Jan. 19, 1965 R. J. HICKIN ETAL 3,166,231

SEAL END CARTON

Filed June 6, 1962 2 Sheets-Sheet 1

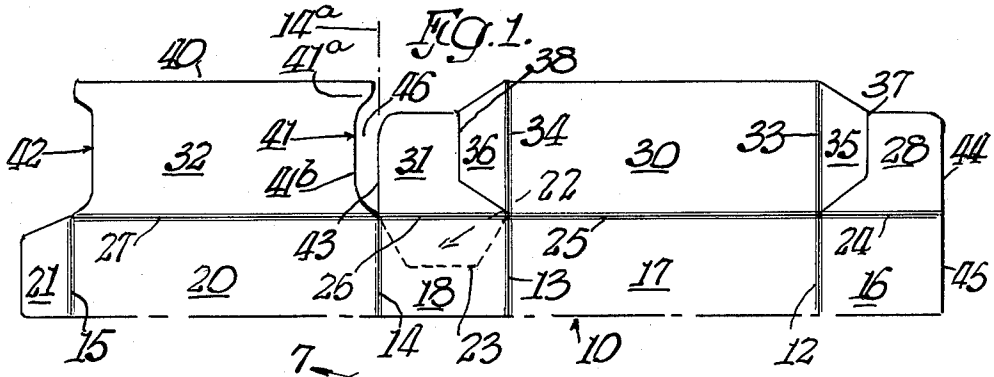

FIG. 1.

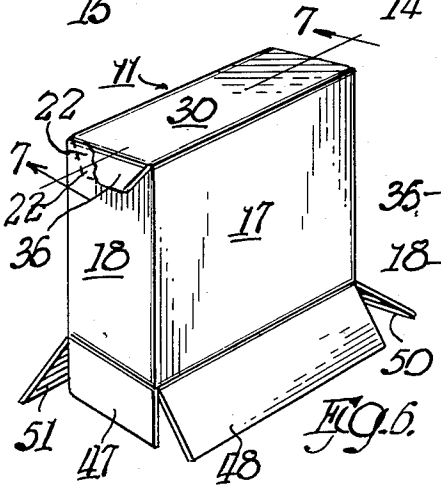

FIG. 6.

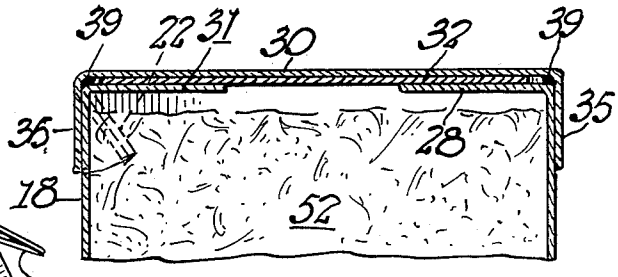

FIG. 7.

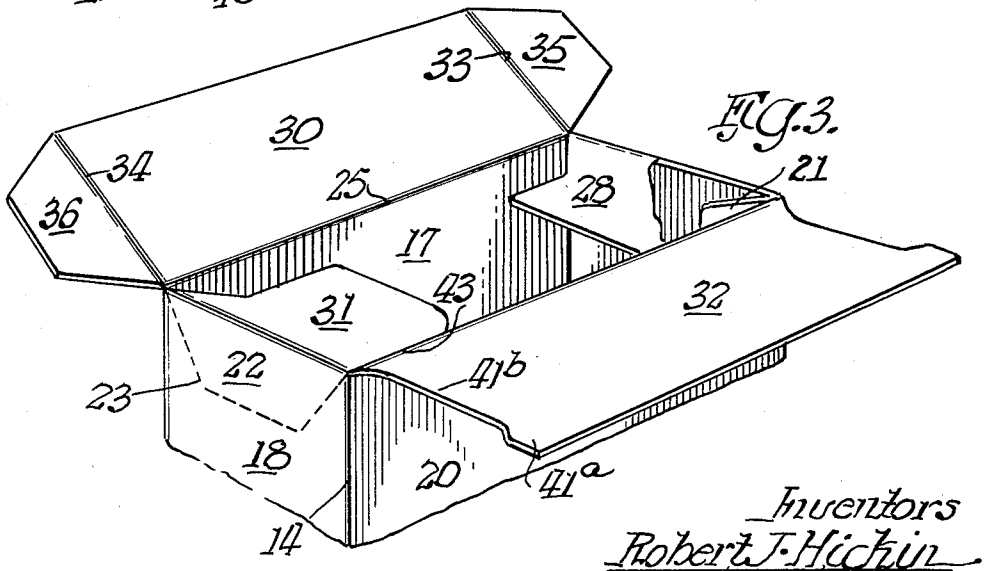

FIG. 3.

