Nov. 22, 1949 K. T. BUTTERY 2,488,703

COLLAPSIBLE TRAY OR CARTON

Filed Dec. 29, 1945 2 Sheets-Sheet 1

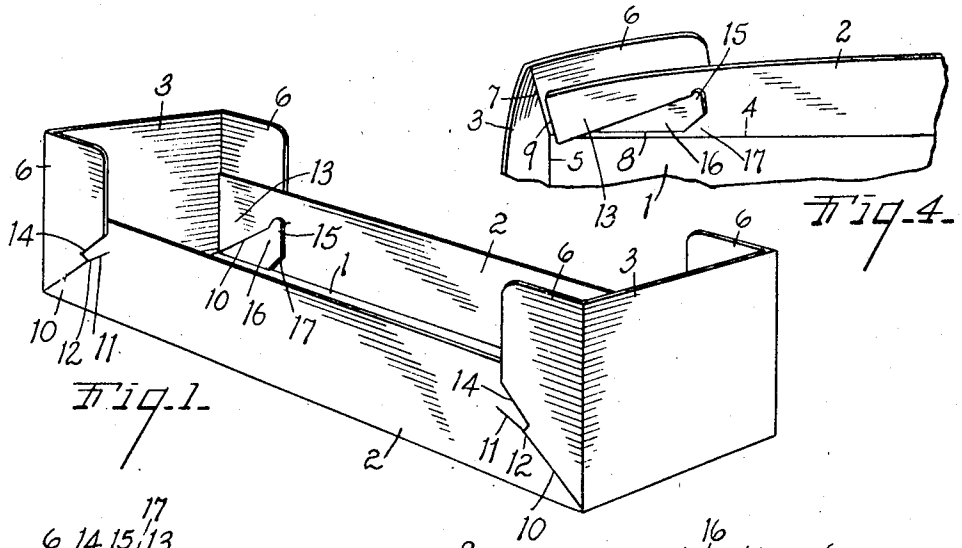


Fig. 1.

Fig. 4.

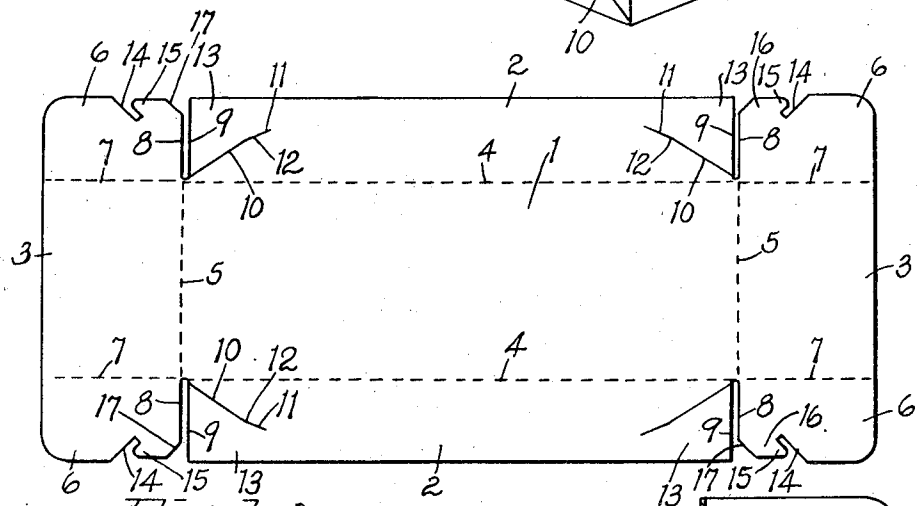


Fig. 2.

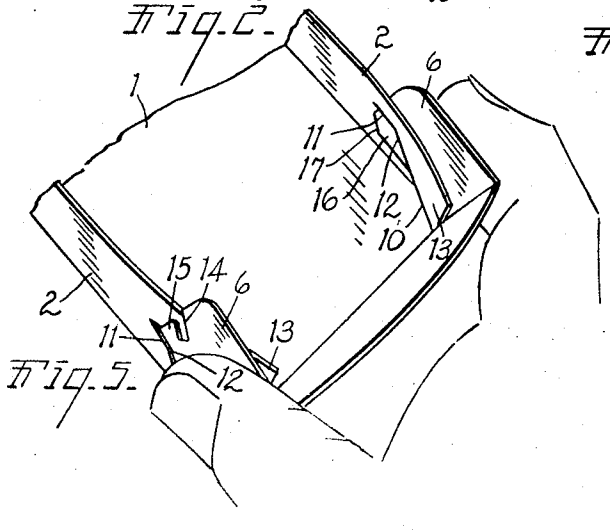


Fig. 5.

