Oct. 12, 1965 C. J. PIERCE, JR 3,211,358

CORNER LOCKS FOR FOLDING BOXES

Filed Feb. 10, 1964 2 Sheets-Sheet 1

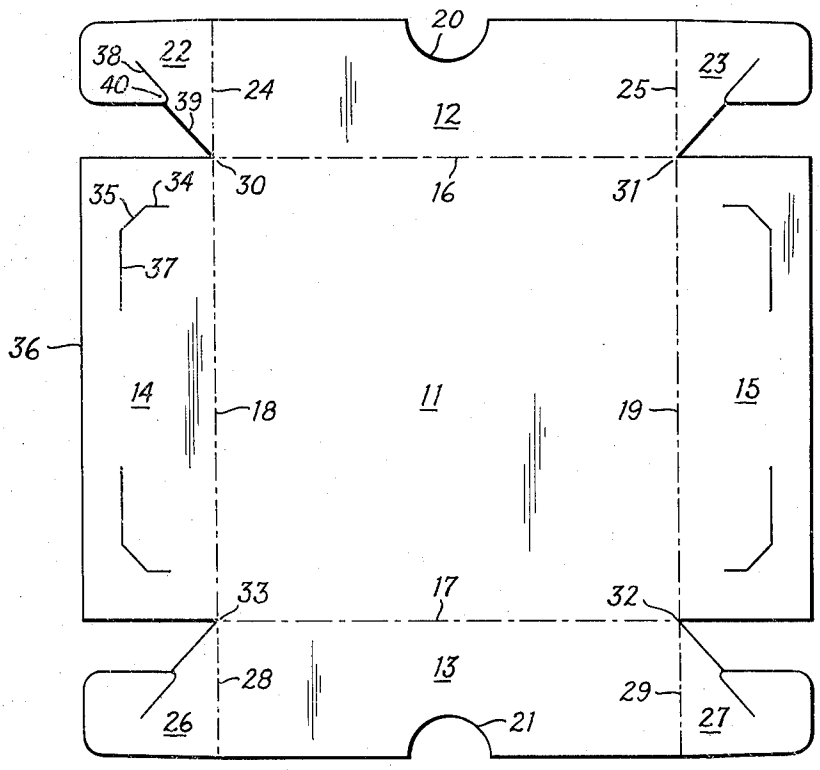


Fig. 1

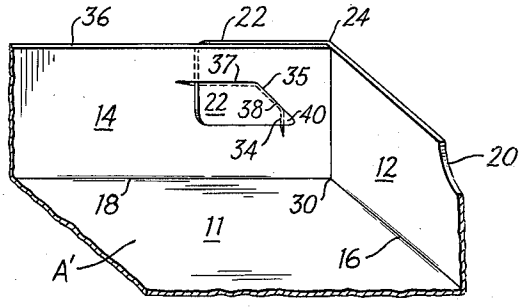


Fig. 2

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Filed Feb. 10, 1964 2 Sheets-Sheet 2

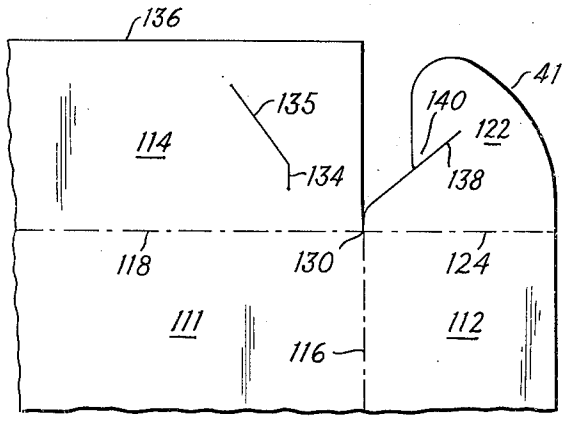


Fig. 3

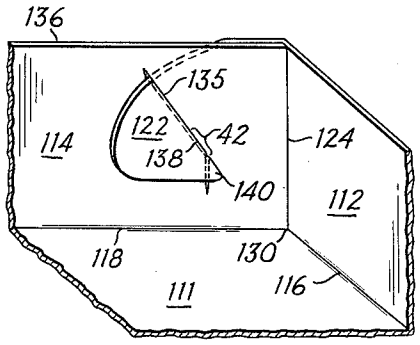


Fig. 4

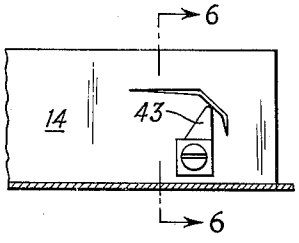


Fig. 5

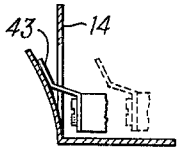


Fig. 6

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CORNER LOCKS FOR FOLDING BOXES

