Jan. 25, 1966 A. J. WEISS 3,231,171

CARTON

Filed May 27, 1963 2 Sheets-Sheet 1

FIG. 1

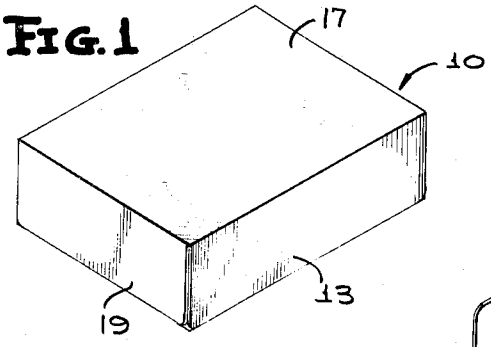


FIG. 2

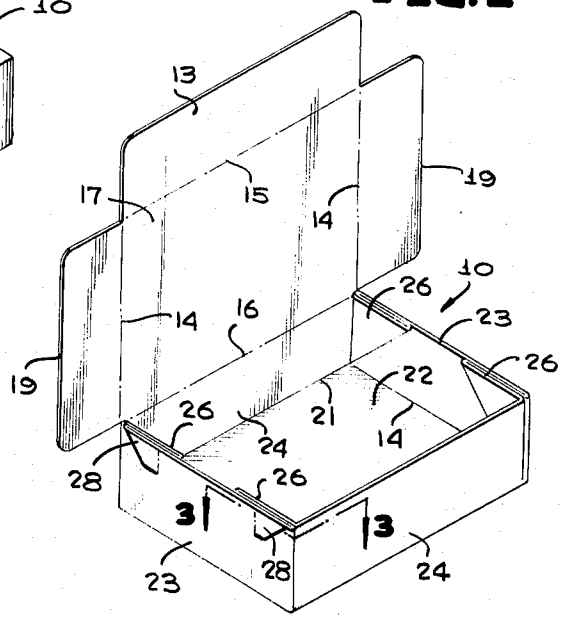
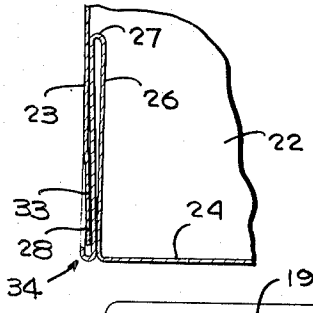


FIG. 3



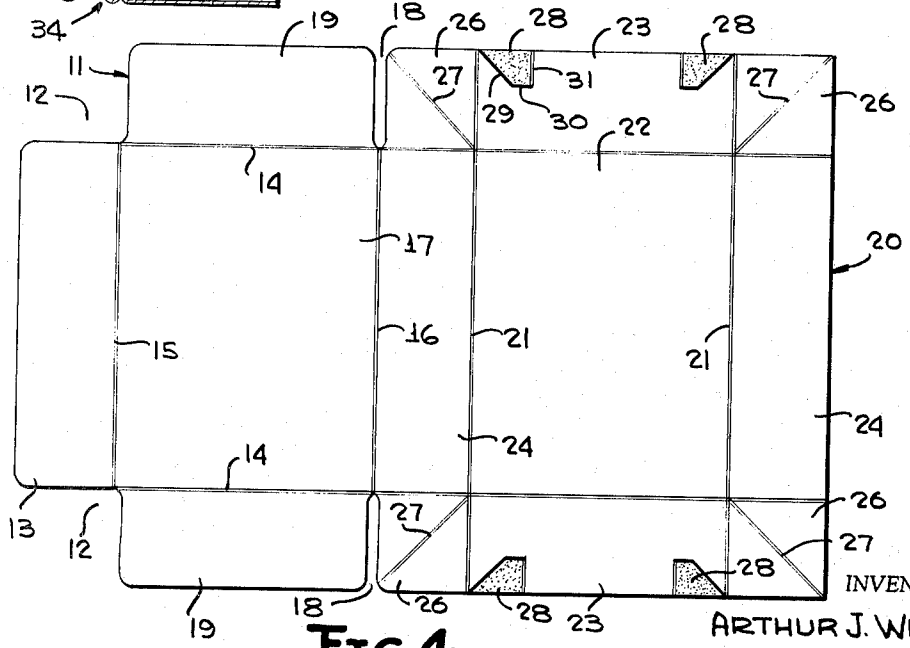


FIG. 4

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CARTON

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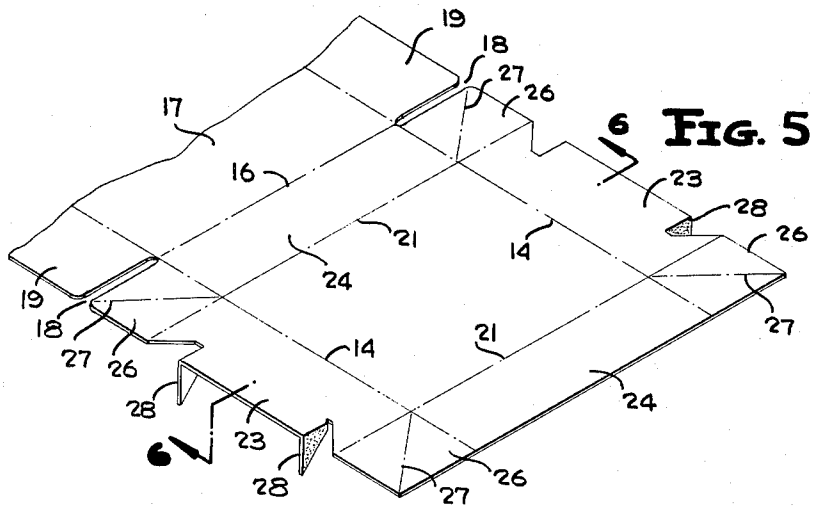


FIG. 5

FIG. 6

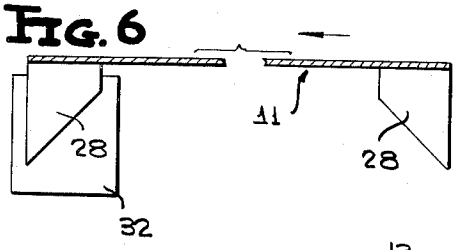


FIG. 7

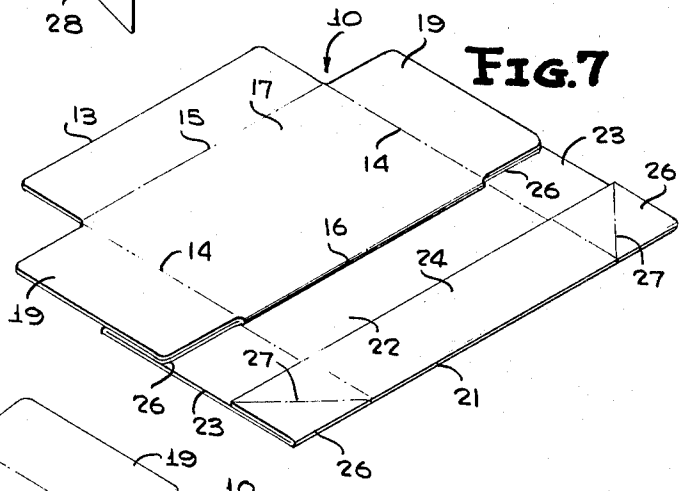
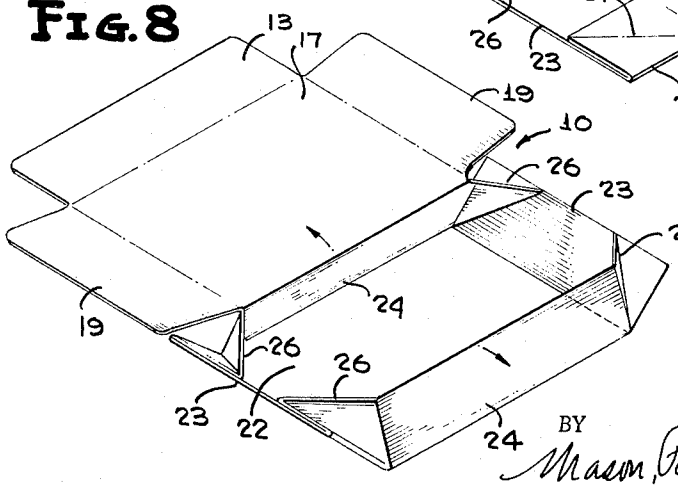


FIG. 8



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3,231,171

CARTON

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Filed May 27, 1963, Ser. No. 283,334
4 Claims. (Cl. 229—31)

This invention relates in general to new and useful improvements in cartons, and more particularly relates to a novel carton which is folded flat when completely bonded together and may be readily opened for the reception of a product. The invention also relates to the blank from which the carton is formed and the novel method of bonding together the corners of the carton.