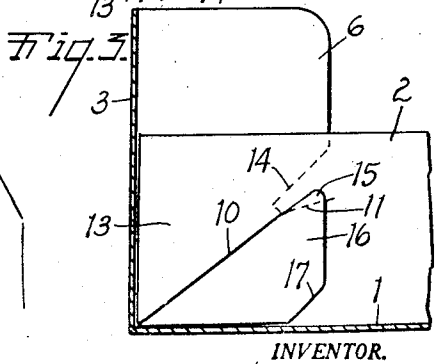


Fig. 3.

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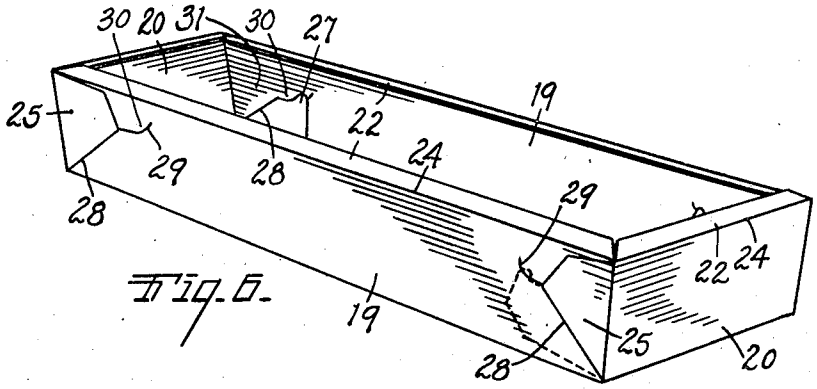


Fig. 6.

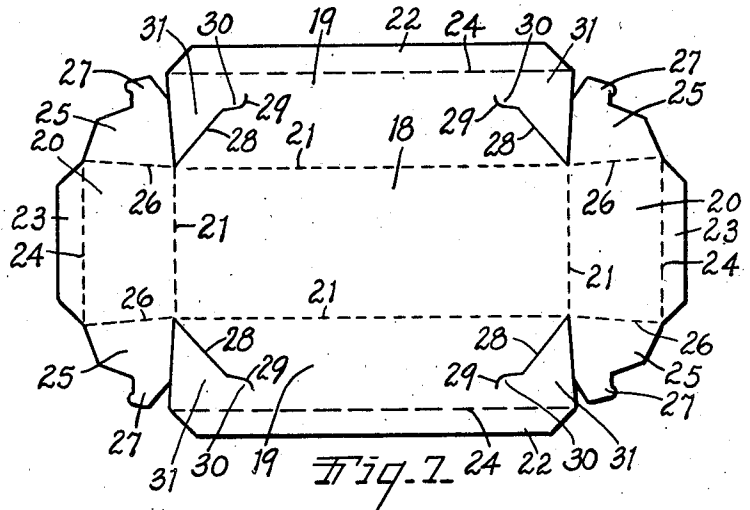


Fig. 7.

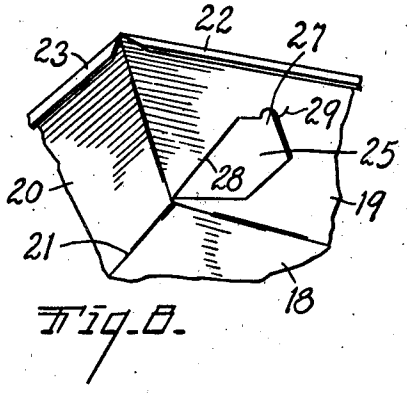


Fig. 8.

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UNITED STATES PATENT OFFICE

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COLLAPSIBLE TRAY OR CARTON

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Application December 29, 1945, Serial No. 638,165

14 Claims. (Cl. 229—32)

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This invention relates to improvements in collapsible trays or cartons.

The main objects of this invention are:

First, to provide a collapsible tray or carton formed of an integral blank which may be easily and quickly erected and one in which the walls when erected are effectively interlocked and supported.

Second, to provide a tray or box formed of an integral blank which may be shipped or transported in the knockdown and quickly set up by a relatively inexperienced person and when set up is quite strong and rigid even when formed of relatively light stock.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a tray or carton embodying my invention erected.

