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3,105,626

LOCKED CONTAINER

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FIG. 1

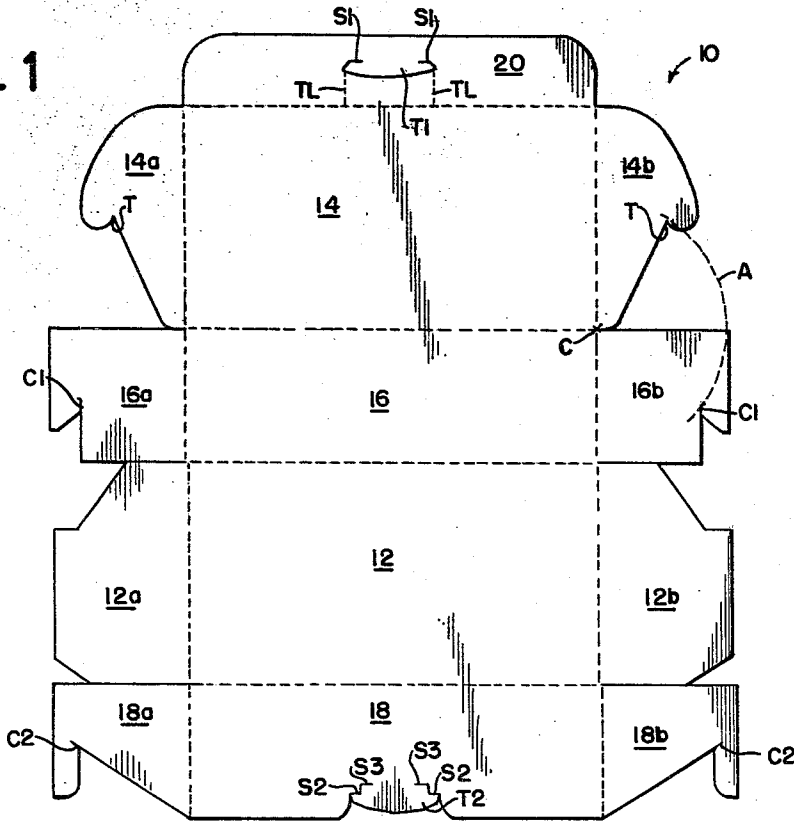
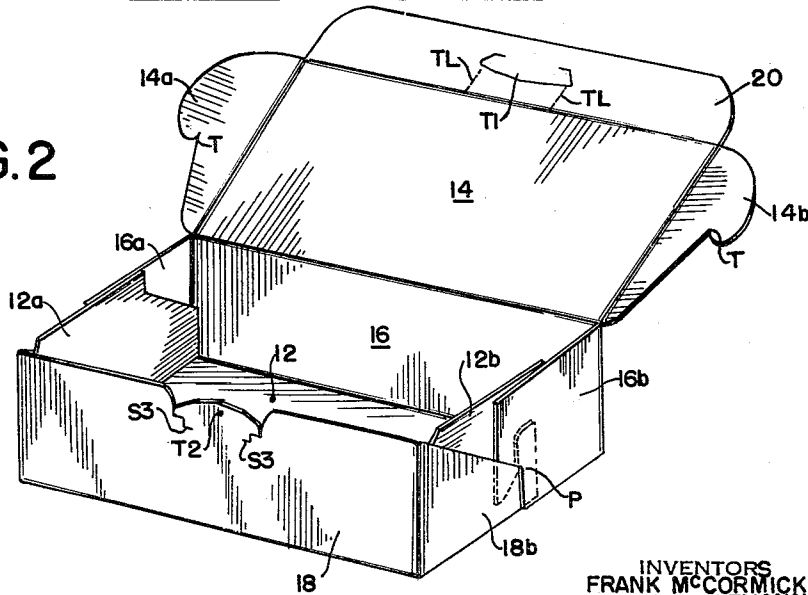