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FIG. 5.

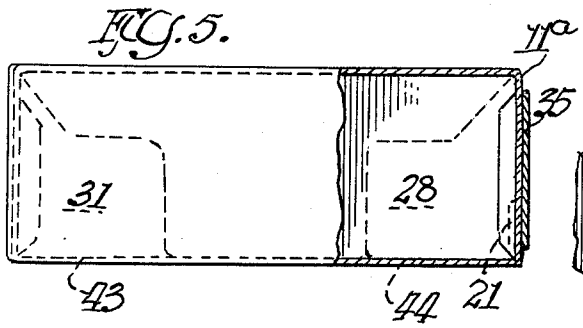
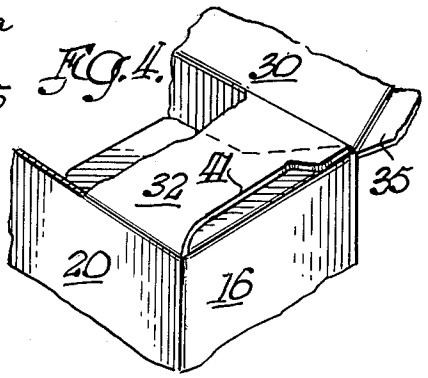


FIG. 4.



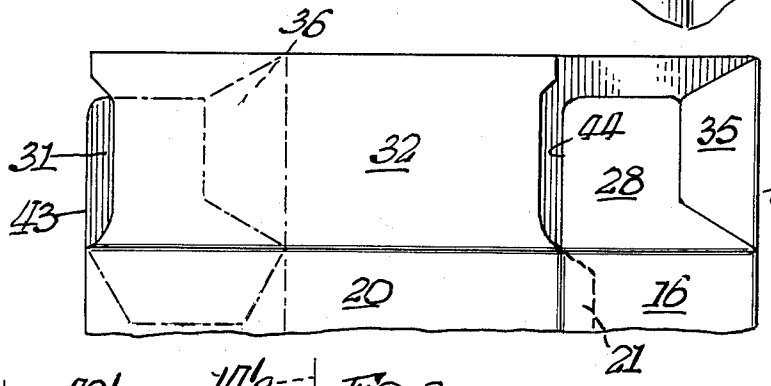
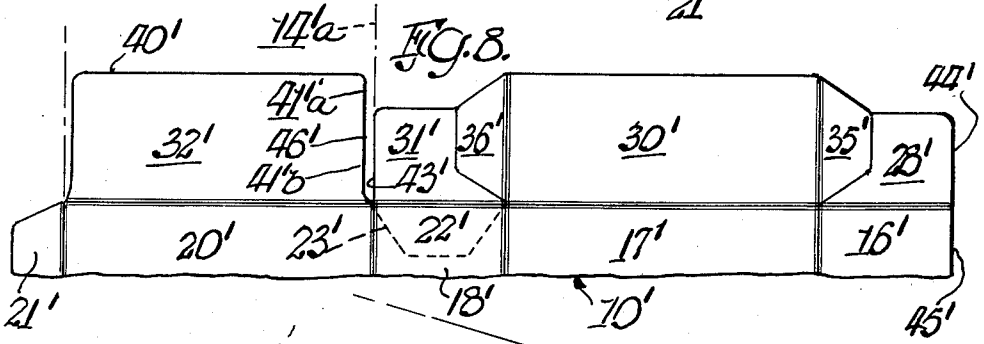


FIG. 2.

FIG. 8.



