

**June 16, 1964**

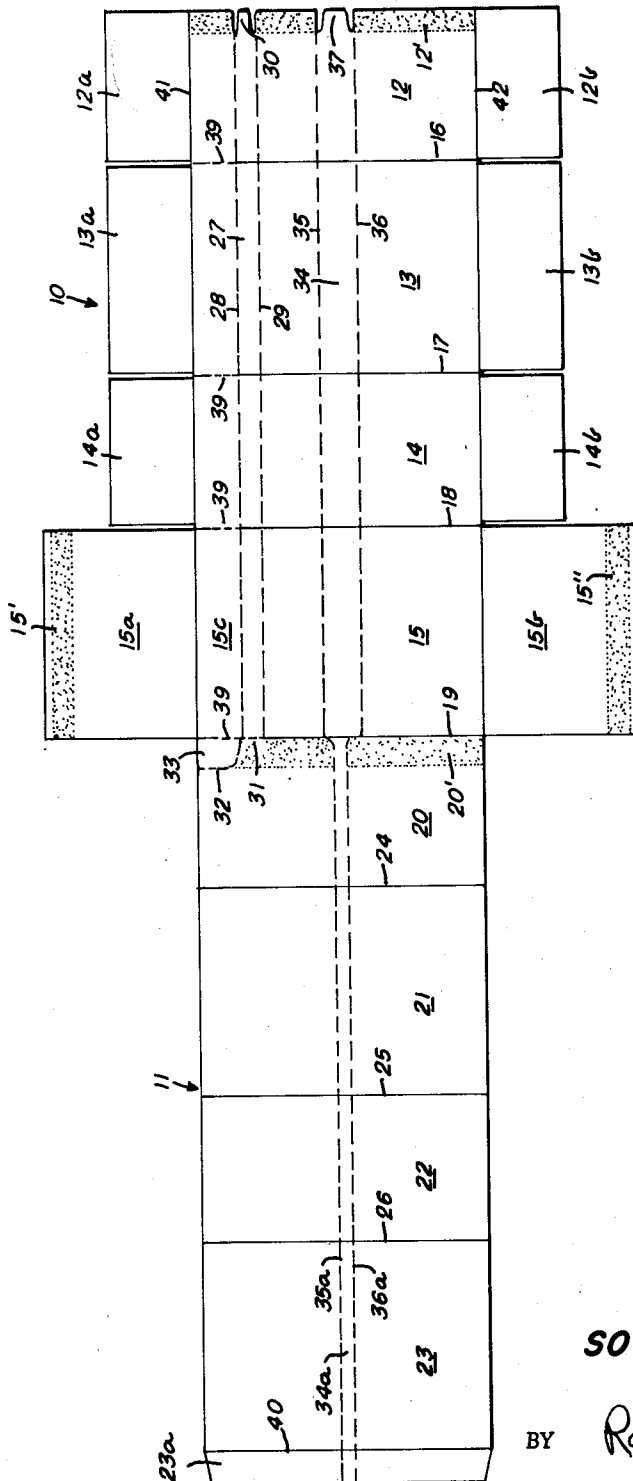
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**3,137,437**