In the past, there have been devised cartons which have the corners thereof secured together and the cartons being shipable in a flatly folded condition for ease of opening. However, the corners of such cartons are relatively weak and normally require a reinforcing type cover to maintain the necessary strength of the corners. Accordingly, it is the primary object of this invention to provide a novel carton construction which may be folded into a flat state for shipment and storage and at the same time is provided with sufficiently strong corners so that the carton may be of the type wherein the cover portion thereof is of the type having depending flanges which may be received within the confines of the lower portion of the carton, or secured to the exterior thereof.

Another object of this invention is to provide a novel carton which has folded corner members integrally connected to end and side panels thereof and which corner members are permanently bonded to either the end panels or side panels whereby folding of the corner members after the carton has been set up is prevented.

Another object of this invention is to provide a novel carton construction which includes a lower portion defined by a bottom panel, side and end panels, and corner members integrally connected to the side and end panels, the carton being formable in a flatly folded state at which time the corner members are permanently secured to either the end panels or the side panels so that the complete folding and bonding together of the carton may be accomplished in a single series of steps.

Another object of this invention is to provide a novel carton of the type having inwardly folding corners wherein the carton may be totally assembled in a flat state and then set up for receiving a product, the carton differing from prior cartons of this type by the provision of tabs on either end panels or side panels thereof, which tabs are bonded to the corner members and serve to prevent relative folding of the corner members after the carton has been set up and a product placed therein.

Still another object of this invention is to provide a novel carton of the type which is initially formed in a flatly folded state and has corner members folded and extending between end panels and side panels of the carton, and the corner members in the flatly folded state of the carton being bonded to either the end panels or side panels whereby when the carton is set up, the corner members automatically fold into generally halves opposing one another and disposed alongside the respective panel to which the respective corner member is secured.

Still another object of this invention is to provide a novel blank for forming a carton which may be completely formed in a flatly folded state and then readily opened to a product receiving state, the blank being rectangular in outline and having disposed adjacent each edge thereof a fold line, the fold lines being generally parallel to their respective edges and combining to define a bottom panel, a pair of end panels, a pair of side panels and four corner members integrally connected to the end and side panels, and there being struck either from the side panels or the end panels tabs which may be secured to respective portions of the corner members in the initial step of forming the carton whereby strengthening of the connections between the side panels and the end panels through the corner members is accomplished.

A still further object of this invention is to provide a novel method of forming a flatly folded carton from a rectangular blank having fold lines defining a centrally located bottom panel and peripherally disposed side panels, end panels and corner members, the method comprising the steps of folding either the end panels or the side panels into overlying relation with respect to the bottom panel and the corner members into overlying relation with respect to either the side panels or the end panels, as the case may be, and simultaneously bonding the corner members to tabs struck from the panels overlying the corner members.

Another object of this invention is to provide a novel method of forming a flatly folded carton from a rectangular blank comprising the steps of displacing from the plane of the blank pairs of tabs, treating the tabs so that they will adhere to corner members of the carton, and then folding edge panels of the carton into overlying relation to the tabs while forcing the tabs back into the initial plane of the blank so as to affect securement of the corner members to the tabs.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a top front perspective view of a carton formed in accordance with this invention.

FIGURE 2 is a perspective view similar to FIGURE 1 and shows the carton in a set up state ready for receiving a product and prior to the folding of the cover panel into the carton closing position.

FIGURE 3 is an enlarged fragmentary horizontal sectional view taken generally along the line **3—3** of FIGURE 2 and shows the specific details of the corner construction of the carton formed in accordance with this invention.

FIGURE 4 is a plan view of a blank for forming the carton of FIGURE 1.

FIGURE 5 is a fragmentary perspective view of the blank of FIGURE 4 and shows tabs of the blank struck therefrom to a vertical position wherein the tabs are heat treated as a preliminary step to the bonding of the tabs to corner members of the carton.

FIGURE 6 is a schematic longitudinal sectional view taken generally along the line **6—6** of FIGURE 5 with intermediate portions broken away and shows the manner in which the tabs are brought into engagement with an iron to effect the heat treatment of the surface layer of the blank along the tabs.

FIGURE 7 is a perspective view of the completed carton in its flatly folded position prior to the setting up thereof.

FIGURE 8 is a perspective view similar to FIGURE 7 and shows the carton being set up.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIGURES 1 and 2 a carton formed in accordance with this invention, the carton being generally referred to by the numeral **10**. The carton **10** is formed from a generally rectangular blank which is best shown in FIGURE 4 and which is generally referred to by the numeral **11**.

