flaps bite into the corner flaps on the intermediate flaps, thereby to retain the sides of the box in position, and shoulders 121 and 131 are forced into resilient frictional abutment with the inside of corner flaps 15 and 17, respectively. It may here be noted that it is desirable to apply pressure to the side flaps prior to the time pressure is applied to the cover panels. Otherwise, the biting action of side flaps 12, 13, 24, and 25 with corner flaps 14, 16, 15, and 17, respectively, will hinder inward movement of the side flaps. Pressure is maintained at the sides and top until the adhesive 330 has set.

In order to achieve a high rate of production in wrapping books, it is desirable to utilize apparatus wherein the desired sequence of folding is accomplished, at least in part, automatically. Referring first to Fig. 6, there is

shown, in simplified form, certain apparatus, including that for folding and sealing a blank about a book. A blank is initially placed in flat condition upon the uppermost members A defining to the top of a passageway in a mold M; a book is placed upon the intermediate panel of the blank; and as the assembly of book and blank is pushed downward, various flaps are folded upwardly by engagement with folding elements B, C, and D within the mold. The cover panels are folded over and the folded package is then pushed out of the bottom of the mold and through pressure apparatus P, wherein pressure is applied to seal the package.

In Fig. 6, the mold is shown to be made up with an open bottom frame formed by fixed lateral members F1 and fixed transverse members F2. Longitudinal supports F3, which may be transversely adjustable on members F2 to accommodate blanks of varying width, carry the various folding elements. There are four post members A, two on each support F3, which project above the remainder of the mold and which are curved in side elevation in order to cooperate with the four corner flaps of a blank and initially fold them upwardly as the blank is moved downwardly. An element B, which is curved in end elevation, is mounted on each support F3 below and between each pair of the elements A for engagement with the intermediate side flaps of the blank, whereas similarly curved elements C are mounted below and alongside of the elements A for engagement with the other side flaps of the blank. It may be noted that the slope or curve of elements C is somewhat sharper than that of the elements B, this being desirable in order to insure that the cover-attached side flaps enter between the intermediate side flaps as shown in Figs. 2–4. Elements D, which are curved in side elevation, are then mounted below and between the elements C for engagement with the end panels of the blank, and they, together with the elements A and C, are adjustable lengthwise of the supports F3 in order to accommodate blanks of varying length.

As a blank is pushed downwardly through the mold after being properly aligned on the top, the corner flaps 14, 15, 16 and 17 are first engaged by the uppermost elements A and folded upwardly as indicated in Fig. 1. Thereafter, the various side flaps are engaged by the folding elements B and C and folded upwardly, the side flaps on the cover panels being brought more nearly vertical than those on the intermediate panel as indicated in Fig. 2, because of the difference in curvature of the elements B and C. Then the end panels engage the element D and are folded up as indicated in Fig. 3. Finally, the short cover panel 10 is folded over and the blank is pushed downwardly onto rollers R and guided out of the mold to the pressure device P. As the blank is pushed out of the mold, the other cover panel 9 is folded over as indicated in Fig. 4.

The pressure device is made up of two series of vertical rollers R1 and R2 and two series of horizontal rollers R3 and R4. Although rollers are shown, an endless belt or fixed guide system might be used, but there preferably should be some drive system for carrying the package through the device. It will be noted that the two series of vertical rollers R1 and R2 are relatively uniformly spaced from one another, whereas the horizontal rollers R3 and R4 are more widely spaced at the entrance than at the exit of the device. This arrangement insures that the outer side flaps 6 and 7 of the package are compressed before the cover panels are pressed down, thereby permitting the outer side flaps and attached corner flaps 14—17 to be moved inwardly before they are locked by the wedging action of the inner side flaps 12 and 13.

Referring now to Figs. 7–11, there is shown complete apparatus for feeding individual blanks, applying glue thereto, conforming the blank about the book, and pressing the parts into sealed relationship. An intermittently driven conveyor belt 31 is arranged to pick indi-

vidual blanks, such as that shown in Fig. 7, from the bottom of a pile 32 thereof and advance the same toward a glue applicator 33 constructed and arranged to apply a narrow band of glue 330 to the respective blanks as they pass thereover. In the embodiment shown, the band of glue 330 is applied to the lower side of the blank as it advances thereacross, but it will be understood by those skilled in the art that an overhead glue applicator may be utilized if desired. The arrangement of the parts as shown requires that the attendant turn the blank upside down as it is withdrawn from the glue applicator and before it is inserted into mold 34.

