Dec. 28, 1954 W. J. HOGAN ET AL 2,698,109

LINED WIREBOUND BOX BLANK

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Fig. 1

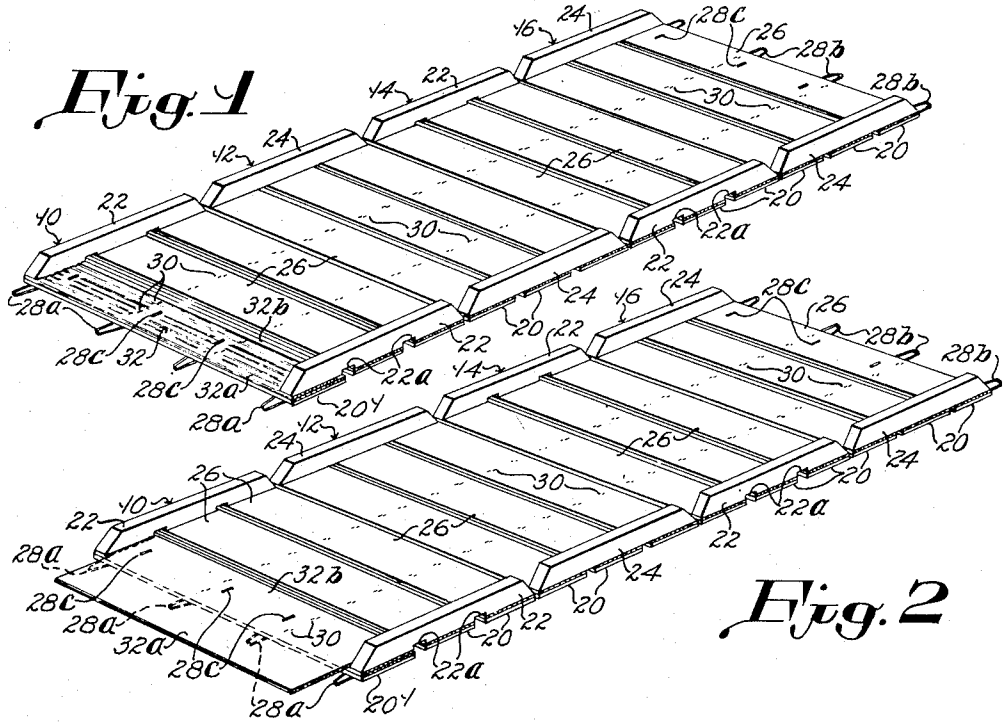
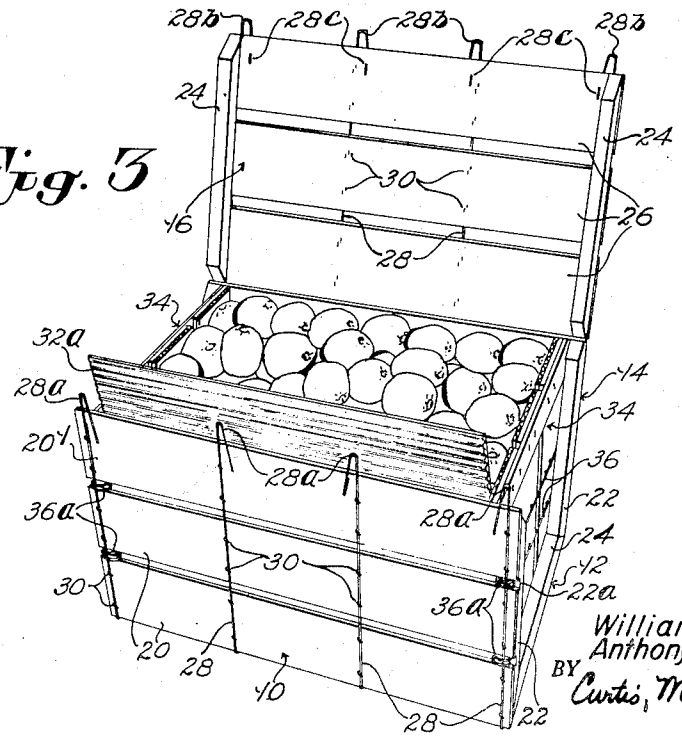


