July 11, 1944. I. DORFMAN 2,353,298

FOLDING BOX AND BLANK FOR MAKING SAME

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Fig. 1

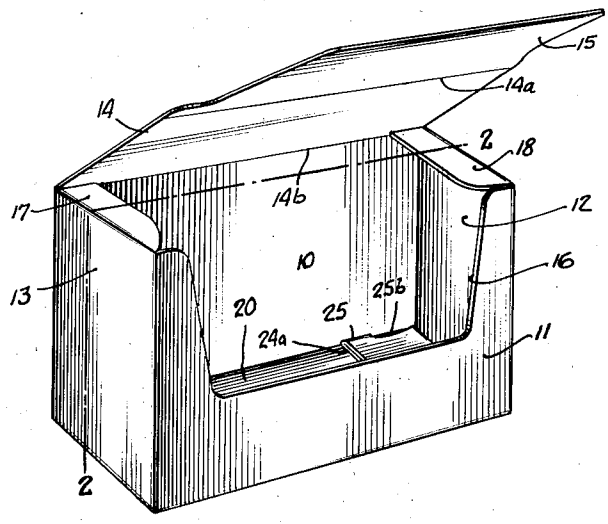


Fig. 2

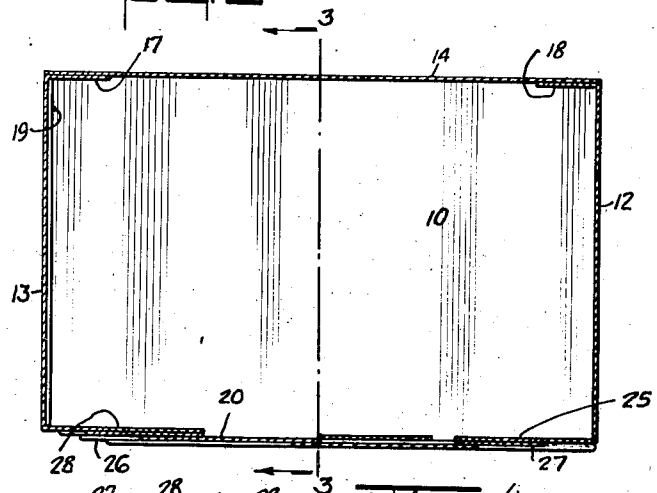


Fig. 3

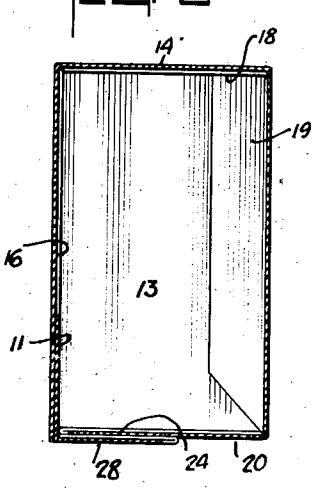
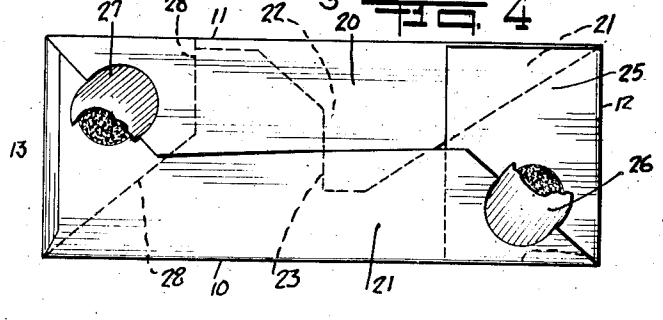


