July 12, 1949. R. VAN ROSEN 2,476,253

RECEPTACLE

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FIG. 1

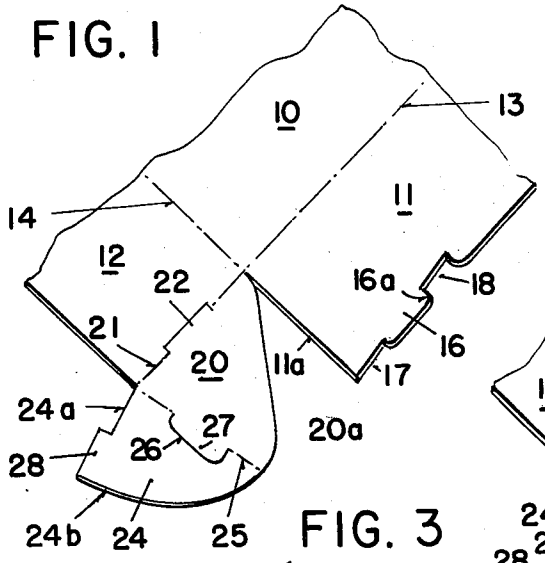


FIG. 2

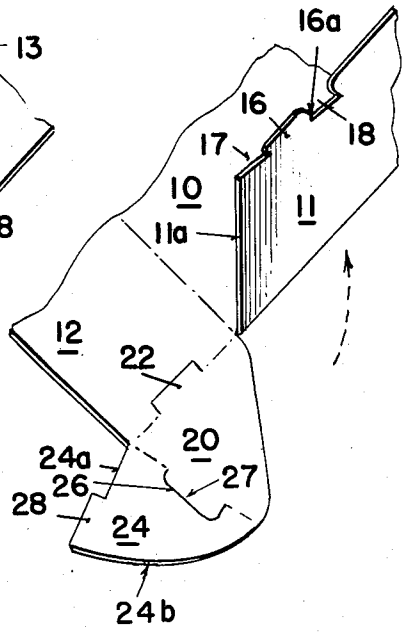


FIG. 3

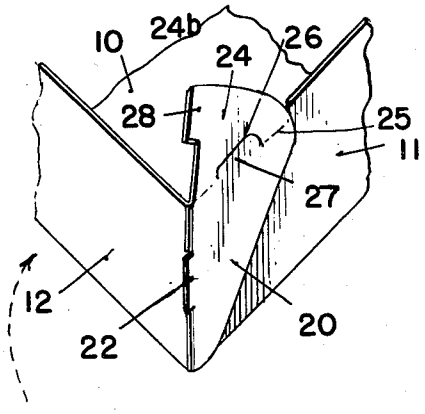


FIG. 4

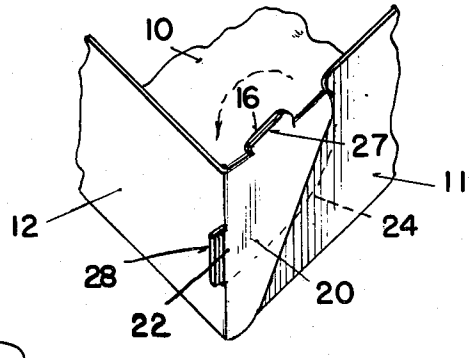
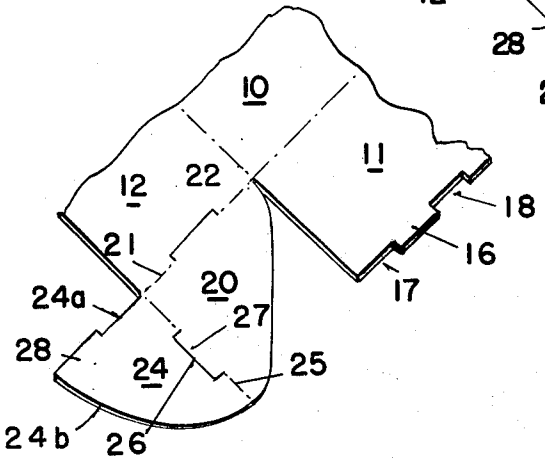