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Claims priority, application Germany, Feb. 15, 1963, A 42,346
3 Claims. (Cl. 229—35)

The invention relates to the corner construction of folding boxes for interlocking, without adhesives, an erected folding box blank at the box corners.

Folding boxes of the aforementioned kind are provided with lock flaps which are articulated to the box side walls and which, upon setting up of the blank, are inserted into slits in adjacent side walls and which engage with an edge of the lock flap an edge of the slit. The lock flap is usually shaped in the nature of a hook in order to prevent separation of the engagement. The hook portion of the lock flap points to the top edge of the box wall, considering the formed box as a tray or a box body, and points to the bottom edge of the telescoping cover, if the set up box structure is considered a telescoping cover.

The known design of interlocks are, for this reason, not suited for two-piece boxes, as the lock flaps get tangled with the top and bottom edges of the walls when the cover is applied and prevents closing of the box.

Similar difficulties arise if tight-fitting box contents are to be inserted into a box.

A lock flap design is known in which the normally upright hook portion of the lock flap is downwardly directed, i.e., pointed towards the bottom. In this known design, however, the danger of disengagement is great, as no safety devices are provided for the flap.

In accordance with this invention a corner design of the aforementioned type is improved in that the locking slit comprises a slit portion substantially parallel to the box corner and, continuing, a further slit portion substantially radially disposed with respect to the box corner, and in that the flap is provided with a safety-catch-protrusion extending into the area between the parallel slit portion and the corner, which protrusion is forced through the slit past an edge of the slit into the interior of the box when the flap is being engaged.

The slit may furthermore be provided with a third slit portion which is substantially parallel to the top or bottom edge of the side wall, in which case the flap, considering the lock in engaged condition, is without an incision above the third slit portion. This modification of the invention is particularly useful for shallow boxes, i.e., boxes having low side walls.

For deeper boxes which do not require a slit portion parallel to the top or bottom edge of the wall it is advantageous to shape that edge of the flap which lies closest to the radial portion of the slit as an arc having the corner point as its center, whereby the insertion of the flap into the slit is facilitated and a flap of great strength is formed.

In the drawings representative embodiments of the invention are shown.

FIG. 1 is a plan view of a blank intended as a telescoping cover;

FIG. 2 is a perspective view of an interlocked corner of the blank;

FIG. 3 is a plan view of a blank corner portion, particularly for deep boxes;

FIG. 4 is a perspective view of the locked corner of the blank shown in FIG. 3;

FIG. 5 is an interior view of the corner portion shown in FIG. 2; and

FIG. 6 is a sectional elevation taken on line 6—6 of

FIG. 5 for the purpose of illustration of a preferred procedure of interengagement.

The blank A shown in FIG. 1 comprises a central bottom or cover panel **11** to which side walls **12**, **13**, **14** and **15** are articulated along fold lines **16**, **17**, **18** and **19**. The illustrated blank is shaped as a telescoping cover and provided with recesses **20** and **21** in the side walls **12** and **13** in order to facilitate the removal of the cover from a similarly shaped box body which, however, lacks recesses. Lock flaps **22** and **23** are articulated to the side wall **12** along fold lines **24** and **25**, and similar flaps **26**, **27**, are articulated to the opposite side wall **13** along fold lines **28**, **29**. The points of intersection of the fold lines **16**, **17**, **18** and **19** become corner points of the box and fold lines **24**, **25**, **28** and **29** become corner edges.

As the shape of the interlocking elements of the four corners of the blank or box, respectively, is identical, only one corner is described.

The side wall **14** (FIGS. 1 and 2) is slit and, more particularly, the slit comprises a slit section or portion **34** substantially parallel to the corner edge **24**, which portion then leads to a portion **35** substantially radial with respect to the corner point **30**, followed by a further slit portion **37** substantially parallel to the top edge **36** of the side wall.

