

Aug. 13, 1968

O. DORFMANN

3,396,898

LOCKED CONTAINER

Filed June 14, 1967

2 Sheets-Sheet 1

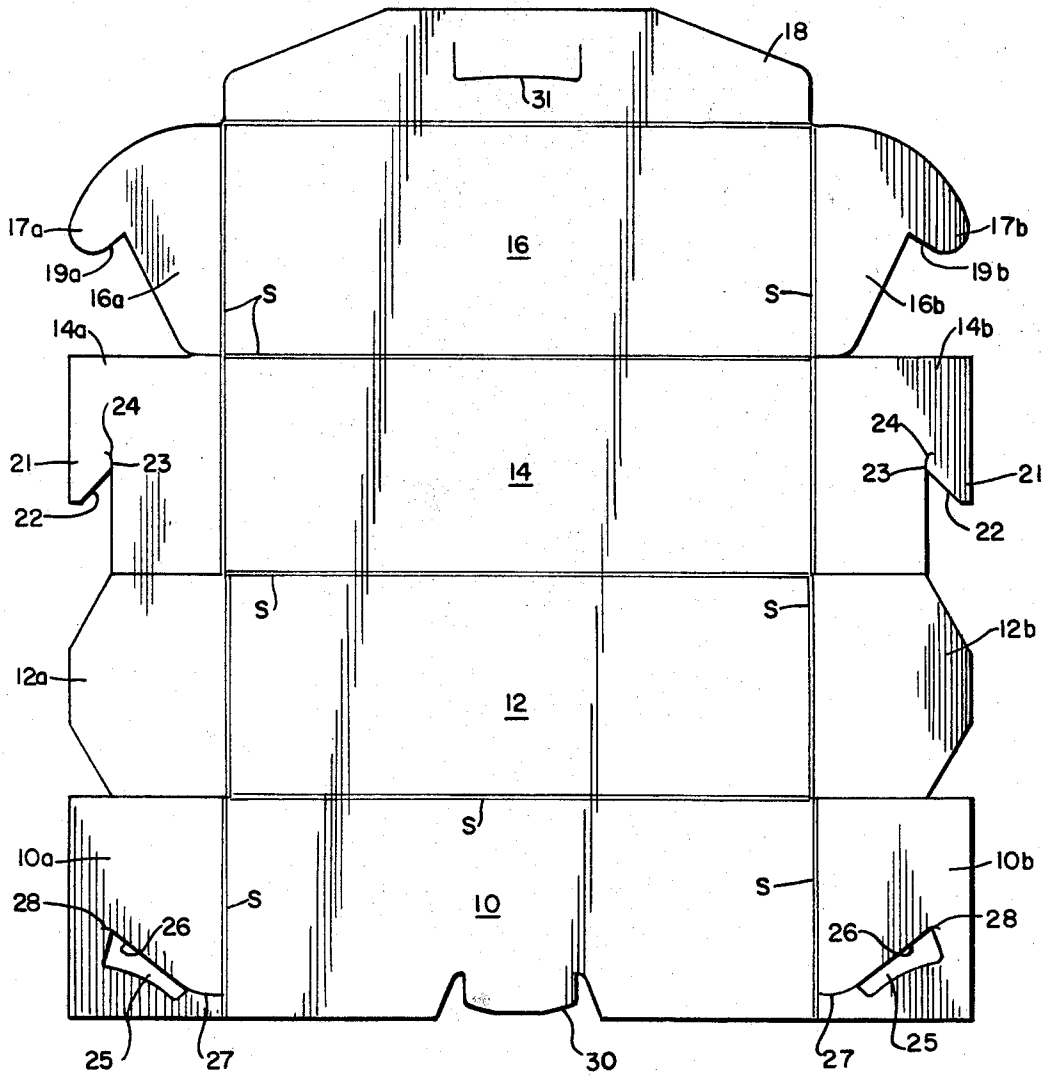


FIG. 1

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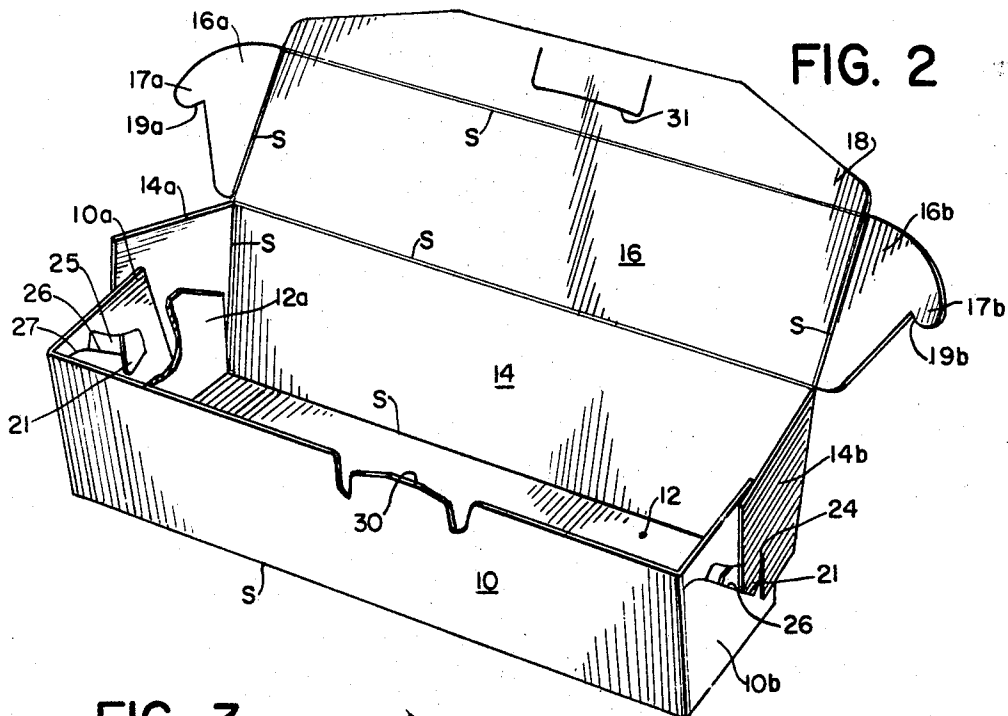
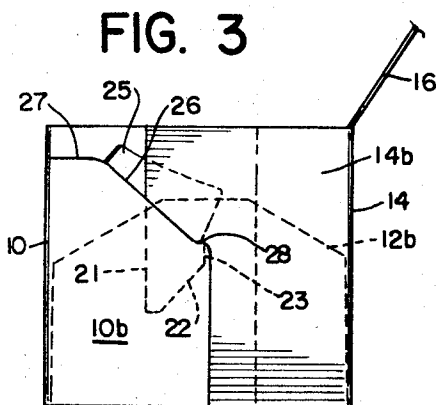
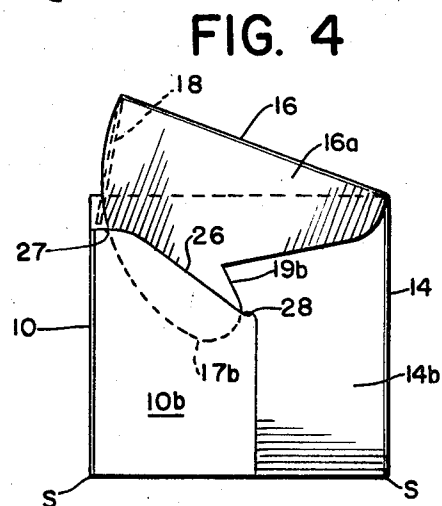
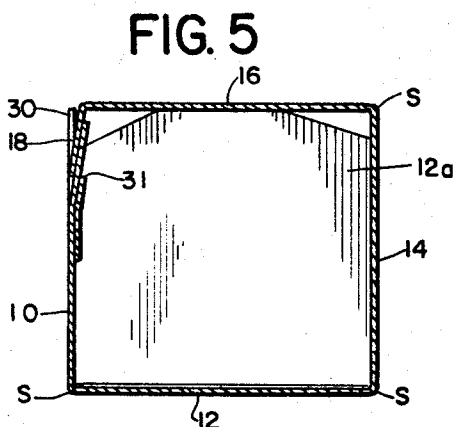
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2 Sheets-Sheet 2



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3,396,898

LOCKED CONTAINER

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2 Claims. (Cl. 229—36)

ABSTRACT OF THE DISCLOSURE

The invention disclosed in this application is a container or carton which is especially adapted, by virtue of its construction, to be utilized in the packaging of compressible products such as food products, especially doughnuts, and which is so arranged as to prevent damage to the packaged product occurring as the carton is closed, and which is in addition, capable of erection and closing on high-speed automatic machinery.

The subject matter of this invention is related to, and the invention constitutes an improvement over, the structure disclosed in United States Patent No. 3,105,626, issued Oct. 1, 1963.

In the past, boxes for the uses above specified have been devised, but these packages had certain disadvantages. In some instances in the earlier box structures, especially when doughnuts were packaged, the tabs of the covers damaged the contents as the container was closed. Further, in such packages, it not infrequently happened that the package could not be entirely closed at the time that the closing operation took place, because of the fact that the doughnuts were then oversize. At the same time, it is essential that the box be so constructed that as the contents return to or arrive at their normal size, the closure will be completed and the cover will lock into position.

Additionally, in prior boxes intended for the packaging of doughnuts and like articles, the end walls were formed of flaps which were not of the full extent of the box height, with the result that the structure tended to be weak and permit crushing of the contents when the boxes were stacked one upon another.