In order to prevent the accumulation of blanks ahead of the glue applicator 33, an electric switch may be arranged so as to be actuated by a passing blank. Such a switch is preferably connected to control a motor or other source of power, driving belt 31, so that motion of belt 31 ceases when the blank is in the position shown in Fig. 7. When that blank is drawn, by the attendant, across glue applicator 33, the switch restores the circuit so that belt 31 moves again until another blank actuates the switch. Hence, in the operation of the device shown, the blanks are automatically advanced one by one to the position shown in Fig. 7, whereupon, an attendant grasps the edge of the blank nearest mold 34, turns the blank upside down (i.e., so that the glue band 330 is up), and inserts the blank into mold 34.

The mold 34 is a box-like structure having exterior side walls 36 and 37 and end walls 38 and 38'. The box-like structure is open at the top and of a size and shape corresponding generally to, but slightly larger than, the blank to be conformed. Adjacent the sides 36 and 37, four posts 39, 40, 41, and 42 are arranged in position to engage corner flaps 14, 15, 16, and 17 of the blank above described, so that with a blank positioned thereon, a slight downward pressure, such as the weight of a book upon intermediate panel 1 of the blank, will cause the several corner flaps to hinge upwardly about score lines 4 and 5, as shown in Fig. 1. Such depression of the blank brings the side flaps 12 and 13 into engagement with shoulders 43, 44, 45, and 46.

Posts 39, 40, 41 and 42 are tapered in plan, as clearly shown in Fig. 11, so that corners 47 of opposite posts 39 and 41 are closer to each other than corners 48 thereof. The several posts at their corners 48 are, however, in substantial alignment with the inner faces of their adjacent shoulders 43, 44, 45 and 46. The shoulders of the latter are rounded, as clearly shown (for 43 and 45) in Fig. 9.

Between the pairs of posts at each side of the mold, a shoulder 49 is provided slightly below the elevation of shoulders 43, 44, 45 and 46, and substantially below the upper edge of shoulder 49, a tapered member 50 projects inwardly. The member 50 is provided with a rabbet 51, and therebelow a resilient roller 52 is mounted in each side wall 36 and 37, so that the periphery thereof normally projects inwardly for a distance substantially within the innermost increments of tapered member 50, which are spaced apart a distance, but slightly in excess of the distance between score lines 2 and 3 of the blank, plus twice the thickness of the material from which the blank is made. Accordingly, rollers 52 are, at their innermost increments, and when not under compression, spaced apart a distance somewhat less than the distance between score lines 2 and 3.

In the embodiment shown, the rollers 52 are themselves resilient as by having their outermost quarter-inch or so constituted of sponge rubber. Alternatively, or in addition to the resilient surface of roller 52, the shafts thereof may be mounted in resilient bearings, so that in either event, the most inward increments of rollers 52 can yield outwardly away from each other. The rollers 52 are so mounted with reference to rabbets 51 that, when the edges of panel 1 of a blank being processed come to rest upon rollers 52, the edges of side flaps 6 and 7 of the blank will lie within rabbets 51.

The rollers 52 are provided with a brake arranged to restrain rotation of the rollers when a blank approaches them. In the embodiment shown, the brake consists of a sheet of spring steel 53 having its outer upper edge 54 secured to the exterior of side walls 36 and 37. The sheet 53 is bent to conform substantially to the contour of roller 52, as shown at 55, and overlies the same so that contoured part 55 is normally free of the surface of the roller. Sheet 53 extends inwardly for a distance such that edge 56 thereof is engaged and moved downwardly by a blank. Upon such downward movement of edge 56, contoured part 55 is forced into engagement with the surface of roller 52 and brakes the latter against rotation. Thus, once a blank has been forced into engagement with the brakes, an extra effort is required to force it further downwardly, such extra effort involving rotating the rollers 52 while under the braking action of strips 53. Strips 53 are sufficiently yieldable to permit their inner edges 56 to distort and pass the blank when sufficient pressure is applied.