FIG. 9



INVENTOR.
ROBERT VAN ROSEN,
BY Karl Fenning
ATTORNEY

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FIG. 7

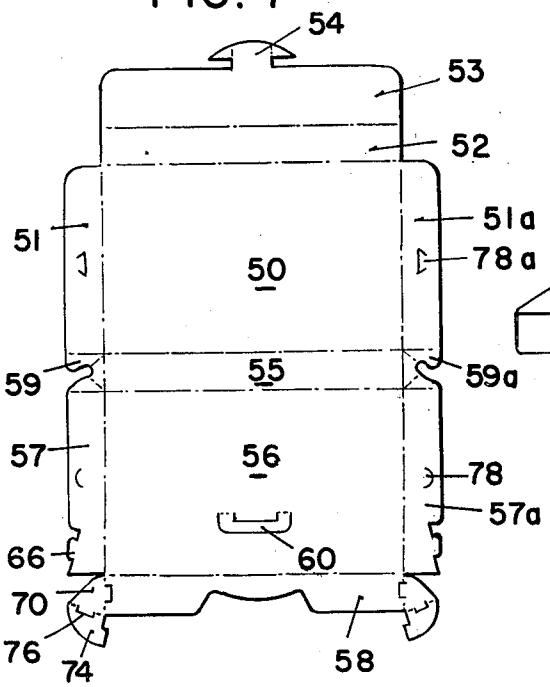


FIG. 8

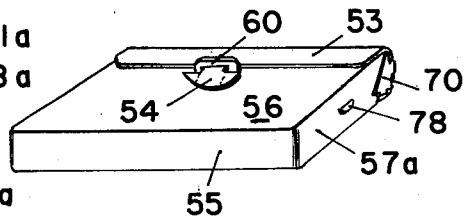


FIG. 5

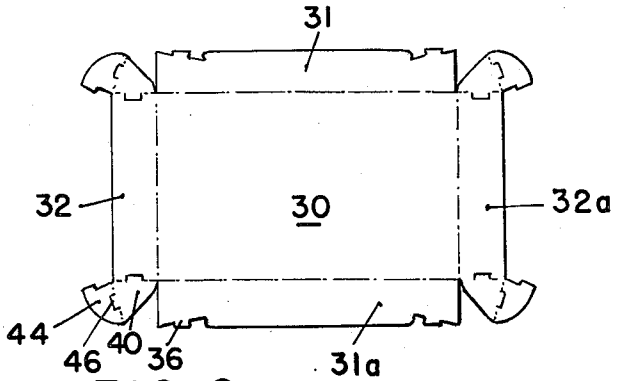
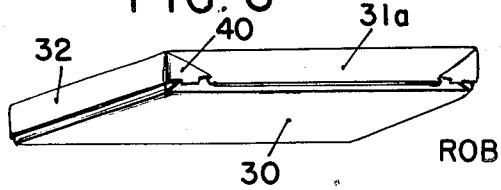


FIG. 6



INVENTOR.
ROBERT VAN ROSEN,
BY
Karl Fenning
ATTORNEY

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UNITED STATES PATENT OFFICE

2,476,253

RECEPTACLE

Robert Van Rosen, New York, N. Y.

Application February 5, 1948, Serial No. 6,419

10 Claims. (Cl. 229—35)

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This invention relates to improvements in receptacles such as boxes, cartons, et cetera, made from any suitable material, especially paper, cardboard, plastic and the like, and more particularly to an improved lock-corner construction for such receptacles.

The invention contemplates a simple yet exceedingly effective and improved lock-corner construction for securing the ends and sides of a box or tray blank in corner-forming relation. It may be employed in receptacles of the various types and forms enumerated, but in all its uses it is characterized by a corner-locking action which is superior to the prior forms of lock-corner construction and is also capable of being set up and unfastened more easily than the prior lock-corner constructions.