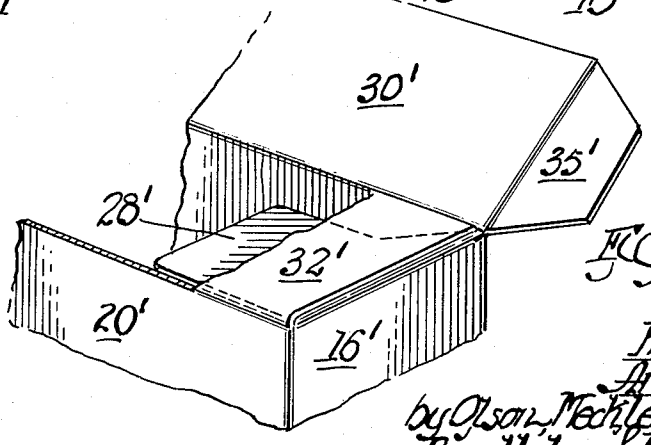


FIG. 9.

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SEAL END CARTON

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9 Claims. (Cl. 229—37)

This invention relates to a seal end carton and more particularly to the blank from which said carton is formed.

In a seal end carton for the packaging of various products it is of paramount importance that the ends of said carton be moisture-proof as well as infestation-proof. One method of obtaining a carton seal end condition is disclosed in United States Letters Patent 3,007,376 in which a non-hardening plastic material is applied to the exposed edges of the top and/or bottom of the carton formed by the intersections between the end panels and the top and bottom surfaces. To be assured that the plastic material will flow properly along said exposed edges so as to fill all voids therein, it is preferred that the outermost side flap of the top and/or bottom of the carton be provided with the well known Van Buren type ears and that such ears be readily folded and secured to the exposed surfaces of the adjacent end panels of the carton.

In high speed end-sealing operations, serious problems are often encountered in squaring up of the carton just prior to sealing the end thereof. Where in prior cartons, the squaring thereof is not proper before the side and end flaps are folded, the securing of the Van Buren ears to the adjacent end panel exposed surfaces to effect sealing of the carton end is seriously impaired. This difficulty stems from the fact that in an unsquared carton a portion of the edge of the overlapped or concealed side flap projects beyond the plane of the end panel exposed surface and thus interferes with the folding of the adjacent Van Buren ear connected to the outer, or overlapping, side flap.

Furthermore, frequently in prior carton blanks of this general type, the end flaps thereof are of such configuration that they fail to aid in attaining the proper squaring up of the carton prior to the seal end thereof being formed.

In addition many prior carton blanks are of such configuration that a large amount of material waste is occasioned during the blanking operation and thus the cost of the carton is substantially increased.

Thus, it is one of the objects of this invention to provide a carton blank which overcomes the aforementioned short-comings which beset prior blanks of this general type.

It is a further object of this invention to provide a carton blank which is capable of high speed folding operation and yet permits an effective seal end to be formed.

It is a still further object of this invention to provide a carton blank which is capable of readily attaining and retaining a true squared up condition during formation of the carton seal end.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of this invention, a carton blank is provided which includes a pair of side panels and a pair of end panels, the panels of each pair being alternately arranged in side by side relation and foldably connected to one another. The side and end panels form the upright walls of the setup carton. Transversely extending from and foldably connected to corresponding peripheral portions of the side panels are first and second side flaps which are adapted to assume an overlapping relation when the carton seal end is formed. The first side flap is adapted to overlap the second side flap. Transversely extending and foldably connected to corresponding peripheral portions of the end panels are end flaps which are adapted to subtend the folded second side flap. Extending laterally from the opposite edge portions of the first side flap are foldable ears which are adapted to overlie and be secured to the exposed surfaces of the end panels. The edge portion of the second side flap opposite the foldline of said second side flap is of lesser dimension than the extent of said foldline with the result that at least one of the edge portions of the second side flap disposed normal to the foldline thereof is recessed from the projection of the adjacent foldline connecting the side and end panels. The recessed edge portion of the second side flap is spaced inwardly from the adjacent end panel exposed surface when the carton seal end is formed.

For a more complete understanding of the invention reference should be made to the drawings wherein:

FIG. 1 is a fragmentary plan view of one form of the improved carton blank.

FIG. 2 is similar to FIG. 1 but showing the carton blank partially folded to form a carton in collapsed condition.