Arranged interiorly of the members which form shoulders 43, 44, 45 and 46 are a plurality of abutments 57, 58, 59 and 60 having their inner upper corners rounded at 61 as shown clearly in Fig. 8. These abutments are arranged to engage panels 8 and 9 of the blank as the latter is moved downwardly. During such movement, panel 8 together with panel 9, and panel 18 together with panel 19, are hinged about score lines 4 and 5 until the end panels 8 and 9 extend substantially vertically as shown in Fig. 3. Thereupon, the attendant turns panel 19 downwardly about score line 20 as a hinge, and then turns panel 9 downwardly about score line 11 as a hinge, while downward movement of panel 1 is restrained by the brake upon rollers 52. When the panels 9 and 19 have been moved into parallel relationship with panel 1, a little extra downward push causes rollers 52 to yield outwardly and permit the conformed blank, with enclosed book or the like, to pass downwardly. The downward movement of the package is arrested by a series of rollers 63 whose axes are arranged to slope downwardly and leftwardly as seen in Fig. 8, so that when a package reaches the rollers, it immediately rolls to the left and is discharged under end wall 38.

The completed package is discharged from rollers 63 upon a conveyor belt 64 and transported leftwardly thereby between opposite resilient rails 56 which, during movement of the package, exert pressure sidewise thereon. The ends of the rails 65 toward mold 34 are flared outwardly to guide the package into a central position beneath a member 66 which applies a vertically downward pressure to the package as it is being transported by belt 64. The pressure member 66 may include an auxiliary conveyor belt 67 driven at the same lineal velocity as belt 64 but in the opposite sense so that the lower reach of belt 67 travels in the same direction and at the same velocity as the upper reach of belt 64.

On passing along the belt 64 between rails 65 and beneath pressure member 66, the several flaps and panels of the package are pressed inwardly toward each other and the pressure maintained for a time sufficient to permit the band of adhesive 330 to take hold; that portion of the band which is on the flap 12 adhering to the outermost face of flap 24; that portion of the adhesive on flap 13 adhering to the outermost face of flap 25; and that portion of the adhesive on panel 9 adhering to the outermost face of panel 19. Thus the book contained within the package is protected from being soiled by contact with the adhesive. While no adhesive is present in a position to seal flaps 6 and 7 against the outermost faces of flaps 12 and 13, the former flaps are, however, held in proper upstanding relationship by their integral connection with corner flaps 14, 15, 16 and 17, which in the

completed package are turned at right angles and retained in that position by the end and cover panels.

In order to adapt the mold **34** to accommodate books and blanks of different sizes, the several parts of the mold may be made relatively adjustable. For example, in wrapping a narrower or wider book, one or both of the side walls **36** and **37** may be adjusted inwardly or outwardly as the case may be. For a book which is thinner or thicker, but otherwise of the same dimensions, some adjustment of the relative position between rabbets **51** of tapered member **50** and the surface of roller **52** may be required to assure that the margins of the intermediate panel side flaps are seated in the rabbets when the corner between the intermediate panel of the blank and its adjacent side flaps is at rest upon the surface of roller **52**. For books which are longer or shorter, corresponding relative adjustment of posts **39** and **40**, as well as **41** and **42**, is required in order to assure that these posts be positioned so as to make engagement respectively with the four corner flaps of the blank.

In this second embodiment of the invention, it will be noted that pressure is applied to the side flaps and cover panels by means of the brake system, whereas the Fig. 6 embodiment omits the brakes and uses a different pressure unit.

With an apparatus of the character hereinbefore described and using blanks of the character described, a single attendant with but brief experience can achieve a wrapping rate of four or five hundred books per hour. The wrapping is not only easy to apply, but affords double thickness protection at each corner of the book or other wrapped article.