Fig. 4



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FIG. 5

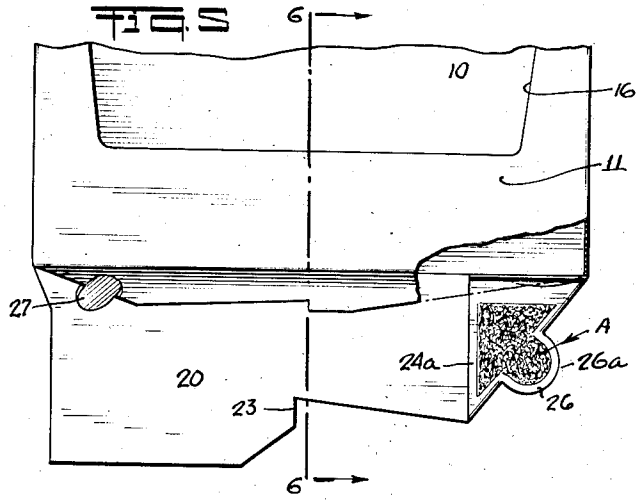


FIG. 6

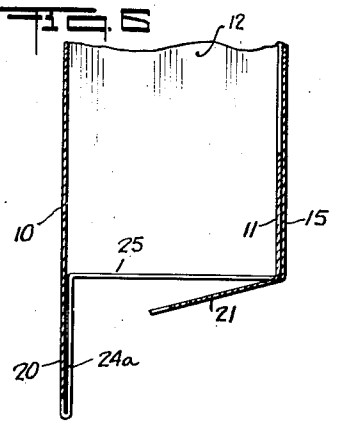
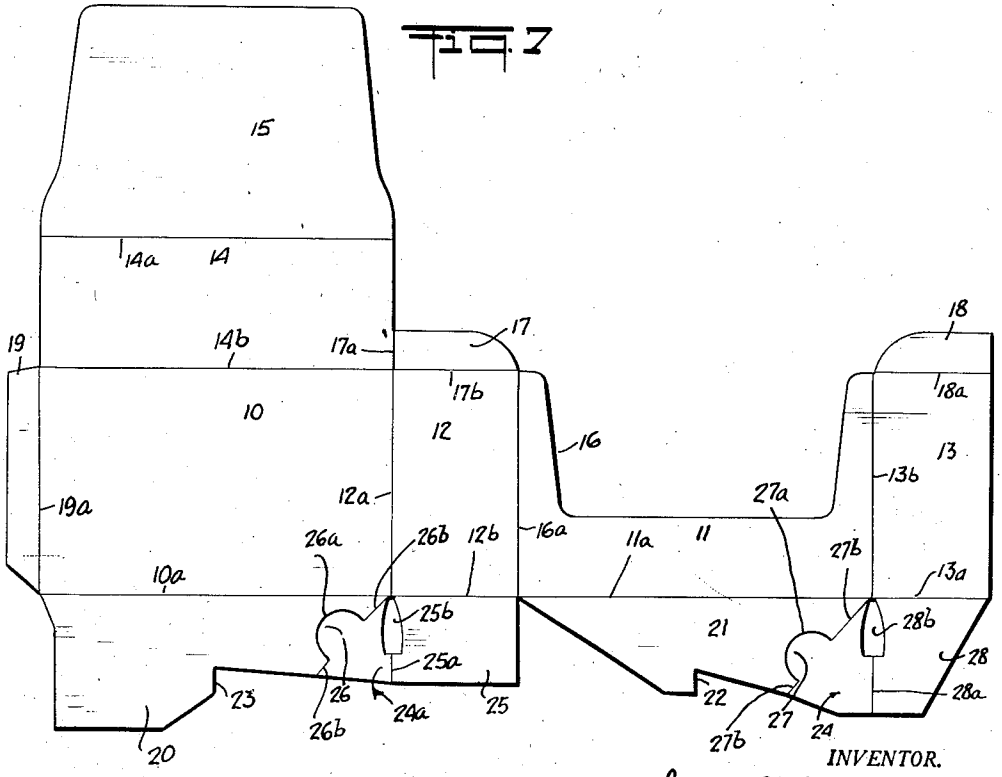


FIG. 7



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2,353,298

FOLDING BOX AND BLANK FOR MAKING SAME

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Application June 7, 1943, Serial No. 489,885

4 Claims. (Cl. 229—16)

My invention relates to a new and improved folding box and to a new and improved blank for making this type of box.

The principal object of my invention is to provide a construction whereby the blank can be folded into box-shape, by means of existing automatic machinery, more simply and easily than heretofore.

Another object of the invention is to provide a blank construction whereby all the bottom parts of the box, which are below a continuous longitudinal bottom fold line, are bent or folded in the same single direction. Since it is unnecessary to bend some of said bottom parts in one direction, and to bend others of said bottom parts in the reverse direction, the folding of the blank into box-shape is greatly facilitated.

Numerous additional and important objects of the invention are stated in the annexed description and drawings, which illustrate a preferred embodiment thereof.

Fig. 1 is a perspective view of the assembled or set-up box, with the cover in open position.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a bottom plan view of Fig. 1.

Fig. 5 illustrates the application of adhesive to the tabs of one of the partial bottom walls. In order to show this more clearly, the respective partial bottom wall is shown as being below the front and rear walls, although said partial bottom wall is not in such position when the adhesive is applied.