FIG. 2



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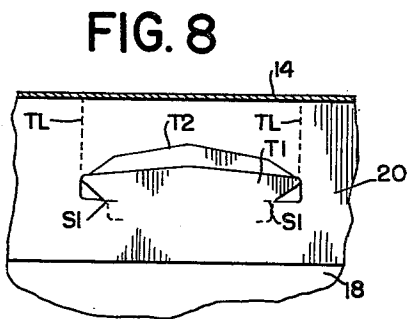
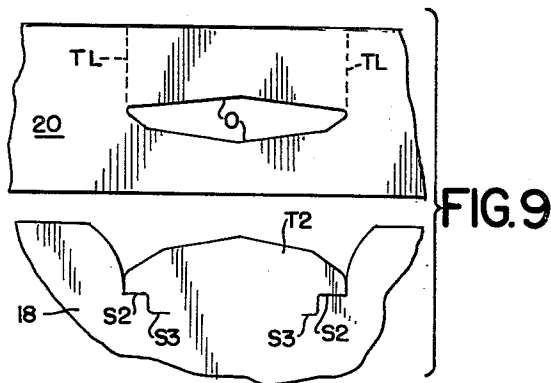
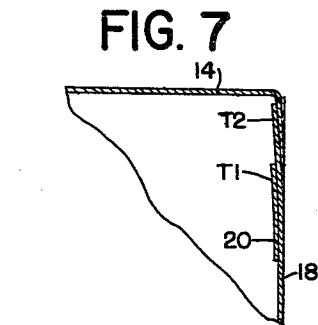
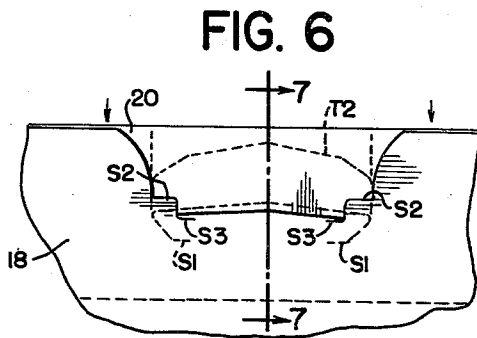
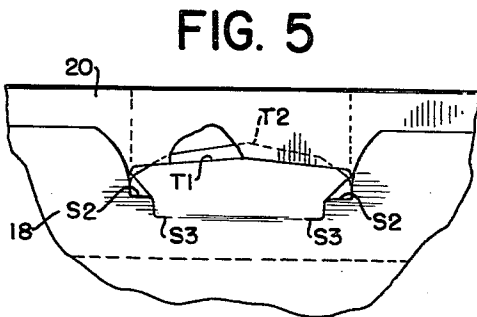
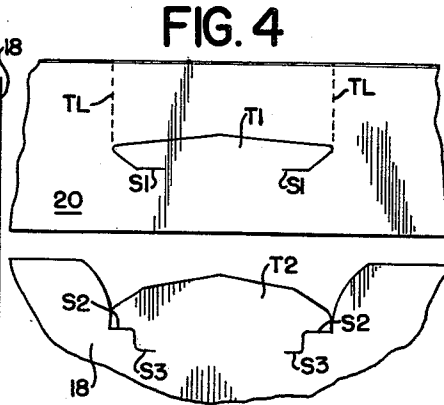
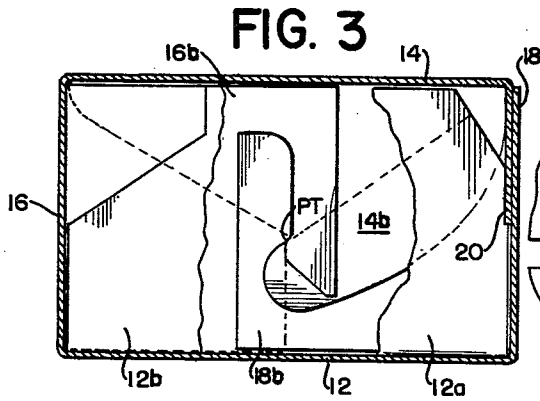
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## LOCKED CONTAINER

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4 Claims. (Cl. 229—33)

This invention relates to improvement in containers of the type that may be locked when closed and characterized by the fact that while locked the cover nevertheless is permitted limited movement without unlocking.

