

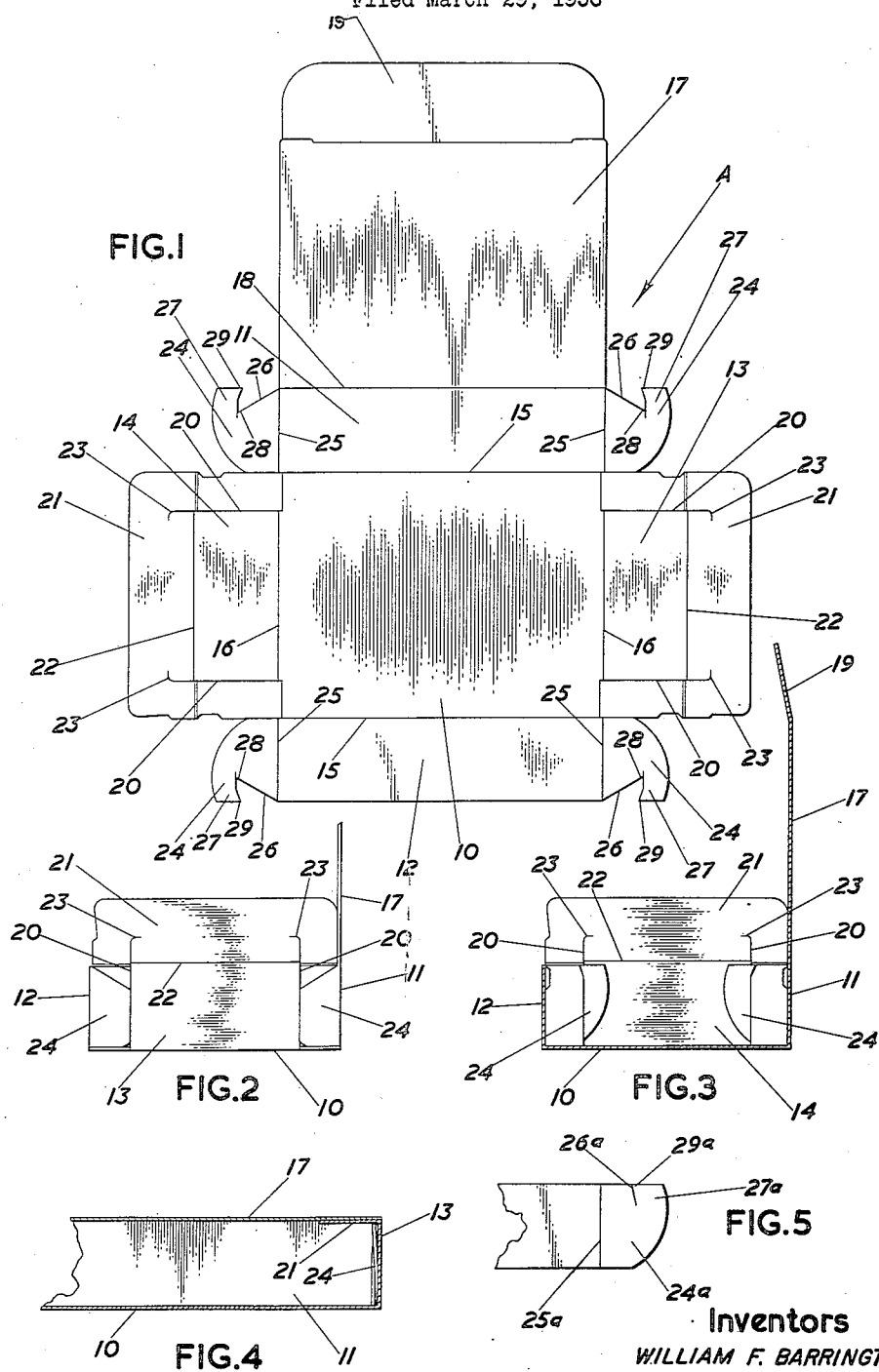
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CORNER LOCK CARTONS.

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1

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CORNER LOCK CARTONS

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This invention relates to corner lock cartons.