The above stated and other objects and advantages of the invention will be apparent from the following detailed description taken with the accompanying drawings illustrating the improved lock-corner construction of the invention and certain applications thereof, it being understood that the invention is not limited to the exact details of construction illustrated or to the particular applications suggested.

In said drawings:

Fig. 1 is a plan view of the corner portion of a box, carton or tray blank according to the invention;

Fig. 2 is a view similar to Fig. 1 illustrating the start of the corner setting-up operation;

Fig. 3 is a similar view illustrating a further development of the corner setting-up operation;

Fig. 4 is a perspective view of the lock-corner construction of the invention when finally set up or assembled;

Fig. 5 is a plan view, representative of a blank for the box body or cover of a two-piece box or carton employing the improved lock-corner construction of the invention on all corners;

Fig. 6 is a perspective view of a complete two-piece lock-corner box, both box pieces employing the herein lock corner construction at all corners thereof;

Fig. 7 is a plan view of the blank for a folded blank box of the integral cover type, illustrating the application of the herein lock-corner construction to two corners thereof;

Fig. 8 is a perspective view of a box or receptacle assembled from the blank illustrated in Fig. 7; and

Fig. 9 is a view similar to Fig. 1 illustrating a somewhat modified form of lock-corner construction according to the invention.

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In the partial box blank illustrated in Figs. 1–4, reference numeral 10 designates a main wall section, 11 a side wall section, and 12 an end wall section, of which the main wall section 10 may constitute either the bottom or top wall of a two-piece lock-corner box, or the back or cover wall of a folded blank box of the integral cover type. Usually, the main wall section 10 is square or rectangular in plan and the side wall section 11 is articulated to its side edge and adapted to be bent upwardly therefrom along a line of fold 13 which may be scored to facilitate such bending. The end wall section 12 is articulated to the end edge of the main wall section so as to bend upwardly therefrom along a line of fold 14 which may be similarly scored for ease in bending.

As best seen in Figs. 1 and 2, the free or outer edge of the side wall section 11, i. e. the edge extending parallel to the line of fold 13, is provided with a locking tongue 16 formed as by notching or undercutting said edge so as to provide two spaced notches 17, 18 having substantial width between which the tongue 16 is disposed. It will be observed that the endmost notch 17 extends to and opens through the end edge 11*a* of the side wall section 11, and that the free or outer edge of the tongue 16 extends flush with the free or outer edge of said side wall section.

Articulated to the end edge of the end wall section 12 is a flap 20 which may have triangular shape, with its free edge 20*a* being inclined outwardly away from the end edge of the side wall section 11 as seen in plan, Fig. 1. At its base, the triangular flap 20 is connected or articulated to the end wall section 12 so as to bend relatively upwardly therefrom on fold or junction line 21, which is preferably scored to facilitate such bending. A slot 22 is provided in the end wall section adjacent the junction or bend line 21, the slot being slightly offset from the bend line so that the slot opening provided thereby is disposed in the plane of the end wall section. Articulated to the flap 20 along its outer side edge is a wing or extension flap 24 which is adapted to be bent back on said flap 20 along bend or fold line 25 which is preferably scored. A slot 26 is provided in the extension flap 24 which is adapted to register with and receive the locking tongue 16 as will be described. Preferably, the slot is U-shaped, so that when extension flap 24 is bent back on flap 20, the U-shaping of the slot results in the formation of an upstanding tab 27 which conforms generally to the shape of the locking tongue 16. As the score or bend line 25 is not continued across the base or root of the tab 27, said tab is

relatively stiff and non-flexible. The wing or extension flap **24** is moreover provided with a holding tab **28** adapted to register with the slot **22**, the tab being formed in the straight free edge **24***a* and extending inwardly (Fig. 1) from the junction of said edge with the angularly related free edge **24***b* of the flap, which latter edge is preferably curved as shown.