The blank **11** has opposite corners thereof cut away, as at **12**, to define a projecting front cover flap **13**. The blank **11** is provided with a pair of fold lines **14** which

extend longitudinally thereof in alignment with edges of the front cover flap 13. A transverse fold line 15 intersects the left ends of the fold lines 14 and serves to set off the front cover flap 13. A transverse fold line 16 extends between the fold lines 14 in spaced relation to the fold line 15 and together with the fold lines 14 and 15 sets off a cover panel 17. The blank 11 is provided with a pair of notches 18 outwardly of the fold lines 14 in alignment with the fold line 16 to set off a pair of cover flaps 19 which are hingedly connected to the cover panel 17 along the fold line 14.

That portion of the blank 11 disposed to the right of the fold line 16 is generally rectangular in outline and defines what may be considered a lower carton blank portion. This carton blank portion, if made separate from the remainder of the blank 11, could be set up as an open top carton, as will be readily apparent upon reviewing FIGURE 2, and considered the upper portion of the carton 10 cut off along the fold line 16. This lower carton blank portion, which is identified by the numeral 20, is provided with a pair of transverse fold lines 21 which extend entirely across the carton blank 11. It will be readily apparent that the fold lines 14 and 21 are disposed adjacent to and parallel to the adjacent peripheral edge portions of the lower carton blank portion 20. The fold lines 14 and 21 combine to define a centrally located bottom panel 22 and edge panels which include end panels 23 and side panels 24. The fold lines 14 and 21 also define rectangular corner members 26 which are hingedly connected to the end panels 23 along the fold lines 21 and to the side panels 24 along the fold line 14. Each corner member 26 is also provided with a diagonal fold line 27.

The carton blank 11, as described above, could be folded into a carton, if so desired. However, the corners of the set up carton would be weak and the carton could be readily opened so as to spill the contents thereof. In order to strengthen the carton 10, the carton blank 11 is provided with pairs of tabs 28. Each of the end panels 23 is provided with two tabs 28, the tabs being disposed adjacent the fold lines 21. Each tab 28 is separated from the remainder of its respective end panel 23 by a diagonal cut line 29 extending generally parallel to the adjacent fold line 27 and from the intersection of the adjacent fold line 21 with the outer border of the blank 11. The cut line 29 terminates at its inner end in a short cut line 30 which extends parallel to the adjacent fold line 14 and away from the adjacent fold line 21. Each tab 28 is further defined by a fold line 31 which extends from the end of the cut line 30 disposed remote to the cut line 29 to the periphery of the blank 11, the fold line 31 being disposed parallel to the fold lines 21.

At this time it is pointed out that if the blank 11 consisted solely of the lower carton blank portion 20, the tabs 28 could be formed equally as well in the side panels 24.

The blank 20 may be of any desired construction. However, in accordance with this invention, it is proposed to heat seal the tabs 28 to the corner members 26. Therefore, the carton blank 11 must have a heat bondable surface on at least that face thereof which is to define the interior of the carton 10. However, it is to be understood that if an adhesive is to be applied to the tabs 28 as opposed to a heat seal for effecting the bonding thereof to the corner members, then the carton 10 could be formed of any desired type of paperboard. It is, of course, desirable in many instances that the carton blank 11 have a moisture resistant surface layer which is preferably one of the many known heat sealable plastics conventionally used in carton manufacture.

Referring now to FIGURES 5 and 6 in particular, it will be seen that in the initial step of forming the carton 10, the tabs 28 are struck downwardly out of the plane of the carton blank 11 in which positions the tabs 28 may be readily treated separately from the remainder of the carton blank 11. When the tabs are in their downwardly struck positions of FIGURES 5 and 6, the tabs 28 may be brought into engagement with fixed irons, such as the iron 32, schematically illustrated in FIGURE 6. The upper surface of each tab 28, which is then vertically disposed, may be heated to the extent necessary to form a bond with other portions of the carton blank.

Immediately after the tabs 28 have been treated by the hot irons 32, the tabs 28 are then folded back into the plane of the carton blank 11 and the carton blank is folded along the fold lines 21 so that the side panels 24 overlie the bottom panel 22 and the corner members 26 overlie the end panels 23. Due to the fact that the corner members 26 are brought into pressure contact with the heat treated tabs 28, the corner members 26 are immediately bonded to the heat treated tabs 28 so as to secure the corner members 26 to the end panels 23.

At this time it is pointed out that if only the lower portion of the carton 10 was being formed, and no carton cover existed, it would be possible to have formed the tabs 28 in the side panels 24 and the end panels 23 would have been folded over onto the bottom panel 22 with the corner members 26 overlying the side panels 24. This folding would also be possible with the folded carton blank. However, it would require a change in direction of folding in the blank with a resultant requirement for either a change in direction of the folding of the blank or special equipment to effect the folding thereof in a direction normal to the direction of movement of the blank.