Corner lock cartons which involve slits in opposed side walls of a carton designed to receive tabs projecting from the other two opposed side walls to lock within the edges of the slits have the disadvantage that very often an initial firm locking engagement is not achieved. Such disadvantages have been, to some extent, overcome in a form of corner lock carton by extending the slits in the end walls to a point above a transversely folding edge flap and by so constructing the locking tabs that they have an upwardly projecting lug which projects beyond the upper edge of the end walls, so that when the edge flaps are returned transversely, the projecting lugs on the locking tabs are bent inwardly of the carton and therefore are firmly locked against release. While such a construction overcomes the disadvantage of insecure locking in the conventional corner lock carton, such improved construction has a number of disadvantages. On the one hand, the lugs cannot be turned in until the contents are placed in the carton. On the other, in order to provide the lugs on the locking flaps which project beyond normal carton defining edges, unnecessary waste results as surplus material must be cut from the stock finally to form said lugs in the blank and the blanks cannot be arranged on the stock closely to arrange for economic cutting. Moreover, since the blanks for such cartons are shipped in a knockdown state and the lugs on the tabs are therefore disposed to project beyond outer edges of the blank, they often are damaged in the course of shipment and either bent or torn so that, in the one instance, there may arise difficulties in setting up the cartons, particularly when using automatic equipment and, in the other instance, the firm locking is not achieved where a lug may have been torn or partially torn.

Finally, the use of elongated slits in the walls tends to weaken the carton since, prior to the folding in of the transverse edge flaps, the structure is somewhat flimsy and the end walls may in some instances tend to shear along the line of the slits through the top flap to the outside edge. Consequently with a view, as far as possible, to avoiding this shear the depth of the flaps has been increased so that more material is provided between the end of the slit and the outer edge of the flap. Again, therefore, more material is required in the blank. This disadvantage is also avoided in the present invention.

The present invention embodies desirable features of this improved type of carton but eliminates some of its disadvantages and provides further improvements to achieve a wholly practical corner lock carton, which particularly lends itself to mechanical forming.

The invention generally comprises a corner lock carton having a rectangular base and side walls integrally connected to each side edge thereof foldable perpendicularly thereto when the carton is set up and interlockable with one another. This is defined by a flap integrally connected along a line of fold at each end of two opposed side walls wherein said flaps in the set-up position of the carton are foldable to lap the other two opposed side walls of said carton and form the interlocking means for said walls, said flaps having free side edges and a free end edge, the normally upper free side edge of each flap in the set-up carton being cut inwardly adjacent its end edge to form a locking tab having a locking tongue substantially projecting in a direction away from the free

2

end edge of the tab and towards the line of fold of its flap, disposed at each corner of the set-up carton, the other two opposed side walls each having a slit adjacent to and in spaced parallel relation to each side edge thereof designed partially to receive therein a flap of said first mentioned side walls, said projecting tongue of each tab of said flaps being initially disposed to lap, on the outside surface of the cooperating slit wall, the edge of the slit receiving said tab, next to the adjacent corner of the carton, each of said tongues being finally projectable through the slit receiving its tab to overlap the opposite surface of said slit wall of the carton, said tongues then projecting respectively on the inside surface of said slit walls in the direction of the adjacent corner of said carton firmly to lock the walls thereof in set-up position. Preferably the side walls containing the slits are formed with an integral terminal flap along their end edges and foldable inwardly of the carton in the set-up position, said tabs of the other two opposed side walls of the carton terminating substantially in a straight edge located substantially flush with the upper extremity of the slit side walls of the carton, said terminal flap of said latter walls when returned being designed to abut the straight edge of said tab as a further means of maintaining said tabs in locked engagement with said slit side walls. Preferably also, the slits in the said side walls are offset adjacent their uppermost ends in a direction substantially at right angles to their normal direction to avoid shearing of the side wall along the line of the slit and to assist in the final projection of the locking tongues through said slits into engagement with the opposite surface of the side wall.

The invention will be clearly understood by reference to the following detailed specification taken in conjunction with the accompanying drawings.