REDUCIBLE CARTON

Filed March 5, 1963

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

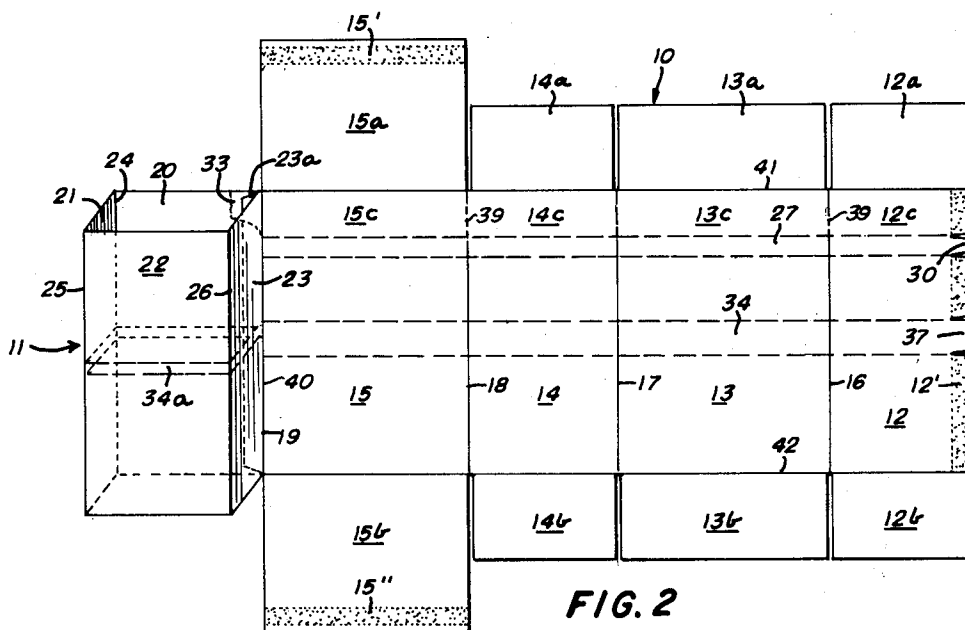


FIG. 2

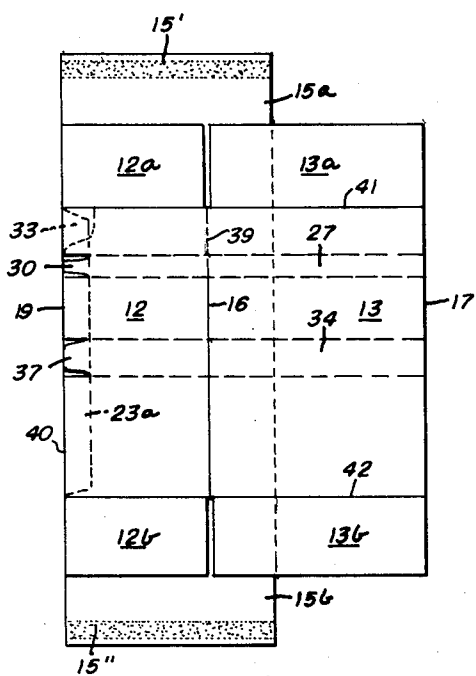


FIG. 3

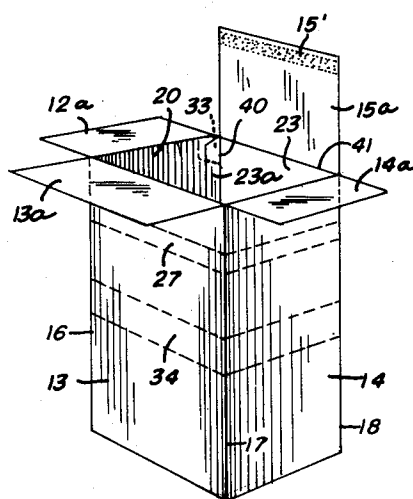


FIG. 4

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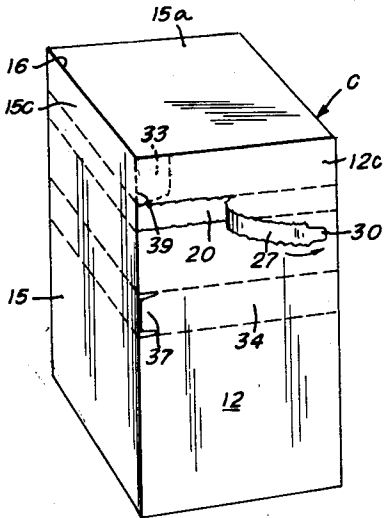