As seen in Fig. 2, the first operation of setting up the corner is that of bending the side wall section **11** at a right angle to the main or bottom wall section **10**. Thereupon the end wall section **12** is bent at right angles to the main wall section **10** as indicated in Fig. 3, and accordingly the end edge **11***a* of the side wall section **11** is disposed adjacent the end edge (bend line **21**) of the end wall section **12** and in corner-forming relation therewith. Next, the flap **20** is bent at right angles to the end wall section **12** around the end edge **11***a* of the side wall section, with the result that bend line **25** coincides generally with the free (now top) edge of said side wall section. Now, the wing or extension flap **24** is bent over the top edge of the side wall section, being turned downwardly on bend line **25** to lie against the inner face of said side wall section. Consequent to such in-folding of the extension flap **24** and the registering relation of slot **26** with locking tongue **16**, the locking tongue passes through the slot **26** to interlock with the flap combination and thereby positively secures and locks the side and end wall sections in corner-forming relation and against unintentional separation. In a final operation, the extension flap is slid or pushed somewhat rearwardly, i. e. in the direction of the end wall section **12**, to cause holding tab **28** to pass into the slot **22** with which it registers, the tab thereupon holding the extension flap **24** against the side wall section **11**.

To augment the tongue-in-slot locking action aforesaid, the side edges of the notch **18** are reversely curved or inclined, so that the notch is narrower at its open than at its base or bottom end. Preferably also, the side edge of the locking tongue **16** corresponding to one edge of the notch **18** forms a 90° angle with the bottom edge of the notch and has a rounded corner defining an overhanging nose designated **16***a*. Accordingly, when the extension flap **24** is bent over the outer or upper free edge of the side wall section **11** as aforesaid, the web or junction portion connecting flaps **20**, **24** in registry with notch **18**, seats into said notch with a snap action and, once seated, is prevented from inadvertently passing out of said notch by the overhanging corner **16***a* of the locking tongue. By reference to Fig. 1, the coinciding side edge of the tongue **27** which corresponds to the aforesaid side edge of the locking tongue may also extend at right angles from the bend line **25**.

Preferably, the aforesaid interlocking action is further enhanced by cutting the notches **17**, **18** so that their bottom edges extend on a line which is inclined downwardly by a slight angle from the free or outer edge of the side wall section **11** in which said notches are formed. Since the line of fold **25** between flaps **20**, **24** coincides with the line containing the base lines of the notches, said line of fold or bend **25** is inclined by the same angle from an imaginary line in continuation of the outer or top edge line of the end wall section **12**. Stated in other words, the line of bend **25** is initially formed at right angles to the inclined line of the bottom or base edges of notches **17**, **18**, so that when the corner is finally set up as in

Fig. 4, the bend line **25** between flaps snugly bears against the notch bottom edges.

For certain receptacles, particularly those made from heavy cardboard, the aforesaid inclination of notch bottoms and of bend line **25** may not be necessary and, as indicated in Fig. 9, the line of the bottom edges of the notches **17**, **18** may extend parallel to the free or outer edge of the side wall section **11** and similarly the line of bend **25** between flap **20** and extension flap **24** may extend on a line in continuation of the outer or free edge of the end wall section **12**.

Referring to Fig. 4, illustrating the lock-corner construction as finally assembled, it will be observed that the stiff tab **27**, which conforms to the shape of the locking tongue **16**, is disposed relatively outwardly of said locking tongue and in face engagement therewith. Accordingly, the tab **27** masks and reinforces the locking tongue **16** and also takes a substantial portion of the wear that would otherwise be taken solely by the locking tongue.