In the drawings:

Fig. 1 is a plan view of a carton blank of preferred form from which a carton of the present invention may be formed.

Fig. 2 is an end elevation of an open carton.

Fig. 3 is a transverse section taken through the open carton as shown in Fig. 2 to illustrate the manner of locking of the tabs of two opposed side walls with one of the other pair of side walls.

Fig. 4 is a fragmentary transverse sectional detail taken transversely of one of the slit end walls to show the manner in which the locking tabs and terminal flaps of the slit end walls cooperate; and

Fig. 5 is a detail of an alternative form of flap and locking tab.

Referring to the drawings, A indicates a carton blank as a whole made up of the base 10 and pairs of opposed integral side walls 11 and 12 and 13 and 14, respectively, extending from the side edges of the base 10 and foldable in respect thereto along the fold lines 15 and 16, respectively, so that they may be disposed perpendicularly to the base to be interlocked with one another to form the set-up carton. The carton preferably includes a cover 17 integral with side wall 11 and foldable with respect thereto along the fold line 18, the cover including a flap 19 also foldable with respect thereto.

The side walls 13 and 14 are formed with pairs of slits 20 which are disposed in spaced parallel relation to the adjacent side edges of these side walls. Preferably, the side walls 13 and 14 include the terminal co-extensive flaps 21 foldable along the fold line 22 so that they may be caused to project inwardly of the carton when the blank is set up to form the latter. In this instance where flaps 21 are included, the slits 20 are designed to extend across the fold lines 22 into the flap 16 and preferably the slits 20 are offset at their free or upper ends as at 23 to extend in a direction substantially at right angles to their normal line of extent.

The opposed side walls 11 and 12 are each formed with integral flaps 24 projecting from their ends as designed by the fold lines 25 and in the blank extend parallel to the opposed slit side walls 13 and 14. The flaps 24 have free side edges and a free end edge, the outer free edge of flaps 24 (or upper free edge in terms of the set-up carton) are cut inwardly as by notching indicated at 26, Fig. 1, to form locking tabs 27, the cut defining the tab being preferably inclined as at 28 to form on the tab a locking tongue 29 substantially projecting in the direction of the fold line 25 of each flap 24. In the alternative form shown in Fig. 5 the locking tab 27a on flap 24a is formed by a single cut 26a disposed substantially at an incline to the fold line 25a and has a locking tongue 29a substantially projecting towards fold line 25a.

When the side walls of the carton 11 and 12, 13 and 14 are swung up perpendicularly to base 10, the flaps 24 of the opposed side walls 12 and 13 are preferably designed to lap the outer surface of the side walls 13 and 14 and are designed to be received within the slits 20 thereof, the outer ends of flaps 24 being then disposed on the inside surface of the walls 13 and 14 with the exception of the locking tongues 29. The fold lines 25 between flaps 24 and side walls 11 and 12 then form the corners of the carton and to effect locking between the tabs 27 and the side walls 13 and 14, it is then necessary to project the locking tongues through the slits 20. The locking tongues 29, it will be understood, at that point are lapping the edge of the slit in which its tab 27 is received, next to the corner of the carton, and by pressing the outer surface of the carton on the opposite side of the slit, the locking tongue 29 in each case will be caused to flex and pass through the slit to locate, as shown in Fig. 3, on the inside surface of the carton projecting in a direction substantially towards the adjacent corner of the carton. In locating the tongue of each flap in this manner, it will be appreciated that the offset portion 23 of each slit 20 will tend to permit the carton wall on the inside of each slit 20 to yield inwardly somewhat more readily than if the slit terminated at this end in the normal line of the major extent of the slit and when the tongues 29 are then disposed, as shown in Fig. 3, it will be obvious that the tabs 27 are firmly locked with the side walls 13 and 14 and consequently through the flaps 24, the side walls 11 and 12 are locked in set-up relation with the walls 13 and 14.