FIG. 5

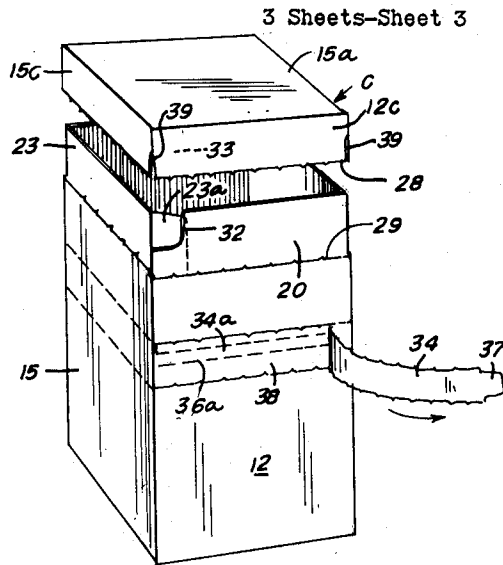


FIG. 6

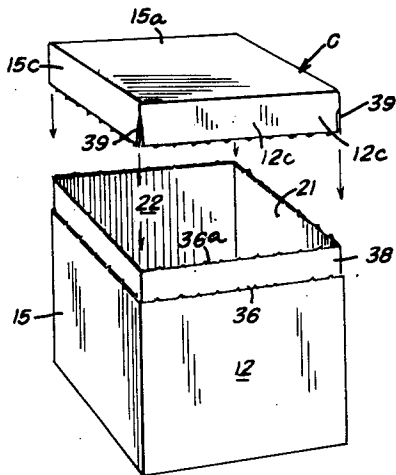


FIG. 7

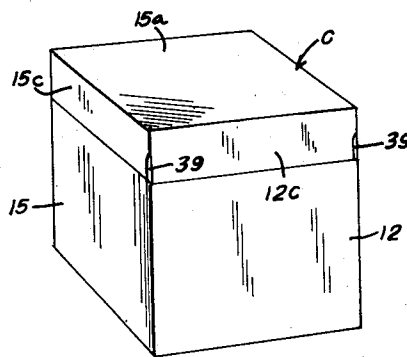


FIG. 8

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## REDUCIBLE CARTON

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Filed Mar. 5, 1963, Ser. No. 263,023

4 Claims. (Cl. 229—51)

This invention relates to foldable cartons, and while it is primarily directed to food containers, such as ice cream cartons, the principle embodied is readily adaptable for various sales package uses. More particularly, the invention consist in new and useful improvements in a reducible carton formed from a single blank of cardboard, boxboard, or other relatively light weight material, and which may be readily collapsed for shipping purposes, and when erected in the form of a completed carton comprises a detachable and replaceable cover and means for progressively reducing the vertical dimension of the carton.

Surveys have shown that a large volume of ice cream, for example, is sold in cartons for storage in refrigerators and deep freeze units for the intermittent dispensing of ice cream and subsequent re-storage. These surveys have also shown that it is highly desirable to provide a package which is designed not only for ease in the dispensing of ice cream but one which is leak-proof, easy to store, and may be opened and closed with a minimum of effort.

While conventional ice cream packages have been developed to fulfill certain of these requirements, they still present a problem for the standpoint of storage and the conservation of refrigerator space which is highly important. In other words, when the container is only partially filled with ice cream, the unfilled portion of the container unnecessarily occupies otherwise useable storage space. If should also be noted that with conventional packages, ice cream in a partially filled container has a tendency to lose flavor and to crystallize on the surface which is exposed to the air in the top portion of the container from which the ice cream has been dispensed.

It is the primary object of the present invention to provide a container of this type which may be progressively reduced in size as the contents are used, thus reducing the volume of air to which the surface of the product is exposed.

Another object of the invention is to provide a container of this type which may be readily sealed against leakage at both ends after being filled.

Another object of the invention is to provide a reducible carton which may be economically manufactured, since such cartons are discarded after one use.

A further object of the invention is to provide a container possessing the required strength and rigidity to meet the needs of intermittent dispensing and re-storage, and, at the same time, provides a maximum of product protection and consumer convenience.