A more specific object of the invention is to provide a carton for general use but specially adapted for packaging food products which are larger than the vertical height of the container when finally closed at the time they are packaged, but which in normal course shrink to a height equal to or less than the depth of the package, as for example doughnuts.

A more specific object of the invention is to provide a simple locking structure for a carton of this type which can be locked while the contents are oversized and which can move to fully closed position and remain locked as the contents shrink to size or undersize.

A more specific object of the invention is to provide a locking structure of this type in which the locking parts cooperate to aid in supporting stacking loads.

Still another object of the invention is to provide a container which can be set up from a single prepared blank to form a rectangular enclosure and in which the end walls are composed of overlapping flaps which are inter-related to resist re-opening under vibration and the application of twisting forces to the closed container.

Still another object is to provide interconnected end structures of this type which facilitate the introduction of flap extensions on the cover into proper relationship when the container is closed, and which flaps contribute resistance to separation under vibration and twisting forces.

A final object of the invention is to provide containers having the overlapped end walls and locking structure referred to above, made and related so as to facilitate machine closing of the cover and engagement of the locking structure.

Other and more detailed objects of the invention will be apparent from the following described embodiments thereof which are illustrated in the accompanying drawings.

In the drawings,

FIGURE 1 is an opened out view of a single piece blank from which the carton of this invention is formed;

FIGURE 2 is a perspective view of the carton erected ready for the reception of its contents, that is with the lid or cover in open position;

FIGURE 3 is a typical, transverse, cross-sectional view of the closed container looking towards the righthand inside face of the container of FIG. 2;

FIGURE 4 is a detailed view of the locking structure of a container with the cover only partially closed;

FIGURE 5 is a view similar to FIG. 4 with the cover closed on oversized contents, but with the locking parts engaged;

FIGURE 6 is a view similar to FIG. 5 showing the

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cover fully closed when the container contents have shrunk showing the locking members still in locked position and a cover supported by the front wall of the container;

FIGURE 7 is a cross-sectional view taken on the line 7—7 of FIG. 6;

FIGURE 8 is an inside detailed elevational view of the locking structure with the parts in the position corresponding to their position in FIG. 5; and

FIGURE 9 is a view similar to FIG. 4 of a slightly modified form of locking structure.

The subject matter of this invention involves two important aspects of container construction. For descriptive purposes it will be assumed that the container illustrated herein is provided for the purpose of packing freshly made doughnuts which are placed therein so as to rest on their peripheries, that is with the doughnuts standing up in rows. For goods of this nature and particularly for doughnuts, it is characteristic of them that after they have been packed for a time they begin to cool and shrink, and having this fact in mind they are originally made in what might be termed oversize. To put it another way, the vertical height of the doughnuts when they are standing on their edges is greater than the depth of the container in which they are packaged. In due course they shrink to the point where they are of the same or lesser height than the vertical depth of the container.

Therefore, one of the features of this invention is to provide a locking structure which can be hand or machine closed and which will provide for relative movement of the cover while maintaining the locked condition. Thus as the container may be locked even though the doughnuts stand higher than the depth of the container and will remain locked after they shrink to that or a lesser depth.

Another feature of this invention relates to the inter-relationship of the extensions on the various walls of the container blank which lie in overlapped relation when the blank is erected to final position. In accordance with this invention the extensions on the cover are arranged to interleave with the extensions on the bottom and front and back walls and are interengaged therewith so as to resist separation under vibration and twisting forces.

Finally, referring again to the locked structure, as will appear later the parts thereof so cooperate that when a plurality of filled containers are stacked to place the containers under compression, and as the contents shrink, the cover will ultimately be supported by the front wall of the container.