FIG. 3 is a fragmentary perspective view of the carton blank of FIG. 1 in setup condition and just prior to the side flaps being folded into overlapping relation.

FIG. 4 is a fragmentary perspective view similar to FIG. 3 but showing the second side flap folded into overlapping relation with respect to said end flaps.

FIG. 5 is a top plan view, partially cut away, showing the blank formed into a carton seal end.

FIG. 6 is a perspective view on reduced scale showing the blank with the top flaps thereof in seal end condition and the bottom flaps thereof unfolded.

FIG. 7 is an enlarged fragmentary sectional view taken along line 7—7 of FIG. 6.

FIG. 8 is a fragmentary plan view of a second form of the improved carton blank.

FIG. 9 is an enlarged fragmentary perspective view of the blank of FIG. 8 and showing the latter in a partially folded condition and with portions of the second side flap cut away.

Referring now to the drawings and more particularly to FIG. 1 one form of the improved blank **10** is shown which is adapted to be folded to form a seal end carton **11**, see FIG. 6. The blank is formed from a sheet or web of paperboard material. A plurality of spaced parallel foldlines **12**, **13**, **14** and **15** are formed in the blank **10** which are adapted to define an end panel **16**, a side panel **17**, a second end panel **18**, a second side panel **20**, and a narrow flap **21**, commonly referred to as a glue lap. All of the panels and lap **21** are arranged in parallel side-by-side relation. The end panels **16** and **18** are of like configuration as is also the case with respect to the side panels **17** and **20**. While in the illustrated embodiment of blank **10**, FIG. 1, lap **21** is shown foldably connected to side panel **20**, it is to be understood of course that such lap may be foldably connected to end panel **16** instead. Furthermore, the disposition of the panels within the blank may be changed from that shown, if desired; that is to say, the positions of the side panels **17** and **20** could be substituted for the positions of end panels **16** and **18**, respectively without effecting the operation or function of the blank when folded. In addition, in some instances, the glue lap **21** may be omitted entirely from the blank in which case a separate tape, not shown, could be utilized to effect retention of the panels in folded relation.

If desired, end panel **18**. as illustrated, may be provided with a punch-out area **22** adjacent the upper end thereof. This area is defined on three sides by a weakened scoreline **23**. The provision of the punch-out area **22** is com-

monly employed in seal end cartons to facilitate dispensing of the product from the carton by the consumer.

Foldably connected to the upper peripheral portions of panels 16–18 and 20 by foldlines 24–27 are flaps 28, 30–32 respectively. Flaps 28 and 31 are commonly referred to as end flaps and flaps 30 and 32 in turn are commonly referred to as side flaps. As will be more fully described hereinafter, end and side flaps are adapted to be folded relative to one another so as to close off the end of the carton.

Side flap 30 in the illustrated embodiment is the outermost, or exposed flap when the carton end is closed. Connected by foldlines 33 and 34 at opposite peripheral portions of side flap 30 are laterally extending ears 35 and 36, which are commonly referred to as Van Buren type ears. When the carton seal end is formed, see FIG. 6, the ears 35 and 36 overlie and are secured to the upper portion of the exposed surfaces of end panels 16 and 18 respectively. Ear 36 is adapted to completely overlie the punch-out area 22 of end panel 18. It will be noted in FIG. 1 that the ears are formed from the adjacent end flaps and two sides of each ear 35 and 36 are separated from the respective end flap 28 or 31 by cutting scorelines or slits 37 and 38. Thus, one side edge portion of each end flap 28 and 31 is deformed or cut back by the amount that the ear 35 or 36 extends laterally from side flap 30.

Side flap 32, which is the inner flap and is overlapped by side flap 30, when the carton sealed end is formed, has the outer edge 40 thereof, opposite foldline 27 of lesser dimension than the extent of such foldline. By reason of this fact, at least one edge portion 41 of flap 32 is recessed, or both edge portions 41 and 42 are recessed, whereby, when the flaps are folded to close the carton end, one or both edge portions will be spaced inwardly from the plane of the exposed end panel surface notwithstanding that the carton should not attain a true squared up condition prior to the ears 35 and 36 being folded down and secured to such end panel surfaces. Thus, the edge portions 41 and 42 will not interfere with the proper folding of the ears and therefore such ears will effect proper squeezing and flowing of the non-hardening plastic material 39, see FIG. 7, applied at the carton edges in the manner described in the aforenoted United States patent.

