July 26, 1960 E. W. CREELMAN 2,946,499

HINGE TYPE CARTON

Filed July 10, 1958 3 Sheets-Sheet 1

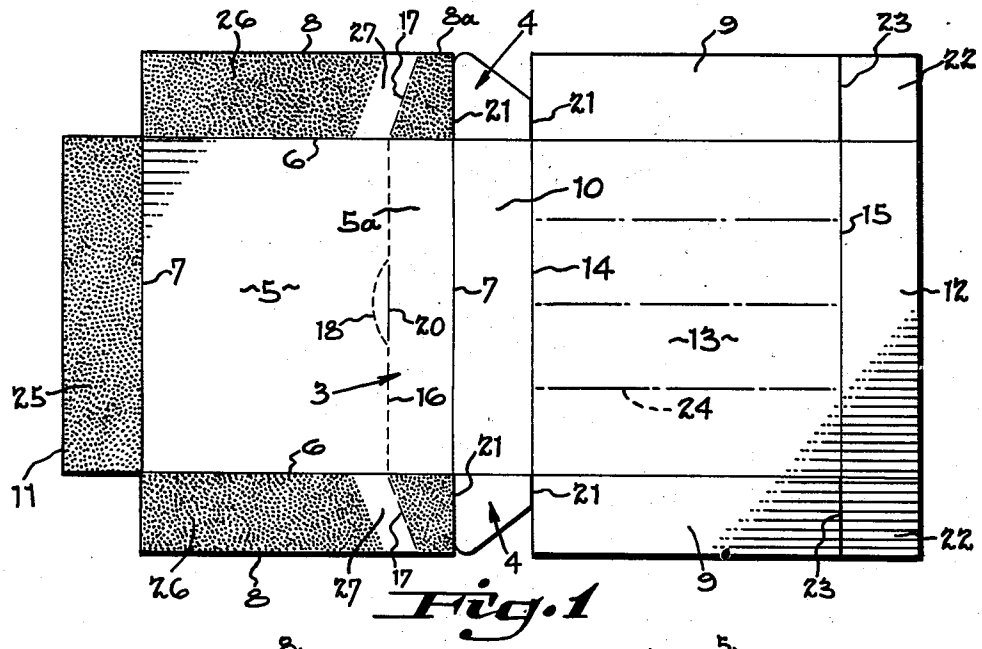


Fig. 1

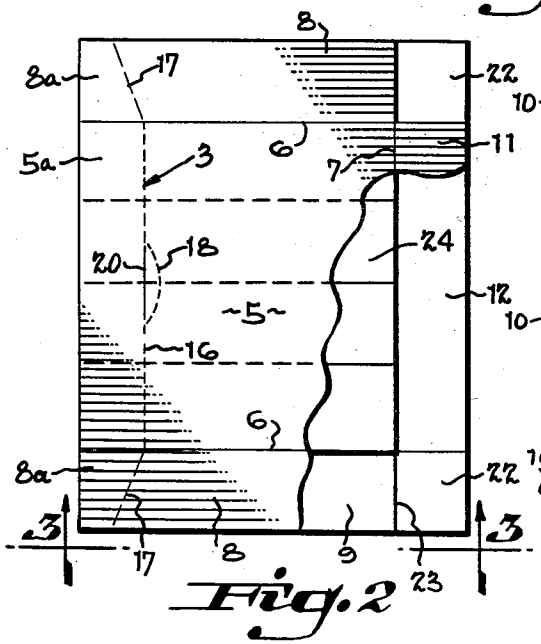


Fig. 2

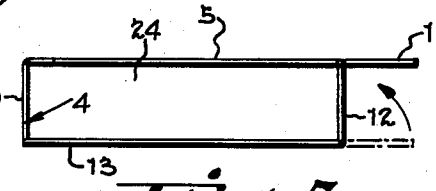


Fig. 3

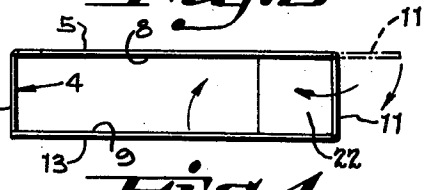


Fig. 4

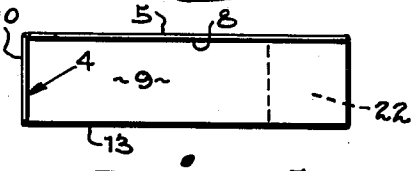


Fig. 5

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HINGE TYPE CARTON

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3 Sheets-Sheet 2

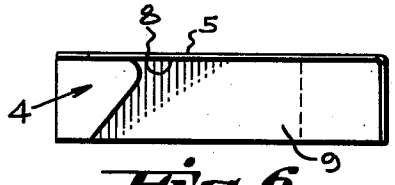


Fig. 6

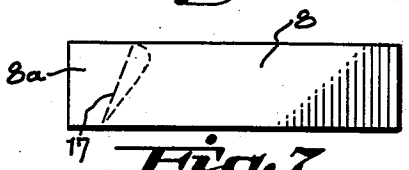


Fig. 7

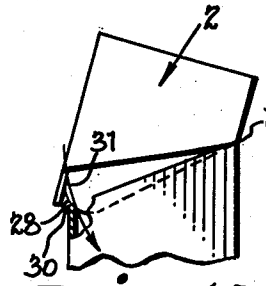


Fig. 15

