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S. LIGHTER

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CARTON CORNER CONSTRUCTION

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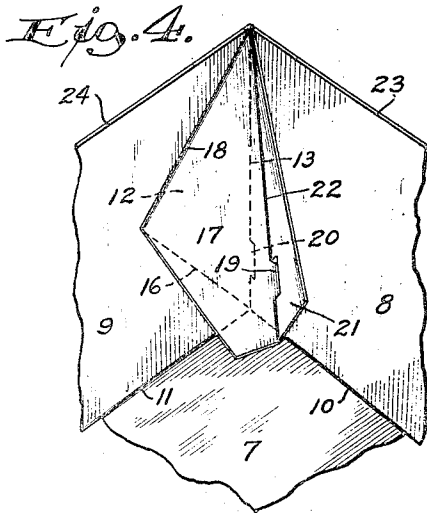
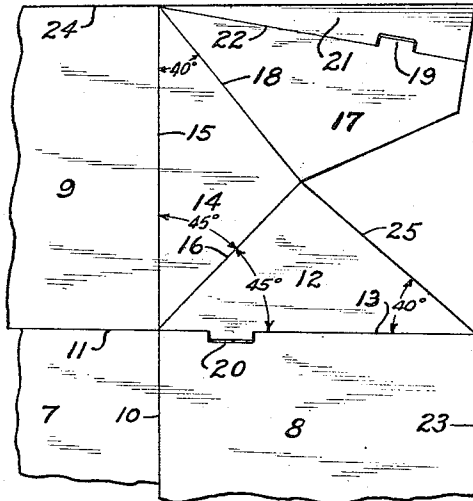
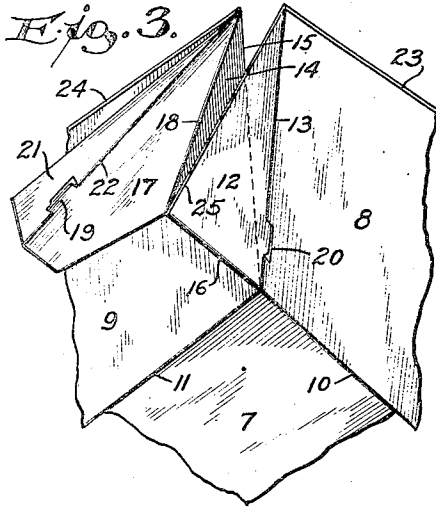


Fig. 1.

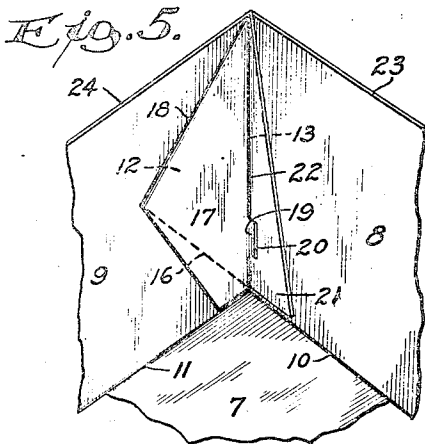
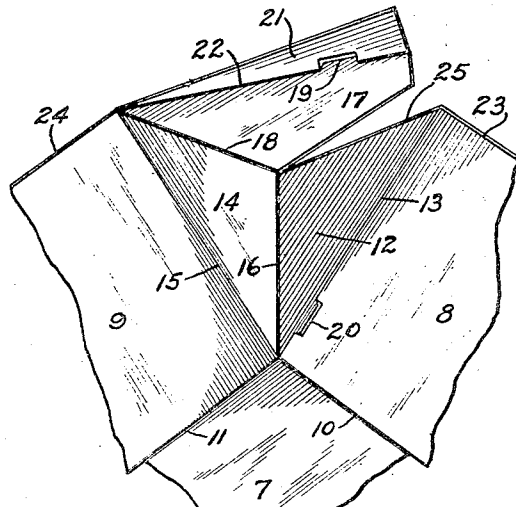


Fig. 2.

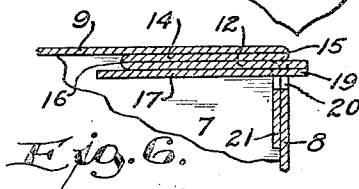


Fig. 6.

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CARTON CORNER CONSTRUCTION

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2 Claims. (Cl. 229—31)

The present invention relates generally to improvements in the art of manufacturing cartons, boxes or the like, and relates more particularly to improvements in the construction and operation of the corners for collapsible cartons formed of cardboard or similar material.

The primary object of this invention is to provide a new and useful carton corner construction which is simple and durable in construction, and which also facilitates assembly and collapse of the cartons to which it is applied.