Fig. 2

Fig. 3



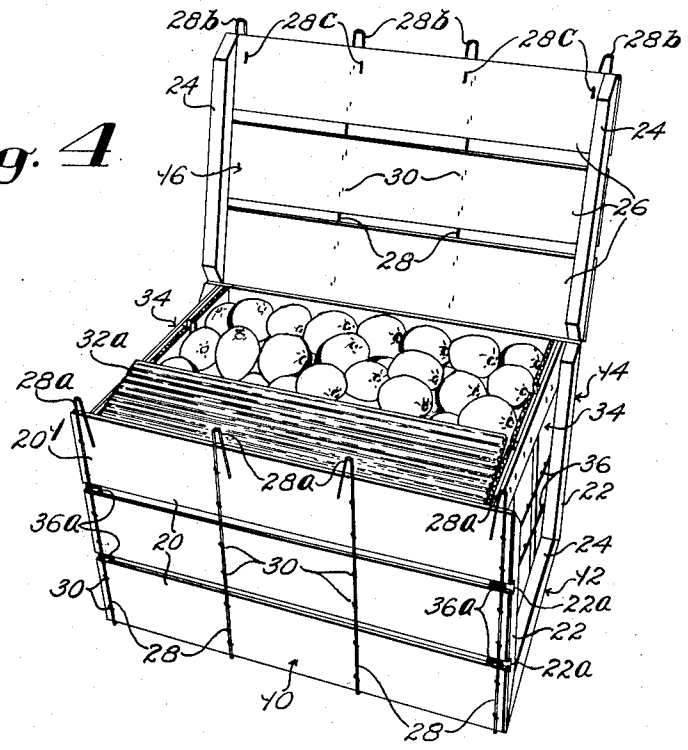
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Fig. 4



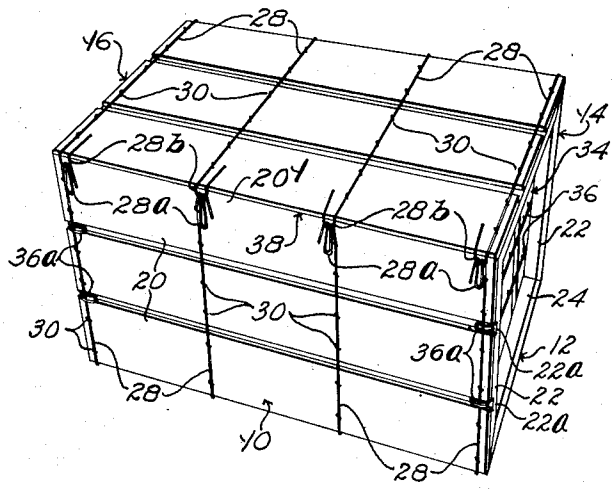


Fig. 5

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LINED WIREBOUND BOX BLANK

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1 Claim. (Cl. 217—3)

This invention relates to wirebound boxes (which term is used herein to include crates and other containers) of the type which are lined, for example with a cushioning material such as corrugated fiber board, and which are provided with a foldable flap of the lining material to seal the closing corner of the box.

Lined boxes of the general type with which the present invention is concerned have gone into widespread commercial use because of their obvious advantage in reducing damage to soft and easily bruised materials contained therein, such as fresh fruits and vegetables. In such boxes, it has been found desirable to provide a foldable flap at the closing corner of the box to seal off the gap which may be left there, particularly where the box is tightly filled and the sides are somewhat bulged, to prevent possible damage to the contents, such as bruising by the wire fasteners at the closing corner of the box. However, this has created a problem in that these foldable flaps have extended beyond the ends of the blanks from which the boxes are made, and have tended to interfere with the mechanism which forms the wire fasteners at each end of the box blanks.