Referring to FIG. 1 the blank is generally indicated at 10. As shown by means of dotted lines, it is scored or prepared to facilitate erection of the walls by relative folding motions by means of score lines. As shown these score lines form a series of panels comprising the bottom wall 12 of the container, the cover 14, the front wall 18 and the rear wall 16. There is also defined a narrow panel 20 which is an extension of the cover and is inserted into the container between its front wall and the contents thereof, as will appear later.

The panels 12, 14, 16 and 18 are respectively provided with integral extensions 12a and 12b, 14b and 14b, 16a and 16b and 18a and 18b. In FIGURE 1 the dotted lines TL are not fold lines but are tear lines. The solid lines of FIG. 1 are outlines defining the blanks, with the ex-

ception of the solid lines C1 and C2 which are re-entrant slits. In addition there are slits which form the locking tab T1 on the cover extension 20 and the locking tab T2 on the front wall 18.

This blank may be erected into the container in the manner illustrated in FIG. 2. To do this the bottom wall extensions 12a and 12b are folded up to a right angle position and the rear and front walls 16 and 18 are folded up to a rectangular position. During the folding up of these walls their extensions are infolded into an overlapping relation, as for example shown at 16b and 18b. These overlapped extensions overlie the adjacent bottom wall extension 12b as clearly shown in FIG. 2. The slits C1 and C2 are inter-engaged so that the front and rear wall extensions when in assembled relation are interconnected with the inner ends of the slits C1 and C2, seating on each other, as at P.

The firmness of engagement of the end wall extensions is aided by the small terminal curvature of slits C1 and C2 which cause the adjacent material of the end wall extensions 18a and 18b to be deflected or offset as they are seated.

When the doughnuts are placed in the box, usually in upstanding rows, the cover is closed by hand or by machine and during the closing the extensions 14a and 14b of the cover panel 14 are folded into a position so that their rounded ends move down between the overlapped extensions of the front and back walls. This is clearly shown in FIG. 3. As indicated in FIG. 1, the outline of the cover extensions consists in the main of continuous edge tabs of a curved line and a straight line which meet at a re-entrant point T. When the cover is closed and these extensions move into position the rounded end of each of the cover flaps goes behind the extensions on the front wall and the point T rests on the point P to provide a common seating as indicated at PT in FIG. 3. The straight line portions of the cover flaps extend downwardly from the hinge point to the point PT on the outside of the rear wall extensions. The parts are proportioned so that the points T snag into position at the junction P. This relationship results from the fact that points T and P are on the radius defining the arc A, centered at each end of the cover hinge axis. Thus the parts cooperate so as to resist separation under vibration and twisting but they are not actually interlocked.

As the cover is closed its extension 20 is righted to a right angle position with respect to the cover panel 14, so that it will pass down inside of the front wall 18, as shown in FIGS. 3 and 7. When the cover gets to the right position the tab T2 is pushed inwardly so that it enters into the slit which defines the tab T1. Thus, as shown in FIGS. 5, 6, 7 and 8, the tab T2 moves in between the tab T1 and the back of the cover flap 20. As soon as the lower edges of the ears formed by the slits S2, see FIG. 4, pass above the top edge of the tab T1, the parts are in interlocking relation. This may require a little compression on the contents of the container. As soon as the pressure is relieved the cover can spring upwardly to the position shown in FIG. 5, which is also the position shown in FIG. 8, so that the ears on the tab T2 formed by the slits S2 get behind the ears on the tab T1 formed by the slits S1 and hold the cover against further movement.

As the contents of the container shrink, the cover moves closer and closer to its final position shown in FIGS. 6 and 7, by which time the slit which formed the outline of the upper end of the tab T1 rests in the corners formed by the slits S3 in the front wall. Thus, any compression laid on the cover which is now finally closed will be transmitted to the front wall.