Many different types of so-called collapsible or knock-down boxes or cartons have heretofore been proposed and used extensively for diverse purposes, and perhaps the majority of these prior cartons have been formed of cardboard stock which is cut into unitary blanks properly scored for convenient assembly and collapse by folding along the score lines. During the formation of such boxes from cardboard stock, it is extremely desirable to utilize as little stock as possible for a carton of predetermined size, while maintaining maximum strength and rigidity of the assembled structures; and it is moreover exceedingly desirable to be able to assemble the receptacles quickly and conveniently in a manner whereby the assemblages will be automatically locked in assembled condition. While many prior attempts have been made to produce such self-locking carton assemblages, most of these prior devices are not commercially satisfactory either because they are too complicated and costly, or because they are too frail and not sufficiently rigid, or because they are too wasteful of valuable stock and cannot be readily produced in large quantities, or because they cannot be assembled and dismantled with sufficient ease. Although it is quite a simple matter to form the bottom and the walls of such knock-down boxes, the production of satisfactory corners and suitable locks for the corners, presents many problems which the prior assemblages of this kind have failed to solve.

It is therefore a more specific object of my invention to provide an improved collapsible carton adapted to be formed of a single blank or sheet of material, and having in addition to the usual bottom and foldable side and end walls, improved corner structures and locking devices which obviate the above mentioned objectionable features and difficulties.

Another specific object of the present invention is to provide an improved carton corner which may be formed of relatively thin cardboard stock or the like, to produce multiple re-

enforcement for the box to which the corner assemblages are applied.

A further specific object of my present invention is to provide an improved automatic lock and reenforcement for each corner of a box formed of a unitary blank of sheet material such as cardboard.

Still another specific object of this invention is to provide an improved carton corner construction which can be produced at moderate cost with minimum waste of stock, and which can be quickly and conveniently assembled to provide a strong and self-retaining box assemblage.

These and other specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of the several features constituting my present improvement, and of the mode of constructing and of assembling a carton corner involving the invention, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a plan view of a corner fragment of a blank for a collapsible carton, showing the same in collapsed or flat condition, but cut and scored ready for folding;

Fig. 2 is a perspective view of the corner fragment of Fig. 1, with the side and end walls elevated approximately half-way;

Fig. 3 is another perspective view of the same corner fragment, showing the side and end walls almost, but not fully erected;

Fig. 4 is still another perspective view of the corner fragment, depicting the side and end walls fully elevated or erected, and also showing the corner construction almost assembled but not yet finally locked;

Fig. 5 is an additional perspective view of the corner fragment, illustrating the corner construction in finally assembled and locked condition; and

Fig. 6 is an enlarged transverse section through the assembled corner showing the locking tongue in action.

While the invention has been shown and described herein as having been embodied in a single carton corner construction of specific dimensions and having vertical walls, it is not my desire or intent to thereby unnecessarily restrict the scope or utility of the improvement, and it should be understood that more than one of the improved corners may be applied to the same carton or box.

Referring to the drawing, the improved carton shown therein may be formed of a single blank of cardboard and comprises in general, a flat rectangular bottom 7 having side walls 8 and end walls 9 foldably connected to its edges along score lines 10, 11 respectively; a triangular corner section 12 foldably connected to the end edge of the side wall 8 along a score line 13; a second triangular corner section 14 foldably connected to the end edge of the end wall 9 along a score line 15, and also being foldably connected to the first mentioned corner section 12 along a diagonal score line 16; a third approximately triangular corner section 17 foldably connected to the free edge of the second corner section 14 along a score line 18 and having an integral locking tab or tongue 19 projecting outwardly from an edge thereof and cooperable with an opening 20 formed at the lower edge portion of the side wall 8; and a triangular panel 21 from which the tongue 19 has been cut, and which is foldably connected to the adjacent edge of the third corner section 17 along a score line 22.

All of the corner sections 12, 14, 17, the bottom 7, the walls 8, 9, the panel 21, and the tongue 19 are formed integral with each other and from a single blank, and in order to avoid waste of stock when producing these blanks, the corner sections 12, 14, 17 and the panel 21 are all confined within the square bounded by the score lines 13, 15 and by the imaginary intersecting extensions of the outer upwardly swinging edges 23, 24 of the walls 8, 9 respectively. In order to insure proper folding of the corner sections 12, 14 when the side and end walls 8, 9 are swung into erect position, and in a structure wherein these walls are finally disposed perpendicular to the bottom 7, the inclination of the score line 18 and of the corresponding free edge 25 of the triangular section 12 should each be disposed at an angle of 40° relative to the adjacent score lines 13, 15, and the fold line 16 should form an angle of 45° with each of the lines 13, 15. The locking tongue 19 should not be scored and should finally coat with the slot or opening 20 in the edge of the wall 8, as shown in Fig. 6, so as to provide a firm lock for the assembled corner; and while the panel 21 provides added strength and reinforcement for the assembled corner, this panel 21 may be omitted providing the fold line 22 properly coats with the score line 13 in the finally erected assemblage as illustrated in Fig. 5.