Moreover, whereas in past constructions certain of the box end flaps were abbreviated in order to provide locking means to retain the box in its erected condition, in the present construction, as indicated above, the flaps are full, while retaining this locking action, thus not only providing an essentially increased locking action, but at the same time assuring that the cover flaps are properly guided into position as the cover is moved to close the box, thus again assuring that the contents will not be damaged, while at the same time assuring that due to the guiding action of the full end flap, the closure operation can be more readily performed by high-speed machinery.

The arrangement of the various flaps and panels of the present box solves a problem which existed heretofore in the art, namely, that with the box disclosed in the United States patent above referred to, the stresses to which the flaps were subjected during erection, and sometimes the stresses to which the boxes were subjected in handling and transportation after erection, were sufficiently great to cause the engaged walls to become disengaged. The box of this invention is, due to the construction of the end flap, such that the stresses do not cause this disadvantageous result.

It is of course to be understood that the box of the prior patent is not in any sense inoperative, but rather is highly useful when erected and closed either by hand or by machinery operating at somewhat lower speeds.

It is therefore an object of the invention to provide a box, particularly for compressible and shrinkable foods such as doughnuts, which is capable of erection and closing by a high-speed automatic machinery and which is at the same time so constructed as to assure that the contents will not be damaged during the closing operation and likewise, so constructed as to assure that the box walls will be locked into the erected position and will not be subject to disengagement under stresses produced during erection, closing, shipping or handling operation.

It is another object of this invention to assure that the box of the present invention will have end flaps substantially co-extensive with the full area of the end walls, thereby assuring that boxes may be stacked without causing collapse of the structure or partial collapse of the structure and consequent damage to the contents.

Other objects and features of the invention will be apparent when the following description is considered in connection with the annexed drawings in which,

FIGURE 1 is a top plan view of the single-piece fibrous blank of this invention;

FIGURE 2 is a perspective view of the box when partly erected;

FIGURE 3 is an elevational view showing the box completely erected but with the cover open;

FIGURE 4 is a similar end elevational view of the box, but with the cover partially closed, and

FIGURE 5 is an end elevational view of the box completely closed, a portion being broken away to show the cooperation of tabs on the front and cover flaps.

Referring now to the drawings, the blank comprises a number of panels designated 10, 12, 14, 16, and 18, the panels being defined by the score lines S. The five panels mentioned become respectively, the front, base, rear, cover, and cover flap of the completed box.

Panels 10, 12, and 14 are supplied with end extensions 10a, 10b, 12, 12b, and 14a, 14b, respectively; extensions 10a, 12a, and 14a together forming one end wall of the box, and extensions 10b, 12b, and 14b together forming the opposite end wall of the box. Extensions or flaps 16a and 16b are formed integral with the cover panel 16 and are utilized to lock the cover in position after the box has been filled and the cover closed. As is illustrated, particularly in FIGURE 1, extensions 14a and 14b have a portion cut away to form a downwardly extending locking tab 21, leaving a V-shaped notch 22. Extending upwardly from the apex of the V-shaped notch 22, is a slit 23 which terminates in a portion 24 extending at an angle to the slit 23.

The front wall extensions 10a and 10b are co-extensive with the front 10, that is, the height of the extensions 10a and 10b is the same as that of the front 10. As will later appear, this provides a rigid support for the cover, particularly since the rear wall extensions 14a and 14b and a major portion of the base extensions 12a and 12b also extend to the full height of the box.

Extensions 10a and 10b are provided with apertures 25, which apertures are generally rectangular in shape and extend at an angle which inclines downwardly from the front toward the rear of the finished box, as seen particularly in FIG. 3. The cut on the line 26 defining the lower side of the generally rectangular cutoff 25 is extended to form generally horizontally extending slits 27 and 28.

As will be seen by reference to FIGURES 1, 2, and 4, extensions 16a and 16b are provided on the cover member 16, these extensions being generally hook-shaped and adapted to enter into the apertures 25. The hook extensions 16a and 16b are guided into the apertures by means of the edge portions of the extensions 14a and 14b, as will appear when the erection of the box is described.

The first step in erecting the box from the blank is

to fold the base extensions 12a and 12b upwardly until they are at right angles to the base 12. The front and rear extensions 10a, 10b, 14a and 14b are folded inwardly at right angles to their respective panels 10 and 14, the tongues 21 being inserted through the apertures 25, as indicated particularly in FIGURES 2 and 3.

As shown in FIGURE 2, the extensions 21 have been inserted through the apertures 25, but have not yet reached their final position, while as shown in FIGURE 3, these portions have reached their final position and the now substantially horizontal extensions or slits 24 are engaged with the substantially horizontal slits or extensions 28, thus locking the extension 10a to extension 14a and the extension 10b to the extension 14b. It will of course be understood that the folding just above described is done by machine and is accomplished very rapidly so that the blanks are taken from a magazine and formed into open containers.