The carton 10 appears in its fully formed flatly folded condition in FIGURE 7. In this condition, the carton 10 is suitable for shipment and storage and at the same time, is ready to be immediately set up. The carton occupies a minimum of space and is readily suitable for insertion into a machine which will automatically open and set up the same, or the opening and setting up of the carton 10 may be accomplished manually.

Reference is now made to FIGURE 8 wherein there is shown that by moving the side panels 24 upwardly and away from each other in the directions shown by the arrows, the carton 10 may be readily set up from its flatly folded position of FIGURE 7 to its product receiving position of FIGURE 2.

Reference is now particularly made to FIGURE 3 wherein the corner construction of the carton 10 is illustrated. It will be readily apparent that the corner member 26, which was folded along the fold line 27 in the setting up of the carton 10, has one half thereof secured against the inner face of the adjacent end panel 23 by the bond 33 formed by the corner members 26 and the associated tabs. At the same time, the other half of the corner member 26 is in face-to-face relation with respect to that half secured to the tab 28 so that there is a definite reinforcement of the carton corner, which carton is referred to by the numeral 34.

When the carton 10 has been erected, as shown in FIGURE 2, it can be folded to its flat condition only by outward movement of the end panels 23 accompanied by inward movement of the side panels 24. Once a product has been placed within the container 10, it will be readily apparent that this is not possible.

The flaps 19 are folded generally normal to the cover panel 17 after the product has been placed in the carton 10, and the cover panel 17 is folded along the fold line 16 with the flaps 13 and 19 being folded down around the outer walls of the lower portion of the carton 10. This is best shown in FIGURE 1. The flaps 13 and 19 may be heat sealed to the front one of the side panels 24 and to the end panels 23, if it is so desired. Also, under certain conditions, it may be desired that the flaps 13 and 19 be folded into the interior of the lower portion of the carton. This is readily done.

From the foregoing, it will be seen that there has been devised an extremely simple carton construction which requires but a minor change in existing carton constructions, but wherein the minor change facilitates the formation of the carton forming blank, provides a carton that may be completed in its flatly folded state so as to facilitate storage and shipment, and at the same time results in the formation of a carton having strong corners as opposed to previous cartons of this type. In addition, the arrangement of the tabs permits the tabs to be readily heated to provide for the necessary bonding of the tabs to the corner members or adhesive may be readily applied to only the tabs. The specific carton construction requires only a minor change over known blank arrangements, but at the same time permits the formation of the cartons automatically in an economically feasible manner. In addition, the resultant cartons may be readily set up without damaging the corner constructions or weakening the same in any manner.

Although only a preferred embodiment of the invention has been specifically illustrated, it is to be understood that minor modifications may be made therein within the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. The carton comprising a bottom panel, side panels and end panels disposed in upstanding relation around the periphery of said bottom panel, said end panels having free upper terminal edges, folded corner assemblies between and wholly internally of adjacent ones of said side and end panels, each folded corner assembly including an imperforate member of a generally rectangular outline joined to adjacent ones of said end and side panels along adjacent edges of said corner member, a diagonal fold line extending across said corner member dividing said corner member into halves folded upon itself and a tab partially cut from each of said end panels and bonded to a respective one of said corner assemblies, each of said tabs lying externally of an associated one of the corner assemblies, each tab being defined by a cut line extending between the bottom edge of a fold line disposed remote from an associated one of the corner members and terminating more closely adjacent said associated corner member, each of said cut lines cutting through the upper terminal edge of an associated end panel whereby the tabs

are partially defined by the upper edges of the end panels, and an integral cover hingedly connected to one of said side panels.

2. A flatly folded carton comprising a rectangular bottom panel, side and end panels hingedly connected to said bottom panel along opposite sides and ends thereof, integral imperforate rectangular corner members hingedly connected to adjacent ones of said side and end panels along adjacent sides of each corner member, said end panels lying in the plane of said bottom panel, said side panels and said corner members being folded into overlying relation to said bottom panel and said end panels respectively, said corner members being secured to said end panels in face-to-face relation, the connection between each end panel and an associated corner member being through a tab partially struck from and hingedly connected to said end panel, and a closure panel hingedly connected to one of said end panels and being reversely folded to overlie said one end panel and a portion of said bottom panel.

3. The carton of claim 2 wherein said carton is formed of a material having a heat bondable surface, and the connections between said end panels and said corner members being heat sealed.

4. The carton of claim 2 wherein the connection between each end panel and an associated end member is through a tab partially struck from and hingedly connected to said end panel, each tab being hingedly connected to the remainder of the respective end panel along a line parallel to and remote from the respective hinge connection between the respective end panel and corner member.

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