The flaps 24 are of a width normally coinciding with the width of their side walls 11 and 12 and the tabs at the outer free edge of these flaps are preferably in the form of a straight edge aligned with the upper edge of side walls 11 and 12 of the set-up carton. Consequently, in providing the tabs 27 and locking tongues 29, no more material is required than normally for forming flaps of this kind. Moreover, since the free end of each tab 27 terminates in a straight line aligned with the upper edge of the side walls 11 and 12, it will be noted that when the flaps are locked within the slits 20 the upper straight edge of each tab 27 is disposed substantially flush with the upper edge of the side walls 13 and 14 or with their fold lines 22 where, as in the case of the preferred form of carton, the side walls have the continuing flaps 21. Consequently, when the flaps 21 of side walls 13 and 14 are turned inwardly and the cover 17 closed, the flaps 21 will bear against the upper straight edge of the tabs 27; thus supplementing the locking effect of the locking tongues 29 and even in the unlikely event that the locking tongues 29 became disengaged, the flaps 21 through this bearing engagement would retain the tabs 27 in position. It is preferred to form the upper ends of the tabs 29 in a straight line as described for the above mentioned reason but where a carton is formed without flaps 21 and/or cover 17, the straight edge of the tabs being flush with the upper edges of the flaps 13 and 14 will not project thereabove. Moreover, in this instance it will be appreciated also that the upper edge of the tab does not have to be formed in a straight line.

Cartons of this general kind are usually oblong with

the opposed side walls, carrying the interlocking flaps, disposed in the long direction of the carton and extending in the general direction of the grain of the stock from which the blank is made. Consequently, since the locking tongues of the tabs of the present invention in an oblong carton extend in the direction of the grain of the stock, it will be appreciated that such locking tongues will flex more readily when they are projected through the co-operating slits in the two opposed walls to locate them on the inside surface of said walls overlapping the edge of the slit next to the adjacent corner of the carton. Therefore, the tongues will not tend to oppose the pressure force used to project them through the slit and, since the opposite edge of the slit will readily yield because of the offsetting of the slit as previously described, it is clear that the interlocking of the tabs with the slit walls is effected quite easily.

From the foregoing it will be appreciated that a substantially positive lock between the side walls of the carton is provided in a particularly simple structure and in which the locking by means of the locking tongues 29 of tabs 27 is such that the tongues are flexed into locking position to achieve a positive lock in which the tongues project substantially in the direction of the corners of the carton or, in other words, in a direction directly to oppose the normal direction of movement of the flaps 24 to disengage the latter from the side walls 13 and 14.

We appreciate, of course, that some changes may be made in the structure within the principle of the invention and it is to be understood, therefore, that the foregoing description and illustration is not to be interpreted in a sense more limiting than the scope of the appended claims.

What we claim as our invention is:

1. A carton comprising a rectangular base having side walls integrally connected to each side edge thereof foldable perpendicularly thereto when the carton is set up and interlockable with one another, a flap integrally connected along a line of fold to each end of two opposed side walls, said flaps in the set-up position of said carton being foldable to lap the other two opposed sides of said carton and form the interlocking means of said walls, said flaps having free side edges and a free end edge, the normally upper free side edge of each flap being cut inwardly adjacent its end edge to form a locking tab having a locking tongue substantially projecting in a direction away from the free end edge of the tab and towards its line of fold disposed at a corner of the set-up carton, the other two opposed side walls each having a slit adjacent to and in spaced parallel relation to each side edge thereof designed partially to receive therein a flap of said first mentioned side walls, said projecting tongue of each tab of said flaps being initially disposed to lap, on the outside surface of the cooperating slit wall, the edge of the slit receiving said tab, next to the adjacent corner of the carton, each of said tongues being finally projectable through the slit receiving its tab to overlap the opposite surface of said slit wall of the carton, said tongues then projecting respectively on the inside surface of said slit walls in the direction of the adjacent corner of said carton firmly to lock the walls thereof in set-up position.

2. A carton as claimed in claim 1, in which the slit side walls have an integral flap foldable inwardly of the carton when set up, the upper ends of said tabs terminating in a free straight edge substantially flush with the fold line of the slit side walls and adapted to be engaged by the intumed flaps in bearing engagement to supplement the locking effect of the tabs.

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