In passing it will be noted that the defining edges of the extensions 14a and 14b on the cover panel 14 are moved into closed container position completely outside of the multiple layer end walls, so that they cannot cut into the contents of the container. In some containers used for this purpose these flaps move down inside of the

container and inevitably slice or damage the contents. This cannot occur with the container of this invention.

In order to unlock the container to get access to its contents, the finger is inserted under the edge of the area tabs by the tear line TL and that portion is torn up to the fold line, unlocking the container, which action can be further facilitated by pressure at the base of the locking tab T2 if it does not easily disengage from the opening. The tearing loose of this area does not actually destroy the locking cooperation previously described, but makes it easy to disengage it by finger pressure as stated, so that when the container is again closed it will lock, but not as firmly or as good as it did originally.

In the modification of FIG. 9 the locking structure differs from that previously described in that instead of forming the tab T1, an opening O is cut in the cover flap 20, completely removing the material in that area. It will be noted, however, that the outline of the top of the opening is of the same shape as the outline of the tab T1, so that this opening cooperates with tab T2 in exactly the same manner as previously described for the structure of FIGS. 1 to 8 inclusive. When the cover of a container having the locking structure of FIG. 9 is closed the tab T2 is pushed into the opening O and the ears formed by the slits S2 get behind the adjacent defining edges of the opening O. Likewise the top edge of the opening will rest in the corners formed by the slits S3 when the container is completely closed, that is in a position corresponding to the position of FIG. 6.

From the above description it will be apparent to those skilled in the art that the subject matter of this invention is capable of some variation in detail, and it is preferred, therefore, that the scope of protection afforded hereby be not limited to the illustrative examples described herein but by the appended claims.

What is claimed is:

1. A container having a bottom wall and hingedly connected front and rear walls, said front and rear walls having end extensions lying in overlapped relation, each pair of overlapped extensions having slits which are nested, a cover hingedly connected to said rear wall and extensions on said cover at each end formed with an outline to provide a reentrant notch, each of said cover extensions nesting between the overlapped front and rear wall extensions when the cover is closed and the base of said notch engaging at the point of intersection of the related nested front and rear wall extensions.

2. A container comprising a single piece of fibrous material cut and scored to facilitate erection into a closeable rectangular enclosure having a front and rear wall and a cover hingedly connected to the top edge of the rear wall and having a flap hingedly connected to its front edge and means comprising headed tabs cut out of said front wall and flap, one of said headed tabs having two pairs of spaced abutments, said means locking the cover in a substantially closed position while permitting limited hinging movement between fully closed position and a partially closed position.

3. A container comprising a single piece of fibrous material cut and scored to facilitate erection into a closeable rectangular enclosure having a front and rear wall and a cover hingedly connected to the top edge of the rear wall and having a flap hingedly connected to its front edge and means comprising a cut-out tab on said front wall with two pairs of spaced lateral ears and a slit on said flap forming a tab with a pair of lateral ears, the tab on the front wall passing through the slit on said flap so that either pair of ears on said first tab may engage the lateral ears of said second flap, said means locking the cover in a substantially closed position while permitting limited hinging movement between fully closed position and a partially closed position.

4. A container comprising a single piece of fibrous material cut and scored to facilitate erection into a closeable rectangular enclosure having a front and rear wall

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and a cover hingedly connected to the top edge of the rear wall and having a flap hingedly connected to its front edge and means comprising a cutout tab on said front wall with lateral ears and a slit in said flap forming a tab with lateral ears, the tab on the front wall passing through the slit on said flap so that the ears of said first tab engage in said slit, and tear lines in said flap extending upwardly from the ends of said slit to destroy said locking engagement when said tear lines are separated, said means locking the cover in a substantially closed position while permitting limited hinging move-

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ment between fully closed position and a partially closed position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,081,981	Palmer -----	Dec. 23, 1913
1,984,371	Hazard et al. -----	Dec. 18, 1934
2,856,114	Guyer -----	Oct. 14, 1958
2,865,549	Inman -----	Dec. 23, 1958
2,944,724	Lefief et al. -----	July 12, 1960