Among the objects of the present invention is that of providing a lined box blank of the type which includes a foldable flap of the lining material at the potential closing corner of the box blank but which can be handled in conventional wirebound box making machinery, without special provisions for accommodating a projecting flap. Another object is the provision of a practical method of making such a box blank.

The present invention provides a lined box blank including a sheet of foldable lining material doubled over against itself along the outer edge of one of the end box sections of the box blank to form two layers, the inner one of which is secured to this box section, and the outer one of which is normally held down flat against the inner layer but is separable therefrom to form a flap foldably secured to the box section along the potential closing corner of the box blank. The ends of the folded section of lining material may be interposed between the side material or slats of the box section and the cleats which are stapled at each end thereof, so that the outer layer of the lining material may be severed adjacent the inner faces of the cleats in order to separate it from the inner section and form the foldable flap.

In the drawings:

Figure 1 is an isometric view of an illustrative lined crate blank embodying features of the present invention and including a section of lining material doubled over against itself to form two layers, the outer one of which is shown in its normal position flat against the inner layer;

Figure 2 is a view similar to Figure 1 but showing the outer layer of the doubled section separated from the inner layer to form a foldable flap;

Figure 3 is a perspective view of the crate blank after it has been folded to set up a complete wirebound crate and has been filled with fruit, with the foldable flap remaining upstanding to facilitate filling of the crate;

Figure 4 is a view similar to Figure 3 but showing the flap after it has been folded down against the contents of the crate; and

Figure 5 is a perspective view showing the crate after it has been closed and fastened.

The crate blank shown in Figure 1 includes four sections or sides indicated generally at **10**, **12**, **14**, and **16**, each of which includes three slats **20**, with cleats **22** or

24 stapled to the inner surfaces of the cleats along the lateral edges of the crate blank. At the inner face of each of the slats **20** a sheet of lining material **26**, in this case corrugated fiber board, is placed. The sheets of lining material are of the same size as the slats **20** and extend between the ends of the slats and the cleats **22** or **24** stapled thereto. The several sections of the crate blank are foldably attached to each other by binding wires **28** (see Figure 3) secured to the sections by staples **30** which are driven astride the binding wires **28** and through the slats **20** and lining material **26** and are clinched over against the undersurface of the lining material, as may be seen in Figure 1. Since the lining material **26** is relatively soft, the clinched-over ends of the staples **30** are buried into the lining material and do not project into the interior of the crate where they might puncture or bruise its contents.

The wirebound crate blank illustrated in Figure 1 may be formed in a conventional wirebound box blank machine wherein properly assembled cleats and slats are carried by endless conveyor bands past a transverse row of stapling units by which they are stapled to each other and to the binding wires to form the crate blanks. The lining material **26** may be laid on the conveyor bands along with the slats **20**, either as a manual operation or by mechanical slat laying apparatus.

The wirebound box or crate blanks normally issue from the box blank machine in a continuous chain joined together by the binding wires. A short interval is normally left between each pair of adjacent box blanks in the chain so that the binding wires may be severed in this interval and bent to form interengageable loop fasteners **28***a* and **28***b* at the ends of the blanks. These loops are anchored by means of prongs **28***c* which are driven through the side material or slats of the end sections and clinched over against the undersurface thereof.

At the extreme left-hand end of the crate blank shown in Figure 1, there is attached a section of lining material **32** which is doubled over against itself along the outer edge of the end section **10** to form two layers the end portions of which are interposed between the end slat **20'** of the section **10** and the cleats **22** stapled thereto. The two layers of the doubled section **32** of lining material are held flat against the inner surface of the end slat **20'** by the staples **30** which are driven through this slat, and the prongs **28***c* of the loop fasteners **28***a*, all of which are clinched over against the inner surface of the outer layer **32***a* of the lining material **32**.

The lining material of the crate, including the doubled section **32**, thus does not extend beyond any of the edges of the crate blank and is held substantially flat against the inner surface of the side material of the blank, so that it does not interfere with the operation of conventional box blank machinery.