From the foregoing description, those skilled in the art should readily understand that the invention accomplishes its objects in a highly expeditious, facile and economic manner. While various embodiments of the invention have been disclosed in detail, it is to be understood that such disclosure is solely for the purpose of illustration and not by way of limitation. It is apparent that many modifications and variations, in both the blank and in the apparatus, will present themselves to those skilled in the art without departing from the spirit of this invention, and it is to be distinctly understood, therefore, that the invention is not limited to the embodiments herein specifically disclosed.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. Apparatus for enveloping an article in a paperboard blank formed with bottom, end and cover panels, side panels hinged to the bottom and cover panels and corner flaps hinged to the bottom-side panels; said apparatus comprising a blank-folding mold formed with an open-top, open-bottom passage through which the blank is moved from top to bottom with the article resting on the bottom panel thereof, said passage containing a first series of abutments spaced from one another adjacent the top of the mold initially to engage the corner flaps of the blank in its movement through said passage, a second series of abutments located below said corner-flap abutments to engage the side panels of the blank, and a third series of abutments located below said side-panel abutments to engage the end panels of the blank.

2. Apparatus as set forth in claim 1 further including a pressure sealing device horizontally offset from the mold adjacent the open bottom thereof, said pressure sealing device having a passage through which said folded blank travels in an endwise direction, said passage containing pressure applicators for compressing the side panels and pressure applicators for applying pressure to the cover and bottom panels.

3. Apparatus as set forth in claim 2 wherein pressure applicators of said sealing device are disposed to apply pressure to the side panels of the package before pressure is applied to the cover and bottom panels.

4. The method of enveloping an article in a paperboard blank formed with bottom, end and cover panels, side panels hinged to said bottom and cover panels, and corner flaps hinged to said bottom-side panels; comprising the step of placing the article on the bottom panel, folding the corner flaps upwardly from the bottom-side panels, then folding the side panels upwardly from the bottom and cover panels so that the corner flaps are carried inwardly over the end panels, then folding the end panels upwardly from the bottom panel about said corner flaps, then folding the cover panels inwardly over the article while guiding the cover-side panels between the bottom-side panels and the contained article, applying pressure to the side panels, and then applying pressure to the cover panels, thereby to pinch the corner flaps between the end panels and the ends of the cover-side panels so as to secure the side panels in position.

5. Apparatus of the character described comprising a mold and a pressure sealing device; said mold having an open top for receiving a wrapper blank and an article to be wrapped, a passage leading downwardly from said top opening, and a bottom opening for discharging the wrapped article to the pressure sealing device; said mold passage having a pair of corner-flap abutments spaced from one another on each side of the mold adjacent the top thereof, side-corner abutments located at the sides of the mold below said corner-flap abutments, and end-panel abutments located below the side-flap abutments.

6. Apparatus as set forth in claim 5, further including a blank-feeder horizontally offset from the mold adjacent the top thereof to feed blanks horizontally to a point adjacent the open top of the mold.

7. Apparatus as set forth in claim 5 wherein said pressure sealing device is horizontally offset from the mold adjacent the bottom discharge opening thereof, said pressure sealing device having a horizontal passage, the entrance to which is located adjacent that end of the mold having said end-panel abutments, so that the wrapped article passes endwise through the pressure sealing device.

8. Apparatus as set forth in claim 5, wherein said side-flap abutments are of sloped configuration, there being side-flap abutments of relatively gentle slope disposed between the corner-flap abutments and side-flap abutments of relatively abrupt slope disposed outwardly of the corner-flap abutments.

9. Apparatus as set forth in claim 7 wherein said pressure sealing device includes side pressure applicators for applying pressure to the side panels of the package, and includes a second set of pressure applicators for applying pressure to the bottom and cover panels of the package.

10. Apparatus as set forth in claim 9 wherein the side pressure applicators of the pressure sealing device are disposed to engage the side panels of the package before said other pressure applicators engage the cover and bottom panels of the package.

11. Apparatus as set forth in claim 10 wherein said cover and bottom pressure applicators in part converge in the direction away from said mold, the side-pressure applicators being relatively uniformly spaced in the region of said convergence between the upper and lower pressure applicators.