In the form of blank shown in FIG. 1 both edge portions 41 and 42 are recessed. For reasons to be hereinafter enumerated it is essential that edge portion 41 be recessed because in the manner in which panels are folded relative to one another there is an inherent tendency for the carton to become distorted in one direction only. The extent to which edge portion 41 is recessed with respect to the projection 14*a* of foldline 14 may vary to considerable degree. It will be noted for example in FIG. 1 that the segment 41*a* of the edge portion 41, that is the segment adjacent the outer edge portion 40 or remote from foldline 27, is recessed a lesser amount than the central segment 41*b* of the edge portion 41. The reason for segment 41*a* being of lesser recess is that it will provide a smaller size void at the corner 11*a* of the setup carton, see FIG. 5, in which the subsequently applied non-hardening plastic material 39 is required to fill. The applied plastic material is possessed of an inherent characteristic that it will flow under pressure and thus fill any voids in the carton edge so as to render the carton edge moisture and infestation proof.

In the modified blank 10' shown in FIG. 8 the various parts thereof comparable to those of blank 10 will be similar numbered except for the prime designation. The outer segment 41'*a* of the edge portion 41' of blank 10' is recessed the same amount as the central segment 41'*b* with respect to the projection 14'*a* of foldline 14'. Aside from this difference, blanks 10 and 10' are the same in other respects. With most types of plastic sealing materials applied to edge of the carton in the manner set forth in the aforementioned United States patent, the

plasicity thereof is such that the material will readily flow and fill up such voids formed in the carton edge when pressure is applied to the plastic material as the ears 35, 35' and 36, 36' are folded into secured position with respect to the exposed surfaces of the adjacent end panels.

It will be noted in either blank 10 or 10' that the edge portion 43 or 43' of end flap 31 or 31' which edge portion is disposed normal to the end flap foldline 26 or 26', is substantially rectilinear and is axially aligned with the foldline 14 or 14' between end panel 18 or 18' and side panel 20 or 20'. Likewise, the corresponding edge portion 44 or 44' of end flap 28 or 28' is also substantially rectilinear and aligned with peripheral edge 45 or 45' of end panel 16 or 16'. The rectilinear configuration of these edge portions of the end flaps aid materially in attaining and retaining the setup carton in a squared condition. This aid is effected, when the end flaps are folded, by reason of the rectilinear edge portions frictionally engaging the inside of the foldline 27 or 27' for side flap 32 or 32' and thus serve to resist the carton becoming distorted or out-of-square, see FIGS. 3 and 5.

The width or shape of slot 46 or 46' formed by reason of the recessing of flap edge portion 41 or 41' may vary from that shown but will be determined in large measure by the ability of the blanking machine to readily remove the strip of paperboard so as to form the slot.

The bottom closing flaps 47, 48, 50 and 51, see FIG. 6, are normally not provided with recessed edge portions or Van Buren type ears, because the problem of effecting a proper adhesive bond between the folded flaps is not generally acute because oftentimes the forming of the closed bottom end is done about a mandrel inserted within the carton interior, before the latter is filled with the desired product. If desired, however, the bottom flaps may assume the same configuration as the corresponding top flaps.

In forming the seal end of the carton, an adhesive is first applied to the upper surfaces of the folded end flaps prior to side flap 32 being folded thereover. An adhesive is then applied to either the upper surface of the folded side flap 32 or the concealed surface of the outer flap 30 prior to the latter being folded into overlapping relation with flap 32. The non-hardening plastic material 39 is then applied under ears 35 and 36 along foldlines 33 and 34. The ears are then folded down and adhesively secured to the exposed surface of the adjacent end panel. The foregoing steps are normally carried out by automatic machinery.