The crate blank may be shipped flat, as shown in Figure 1, with the doubled section **32** of the lining material flat against the inner surface of the crate section **10**. When it is desired to set up the crate, the outer layer of the doubled section of lining **32** is severed adjacent the inner faces of the cleats **22**, for example by passing a knife along the inner edges of the cleats, with the point of the knife scribing or cutting through the outer layer **32***a* of the lining material. Then the outer layer is separated from the inner layer by grasping the edge of the outer layer and pulling it upwardly and away from the inner layer **32***b* to tear the outer layer **32***a* adjacent the clinched-over staples **30** and prongs **28***c* and to form a flap **32***a*, as shown in Figure 2, which is foldably secured to the crate blank along its potential closing corner. In order to facilitate grasping of the outer layer **32***a*, it may be made somewhat narrower than the inner layer **32***b* and the slat **20'**, so that its edge is spaced slightly from the edge of the inner layer, as may be seen in Figure 1.

When the crate blank is folded around to set up the crate, as shown in Figure 3, the end section **10** of the blank becomes the front of the crate and the other end section **16** becomes the top, which is hingedly attached to the crate by the binding wires **28**. A pair of crate ends **34** are secured at opposite ends of the crate by loop fasteners **36***a* formed on binding wires **36** stapled to the

crate ends, the loop fasteners **36***a* extending through notches **22***a* in the cleats **22** on the front and rear sections **10** and **14** of the crate and being bent around the outside binding wires **28** of the box blank. These crate ends **34** may be hingedly attached, one to the "front" section **10** and the other to the "rear" section **14**, before shipment of the blanks and while they are still flattened, as shown in Figure 1 or 2. If the ends **34** are attached to the crate blank before the outer layer **32***a* of the doubled section **32** of the lining material is severed and separated from the inner layer to form a foldable flap, the crate end **34** which is attached to the section **10** may be swung outwardly from the section to a vertical position in order to provide room for inserting a knife to sever the outer layer of the lining material and permit bending of the outer layer to the position shown in Figure 2.

The flap **32***a* normally extends upwardly from the edge of the front section **10** of the crate, as illustrated in Figure 3, so as not to interfere with the filling of the crate. After the crate has been filled and prior to closing of the crate, the flap **32***a* is folded down against the contents, as shown in Figure 4.

Figure 5 shows the box after the top section **16** has been closed and the narrow loop fasteners **28***a* on the front section **10** have been inserted through the wider loop fasteners **28***b* on the top section **16** and bent down against the front of the crate to secure the crate closed. When the crate is thus closed, the flap **32***a* seals off any gap at the closing corner **38** of the crate.

There will therefore be seen to have been provided a box blank wherein a foldable flap is provided at the potential closing corner of the box blank, but which normally is held flat against the box blank and does not extend beyond the box blank in position to cause possible interference with the wirebound box-making machinery. It will thus be appreciated that the aforementioned as well as other desirable objectives have been achieved.

However, it should be emphasized that the particular embodiment of the invention shown and described herein is intended as merely illustrative and not as restrictive of the invention.

We claim:

In a wirebound box blank of the type having a plurality of box sections each formed of side material with cleats stapled thereto adjacent the lateral edges of said box blank, with the several box sections foldably attached to each other by binding wires secured to the box sections by staples driven astride of said binding wires and through said side material, and with the end portions of the binding wires formed into interengageable loops secured by prongs formed at the ends of the loops and driven through said side material, a box liner including a sheet of foldable lining material doubled over against itself along the outer edge of one of the end box sections of said box blank to form two layers the end portions of which are interposed between the side material of said box section and the cleats stapled thereto, with the staples and prongs in the region of the doubled box liner extending through both of said layers and being clinched over against the outer layer of said lining material, so that said outer layer may be severed adjacent the inner faces of said cleats and pulled away from the inner layer by tearing of said outer layer adjacent the clinched-over prongs and staples to form a box-sealing flap foldably secured to said box section along the potential closing corner of said box blank.

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