A still further object of the invention is to provide a container which may be filled and sealed on conventional machinery and which makes a maximum utilization of material.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel features herein set forth, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

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Referring to the drawings in which numerals of like character designate similar parts throughout the several views:

FIG. 1 is a plan view of the blank from which the carton of the present invention is formed;

FIG. 2 is a generally similar view of the blank, illustrating the first step in fabrication;

FIG. 3 is a plan view of the blank after having been initially sealed in tubular form and collapsed for shipping;

FIG. 4 is a perspective view of the carton of the present invention after having been sealed at its bottom end and ready for filling with ice cream or the like;

FIG. 5 is a perspective view of the closed and sealed carton and showing the top severing tear strip in the course of removal;

FIG. 6 is a similar view showing the carton cover removed and the intermediate tear strip in the course of removal;

FIG. 7 is a perspective view of the reduced carton with the replaceable cover in open position; and

FIG. 8 is a similar view showing the cover replaced on the reduced carton.

As will be seen from FIG. 1 of the drawings, the blank from which the carton of the present invention is formed consists of a main body section generally indicated by the numeral 10, and an integral liner section generally indicated by the numeral 11. In the die cutting of this blank, the portion forming the body section 10 is provided with four side wall panels 12, 13, 14 and 15, respectively connected along parallel, vertical crease lines 16, 17 and 18 to facilitate folding into a rectangular, tube-shaped container, as will later appear. In the present form of the invention, the panels 12 and 14 are of common dimensions and are alternately arranged with respect to panels 13 and 15 which are of the same length as panels 12 and 14, but wider. Naturally, for a carton which is completely square in transverse cross-section, all panels could be of common dimensions.

Each of the panels 12, 13, 14 and 15 is provided at its opposite extremities with top and bottom closure flaps 12a, 13a, 14a and 15a and 12b, 13b, 14b and 15b respectively, the flaps 15a and 15b being longer than the others. These top and bottom closure flaps are integrally connected to the respective panels along parallel, horizontal crease lines 41 and 42 which extend for the entire length of the body section 10 to facilitate folding, the individual closure flaps being separated from one another by cut lines as shown.

The liner section 11 is integrally connected to side wall panel 15 along vertical crease line 19 and is similarly divided into liner panels 20, 21, 22 and 23 by vertical crease lines 24, 25 and 26 to facilitate folding into tubular form. As seen in FIG. 1, liner panel 20 is complementary to side wall panel 12, liner panel 21 to side wall panel 13, liner panel 22 to side wall panel 14, and liner panel 23 to side wall panel 15. Thus, when the entire blank is folded into a rectangular, tube-shaped container, as will later appear, the complementary side wall and liner panels will respectively form a main tubular body portion having a concentric, underlying, tubular liner portion.

It will be noted that the panels of the liner section are not provided with closure flaps, and that their opposite longitudinal edges terminate substantially in line with the respective body crease lines 41 and 42 so that the body

closure flaps can be folded inwardly in overlapping relation without interference by the liner panels.

Returning to the body section 10, it will be seen that in downwardly spaced relation to the horizontal crease line 41, a tear strip 27 is defined by two laterally spaced, parallel, interrupted die cut lines 28 and 29 which extend horizontally entirely across side wall panels 12, 13, 14 and 15, terminating at vertical crease line 19 which forms the junction between the body section and the liner section. The leading end of the tear strip 27 is provided with a pull tab 30 lying within the confines of panel 12 but disconnected therefrom along its edges by suitable cut lines as shown. The opposite end of the tear strip 27 terminates contiguous with a right angularly disposed, interrupted, die cut line 31 aligned with the crease line 19 and which is laterally offset as at 32 to form a securing tab 33 from the adjacent corner of liner panel 20, for the purpose hereinafter described.

An intermediate tear strip 34 is defined by two parallel, interrupted die cut lines 35 and 36 which are downwardly spaced from the cut lines 28 and 29, and likewise extend horizontally for the entire length of the body section 10, the leading end of said intermediate tear strip being provided with a pull tab 37 similar to pull tab 30. The opposite end of the tear strip 34 proper terminates at crease line 19 where the side wall panel 15 joins the liner panel 20. However, as distinguished from the tear strip 27, the tear strip 34 has an integral tear strip extension 34a, defined by parallel, interrupted, die cut lines 35a and 36a which extend entirely across the liner section 11. As seen in FIG. 1, the die cut lines 35a and 36a are inwardly offset with respect to the corresponding tear strip cut lines 35 and 36 in the body section, thus forming a narrower tear strip extension 34a which, when removed, leaves an upstanding edge 38 attached to the respective panels of the liner section 11. Thus, when the panel is folded in tubular form, upon removal of the intermediate tear strip 34, the liner tear strip extension 34a is sequentially removed, but the upstanding edge 38 provides a lip to facilitate the replacement of the carton cover, as will be described.