It will furthermore be understood of course that at this time, the box is filled with, for example, doughnuts, and that only after this filling has occurred, is the box closed.

During the closing operation the hooked extensions 16a, 16b of the cover 16 are folded along the score lines S until they are at substantially right angles to the cover, while at the same time the cover extension 18 is likewise folded along these score lines until it is at right angles to the cover.

As the cover is closed, the leading edges of the hooks 17a and 17b of extensions 16a and 16b overlies the forward edges (left-hand of FIGS. 3-5) of the extensions 14a and 14b, while the remaining portions of the hooks bear against the upper inner edges of the flaps 10a and 10b. Due to this guiding, the cover hooks lie on the outside of the forward portion of the flaps 14a and 14b, and to the outside of the portion of flaps 10a and 10b above the cut 26, but lie to the rear of the portion of flaps 10a and 10b below the cut line 26. Further, when the box is fully closed, the sharp angles 19a and 19b of the hooks 17a and 17b respectively engage at the point of interengagement of slits 24 and 28, thereby causing a locking action of the cover into its closed position.

It will be understood that in packaging goods such as doughnuts, it is not infrequent that the contents, when first deposited in the box, and the cover is closed, are in an enlarged condition and that shrinkage will occur thereafter. The box of the present invention, due to the construction features heretofore mentioned, is adapted to be but partially closed, i.e., in the fully erected condition, but with the cover not fully seated, until after such shrinkage has occurred. When thereafter the boxes being stacked, these covers will, due to the weight of the boxes above, be caused to close, the locking engagement just above described will then occur.

In order to facilitate opening of the box, a cutout is provided in the upper edge of the front panel 10, this cutout being in the form shown particularly in FIGURE 1, and designated 30. A cooperating U-shaped cut 31 is made in the cover flap 18.

As shown in FIGURE 5, this arrangement of cuts 30 and 31 provides an exposed horizontal edge and adjacent portion of the cover flap 18, which may be grasped to open the box.

It is to be noted that due to the fact that the hooks a and b lie always on the outside of the edges of rear panel extensions 14a and 14b, they are held in position against the inner side of the lower portion of flaps 10a and 10b and thus do not come into contact with the box contents, such as, for example, doughnuts, and do not damage the contents as the cover is closed. This result has not been attained, so far as I am aware, in any of the prior structures, including the structure of my patent hereinabove mentioned.

What is claimed is:

1. A container comprising a single piece of fibrous material cut and scored to facilitate erection and provide a collapsible box having a bottom wall, side walls, end walls, and a cover hingedly connected to one of said side walls, each of said end walls comprising a multi-ply and interlocked assembly, which is formed by integral extensions of said side walls, said extensions being of a height equal to the height of the front and rear walls, each said front wall extension having a generally rectangular cut-out therein, said cut-out having slits extending therefrom forming extensions of the bottom of said rectangular cut-out, each said rear wall extension terminating at its forward edge in a downwardly extending portion which passes through the corresponding front extension aperture to lie behind said front wall extension, said cover having extensions at each end thereof, each said cover extension having a reentrant notch forming a hook, the nose of each hook being adapted when the box is closed, to enter said forward and rearward slits in said front wall extension, said hook passing between said front and rear wall extensions, the forward lower edge of said cover extensions lying to the inside of the front extensions and the upper forward edge lying to the outside of said front cover extensions, thereby minimizing damage to the box content on closure of the cover.

2. A container comprising a single piece of fibrous material cut and scored to facilitate erection and provide a collapsible box having a bottom wall, side walls, end walls, and a cover hingedly connected to one of said side walls, each of said end walls comprising a multi-ply and interlocked assembly, which is formed by integral extensions of said side walls, said extensions being of a height equal to the height of the front and rear walls, each said front wall extension having a generally rectangular cut-out therein, said cut-out inclining downwardly from front to rear of said container, said cut-out having slits extending therefrom forming extensions of the bottom of said rectangular cut-out, each said rear wall extension terminating at its forward edge in a downwardly extending portion which passes through the corresponding front extension aperture to lie behind said front wall extension, said downwardly extending portion being separated from the remainder of said flap by a vertical slit with an angular termination, said angular slit termination engaging the rearward one of said slits in the corresponding front wall extension, said cover having extensions at each end thereof, each said cover extension having a reentrant notch forming a hook, the nose of each hook being adapted when the box is closed, to enter said forward and rearward slits in said front wall extension, said hook passing between said front and rear wall extensions and underlying said interengaged front and rear wall slits, the forward lower edge of said cover extensions lying to the inside of the front extensions and the upper forward edge lying to the outside of said front cover extensions, thereby minimizing damage to the box content on closure of the cover.

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