A lock-corner construction as described may be employed at all corners of a box or receptacle or for selected corners only thereof. Referring to Figs. 5 and 6, illustrating the improved lock-corner construction applied to all corners of a two-piece box or carton, a blank forming each of the pieces thereof is shown to comprise a main wall section **30**, which may be the bottom or cover wall section of one or the other of the box pieces. Articulated to the side edges of the main wall section are side wall sections **31**, **31***a* and articulated to the end edges thereof are end wall sections **32**, **32***a*. Adjacent each of their corner-forming end edges, the side wall sections are provided with top-edge locking tongues **36** corresponding to the previously described tongue **16**. Articulated to the corner-forming end edges of the end wall sections are flaps **40** corresponding to the previously described flaps **20**, each of said flaps carrying a wing or extension flap **44** corresponding to the described extension flap **24**. A slot **46** is cut in the junction line between the flap combinations **40**, **44** so as to register with and receive the tongue **36** of the adjacent side wall sections. It will be understood that each box blank is set up to provide a box piece by following the corner-forming operations described in connection with Figs. 1–4. When the two box parts or pieces have been fully set up, they may be assembled one on the other to provide a complete two-piece box or carton of the type illustrated in Fig. 6 characterized by the employment of the improved lock-corner construction at all eight corners of the two-piece box.

Referring to Figs. 7 and 8, illustrating another application of the improved lock-corner construction in a folded blank box of the integral cover type, wherein the lock-corner construction is employed at only two corners of the box, reference character **50** designates a back wall section having side wall sections **51**, **51***a* articulated to its side edges. Articulated to the upper end edge of the back wall section **50** is a top end section **52** carrying a flap **53** provided on its free end edge with a holding or securing tongue **54**. Articulated to the opposite end of the back wall section **50** is a bottom end wall section **55**, and articulated to the longitudinal edge thereof is a front wall member or section **56** having side wall sections **57**, **57***a* articulated thereto along its side edges. Articulated to the other end edge of the front wall section **56** is a top end wall section **58**. The front wall section **56** is provided with a locking loop member **60**, with which the holding

or securing tongue **54** is adapted to be cooperated, as more fully disclosed in my patent application Serial No. 709,716, filed November 14, 1946, now abandoned.

In a box made from the blank illustrated in Fig. 7, the lock-corner construction of the invention may be applied to the corners defined by the adjacent end edges of the side wall sections, **57**, **57***a* and of the top end wall section **58** of the box front. Accordingly, the side wall sections **57**, **57***a* are each provided adjacent their corner-forming end edges with a top edge locking tongue **66** corresponding to the earlier described locking tongue **16**. The top end wall section **58** carries at each of its end edges the above described flap combination consisting of flap **70** and extension or wing flap **74** corresponding to the flaps **20**, **24**, as previously described. In the fold line between each of said flaps **70**, **74** is a slot **76** corresponding to the slot **26** which registers with an associated locking tongue **66** and through which the locking tongue is adapted to be projected in setting up of the corner.

To facilitate setting up a box from the Fig. 7 form of blank, one-way flap hinges generally designated **59**, **59***a* are provided between the aligned side wall sections **51**, **57** and **51***a*, **57***a*, such hinges insuring intended disposition of side wall section **57** over the related side wall section **51**, and of side wall section **57***a* over related side wall section **51***a*, in assembling the blank to form the box.

To assemble a box from a blank as illustrated in Fig. 7, the two corners having the improved lock-corner construction herein contemplated are first interlocked and thereupon the front or cover wall section **56** is swung over to parallel the back wall section **50**. Thereupon, the flap **53** is brought forwardly over the box front and the securing tongue **54** is inserted through the loop **60**. During such assembly operation, the one-way hinges **59**, **59***a* insure proper in-folding of the side wall sections **51**, **51***a* and there results a box as generally indicated in Fig. 8. To prevent outward bulging of the sides of the box under the weight or pressure of its contents, the related side wall sections **51**, **57** and **51***a*, **57***a* may be provided with complemental stiffening tongues and slots designated **78**, **78***a* which coact to lock the overlapped side wall sections intermediate their ends.

Various changes may be made in shape, size, dimensions and arrangement of parts without departing from the invention which is not limited to the specific details of construction.