Fig. 2 is a plan view of the carton collapsed or in the flat.

Fig. 3 is an enlarged fragmentary view in vertical longitudinal section.

Fig. 4 is a fragmentary perspective view illustrating certain of the steps in erecting the structure and the relation of parts of the structure.

Fig. 5 is a fragmentary perspective view further illustrating the preferred steps in setting up the carton.

Fig. 6 is a perspective view of a somewhat modified form or embodiment of the invention.

Fig. 7 is a plan view of the embodiment of the invention shown in Fig. 6 fully collapsed or in the flat.

Fig. 8 is an enlarged fragmentary view further illustrating structural features of the invention of Figs. 6 and 7.

My improved collapsible tray or box or carton is formed of an integral blank and comprises a bottom 1, side walls 2, 2, and end walls 3, 3, the side walls being hingedly connected to the bottom along the score lines 4, 4 while the end walls are hingedly connected to the bottom along the score lines 5, 5. The end walls 3, 3 have corner flaps 6 on their end edges hingedly connected thereto at 7.

In the embodiment shown in Figs. 1 to 5 inclusive, the end walls and their corner flaps are substantially greater width than the side walls, thus providing when the box is erected a structure having the effect of recessed side walls for

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exposing the contents, the higher end walls and corner flaps supporting the cover or wrapping which is commonly of transparent material so that the goods are exposed and may be inspected not only through the top of the box or wrapper but through what amounts to recessed sides.

It will be noted that the bottom edges 8 of the corner flaps are in alignment with the scores or hinged connections 5 for the end walls to the bottom and that the end edges 9 of the sides are spaced from the bottom edges 8—that is, when the blank is considered in the flat.

The side walls have slits 10 opening at their end edges and extending diagonally outward from adjacent their bottom edges or adjacent the hinge connection 4 to the bottom. These slits, as illustrated, have outer end portions 11 disposed at an angle to their inner or main portions, this resulting in the forming of keeper-like portions 12 above the slits. The end portions 13 of the end walls above the slits constitute tongue-like members which are readily deflectable inwardly to facilitate insertion of the corner flaps through the slits and the engagement of the corner flaps with the side walls and generally to facilitate the erection of the structure.

The corner flaps have slots 14 inclined downwardly from their outer edges providing upwardly projecting tongues 15. The tongue portions of the corner flaps are somewhat narrower than the outer portions of the corner flaps 16 and the corner flaps are desirably beveled at 17 to further facilitate erection of the carton.

To erect the carton, the sides are swung upwardly and an end grasped by grasping the corner flaps and swinging the same inwardly against the deflectable portions 13 of the side walls which permits the bottom edges of the corner flaps to be inserted through the slits 10 as shown in Figs. 4 and 5, bringing the tongues 15 into engagement with the portions of the side walls above the slits and with the keeper-like angled portions 12 when the end wall is completely erected. It will be noted that the bottom portions of the corner flaps lie within the side walls and that they are in supported engagement with the bottom, thus maintaining the end walls in their erected position substantially at right angles to the bottom. The upper portions of the corner flaps are on the outer side of the deflectable portions of the side walls so that although these end portions of the side walls are weakened somewhat by the slits, this is counteracted or offset by the supporting engagement of the corner flaps with the side walls.

The structure may be quickly erected and at the same time is very effectively supported in erected position. The extending end walls and corner flaps provide an effective support for a cover or wrapping and permit the use of narrower side walls which also constitutes a saving in material as well as aiding in attractive packaging.

In the embodiment of my invention shown in Figs. 6, 7 and 8 the container is somewhat flared and comprises a bottom 18, side walls 19 and end walls 20, these walls being tapered inwardly. The side and end walls are provided with hinge connections to the bottom conventionally illustrated at 21. The side and end walls have top flaps 22 and 23 relatively hingedly connected thereto by hinging, indicated conventionally at 24. These form cover or wrapper supporting flanges as is shown in Fig. 6. The corner flaps 25 are hingedly connected to the ends of the end walls at 26 and they are provided with hooked tongues 27 on their side edges. The side walls have slits 28 extending from their end edges, the inner ends of the slits being somewhat hook-shaped as shown at 29 to provide keeper-like portions 30 with which the tongues engage. The portions 31 of the end walls above the slits are deflectable to facilitate engagement of the tongues when the structure is erected substantially as has been described.