As shown in FIG. 7, to provide access to the interior of the seal end carton, the consumer merely presses inwardly on ear 36 or 36' which, in turn, causes the punch-out area 22 of panel 18 to break away from the panel along weakened scoreline 23. With ear 36 and the adhesively attached area 22 in the position shown in dotted lines in FIG. 7, the contents 52 of the carton may be dispensed through the resulting opening formed in the panel 18.

The side flaps 30 and 32, or 30' and 32' of the illustrated blanks 10 and 10' are of such dimension, taken normal to the their foldlines, that they span completely the distance between the side panels when the carton is set up. This dimension, if desired, may be varied and in addition the length of the end flaps taken normal to their foldlines may also be varied from that shown without departing from the scope of this invention. It is understood, of course, that the configuration of the panels may also be varied from that shown.

Thus, it will be seen that an improved carton and carton blank have been provided which are not beset with the aforenoted shortcomings associated with prior structures. The improved blank facilitates the formation of a seal end, and results in a minimum of waste material during the blanking operation.

While several embodiments of the invention have heretofore been illustrated and described, it is to be under-

stood that the invention is not to be limited thereto, as further and additional modifications may be made without departing from the scope of such invention.

We claim:

1. A foldable carton blank for use in forming a seal end carton, said blank comprising a pair of side panels and a pair of end panels, the panels of one pair being alternately arranged in side by side relation with the panels of the other pair and being foldably connected thereto to cooperate with one another to form upright walls of the carton; transversely extending first and second side flaps foldably connected to corresponding peripheral portions of said side panels, said first side flap being foldable into overlapping relation with respect to said second side flap; transversely extending end flaps foldably connected to corresponding peripheral portions of said end panels, said end flaps when folded being adopted to subtend said second side flap, an edge portion of one of said end flaps adjacent said second side flap being separated therefrom by a slot; and ears extending laterally from opposite peripheral portions of said first side flap, said ears being adapted to overlie and be secured to the end panel exposed surfaces when the carton seal end is formed; said second side flap having the edge portion thereof opposite the foldably connected edge portion thereof of lesser dimension than said foldably connected edge portion whereby the slot-forming edge portion of said second side flap will have the segment thereof remote from the foldline of said second side flap recessed and spaced from the adjacent ear when the latter is folded and secured to the end panel exposed surface.

2. The carton blank recited in claim 1 wherein the dimension of each side flap taken normal to the line of fold therefor is substantially equal to the spacing between the side panels when the carton seal end is formed.

3. The carton blank recited in claim 2 wherein each end flap has an elongated edge portion engaging the line of fold of said second side flap, when the carton seal end is formed.

4. The carton blank recited in claim 1 wherein the slot-forming edge portion of said one end flap is aligned with a line of fold between said side and end panels and the slot-forming edge portion of said second side flap remote from the foldline of said second side flap is recessed from the projection of said line of fold.

5. The carton blank recited in claim 4 wherein the

recess of the slot-forming edge portion of said second side flap is greatest at a central segment of said slot-forming edge portion.

6. A seal end carton comprising a pair of oppositely disposed end panels, a pair of oppositely disposed side panels foldably connected to said end panels and forming the upright walls of said carton, side flaps foldably connected to said side panels and arranged in overlapping relation, end flaps foldably connected to said end panels and folded into subtending relation with the innermost of said overlapping side flaps, and laterally extending ears foldably connected to the outermost of said overlapping side flaps and folded into overlapping relation with and secured to the exposed surfaces of said adjacent end panels; the edge portion of the innermost side flap opposite the foldline thereof being of lesser dimension than the extent of said foldline whereby at least one of the edge portions of said innermost side flap, adjacent one of said ears, is recessed inwardly from the plane of the exposed end panel surface to which said one ear is secured, whereby the said edge portion of the innermost side flap will not obstruct the folding of the said adjacent one ear into overlapping and secured relation with respect to the exposed end panel surface.

7. The seal end carton recited in claim 6 wherein the recessed edge portion of said innermost side flap has a greater recess at the central segment thereof.

8. The seal end carton recited in claim 6 wherein each end flap has a rectilinear edge portion which is in engagement with the foldline of said innermost side flap.

9. The seal end carton recited in claim 6 wherein each edge portion of the innermost side flap adjacent the secured ear is recessed inwardly from the plane of the exposed end panel surface to which said ear is secured.

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