Fig. 6 is a section on the line 6—6 of Fig. 5, showing the cover in position.

Fig. 7, which is to scale, is a plan view of the blank.

Fig. 7 shows a cover 15, a top wall 14, a rear wall 19 which has a flap 19; a first partial bottom wall 20 which has a flap 25; an end wall 12 which has a flap 17; a front cut-out wall 11, which is cut out along line 16; a second partial bottom wall 21 which has a flap 28; and an end wall 13, which has a flap 18.

Fold lines are indicated by the reference numerals 14*a*, 14*b*, 19*a*, 19*a*, 12*a*, 12*b*, 17*b*, 16*a*, 11*a*, 13*b*, 13*a*, 18*a*, 26*b*, 25*a*, 27*b*, and 28*a*.

The blank is suitably scored along said fold lines.

Cut lines are indicated by the reference numerals 17*a*, 26*a*, and 27*a*.

Cut-outs are indicated by the reference numerals 25*b* and 28*b*.

The entire blank can be made by a suitable scoring and cutting die or a plurality of scoring and cutting dies. The fold lines 26*b* and the cut-line 26*a* and the fold line 25*a* and the cut-out 25*b*, define a tab 24*a* of the rear partial bottom wall 20. The front partial bottom wall 21 has a similar tab 24.

In order to assemble the blank, said blank is fed through the machine in a direction parallel to its longitudinal axis, namely, in a direction parallel to the coincident bottom fold lines 10*a*, 12*b*, 11*a*, and 13*a*.

The cut-line 26*a* and the two coincident fold-lines 26*b* provide a tab-extension 26 of tab 24.

As shown in Fig. 5, the bottom face of tab-extension 26 and the bottom face of tab 24*a* are provided with an area A of adhesive.

The cut-line 27*a* and the two coincident fold-lines 27*b* provide a tab-extension 27 which is identical with tab-extension 26.

The bottom faces of tab-extension 27 and of tab 24 are provided with an area of adhesive which is identical with area A. Hence the application of adhesive to tab-extension 27 and to tab 24 is not specifically illustrated.

In setting up the box from the flat blank, the first operation is to upwardly fold the partial bottom walls 20 and 21 and their respective tabs 24*a* and 24 and their respective adjacent flaps 25 and 28, along the respective coincident longitudinal fold lines 19*a*, 12*b*, 11*a*, and 13*a*, until said partial bottom walls and said tabs and said flaps abut the walls 10, 12, 11, and 13, which are then in the same plane.

The areas A of adhesive are then applied to the members 26, 24*a*, 27, and 24, and optionally to the bottom faces of flaps 25 and 28.

The bottom faces of the partial bottom walls 20 and 21, and of the members 26, 24*a*, 25, 27, 24, and 28, in the blank of Fig. 7 are in top or exposed position when the adhesive is applied.

When the adhesive is applied to the members 26, 24*a*, 27, and 24, said members are in the common plane of the partial bottom walls 20 and 21.

All the parts of the blank which are below the coincident bottom fold lines 10*a*, 12*b*, 11*a*, and 13*a* are thus turned simultaneously in the same single direction in order to apply the adhesive, which greatly facilitates the bending of the blank and application of adhesive thereto.

The blank is then bent along fold-lines 13*b*, 13*a*, 28*a*, and 27*b*.

The end-wall 13 is thus turned until it is perpendicular to front wall 11. The flap 28 is turned until it is perpendicular to end-wall 13.

The tab-extension 27 is also thus automatically turned 180° around the fold-lines 27*b*, until the bottom face of tab-extension 27, to which the adhesive has been applied, contacts with a portion of the bottom face of flap 28, to which adhesive may optionally have been previously applied.

The tab 24 of the front partial bottom wall 21 now overlies said partial bottom wall 21, so that said tab 24 is located between said partial bottom wall 21 and said flap 28.

Said tab 24 now closes the space in the par-

tial bottom wall 21 which has been formed by the turning of tab-extension 27 into abutment with the bottom face of flap 28.

The blank is also bent along vertical fold line 12a and along fold line 12b, so that end-wall 12 is perpendicular to rear wall 10, and flap 25 is perpendicular to end-wall 12.

Tab-extension 26 is thus automatically turned to contact with the bottom face of flap 25, and tab 24a is thus located between partial bottom wall 20 and flap 25.

The blank is then bent along fold line 16a, so that the partial bottom walls 20 and 21 are interlocked at their shoulders 23 and 22 in overlapping relation, thus forming a complete wall for the box.

Tab 19 is connected to end-wall 13 by adhesive.

Flaps 17 and 18 are bent to horizontal position, to abut the top wall 14, when the box is closed.

When the box is closed, flaps 17 and 18 can be optionally connected by adhesive to the top wall 14.

When the box is closed, the cover 15 closes the cut-out of the front wall 11, and the bottom edge of cover 15 is then substantially coincident with the bottom edge of front wall 11.

The construction of the box is thus substantially indentical at each end-wall. The only difference is that flap 28 has a rectangular shape, and flap 28 has the shape of a trapezoid.

The invention is not limited to any specific method for setting up the box.

The cut-outs 25b and 28b facilitate the setting up of the box. Said cut-outs 25b and 28b are covered by respective parts of the set-up box.

I have disclosed a preferred embodiment of my invention, but it is clear that numerous changes and omissions and additions can be made without departing from its scope.

For convenience, the walls 10 and 11 are designated as longitudinal box-walls and the walls 12 and 13 are designated as transverse box-walls. In the flat blank, the bottom edges of said longitudinal box-walls and of said transverse box-walls form a single straight longitudinal line 10a, 12b, 11a, and 13a.

Each partial bottom wall 20 and 21 has a pair of coincident fold lines 26b or 27b. Each said pair of fold lines are inclined in the same direction to said line 10a, 12b, 11a, and 13a. In this embodiment the coincident fold-lines 26b are parallel to the fold lines 27b. Each bottom fold line 26b or 27b extends to the free edge of the respective partial bottom wall. The upper fold lines 26b and 27b extend to said straight line 10a, 12b, 11a, and 13a, and to the corner of walls 10 and 12, or to the corner of walls 11 and 13.

The cut lines 26a and 27a are convex cut-lines, although any projecting shape of the extensions 26 and 27 would be equivalent to the convex shape which is specifically illustrated.

For convenience, the tabs 24a and 24 are designated as closure tabs, because they close the openings which are shown in Fig. 4. In Fig. 4, parts of the representations of members 26 and 27 have been omitted, in order to show the adhesive.

The tab-extensions 26 and 27 act as sealing tabs in the set-up box.

I claim:

1. A flat box-blank which has integral longitudinal box-walls and transverse box-walls which are connected at respective main hinge lines which are parallel to each other, said walls having bottom edges which form a single straight longitudinal line, said longitudinal walls being continuous with respective partial bottom walls which are located below said longitudinal line, said transverse walls being continuous with bottom flaps which are located below said longitudinal line, each said bottom flap being integral with the next adjacent partial bottom wall along a respective hinge line which is parallel to said main hinge lines, each said partial bottom wall having a pair of coincident fold lines which are separated by an intermediate convex cut line, each said pair of fold lines being inclined in the same direction to said longitudinal line, one of each said pair of fold lines extending to the free edge of the respective partial bottom wall, the other of each said pair of fold lines extending substantially to said longitudinal line and to the corner between the respective longitudinal wall and transverse wall.

2. A blank according to claim 1, in which said pairs of fold lines are parallel to each other.

3. A blank according to claim 1 in which said pairs of fold lines are parallel to each other, each said blank having a cut-out between each said partial bottom wall and the respective bottom flap, each said cut-out extending substantially to said longitudinal line, each said cut-out being spaced from the free edges of the respective partial bottom wall and the respective bottom flap.

4. A box having longitudinal walls which are connected by transverse walls along respective main parallel hinge lines, said longitudinal walls being integral with respective partial bottom walls which close the bottom of said box, each said transverse wall being integral with a bottom flap which is perpendicular to said longitudinal walls and also to said transverse walls, each said bottom flap being integral with a respective partial bottom wall along a respective hinge-line which is perpendicular to a respective main hinge-line and which joins the respective main hinge-line, each said partial bottom wall having an integral closure tab, each said closure tab overlying the respective partial bottom wall and abutting and being connected to the top face of the respective partial bottom wall and also to the bottom face of the respective bottom flap, each said closure tab being bent relative to the respective partial bottom wall along a pair of coincident fold lines which are separated by a cut line, one of each said pair of fold lines extending to the free edge of the respective partial bottom wall, the other of each said pair of fold lines extending to the respective corner of the box, said cut-out forming a sealing tab in the respective partial bottom wall, each said sealing tab being connected to the bottom face of the respective bottom flap outwardly of the respective pair of fold lines, each said closure tab closing the respective opening in the respective partial bottom wall which is produced when said sealing tab is located in its aforesaid position.

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