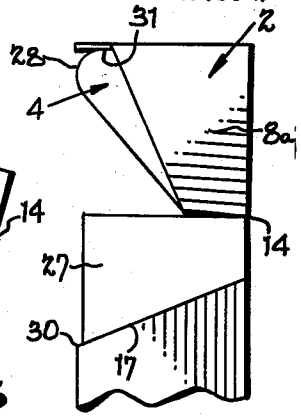


Fig. 14

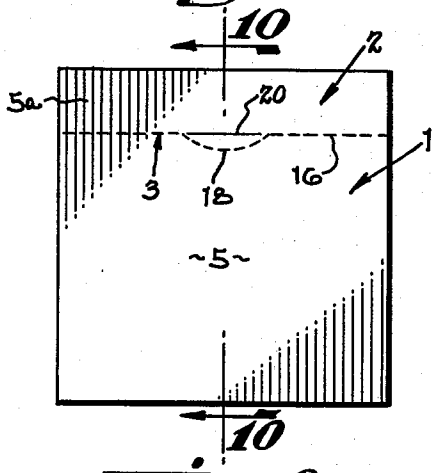


Fig. 8

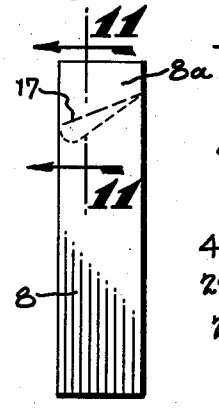


Fig. 9

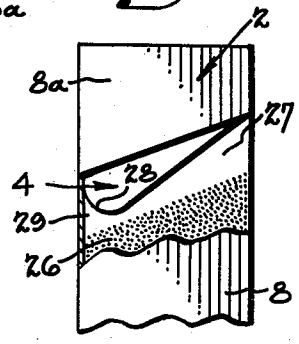


Fig. 12

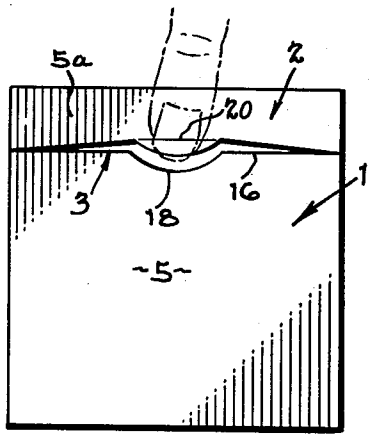


Fig. 13

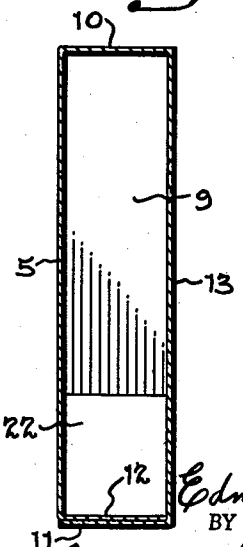


Fig. 10

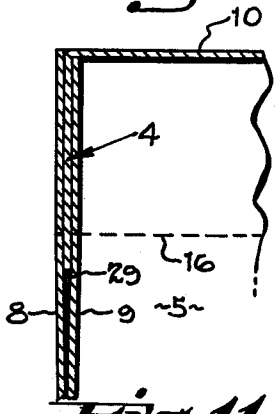


Fig. 11

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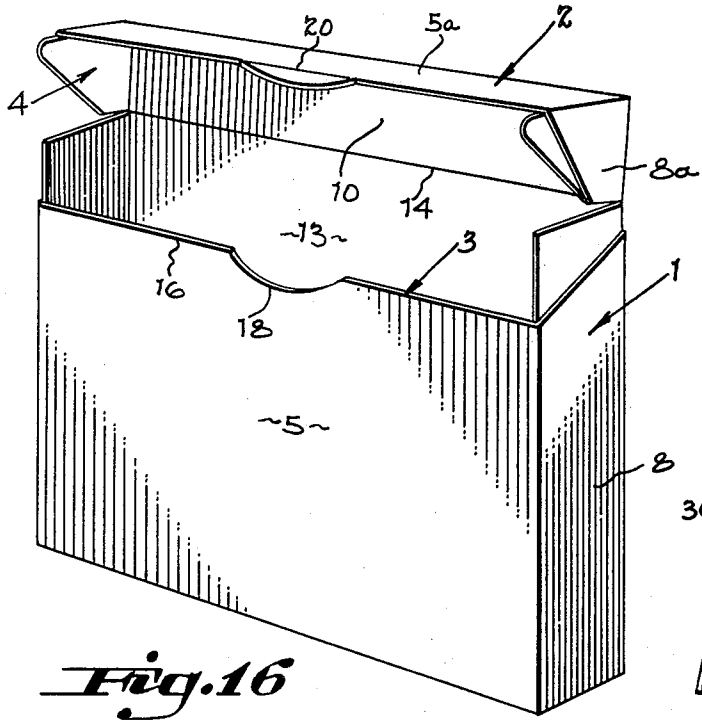


Fig. 16

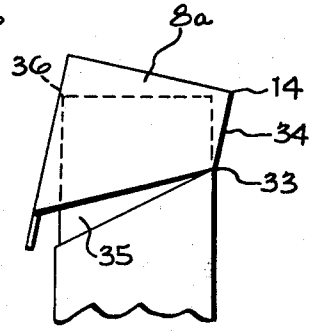


Fig. 18

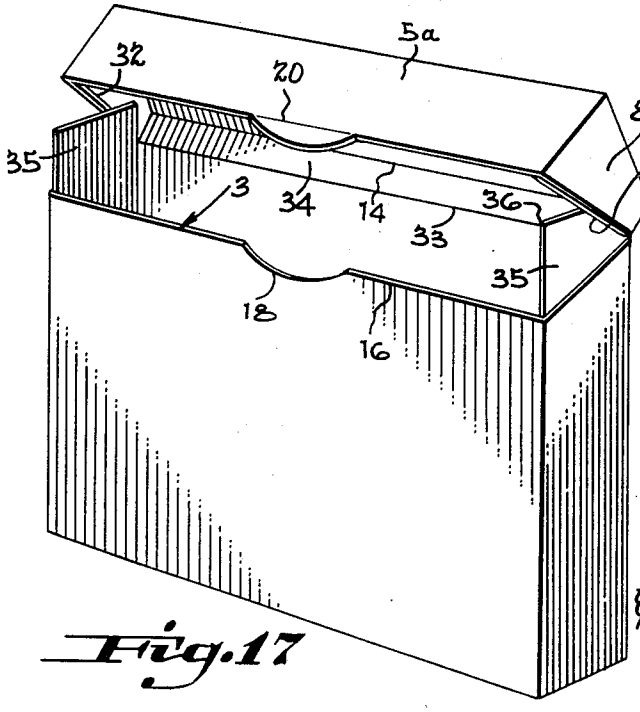


Fig. 17

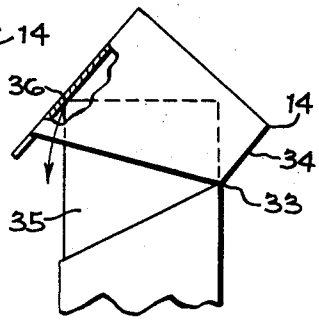


Fig. 19

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Patented July 26, 1960

2,946,499

HINGE TYPE CARTON

Edmund W. Creelman, Cincinnati, Ohio, assignor to The C. W. Zumbiel Company, Cincinnati, Ohio, a corporation of Ohio

Filed July 10, 1958, Ser. No. 747,652

5 Claims. (Cl. 229—37)

This invention is directed to a carton fabricated from a one-piece sheet blank, the carton being provided with a hinged cover and useable as a storage container. The invention further is directed to a method of erecting the blank about the merchandise to provide a package in which the hinged cover is sealed in closed position, to be presented to the ultimate user with the contents sealed in.