12. The process of enveloping an article in paperboard blank formed with bottom, end and cover panels, side panels hinged to the bottom and cover panels, and corner flaps hinged to the bottom-side panels; comprising the steps of withdrawing a blank from a stack thereof and placing the blank upon an open-top mold having a vertical passage which contains corner-flap abutments, side-panel abutments and end-panel abutments in the order named in the downward direction; placing the article to be wrapped on the bottom panel of said blank; applying pressure to the top of said article so as to move said blank and article downwardly through the mold to cause the corner flaps to fold upwardly from the bottom-side panels and cause the side panels to fold upwardly from

the bottom and cover panels and to cause the end panels to fold upwardly from the bottom panel; folding said cover panels over the article while guiding the cover-attached side panels between the bottom-attached side panels and the contained article; applying pressure to the side panels to move them inwardly; and thence applying pressure to the cover panels, thereby to pinch the corner flaps between the end panels and the ends of the cover-attached side panels.

13. The process set forth in claim 12 wherein said cover panels are over a total length greater than said bottom panel so as to overlap one another; and further including the step of applying adhesive to said overlapping portion of a cover panel after the blank is withdrawn from its supply and prior to placement of the blank upon said open-top mold.

14. A mold for conforming flat blanks into wraps about articles comprising an open top for receiving a blank and an article, a central passage for folding the wrapper about the blank, and a bottom opening for discharging the wrapped article, said central passage having a pair of corner-flap abutments spaced apart at each side of the mold adjacent the top thereof, side-flap abutments of relatively gentle slope located between and below the corner-flap abutments, side-flap abutments of relatively abrupt slope located outwardly of and below said corner-flap abutments, and end-panel abutments located between and below said side-flap abutments.

15. The process of wrapping an article comprising the steps of providing a paperboard blank having a bottom panel, end panels hinged to said bottom panel, cover panels hinged to the end panels, side panels hinged to said bottom and cover panels, and corner flaps hinged to said bottom-side panels; placing the blank over the opening of a mold having an open-ended passage therethrough; placing an article to be packaged on the bottom panel of the blank; pushing the blank and article through the mold passageway, which passage has abutments located therein for engagement with the corner flaps and cover-side panels followed by abutments located for engagement with the bottom-side and end panels, so that the corner flaps and cover-side panels are folded upwardly, the bottom-side panels are folded inwardly toward the article with the corner flaps carried over the end panels, and the end panels are folded inwardly toward the article; folding the cover panel over the article while guiding the cover-side panels inwardly of the bottom-side panels; and ejecting the so-enveloped article from the bottom of the mold.

16. In the method of packaging an article, the steps of providing a substantially flat paperboard blank cut and

scored to define a bottom panel, end panels hinged to said bottom panel, a cover panel hinged to an end panel, side panels hinged to the bottom panel, and flaps hinged to some of said panels for overlapping with other panels; providing a mold having a vertical passageway defined at its upper end by abutments spaced apart at distances such as to engage each side and end panel when the bottom panel is aligned with said passageway and braking means disposed beneath said abutments for braking the passage of the blank therethrough; placing the blank on said mold with said bottom panel in alignment with and above said passageway; pushing said blank down said passageway until engaged by said brake means so that the side and end panels are engaged by said abutments and folded upwardly by downward movement of the blank realtive thereto to form a pocket opening upwardly in said passageway; then, with said article in said pocket, folding the cover panel over the top of the article to close the pocket while said blank is so positioned in said passageway at said brake means; and then pushing the so-enveloped article beyond said brake means and ejecting it from the lower end of said vertical passageway.

17. Apparatus for packaging an article with a blank of substantially flat paperboard cut and scored to define a bottom panel, end panels hinged to said bottom panel, a cover panel hinged to said end panel, and side panels hinged to the bottom panel and the cover panel; said apparatus comprising a mold having a vertical passageway, abutments defining said passageway and spaced apart distances such as to engage each side and end panel when said bottom panel is aligned with said passageway; brake means disposed beneath said abutments which cooperate with the bottom-side panels and in spaced relationship therefrom so as to provide rabbet means therebetween into which the bottom-side panels may spread while the cover side panels are guided inwardly of the said bottom side panels by the overlying side panel abutments as the cover is swung into substantial parallel relationship with the bottom panel.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,885,842 May 12, 1959

Arwed C. Boitel

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 48, for "rails 56 which," read -- rails 65 which, --; column 4, line 50, for "panel 10 is" read -- panel 19 is --; column 9, line 11, claim 13, for "are over a" read -- are of a --.

Signed and sealed this 6th day of October 1959.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents