Feb. 26, 1957 P. THOMPSON 2,782,977

BOX AND BOX BLANK

Filed July 6, 1950 2 Sheets-Sheet 1

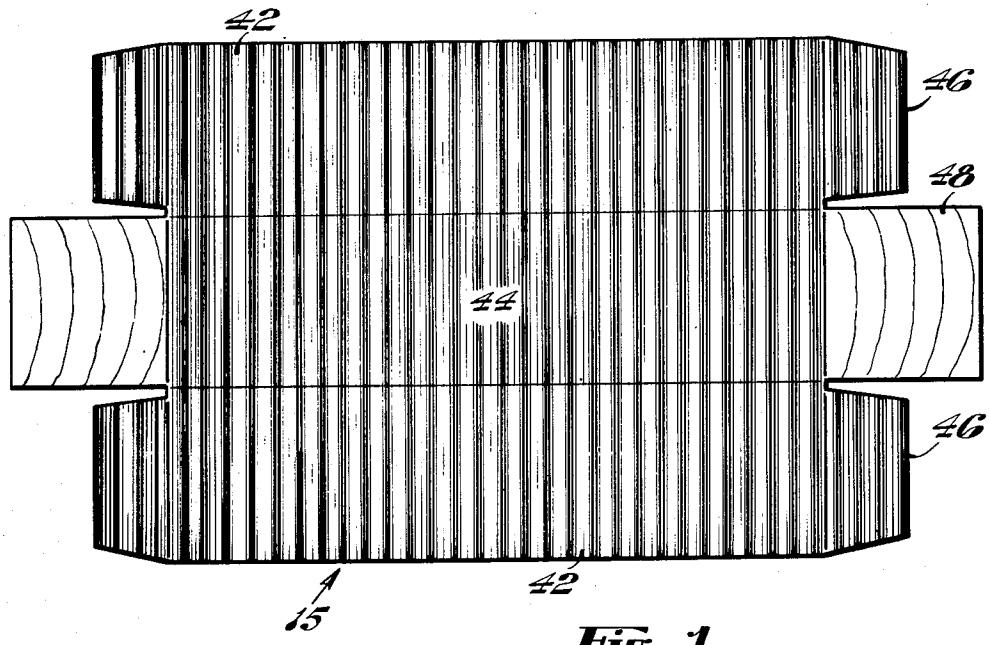


Fig. 1

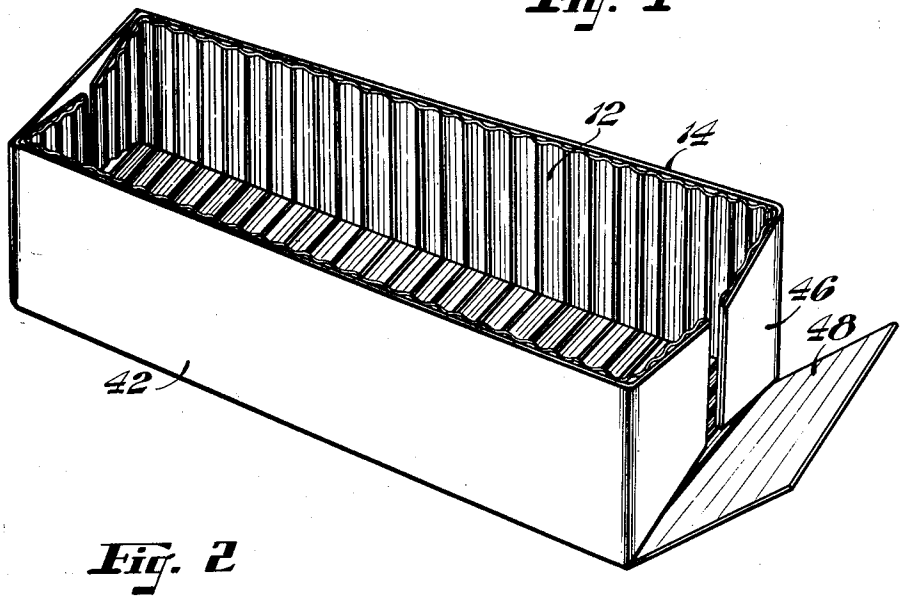


Fig. 2

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BOX AND BOX BLANK

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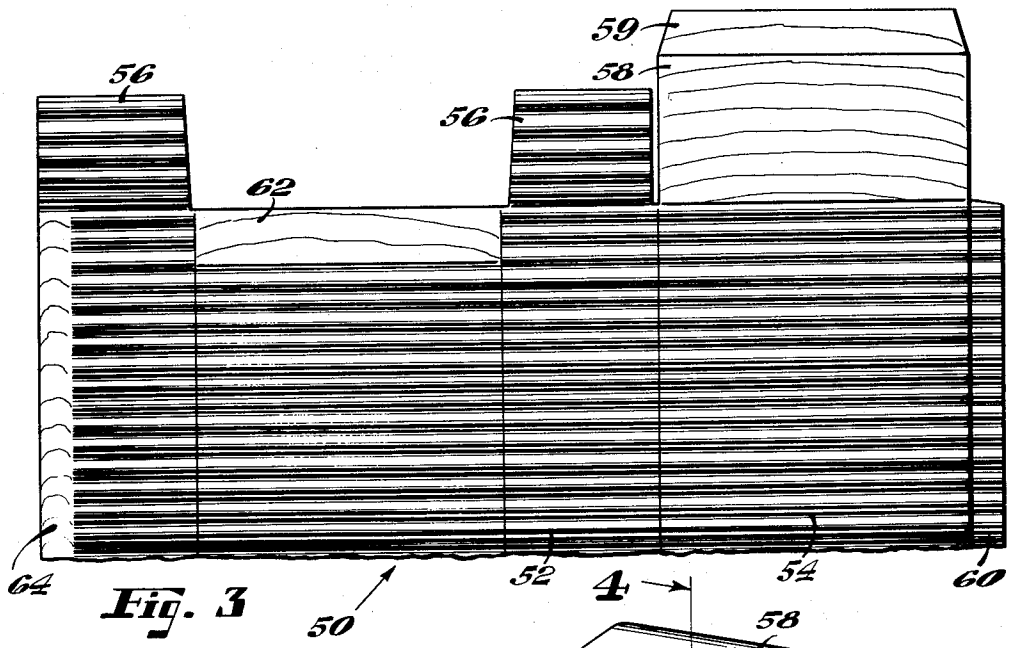


Fig. 3

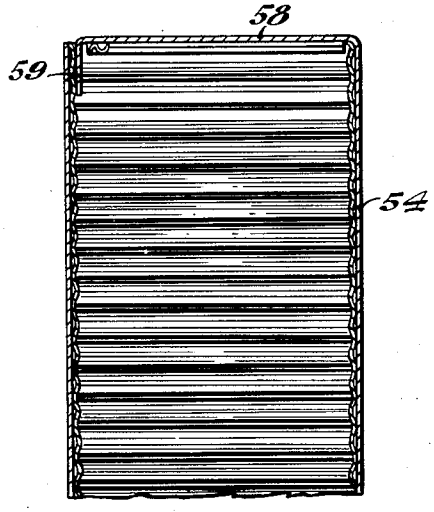


Fig. 4

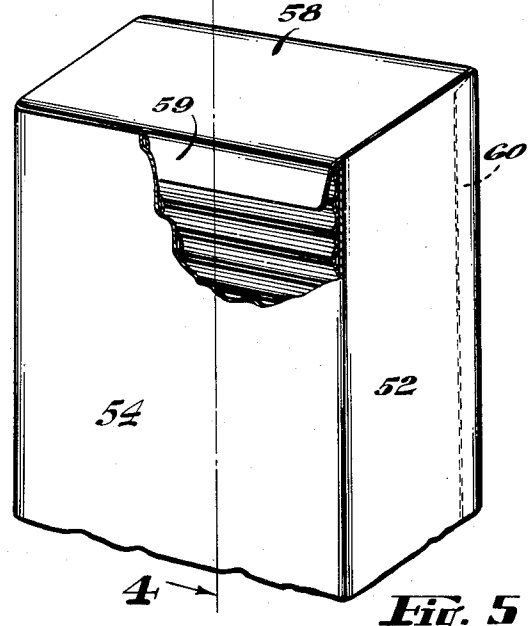


Fig. 5

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BOX AND BOX BLANK

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Application July 6, 1950, Serial No. 172,270

4 Claims. (Cl. 229—14)

This invention relates to an improved box and packaging blank and the method of producing the blank. The invention relates particularly to packages employing corrugated paperboard for use in the shipping of fragile products. Heretofore such packages have ordinarily included a box with a corrugated paper liner. My invention contemplates a blank formed from plied sheet stock having oppositely disposed plane and corrugated faces. The blank is cut from the sheet stock and each box blank includes body panels and foldable end wall flaps. Flat stock blanks of this nature are commonly folded into box form by overlapping and adhesively securing each outer end wall flap to the adjacent inner flaps. Thus folding a blank employing corrugated stock at one face would however be impractical and unsatisfactory since the inwardly facing corrugated stock on the outer end wall flap would contact the outwardly facing plane face of the inner flaps only at the crests of the corrugations and thus result in (1) a limited and insecure bond, (2) the bond pressure would partially crush the corrugations and produce a shifting joint, (3) the thickness of the end wall would be substantially increased and unsightly and (4) the overall length of the box would be increased or its inner length decreased.

The paperboard stock comprises a corrugated sheet adhesively attached to one face of a backing sheet and, in accordance with my invention, I flatten the corrugated face areas of the blank that are to be engaged and bonded to other and cooperating plane faces of the blank, while the adhesive between the two plied sheets is tacky. Thus the corrugations are eliminated and a substantially flat surface with reduced wall thickness is produced, and the tacky adhesive serves to retain this relation. The production of an improved packaging blank of this nature comprises the primary object of the invention.

When a box blank is thus constructed in accordance with my invention and folded to box form this flattened surface bonds with maximum surface contact to the cooperating flat surface of the inner flaps, thus producing a secure bond and an end wall of reduced thickness. The production of an improved box blank and box of this nature in which the objectionable features above recited are eliminated comprises a further object of my invention.

These and other features of the invention will be best understood and appreciated from the following description of preferred embodiments thereof selected for purposes of illustration and shown in the accompanying drawings in which,

Fig. 1 is a plan view of a box blank embodying my invention,

Fig. 2 illustrates the setting up of the blank to box form,

Fig. 3 is a fragmentary view of another box blank constructed in accordance with the invention,

Fig. 4 is a fragmentary sectional view of a box formed from the blank,

Fig. 5 is a fragmentary perspective view of the box, a portion of one wall being broken away.

The box blanks comprising the invention are cut from stock embodying a corrugated sheet adhesively attached to one face to a plane backing sheet and certain predetermined areas of the corrugated sheet are flattened against the backing sheet while the adhesive therebetween is tacky, whereby the adhesive serves to bond the flattened corrugations to the backing sheet and provide substantially flat surfaces at said areas with reduced wall thickness. If desired, heat can be applied to facilitate the bonding of the flattened corrugated material. The combined stock thus formed is cut by severing knives into desired blanks.

The blank **15** comprises three body sections or panels **42** and **44** and end closure flap sections **46** and **48**. The two end flaps **46** are of a combined length equal to the width of the end flap **48** and form the inner end wall portion of the box. The flaps **48** are adapted to fold flatly against the flaps **46** and form the outer end wall portion of the box. The flattened area **30** engages flatly against and is adhesively secured to the plane outer faces of the flaps **46**, thereby producing a secure and non-shifting bond of maximum surface engagement therebetween and of minimum end wall thickness. A blank constructed in accordance with my invention thus produces a carton with a corrugated board liner as the inner wall of the blank and provides this superior carton at substantially reduced cost.

The corrugated face of the compound stock is flattened in the area or areas that are to engage against cooperating areas of the backing sheet when folded into box or packaging form, and in Figs. 3–5 I have illustrated a blank **50** requiring a plurality of such flattened areas. This blank comprises body panels **52** and **54** having end closure flap sections **56** and **58—59** and a side gluing flap **60**. The corrugated area of the flaps **58—59** and the body panel areas **62** and **64** are flattened in the manner above described. When the blank is folded to the box form illustrated in Figs. 4 and 5, the flattened area **58** engages against the outer plane faces of the flaps **56** and the plane face of the tab **59** engages against the flattened area **62**. Also the gluing flap **60** is disposed within the adjacent panel **52** and secured adhesively to the flattened area **64**, as illustrated in broken lines in Fig. 5.

It will be understood that my invention is applicable to a great variety of blanks for packaging and boxing toiletries, pharmaceuticals, crackers, electric light bulbs, etc., and the method steps can be modified to suit the particular product to be made. In combining the two sheets **12** and **14** the adhesive is preferably placed on the backing sheet where it will better facilitate the bonding of the flattened corrugated areas.

It is particularly pointed out that in the flattened areas the corrugations are not only crushed but they are compacted and laminated to the backing sheet as clearly shown in the drawing and are held in such position due to the tacky adhesive placed on the backing sheet. The result obtained is the flat anchoring of the excess material in the corrugations to produce a complete and firm bond thereof with the backing sheet.

Having thus disclosed my invention what I claim as new and desire to secure by Letters Patent is:

1. A folded paperboard box including body and end walls formed from a single piece of plied paperboard stock embodying a corrugated sheet adhesively attached to one face of a backing sheet with the corrugated and backing sheets disposed respectively at the inner and outer faces of the box, certain of said walls embodying overlapping flaps adhesively secured in face to face contact to form a wall portion of the box and including a plane outwardly facing backing sheet face engaged and cov-

ered by an inwardly facing and substantially flat face embodying said corrugated sheet flattened against the backing sheet and held in such flattened condition by adhesive contact with the backing sheet, thereby forming the exposed face of the corrugated sheet into a permanently flat plane surface, and means adhesively securing said surface to the cooperating backing sheet face in a continuous flat plane at the junction of said faces.

2. A folded paperboard box including body and end walls formed from a single piece of plied paperboard stock embodying a corrugated sheet adhesively attached to one face of a backing sheet with the corrugated and backing sheets disposed respectively at the inner and outer faces of the box, certain of the end walls including two flaps integral with oppositely disposed body walls and a third flap integral with a body wall therebetween and having its inner face in contact with and covering the outer face of said two flaps, the corrugated inner face of the third flap being substantially flat and embodying said corrugated sheet flattened against the backing sheet and held in such flattened condition by adhesive contact with the backing sheet to provide flat and maximum surface contact with said outer face and an end wall of reduced thickness.

3. The box defined in claim 2 plus a gluing flap integral with one body wall and having the backing sheet face thereof in adhesive contact with a corresponding area of the corrugated face of an adjacent body wall, the corrugated sheet of said area being likewise flattened and adhesively secured to the backing sheet and providing a plane face in adhesive surface contact with the plane backing sheet face of the gluing flap.

4. A box blank formed from plied paperboard stock embodying a corrugated sheet adhesively attached to one face of a backing sheet and scored along parallel fold lines dividing the blank into four box forming panels integrally connected at said lines, end closure flap sections extending outwardly from certain of the panels and

integral therewith and with the blank along parallel scored lines disposed right angular to the first named lines, the blank being adapted to fold along said lines to form a box, and the corrugated sheet of the blank at certain of said flap sections being flattened and laminated against and adhesively secured in said flattened and laminated condition to the backing sheet, thereby providing a flat plane surface adapted to engage the plane backing sheet face of other of said flaps in continuous surface contact when the flaps are folded on said lines to form the blank into a box, a tuck flap section extending outwardly from and integral with one of said certain flap sections along a scored fold line parallel with the second named lines and the corrugated face thereof being likewise flattened and adhesively laminated to the backing sheet, and one of the panels being disposed between two panels to which two of said other flaps are attached and the corrugated face thereof being likewise flattened and adhesively laminated to the backing sheet in a marginal area disposed between and adjacent to said two other flaps, said tuck flap and marginal area being substantially of like shape and equal area and disposed at the same margin of the blank and on alternate panels thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 19,180	Boeye	May 29, 1934
915,579	Ferris	Mar. 16, 1909
1,148,115	Morton	July 27, 1915
1,569,932	Hill	Jan. 19, 1926
1,588,123	Maston	June 8, 1926
1,697,479	Schilling et al.	Jan. 1, 1929
1,927,272	Patt	Sept. 19, 1933
2,472,883	Bergstein	June 14, 1949
2,547,005	Herrick et al.	Apr. 3, 1951
2,598,173	Humphner	May 27, 1952