Again returning to the body section 10, it will be seen that short areas of the vertical crease lines 16, 17, 18 and 19 above the horizontal die cut line 28 are weakened or cut as at 39. The lower ends of these cut lines 39 join the tear strip cut line 28, but their upper ends are spaced downwardly from the upper fold line 41 so that when the cover portion of the body is removed after fabrication, the cut lines 39 are located at the four corners of the cover adjacent its lower edge to facilitate the replacement of the cover, as hereinafter explained more in detail.

Glue or any suitable adhesives may be applied to selected areas of the blank by any conventional means, and as shown in FIG. 1, an adhesive strip 20' is applied to the vertical edge of liner panel 20, adjacent the fold line 19, omitting the inner face of securing tab 33. Preferably, the end liner panel 23 carries a seal strip 23a which is connected to the panel along a vertical crease line 40, so that when the liner section 11 is folded into tubular form along its crease lines, the seal strip 23a is directed inwardly with its rear face in engagement with the adhesive 20'. The opposite outer vertical edge of the end side wall panel 12 is also provided with a strip of adhesive 12' which extends between the closure crease lines 41 and 42, but is interrupted for the areas of the pull tabs 30 and 37. This adhesive strip 12' is so located that when the entire blank is folded into double tubular form, the adhesive strip sealingly engages the outer edge of liner panel 20 adjacent the panel fold line 19, leaving the pull tabs 30 and 37 free of adhesive, but lying flush against the outer face of liner panel 20.

The upper edge of closure panel 15a is provided with a strip of adhesive 15' and the lower edge of bottom closure panel 15b is provided with an adhesive strip 15'',

the adhesive strip 15' being provided for engagement with the outer face of the top closure flap 13a and the adhesive strip 15'' for engagement with the outer face of bottom closure flap 13b, when the carton is filled and sealed.

Turning now to FIG. 2, it will be observed that the first step of fabricating the carton comprises the folding of the liner section 11 along the vertical fold lines 24, 25, 26 and 40 to form an open-ended liner which is independently sealed in tubular form by the inwardly folded seal strip 23a in sealing engagement with the inner face of the liner panel 20. The tubular liner section is then folded bodily inwardly along fold line 19 so that it overlies the body panels 14 and 15 with the liner fold line 25 lying adjacent the body fold line 17, and, thereafter, side wall panels 12 and 13 are bodily folded inwardly along said fold line 17 in overlying relation to the flat folded liner section as shown in FIG. 3.

After the side wall panels are folded along crease line 17 as described, the adhesive strip 12' on side wall panel 12 is sealed to the outer face of the underlying liner panel 20 on the opposite side from the sealed strip 23a. The liner panel 20 is not visible in FIG. 3 but it will be understood that it underlies the side wall panel 12 when folded in this position. In the position shown in this figure, the closure flaps are still unfolded, but the respective side wall panels and liner panels have been permanently located in their relative superposed positions and are maintained in such positions by the adhesive strips 12' and 20', so that when the blank is later erected in tubular form, a double, tubular-walled container is provided.

In the flattened form shown in FIG. 3, the semi-completed cartons may be readily stacked and packaged for shipment and are in condition for immediate use by product distributors. As previously pointed out, the carton of the present invention has been designed for sealing and filling with conventional machinery.

In order to erect the folded and sealed blank for filling with ice cream or other product, the folded panels of the combined body and liner portions are swung apart on their fold lines to provide a rectangular tube. The bottom closure flaps 12b and 14b are first folded inwardly, after which the bottom closure flap 13b is folded to overlap the latter two flaps. The final bottom closure flap 15b which is longer than the other three, is then folded to completely overlap the closure flap 13b and its seal strip 15'' is caused to adhere to the outer face of flap 13b adjacent the flap fold line 42, thus completely sealing the bottom with one sealing strip.