The lock flap **22** comprises a cut **38** which extends into the flap from the corner point **30** and, more particularly, this cut is substantially radial with respect to the corner point and extends to the outer cut edge **39** which is formed by a notch in the blank. The cut forms a safety catch extension **40** which extends into the area between the cut portion **34** and the corner edge and protects the interlock against disengagement.

As can be seen from FIG. 2, the slit portion **35** as well as the cut **38** are so directed, and the extension **40** is so oriented, that the erected box structure A', serving as a cover for a box body, will not tangle with the top edges of the box body. Similarly, the corner construction does not interfere with the insertion of tight-fitting box contents.

The embodiment shown in FIGS. 1 and 2 is particularly suited for shallow boxes.

In the event the box is deeper the style may be selected which is shown in FIGS. 3 and 4. For the sake of simplicity reference numerals are employed in FIGS. 3 and 4 which differ from those used in FIGS. 1 and 2 by 100. A slit portion corresponding to slit portion **37** (FIG. 2) is dispensable in deeper boxes. The outer edge **41** of flap **122** is rounded off and represents approximately an arc about the corner point **130**, which facilitates insertion of the flap into the slit **134**, **135** when the wall **112** is being folded at its line of articulation **116**. The engagement portion of the interlocked edges is denoted **42**.

The erection of the blank may be accomplished in a conventional manner by a plunger which is movable into a folding die. The plunger may, in a manner known per se, be equipped with hook-like extensions **43** which are actuated in dependence on the plunger stroke movement. In projected position (FIG. 6) the extensions **43** flex the slitted wall portion **14** outwardly and open the slit, so that the lock flap may enter between the wall **14** and the extension **43**. Thereafter the extension is withdrawn towards the interior of the box (and of the plunger) which then forces the safety catch extension through the slit.

In the event a box body constructed according to the invention is to be closed by a telescoping cover, it is advisable to offset the lock flaps so that, for example, the flaps of the box body extend along the side walls and the flaps of the cover lie along the end walls.

What is claimed is:

1. In a corner lock for folding boxes in which a lock flap articulated to a side wall of the box along a fold line forming the corner edge is inserted into a slit in the adjacent side wall and is interlocked with the edge of the slit by means of a cut edge on the lock flap substantially radially disposed with respect to the corner point, both side walls being articulated to a main panel along main fold lines, the improvement which comprises a slit comprising a first slit portion substantially parallel to the corner edge and a second slit portion extending from that end of the first slit portion which is remote with respect to the respective main fold line in a direction substantially radial with respect to the corner point and away from the corner point and lying in coincidence with at least a portion of said cut edge when the corner is formed and locked, the improvement comprising further a lock flap so shaped that said cut edge defines a hook pointing towards the corner edge when the corner is formed and locked, said cut edge extending from the tip of the hook in a direction away from said corner point, the tip forming a safety catch extension on the lock flap which extension extends into the area between the said first slit portion and the corner edge.

2. A corner lock for folding boxes according to the preceding claim 1 in which the edge of the flap which lies closest to that end of the second slit portion which is farthest remote from the corner point is substantially arcuate with the corner point as center of the arc.

3. In a corner lock for folding boxes in which a lock flap articulated to a side wall of the box along a fold line forming the corner edge is inserted into a slit in the adjacent side wall and is interlocked with the edge of the slit by means of a cut edge on the lock flap substantially radially disposed with respect to the corner point, both side walls being articulated to a main panel along main fold lines, the improvement which comprises a slit comprising a first slit portion substantially parallel to the corner edge, a second slit portion extending from that end of the first slit portion which is remote with respect to the respective main fold line in a direction substantially radial with respect to the corner point and away from the corner point and lying in coincidence with at least a portion of said cut edge when the corner is formed and locked, and a third slit portion which is substantially parallel to the said respective main fold line, the said cut edge of the lock flap terminating at said third portion, and a safety catch extension on the lock flap which extension extends into the area between the said first slit portion and the corner edge, said catch extension being forceable from a position overlying the outside of the slitted panel when inserting the flap into the slit into a position overlying the inside of the slitted panel past an edge of the first slit portion.

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