I claim:

1. In a receptacle, a main wall, angularly related walls articulated to the side and end edges of the main wall and having adjacent end edges meeting to form a corner, and corner-locking means comprising a locking tongue projecting from the outer free edge of one of said angularly related walls adjacent said end edge, said tongue being defined by two spaced notches provided in said outer free edge, a flap articulated to said end edge of the other of said angularly related walls, said flap extending around said end edge of and overlying the outer face of and folding over said outer free edge of said one wall, the fold-over portion of said flap having a tongue-receiving slot intermediate its ends, said locking tongue projecting through said slot, and the unslotted ends of said fold-over portion seated in said spaced notches.

2. In a receptacle, a main wall, angularly related walls articulated to the side and end edges

of the main wall and having adjacent end edges meeting to form a corner, and corner-locking means comprising a locking tongue projecting from the outer free edge of one of said angularly related walls adjacent said end edge, a flap articulated to said end edge of the other of said walls, said flap extending from said last-named end edge to said outer free edge of said one wall and overlapping the outer face thereof, and an extension flap articulated to the first-named flap along a line of junction corresponding substantially to the line of the upper free edge of said one wall, and being folded over said latter edge and lying against the inner face of said one wall, said first-named flap having a tongue-receiving slot adjacent said line of junction, and said locking tongue projecting through said slot.

3. In a receptacle, a main wall, angularly related walls articulated to the side and end edges of the main wall and having adjacent end edges meeting to form a corner, and corner-locking means comprising a locking tongue projecting from the outer free edge of one of said angularly related walls adjacent its end edge, said tongue being defined by two spaced notches provided in said outer free edge, a flap articuated to said end edge of the other of said angularly related walls, said flap extending from said last-named end edge to said outer free edge of said one wall and overlapping the outer face thereof, and an extension flap articulated to the first-named flap along a junction line corresponding substantially to the line of the outer free edge of said one wall and being folded over said latter edge to lie against the inner face of said one wall, said first-named flap having a tongue-receiving slot adjacent said line of junction and intermediate the ends thereof, said locking tongue projecting through said slot, and the unslotted junction line portion of the flaps seating in said edge notches.

4. A lock-corner construction for a receptacle as set forth in claim 1, wherein the bottom edges of the notches provided in the free outer edge of said one wall extend on a line which is inclined downwardly from said edge line, and wherein the fold-over portion of said flap is articulated to the flap proper on a bend line which is correspondingly inclined.

5. A lock-corner construction for a receptacle as set forth in claim 3, wherein the bottom edge line of the notches provided in the free outer edge of said one wall is inclined downwardly from the line of said edge, and the line of junction between said flaps is correspondingly inclined.

6. A lock-corner construction for a receptacle as set forth in claim 2, wherein said other wall is provided with a slot adjacent its line of junction with the first-named flap, and the extension flap is provided along a free edge thereof with a holding tab which registers with and projects through said slot.

7. A lock-corner construction for a receptacle as set forth in claim 3, wherein said other wall is provided with a slot adjacent its line of junction with the first-named flap, and the extension flap is provided along a free edge thereof with a holding tab which registers with and projects through said slot.

8. In a lock-corner construction for receptacles having angularly related side and end walls whose adjacent end edges meet to form a corner, the combination of a locking tongue formed in the upper edge of the side wall adjacent its corner-forming edge, and a flap articulated to the corner-forming edge of the end wall and over-

lapping the outer face of the side wall, said flap folding over the upper edge of the side wall and terminating in a holding flap lying against the inner face of said side wall, said flap having a slot in its fold-over portion which registers with and receives the locking tongue.

9. A lock-corner construction for a receptacle as set forth in claim 8, wherein the side edge of the locking tongue remote from the corner is angled to provide an overhanging corner with which the fold-over portion of the flap interlocks.

10. A lock-corner construction for a receptacle as set forth in claim 8, wherein a free edge of the holding flap coincides substantially with the corner line and is formed with a projecting tab,

and wherein the end wall is provided adjacent its corner-forming end edge with a slot through which the tab projects.

ROBERT VAN ROSEN.

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