The carton is now in the position shown in FIG. 4 with its upper end open to receive the package content which, as before stated, may be introduced by any of the conventional automatic filling mechanisms. In sealing the top of the carton after filling, the same procedure is followed as was described in connection with the bottom of the carton. In other words, the closure flaps 12a and 14a are first folded inwardly, followed by overlapping the closure flap 13a to which the final closure flap 15a is sealed by the seal strip 15', thus presenting a completely sealed carton as shown in FIG. 5.

It will be apparent from FIGS. 2 and 4 that the carton, when erected, comprises a body portion, the side walls of which are lined with complementary liner walls which are unattached to the respective body walls except at the junction of the liner section 11 and body section 10 adjacent fold line 19. The offset arrangement of the tear strip extension 34a with respect to the main tear strip 34 is designed to present the respective interrupted die cut lines defining the composite tear strip 34-34a in offset relation when the carton is erected, so that each of these die cut lines falls immediately adjacent an uncut area of its complementary wall, to thus prevent leakage of the contents through the die cut lines.

When the carton is completely erected, sealed and filled with product, as seen in FIG. 5, the upper portions of the side wall panels of the body above the tear strip 27, to-

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gether with the folded and sealed top closure flaps, jointly form an integral top cover represented by the letter C. Thus, when the tear strip 27 is removed, these upper portions of the side wall panels, as shown at 12c, 13c, 14c and 15c, form the side walls or apron of the cover C. As previously explained, the interrupted die cut line 31-32 leaves a tab 33 attached to the side wall portion 15c of the cover. The outer face of this tab in the erected position of the carton is sealed to the adhesive strip 12' on the edge of side wall panel 12, but its inner face is left free of the adhesive so that it is not connected to the sealing strip 23a on panel 23 of the liner. Thus, as shown in FIG. 6, when the tear strip 27 has been removed, the tab 33 which is adhered to the inner face of the cover side wall 12c by adhesive 12' is removed with the cover to retain the rectangular shape of the side walls of the cover as a self-sustained integral structure. In the position shown in FIG. 6, the cover has been removed, leaving the upstanding edges of the respective liner panels in position to serve as a lip for receiving the cover when it is replaced. As previously explained, the slits 39 at the four corners of the cover, although not entirely essential, make the cover more easily replaceable when the cover side walls 12c, 13c, 14c and 15c slide over the upstanding lip formed by the exposed portions of the liner panels which are slightly inwardly offset with respect to the complementary side wall panels of the body.

After the content of the carton has been sufficiently reduced in volume, the height of the container may be correspondingly reduced by removing the intermediate tear strip 34, which is shown in the course of removal in FIG. 6. Thus, as shown in FIG. 7, the removal of the tear strip 34 leaves the upstanding lip 38, formed by the remaining upper portions of the liner panels, in condition to receive the cover C when it is replaced. It will be apparent by returning to FIG. 1 that after the tear strip 34 has been completely removed from the side wall panels of the body, a continued pulling of this tear strip takes with it the tear strip extension 34a which, as before explained, leaves the remaining upper edges of the liner panels intact to provide the upstanding lip 38 shown in FIG. 7.

The design of this carton provides a very easily assembled, rugged and leak-proof carton which is adapted for use as a container for various consumer products. It is also easy for the consumer to manipulate and greatly facilitates the storage of food products and the like in progressively decreasing space as the product is used. The particular relationship of the liner section to the body section provides, in effect, a double walled carton for insurance against leakage.

Also, the manufacturer of the carton of the present invention is enabled to utilize far less expensive boxboard because of the double thickness of the side walls. In other words, with the use of boxboard of a thickness of .012, a double thickness of .024 is obtained which materially reduces the overall cost without sacrificing strength or leak-proof properties.

From the foregoing, it is believed that the invention may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details disclosed without departing from the spirit of the invention as set forth in the following claims.