The present carton is intended particularly for packaging butter, oleomargarine, and similar products which are produced in quarter-pound sticks and packaged in side-by-side relationship, usually in a moisture-proof carton. The conventional butter carton is of a type in which a one-piece blank is folded about the merchandise and locked in erected condition by appropriate tucking flaps. This type of carton is quite satisfactory for the shipment and handling of the product. However, the carton is not permanently erected and has a tendency to return to flat condition once it has been opened. As a consequence, after initially opening the package, the housewife usually wraps the carton loosely about the remaining butter sticks for storage in the refrigerator. However, the quality of the butter is better preserved by keeping it in a closed container because butter is likely to absorb flavors from other foods stored in the refrigerator.

One of the primary objectives of the present invention has been to provide a normally sealed carton having a hinged cover and adapted particularly for packaging sticks of butter and the like, wherein the carton remains permanently erected after the cover has been unsealed and opened, so as to provide a closed storage receptacle for preserving the quality of the sticks of butter during storage in the refrigerator.

A further objective has been to provide a latching device on the hinged cover, coacting with the body of the carton, by means of which the unsealed cover conveniently may be locked in a closed position while the carton is used as a temporary storage receptacle.

According to the present concept, the carton is erected by placing the butter sticks or bars upon one panel of the blank, then folding the several panels in sequence about the contents, utilizing the contents to support the panels and flaps during erection. During erection, the flaps at the bottom and two sides are folded one upon another in overlapping relationship and permanently united with an adhesive. The blank is provided with a weakened tear line which upon erection of the blank, delineates the hinged cover as an incident to the erection. The package is thus presented to the user in sealed condition, clearly showing that the contents have not been disturbed after leaving the hands of the producer. To open the package, the seal is broken by rupturing the tear lines, thereby converting the upper portion of the package into a hinged cover.

In order to latch the hinged cover in its closed position after the package initially has been opened, the swinging portion of the hinged cover is provided with latching tabs which slide relative to respective pockets formed in the upper portion of the carton side walls. The forward edge of each tab intercepts a forward edge of its pocket and latches the cover in its closed position by a camming action to protect the contents during storage. To provide the pockets, the side walls of the erected carton are of two-ply formation adhesively secured together, with non-adhesive areas delineating the pockets.

A further aspect of the invention resides in a simple method of erecting the panels of the blank in predetermined sequence, whereby the locking tabs are properly located within the pockets at opposite sides of the carton during erection of the blank. For this purpose, the one-piece blank is erected about the contents in wrap-around fashion, the opposite ends of the blank having respective bottom flaps which are adhesively secured in overlapped relationship to form the bottom of the carton. After the bottom flaps are joined, one pair of side flaps is folded inwardly, then the latching tabs, which project outwardly from the top wall panel, are folded inwardly upon the surface of the side flaps. Finally, a second pair of side wall flaps is folded and adhesively secured in overlying relationship with the latching tabs and with the first pair of side flaps to complete the sealed package. The adhesive is interrupted in an area which is occupied by the endwise portions of the latching tabs to provide the pockets. The user unseals the package by rupturing the tear lines; the latching tabs are withdrawn from their pockets with the top cover when it is hinged to its open position and reenter the pockets when the cover is hinged to closed position.

In the preferred mode of fabrication, a heat-sensitive adhesive is applied to the flat blank upon the flap surface which form the overlapped bottom and side walls. This adhesive is of a type which provides a strong bond in response to momentary application of heat to the overlapped flaps as the package advances through the machine; consequently, the cartons may be filled and erected at a high production rate. It will be understood that the over-folded flaps, in the alternative, may be secured with a conventional liquid adhesive applied during the erection of the carton, utilizing the present method of sequential erection of the flaps.

It will be understood that the carton disclosed herein is selected to illustrate the principles of the invention; the carton readily may be modified in size and shape to accommodate various other types of merchandise. The various features of the invention will be more fully apparent to those skilled in the art from the following detailed description taken in conjunction with the drawings in which:

Figure 1 is a plan view of the one-piece sheet blank before erection, as viewed toward the internal surface of the blank;

Figure 2 is a view of the blank with the articles placed in position for packaging, with the front wall panel folded over upon the articles. This represents the first step in the filling and erection of the carton;

Figures 3–7 inclusive illustrate the subsequent steps in the progressive folding of the blank as the carton is erected about the articles;

Figure 8 is a front view of the erected package with the hinged top in its sealed position;

Figure 9 is a side view of the completed package as projected from Figure 8;

Figure 10 is a sectional view taken along line 10—10 of Figure 8, detailing the wall structure of the erected carton with the articles omitted to clarify the view;