When the improved carton blanks have been properly cut and scored as shown in Fig. 1, they may be stacked in compact rectangular piles, and the self-locking corner assemblages may be applied to two or more corners of each blank. In order to erect or assemble a box from one of the blanks, it is only necessary to perform the several successive steps depicted in Figs. 2 to 5 inclusive. During such assembly of a corner, the side and end walls 8, 9 should be swung upwardly away from the bottom 7 about their respective fold lines 10, 11 so as to cause the hingedly connected triangular corner sections 12, 14 to swing inwardly about their fold lines 13, 15 respectively, as illustrated in Fig. 2. Continued erection of the side and end walls 8, 9 will cause the corner sections 12, 14 to move toward overlapping position and these sections 12, 14 should be simultaneously pressed against the inner surface of the adjacent end wall 9, see Fig. 3. As the overlapping or superimposed triangular sections 12, 14 approach their final position against the end wall 9, the slot 20 will be opened; and the triangu-

lar corner section 17 should be swung about the fold line 18, inwardly and downwardly over the free edge 25 of the corner section 12, as shown in Fig. 4. The panel 21 may be simultaneously folded in a reverse direction about its hinge line 22 so as to cause the locking tab or tongue 19 to project outwardly; and when the three corner sections 12, 14, 17 are finally pressed into snug superimposed position against the inner surface of the end wall 9 as in Figs. 5 and 6, the tongue 19 will snap into the slot 20 to firmly lock the corner in assembled position. This final positioning of the corner sections 12, 14, 17 will materially reinforce the wall 9 at the corner, and will also cause the panel 21 to hug the interior surface of the side wall 8 thereby likewise reinforcing this wall at the carton corner; and in order to dismantle or collapse the box, it is only necessary to withdraw the tongue 19 from the slot 20 and to reverse the operations above described.

From the foregoing detailed description, it will be apparent that my present invention provides an improved carton corner construction which is simple, compact and sturdy in structure, and which is moreover adapted for rapid and convenient assembly and dismantling. The improved structure is also self-locking and provides strong reinforcement for the corner of the carton to which it is applied, without undesirably obstructing the interior of the box. The new corner construction may be applied to any or all of the corners of a box, and besides eliminating waste of stock the corner structure utilizes the stock available within a rectangular blank to best advantage for reinforcing purposes. While the panel 21 may be omitted, it does serve to reinforce the wall 8, and the corner section 17 may also be widened at its outermost end in a direction toward the free edge 25 of the section 12, if so desired. The blanks utilized in the formation of the improved cartons may also be produced of relatively thin cardboard stock and with the aid of simple equipment, and since these blanks lie flat when collapsed, they may be compactly stacked for storage and shipment. The automatically functioning locking tongues 19 serve to maintain the corners in assembled condition while also retaining the triangular sections 12, 14, 17 and the panels 21 snugly superimposed and against the adjacent walls, and the improved boxes can be manufactured at moderate cost and have proven highly satisfactory in actual use and are especially adapted for packaging laundry or the like.

It should be understood that it is not desired to limit this invention to the exact details of construction, or to the precise mode of assembly and dismantling, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A carton formed of a single blank having a bottom provided with side and end walls foldably connected to the bottom and being disposable either perpendicular to or flatly collapsed into the plane of the bottom, the adjacent end edges of said side and end walls being foldably interconnected by a set of three approximately triangular corner sections one of which is foldably connected to one of said wall edges and another of which is likewise connected to the other of said wall edges and to said first mentioned section while the third section is foldably connected to said second mentioned section whereby said three sections are

foldable from flat position in the plane of said bottom into triple-ply substantially triangular formation lying flat against one of said walls, a tongue projecting from an edge of said third section and being insertible in a slot near the end edge of the wall which is not engaged by the 5 folded corner sections so as to hold the three superimposed sections snugly against the other wall and to lock both walls in erected position, and a re-enforcing panel foldably connected to the 10 edge of said third corner section from which the tongue projects and being adapted to lie flat against the slotted wall when the tongue engages the slot, the direct connected edges of the first 15 and second triangular corner sections being disposed at 45° angles with respect to the end edges of the walls when the blank is in flat condition and the other swinging edges of these two sections being disposed at 40° angles relative to the 20 end edges of their supporting walls, and all three of the corner sections and the locking tongue and panel being formed from the blank stock originally disposed within the corner rectangle.

2. A carton formed of a single blank having a 25 bottom provided with side and end walls foldably connected to the bottom and being disposable either perpendicular to or flatly collapsed into the plane of the bottom, the adjacent end edges of

said side and end walls being foldably interconnected by a set of three approximately triangular corner sections one of which is foldably connected to one of said wall edges and another of which is likewise connected to the other of said wall edges and to said first mentioned section while the third section is foldably connected to said second mentioned section whereby said three sections are foldable from flat position in the plane of said bottom into triple-ply substantially triangular formation lying flat against one of said walls, a tongue projecting from an edge of said third section and being insertible in a slot near the end edge of the wall which is not engaged 5 by the folded corner sections so as to hold the three superimposed sections snugly against the other wall and to lock both walls in erected position, the direct connected edges of the first and second triangular corner sections being disposed 10 at 45° angles with respect to the end edges of the walls when the blank is in flat condition and the other swinging edges of these two sections being disposed at 40° angles relative to the end edges of 15 their supporting walls, and all three of the corner sections and the locking tongue being formed from the blank stock originally disposed within the corner rectangle.

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