I claim:

1. In an elongated blank of suitable sheet material adapted to form a reducible carton, a liner section having a plurality of longitudinally spaced vertical fold lines defining a series of liner panels which are foldable to provide a tubular liner, an integral body section adjoining one end of said liner section and having a plurality of vertical fold lines longitudinally spaced to correspond with said liner fold lines, defining a series of body panels which are foldable to overlie respective liner panels in tubular form, said body section having hori-

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zontal fold lines at its vertical extremities, substantially aligned with the vertical extremities of said liner section, a series of longitudinally spaced vertical cut lines defining with said last-named fold lines foldable top and bottom closure flaps, means for sealing the folded liner and body panels in concentric tubular form, means for sealing respective closure flaps in folded position, interrupted cut lines forming a first severable tear strip extending horizontally across said body panels in downwardly spaced relation to the upper horizontal fold lines, adapted to separate the upper portion of said tubular body and its folded and sealed top closure flaps in the form of an integral removable and replaceable top cover, the adjacent upper extremities of said liner panels remaining intact after removal of said tear strip to provide an inwardly offset, upstanding lip to accommodate said top cover, interrupted cut lines forming a second severable tear strip spaced downwardly from said first named tear strip, running parallel and co-extensive therewith across said body panels and an integral liner tear strip extension running parallel with said second tear strip across said liner panels, the cut lines forming the lower longitudinal boundary of said liner tear strip extension being upwardly offset with respect to those of said second tear strip and lying intermediate the longitudinal boundaries of said second tear strip, whereby when said second tear strip and liner tear strip extension are removed a second upstanding, inwardly offset lip is provided on the remaining upper edge of said liner to accommodate the replacement of said cover.

2. A blank as claimed in claim 1, wherein the cut lines forming both of the longitudinal boundaries of said liner tear strip extension are centrally offset with respect to the corresponding cut lines of said second tear strip in underlying surface contact with the uncut area of said second tear strip, whereby when said liner panels and said body panels are superposed, the respective cut lines defining said second tear strip and tear strip extension are alternately obstructed by the adjacent uncut areas to prevent leakage through said cut lines.

3. A reducible carton formed from a single blank of flexible material, comprising a tubular liner section, an integral tubular body section freely wound upon and co-extensive with said liner section, means separately sealing said liner and body sections in tubular form with their adjacent surfaces in free contact, top and bottom closure means integral with said body section and freely overlying the respective ends of said liner section, a first severable tear strip encompassing said body section in downwardly spaced relation to said top closure means, adapted to separate the upper edge of said body section and its closure means in the form of an integral, removable and replaceable cover, the adjacent upper edge of said liner section remaining intact after removal of said tear strip to provide an upstanding, inwardly offset lip to accommodate said cover, a second severable tear strip spaced downwardly from said first-named tear strip, running parallel and co-extensive therewith around said body, and a liner tear strip extension integral with said second tear strip and running parallel therewith around said liner portion, the lower longitudinal boundary of said liner tear strip extension being upwardly offset with respect to that of said second tear strip and lying intermediate the longitudinal boundaries of said second tear strip, whereby when said second tear strip and liner tear strip are sequentially removed, a second upstanding, inwardly offset lip is provided on the upper edge of said liner to accommodate the replacement of said cover.

4. A reducible carton formed of a single blank of flexible material, comprising a tubular body section and an integrally formed, tubular liner section, the side walls of which freely underlie corresponding side walls of said body section in face-to-face contact, means for sealing the bottom of said carton, an integrally formed,

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removable and replaceable cover for the top of said carton, and a pair of spaced, parallel rows of interrupted cut lines extending entirely around said body side walls intermediate the vertical extremities thereof, defining a body tear strip, the rows of cut lines of said body section being extended entirely around the liner side walls to define an integral liner tear strip extension, said rows of liner cut lines being respectively in laterally offset relation to said rows of body cut lines in underlying surface contact with the uncut area of said second

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tear strip, whereby the cut lines of each row are sealed by an adjacent uncut area to prevent leakage through said cut lines.

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