Figure 11 is an enlarged fragmentary sectional view taken along line 11—11 of Figure 9, further detailing the carton structure, particularly the latching tab of the hinged cover;

Figure 12 is an enlarged fragmentary view taken from

Figure 9, further illustrating the latching tab of the hinged top cover;

Figure 13 is a view similar to Figure 8, showing the sealed top cover being parted along its tear line by the user preparatory to opening the package;

Figure 14 is an enlarged fragmentary side view showing the hinged cover in its open position;

Figure 15 is an enlarged view, similar to Figure 14, with the hinged cover partially closed;

Figure 16 is a perspective view of the erected carton with the top cover in open position to further illustrate its construction;

Figure 17 is a perspective view similar to Figure 16, showing a modified carton in which the latching tabs are omitted from the hinged cover;

Figure 18 is a fragmentary side view showing the modified top cover latched in partially closed position after the seal has been broken; and

Figure 19 is a view similar to Figure 18, showing the motion of the top cover as it is hinged to closed position.

Referring to the drawings, the carton blank, as shown in Figure 1, is stamped from a suitable paperboard stock for use in packaging butter, as in the present example, the blank is fabricated from moisture-resistant material. The blank is formed with a suitable cutting die which severs the blank to the required configuration, at the same time impressing into the blank the score lines and perforated tear lines. The upper surface of the blank in Figure 1 represents the internal surface of the erected carton; the name of the product and other indicia is applied to the opposite surface, which subsequently forms the external surface of the carton. The carton disclosed in the drawings is intended for packaging four quarter-pound sticks of butter in side-by-side relationship within each carton, the blank being configurated to provide a package which is generally square in one plane, having a thickness corresponding to the merchandise. The package preferably is packed and erected with an automatic cartoning machine in which the flat blanks are stacked in a magazine and fed individually therefrom, while the sticks of butter (or other articles) are advanced to the flat blanks and located thereon at the start of the operation. Thereafter, the several wall panels of the blank are folded over about the merchandise and adhesively secured, as explained below, ready for shipment and distribution to the user.

Referring to Figure 16, the finished package comprises a carton body indicated at **1** and a hinged top cover indicated generally at **2** which is sealed with respect to the carton body along a tear line indicated generally at **3**. The tear line delineates the hinged cover **2** as an incident to the erection of the carton and allows the top closure to be separated from the carton body (Figure 13) and swung to the open position for access to the contents. After removal of one or more of the articles, the carton forms a temporary storage receptacle which may be closed by forcing the top closure **2** back to its closed position, as shown in Figures 12 and 15. As explained later in detail, the latching tab, indicated generally at **4**, holds the top cover in its closed position after the package initially has been unsealed and opened.

Described in detail with reference to Figure 1, the carton blank comprises a front wall panel **5** delineated by the horizontal score lines **6—6** and vertical score lines **7—7**. Front panel **5** includes a pair of side flaps **8—8** joined along the horizontal score lines **6—6**, and a top wall panel **10** joined along one of the vertical score lines **7**; the top panel **10** resides to the right of the front panel **5**, as viewed in Figure 1. A bottom flap **11** is joined along the other vertical score line **7** to the left side of the front panel **5**. The bottom flap **11**, in the erect position of the carton, overlaps and is adhesively secured to a second bottom flap **12** which is joined to the rear wall panel **13**.

The rear wall panel **13** is joined to the top panel **10** along a vertical score line **14**, which forms the hinge line of the top cover, as explained later. The second bottom flap **12** is joined to the rear panel **13** along the vertical score line **15**. The rear panel **13** includes a pair of side flaps **9—9** similar to the side flaps **8** of the front panel **5**. Upon erection of the carton, the flaps **8** of the front wall panel overlap the flaps **9** of the rear wall panel, the matching flaps being adhesively secured together, as explained below.

The tear line, generally indicated at **3**, comprises interrupted slits extending as at **16** across the front panel **5** and having angular extension **17—17** extending across the side flaps **8**. The mid portion of tear line **16** includes an arcuate section **18** delineating a tear-out flap which may conveniently be ruptured for separating the top closure from the carton body. The tear-out flap is joined to the blank along the score line **20**, which interrupts the central portion of tear line **16**. It will be noted at this point, that the upper portion of the front panel **5**, as delineated by the tear line **16**, forms the front wall **5***a* of the hinged cover **4**; the angular tear lines **17** delineate the side walls **8***a* of the erected top cover; and the top wall **10** forms the top wall of the hinged cover.

Each latching tab, indicated generally at **4**, is joined to the top wall **10** along the score line **6** at opposite ends of the top panel. The tabs **4** are severed from the adjoining side flaps **8** and **9** by the slits **21—21** which extend inwardly to the respective score lines **6—6**. The bottom flap **12** is provided at opposite ends with corner flaps **22—22** joined along the score lines **6—6**. These flaps are severed from the adjacent side flaps **9** by slits **23** similar to the slits **21**.

In erecting the blank about the articles to be packaged, the bottom flaps **11** and **12** and the side flaps **8** and **9** are overfolded relative to one another and secured with an adhesive. The adhesive preferably is of the heat-sensitive type applied to the appropriate flap surfaces, as explained below. The flat blanks are intended to be fed individually from a stack by suitable mechanism on the cartoning machine to be progressively filled and erected during advancement.

After the blank is fed from the stack, the sticks of butter indicated by the broken lines at **24** (Figure 1) are advanced upon the rear panel **13**; thereafter, the top panel **10** and front panel **5**, as a unit is folded upwardly and over upon the merchandise, as indicated in Figure 2. The score lines, which delineate the several panels and flaps, provide lines of weakening having sufficient strength to support the flaps (Figure 2) prior to the flap folding operations. Thus, as viewed in Figure 3, the bottom flap **11**, which is joined to the front panel **5**, is self-supporting in its overhanging relationship with the merchandise. However, if necessary, the cartoning machine may be provided with suitable means for supporting the flaps before folding.

After the front panel **10** is folded over upon the merchandise, the lower bottom flap **12** is folded upwardly (Figure 3) from the position shown in broken lines to the position shown in full lines into facial contact with the ends of the merchandise **24**. At this point, the corner flaps **22** of bottom flap **12** remain in flat condition projecting outwardly from opposite ends of bottom flap **12**.

In the next operation, the overhanging bottom flap **11** is folded downwardly (Figure 4) as indicated by the arrow into facial engagement with the bottom flap **12** and adhesively secured thereto. For this purpose, the inner surface of flap **11** is coated with a heat-sensitive adhesive as indicated at **25** in Figure 1. In order to provide the bond, heat is applied momentarily to the external surface of the overlying bottom flap **11** after it is folded in place over flap **12**, thus activating the heat-sensitive adhesive and permanently joining the two flaps.

After the bottom is completed as shown in Figure 4, the corner flaps **22** at opposite ends of bottom flap **12** are folded inwardly, as indicated by the arrow in Figure

4, to overlie the opposite sides of the merchandise while the side flaps 8 and 9 overhang opposite sides of the merchandise.

After the corner flaps 22 are folded in, the lower side flaps 9 of rear wall panel 13 are folded upwardly, as indicated by the arrow (Figure 5) to overlie the corner flaps 22 and opposite sides of the merchandise. It will be noted in Figure 1, that the inner surface of each outer side flap 8 is coated with a heat-sensitive adhesive, as indicated at 26. However, a portion 27 of the flap adjacent the score line 17 is uncoated; the non-adhesive portion subsequently forms a pocket to be occupied by the latching tabs 4.

After the side flaps 9 are folded upwardly, the latching tabs 4 are folded in upon them, as shown in Figure 6; thereafter, the side flaps 8, of the front wall 5, are folded down (Figure 7) bringing the adhesive surface 26 into contact with flaps 9, and also with the infolded latching tabs 4. At this point, heat is applied momentarily to the external surface of the overfolded side flaps 8 to activate the adhesive coating 26, bonding flap 8 to flap 9. At the same time, the latching tabs 4 and the side wall portion 8a, which form the sides of the top cover, are bonded. However, the endwise portion of the tabs in the non-adhesive area 27 are not bonded; consequently, when the tear lines 16 and 17 are ruptured, the latching tabs 4, with the hinged cover, are free to be withdrawn from the pockets 29 (Figure 12) of the overlapped side flaps.

After the side flaps 8 and 9 are bonded, the package is completed and ready to be presented to the user in sealed condition, as shown in Figure 8. As shown in Figure 10, the completed carton is generally of single wall construction, with the exception of the bottom flaps 11 and 12 and the side flaps 8 and 9, which are overlapped and adhesively secured.

It will be understood that in place of the heat-sensitive adhesive, a conventional liquid glue may be utilized in erecting the carton. In this event, the liquid glue may be applied to the flap surfaces by suitable applicator means of the cartoning machine as the carton advances during the process of erection. However, the heat-sensitive adhesive is preferred because it permits more rapid erection of the carton due to its rapid bonding action in response to momentary application of heat.

In order to open the sealed package (Figure 13), the user ruptures the arcuate tear line 18 of the tear-out tab with the fingernail, then grasps the tab and exerts an upward force to rupture the transverse tear line 16 across the front and the angular tear lines 17—17 along the side walls. The top cover 2 then is swung back as shown in Figure 14 for access to the upper ends of the butter sticks. It will be noted that the top cover pivots about the hinge line, which is delineated by the score line 14, previously identified in Figure 1.

In order to latch the hinged top 2 in its closed position after the carton has been unsealed and opened, the user simply swings the cover about its hinge line in the downward direction. The forward edge of each latching tab 4 is curved as at 28 (Figures 14 and 15); as the cover swings down, the tab reenters the pocket 29 and intercepts the upper edge of the joined panels, as indicated at 30. The arrangement is such that the curved edge 28 creates a camming action with respect to the edge 30 as the cover approaches its closed position, as indicated in Figure 15. As the curved edge 28 cams along the edge 30, a compressive force develops across the tab 4, while an expansion force develops across the upper portion of the composite side wall or pocket 29. As the hinged top approaches its fully closed position (Figure 9), the straight edge portion 31 of tab 4 advances across the edge 30, allowing the tab and composite side wall to spring back to normal position. The camming action thus latches the hinged top in its closed position; the same camming action occurs when the tear-out tab is pulled upwardly to open the carton.

The modified structure shown in Figures 17–19 is similar to the above except that the protruding portions of the latching tabs 4 have been omitted; being sheared off along the line 32 (Figure 17). In this case, the blank is provided with a hinge line 33 located below the hinge line 14 of the primary form of the invention. Accordingly, a portion of the rear wall as indicated at 34 (Figures 17 and 18) swings with the top cover.

The modified carton is erected from the blank in the same sequence as described above, with the modified tab 4 adhesively secured to its companion flap, previously indicated at 8a in Figure 1. In the present instance, the adhesively secured flaps 4 and 8a reside to the exterior of the upwardly projecting side wall extensions indicated at 35 in Figure 17. The arrangement is such that the forward portion of the hinged top swings through an arc intercepting the upper corner 36 of the carton, as indicated by the arrow in Figure 19.

The modified carton is unsealed and opened by the user, as above described with reference to Figure 13, and the hinged top may be latched in partially closed position for temporary storage of the merchandise in the carton. As the hinged cover is forced down, the forward panel 5a of the top cover cams along the corner 36, as indicated by the arrow in Figure 19, creating a springing action between the hinged cover and carton side walls. After having been closed, the top cover tends to spring open; however, the corner 36 intercepts the forward wall 5a of the cover, thus latching it in partially closed position, as shown in Figure 18.

Having described my invention, I claim:

1. A carton formed from a one-piece blank and having a top cover hingedly connected to an open end of the carton, said carton comprising a carton body having opposed front and rear walls, a pair of side walls, and a bottom wall, said side walls comprising respective inner and outer side flaps overlapped one upon another and having an adhesive surface facially securing said flaps together, each pair of overlapped inner and outer side flaps having a non-adhesive area providing a respective pocket within the opposed side walls, each pocket having an open end adjacent the open end of the carton body, a top cover having a top wall hingedly joined to the rear wall of the carton body, said top cover having a front wall and a pair of side walls corresponding to the front and side walls of the carton body, said top wall having a pair of latching tabs joined thereto and residing parallel with the side walls of the top cover, said latching tabs being adhesively secured to the inner surface of the side walls of the top cover and having respective outer end portions projecting downwardly beyond the lower edges of said side walls, said outer end portions of the tabs depending downwardly into said pockets through the open ends thereof, said top cover being free to pivot relative to said rear wall to an open position withdrawing said latching tabs from said pockets, said outer end portion of each of said latching tabs having a forward edge which moves through an arc intercepting and forcibly camming against the upper edge of the respective pockets as the top cover is pivoted to said open position, the forward edges of the tabs latching the top cover relative to the carton body when the top cover is pivoted to a closed position relative to the carton body.

2. A carton having a normally sealed top cover hingedly connected to one end thereof, said carton comprising a carton body having opposed front and rear walls, opposed side walls, and top and bottom walls, each side wall having a pocket residing at an end portion of said carton body, said pockets having open ends adjacent said top wall, said top cover being delineated by a tear line extending transversely across said front wall in a plane spaced below said top wall, said tear line having endwise portions extending across said side walls, the portion of the front wall and side walls above said tear line forming the front and side walls of the hinged top cover, said

rear wall having a hinge line extending transversely thereof adjacent said top wall, said top wall having a pair of latching tabs joined thereto and residing parallel with the side walls of the top cover, said latching tabs being adhesively secured to the inner surface of the side walls of the top cover and having respective outer end portions projecting below the tear lines which extend across the side walls, said end portions of the tabs depending downwardly through the open ends of said pockets, said tear line adapted to be ruptured, whereby the top cover is free to be pivoted about said hinge line to an open position withdrawing said latching tabs from the open ends of said pockets, said outer end portion of each of said latching tabs having a forward edge which moves through an arc intercepting and forcibly camming against the open end of the respective pockets as the top cover is pivoted to said open position, the forward edges of the tabs latching the top cover relative to the carton body when the top cover is pivoted to a closed position relative to the carton body.

3. A carton having a normally sealed top cover hingedly connected to one end thereof, said carton comprising a carton body having opposed front and rear walls, opposed side walls, and top and bottom walls, said side walls comprising respective inner and outer side flaps overlapped one upon another and secured together, each pair of overlapped side flaps having an unsecured area in the upper portion thereof delineating a respective pocket within the opposed side walls, said pockets residing at an end of said carton body adjacent said top wall, said hinged top cover being delineated by tear lines extending transversely across said front wall in a plane below said top wall, said tear line having endwise portions extending across said outer side flaps, said tear delineating the front and side walls of the hinged cover, said tear line delineating an open end in said pockets, said rear wall having a hinge line extending transversely thereof adjacent said top wall, said top wall having a pair of latching tabs joined thereto, said latching tabs being in facial contact with the inner surface of the side walls of the top cover and adhesively secured thereto, said tabs having respective outer end portions projecting downwardly beyond the endwise portions of the tear line which extends across the outer side flaps, said outer end portions of the tabs depending downwardly into said pockets, said tear lines adapted to be ruptured, whereby the top cover may be pivoted about said hinge line to an open position withdrawing said latching tabs from the open ends of said pockets, said outer end portion of each of said latching tabs having a forward edge which moves through an arc intercepting and developing a camming force relative to the open end of the respective pockets as the top cover is pivoted to said open position, the forward edges of the tabs latching the top cover relative to the carton body when the top cover is pivoted to a closed position relative to the carton body.

4. A carton formed from a one-piece blank and having a hinged top cover, said carton comprising a carton body

having opposed front and rear walls, opposed side walls, a bottom wall, and an open top, the upper portion of each side wall being of double-ply construction adhesively secured together, the upper portion of each side wall having a non-adhesive area providing respective open pockets adjacent the open top of the carton body, said hinged top cover comprising a top panel hingedly joined to said rear wall adjacent the open top of the carton body, said top panel having a pair of latching tabs joined thereto at opposite ends, said latching tabs depending downwardly into said open pockets, when the top cover is in a closed position, said top cover being free to swing to an open position withdrawing said latching tabs from said pockets, each of said latching tabs having a forward edge which swings through an arc intercepting the forward edges of the open pockets as the top cover swings to said open position, the forward edge of the tabs providing a camming action with respect to the pockets, said camming action relatively springing the forward edges of the pockets and tabs and latching the top cover to the carton body when the top cover is pivoted to a closed position with respect to the carton body.

5. A carton having a normally sealed top cover hingedly connected to one end thereof, said carton comprising a carton body having front and rear walls, side walls, and top and bottom walls, said hinged top cover being delineated by a tear line extending transversely across said front wall in a plane below said top wall, said tear line having portions extending across said side walls, said top cover thereby comprising a top wall, a front wall and a pair of side walls forming upward extensions of the walls of the carton body, said rear wall having a hinge line extending transversely thereof, said top wall having a pair of latching tabs joined thereto, said latching tabs being in facial engagement with the inner surface of the side walls of the top cover and adhesively secured thereto, said tabs having respective outer end portions projecting downwardly beyond the tear lines which extend across the side walls, said outer end portions of the tabs depending downwardly into the carton body below said transverse tear line, said tear line adapted to be ruptured, whereby the top cover is free to be pivoted about said hinge line to an open position, thereby withdrawing said latching tabs from the carton body, said outer end portion of each of said latching tabs having a forward edge which moves through an arc intercepting forcibly camming against the forward edge of the carton body along said transverse tear line as the top cover is pivoted to said open position, the forward edges of said tabs latching the hinged top cover relative to the carton body when the top cover is pivoted to a closed position relative to the carton body.

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