In this structure, the bottom portions of the corner flaps lie within the side walls and their upper portions are on the outer sides of the side walls substantially as I have pointed out. The parts in the erected structure are effectively retained throughout and in effective supporting relation to each other. This enables the use of relatively light stock. The facility with which the structure may be erected is, however, a major advantage or accomplishment of my invention.

I have illustrated and described my invention in two practical embodiments thereof. I have not attempted to illustrate or describe other modifications or adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described by invention, what I claim as new and desire to secure by Letters Patent, is:

1. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the ends of the side walls in the flat blank being adjacent to but spaced from the bottom edges of the corner flaps, the side walls having slits opening at their end edges and extending diagonally outward from adjacent their bottom edges, the outer end portions of the slits being angularly disposed relative to their inner portions providing keeper-like projections above the slits, said corner flaps having slots inclined downwardly from their outer edges opposite their hinge connections to the end walls providing upwardly projecting tongues spaced from the bottom edges thereof to engage the portions of the side walls above the slits when the parts are erected, the portions of the corner flaps below said slots being of less vertical dimension than the portions above the slots and being beveled at their lower inner corners to facilitate their entrance through said slits of the side walls, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate the locking engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and with their bottom edges engaging the bottom and with the upper portions of the flaps on the outer sides of the said deflectable portions of the side walls above the slits and in supporting relation thereto.

2. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the side walls having slits opening at their end edges and extending diagonally outward from adjacent their bottom edges, said corner flaps having slots inclined downwardly from their outer edges opposite their hinge connections to the end walls providing upwardly projecting tongues spaced from the bottom edges thereof to engage the portions of the side walls above the slits when the parts are erected, the portions of the corner flaps below said slots being of less vertical dimension than the portions above the slots and being beveled at their inner corners to facilitate their entrance through said slits of the side walls, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate the locking engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and with their bottom edges engaging the bottom and with the upper portions of the flaps on the outer sides of the said deflectable portions of the side walls above the slits and in supporting relation thereto.

3. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the ends of the side walls in the flat blank being adjacent to but spaced from the bottom edges of the corner flaps, the side walls having slits opening at their end edges and extending diagonally outward from adjacent their bottom edges, the outer end portions of the slits being angularly disposed relative to their inner portions providing keeper-like projections above the slits, said corner flaps having upwardly projecting tongues on the outer edges thereof opposite their hinge connections to the end walls and spaced from the bottom edges thereof to engage the portions of the side walls above the slits when the parts are erected, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate such engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and with the upper portions of the flaps on the outer sides of the said deflectable portions of the side walls above the slits.

4. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the side walls having slits opening at their end edges and extending diagonally outward from adjacent their bottom edges, said corner flaps having upwardly projecting tongues on the outer edges thereof opposite their hinge connections to the end walls and spaced from the bottom edges thereof to engage the portions of the side walls above the slits when the parts are erected, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate such engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and with the upper portions of the flaps on the outer sides of the said deflectable portions of the side walls above the slits.

5. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the end walls and said corner flaps being of a height substantially exceeding the height of the side walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the side walls having slits opening at their end edges and extending diagonally outward from adjacent their bottom edges, said corner flaps having upwardly projecting tongues on the outer edges thereof opposite their hinge connections to the end walls and spaced from the bottom edges thereof to engage the portions of the side walls above the slits when the parts are erected, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate such engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and with the upper portions of the flaps on the outer sides of the said deflectable portions of the side walls above the slits.

6. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the side walls having slits opening at their end edges and extending diagonally outward with their outer ends substantially spaced from the end edges of the side walls, the outer end portions of the slits being conformed to provide keeper-like projections above the slits, said corner flaps having upwardly projecting tongues on their outer edges opposite their hinge connections to the end walls engageable with the portions of the side walls above the slits when the parts are erected, the flaps being beveled at their lower inner corners to facilitate entrance of the corner flaps into the slits, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate such engagement and the locking engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and their upper portions on the outer sides of the said deflectable portions of the side walls.

7. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner laps hingedly connected to the ends of the end walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the side walls having slits opening at their end edges and extending diagonally outward with their outer ends substantially spaced from the end edges of the side walls, said corner flaps having upwardly projecting tongues on their outer edges opposite their hinge connections to the end walls engageable with the portions of the side walls above the slits when the parts are erected, the end portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate such engagement and the locking engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and their upper portions on the outer sides of the said deflectable portions of the side walls.

8. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the bottom edges of the corner flaps in the flat blank being substantially aligned with the hinge connections for the end walls to the bottom, the ends of the side walls in the flat blank being adjacent to but spaced from the bottom edges of the corner flaps, the side walls having slits opening at their end edges and extending diagonally outward, said corner flaps having upwardly projecting tongues on their side edges opposite their hinge connections to the end walls engageable with the portions of the side walls above the slits when the parts are erected, the corner flaps being beveled at their lower inner corners to facilitate the entrance of the flaps through the slits, the end portions of the side walls above the slits constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate such engagement and the locking engagement of the tongues with the side walls with the bottom portions of the corner flaps within the side walls and engaging the bottom and with their upper portions on the outer sides of the portions of the side walls in supporting relation thereto.

9. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the side walls having slits opening at their edges and extending diagonally outward, said corner flaps having upwardly projecting tongues on their side edges opposite their hinge connections to the end walls engageable with the portions of the side walls above the slits when the parts are erected, the lower inner corners of the corner flaps being removed to facilitate the entrance of the corner flaps into the slits, portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate the locking engagement of the tongues

with the side walls with bottom portions of the corner flaps within the side walls and engaging the bottom and with upper portions thereof on the outer sides of the portions of the side walls in supporting relation thereto.

10. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls, the side walls having slits opening at their edges and extending diagonally outward, said corner flaps having upwardly projecting tongues on their side edges opposite their hinge connections to the end walls engageable with the portions of the side walls above the slits when the parts are erected, portions of the side walls above the slits therein constituting tongue-like members freely deflectable inwardly to facilitate insertion of the corner flaps and the tongues thereof through said slits and to facilitate the locking engagement of the tongues with the side walls with bottom portions of the corner flaps within the side walls and with upper portions thereof on the outer sides of the portions of the side walls in supporting relation thereto.

11. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls and foldable on the outer sides of the side walls when they are in erected position, the side walls having diagonally disposed inwardly inclined slits extending to their bottom edges opposite their hinge connections to the end walls, the side edges of the end flaps being provided with slits downwardly inclined from said edges and engageable with the diagonal slits of the side walls, the inner edges of the corner flap slits engaging the outer edges of the diagonal side wall splits when the box is erected with the end walls in supported engagement with the end edges of the side walls and with portions of the bottom edges of corner flaps in supported engagement with the bottom.

12. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end walls and foldable on the outer sides of the side walls when they are in erected position, the side walls having slits opening at their end edges and extending diagonally outward, the outer ends of said slits being diagonally disposed relative to their inner portions, the corner flaps having downwardly inclined slits extending from their side edges opposite their hinge connections to the end walls providing tongues engageable with the diagonal slits of the side walls, the slits of the corner flaps being at an angle corresponding substantially to the angle of the said outer portions of diagonal slits of the side walls, the inner edges of the corner flap slits engaging the outer edges of the angled outer portions of diagonal side walls slits when the box is erected with the end edges of the side walls and with portions of the bottom edges of corner flaps in abutting supported engagement with the bottom.

13. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of one of the end walls and foldable on the outer sides of the side walls when they are in erected position, the side walls having slits opening at their end edges and extending diagonally outward, the corner flaps having downwardly inclined slits extending inwardly from their side edges opposite their hinge connections to the end walls providing tongues engageable with the diagonal slits of the side walls, the inner edges of the corner flap slits engaging the outer edges of the side walls slits when the box is erected with the end walls in supported abutting engagement the end edges of the side walls and with portions of the bottom edges of corner flaps in abutting supported engagement with the bottom.

14. A collapsible tray or box formed of an integral blank comprising a bottom and side and end walls hingedly connected thereto, and corner flaps hingedly connected to the ends of the end wall and foldable on the outer sides of the side walls when they are in erected position, the side walls having slits extending diagonally outward from their inner edges and opening at their end edges, the outer ends of said slits being diagonally disposed relative to their inner portions, the corner flaps having downwardly inclined slits extending inwardly from their side edges opposite their hinge connections to the end walls providing tongues engageable with the diagonal slits of the side walls, the slits of the corner flap being at an angle corresponding substantially to the angle of the outer portions of slits of the side walls, the inner edges of the corner flap slits engaging the outer edges of the angled outer portions of diagonal side walls slits when the box is erected with the end walls in supported engagement the end edges of the side walls and with portions of the bottom edges of corner flaps in supported engagement with the bottom.

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