

Sept. 1, 1970

H. R. JAESCHKE

3,526,353

STERILE PACK CARTON

Filed April 9, 1968

3 Sheets-Sheet 1

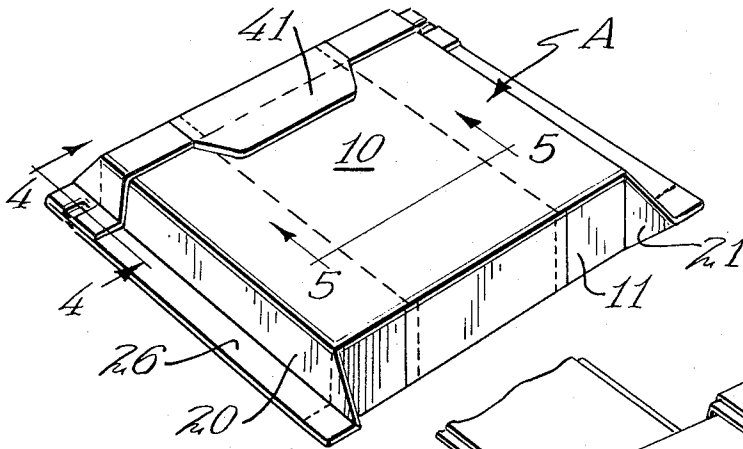


FIG. 1

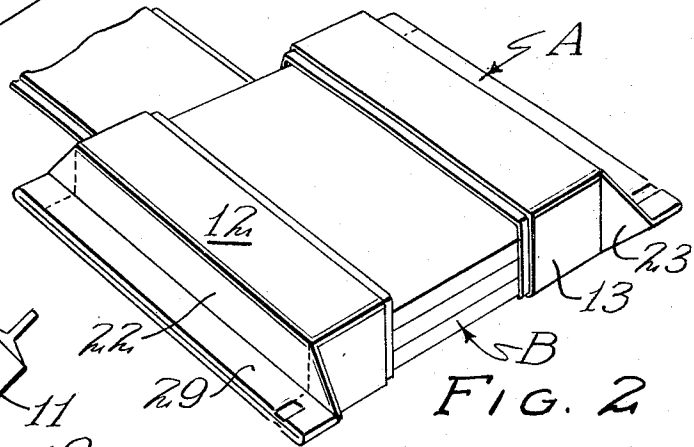


FIG. 2

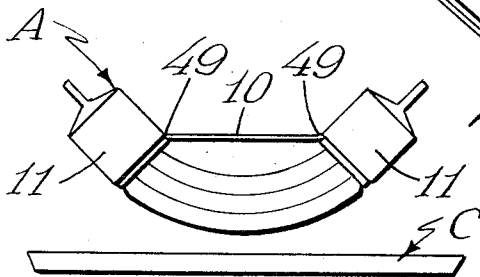


FIG. 3

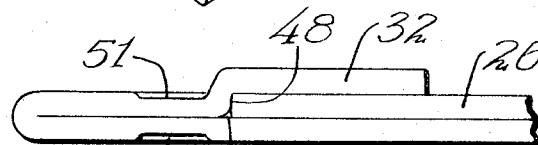


FIG. 4

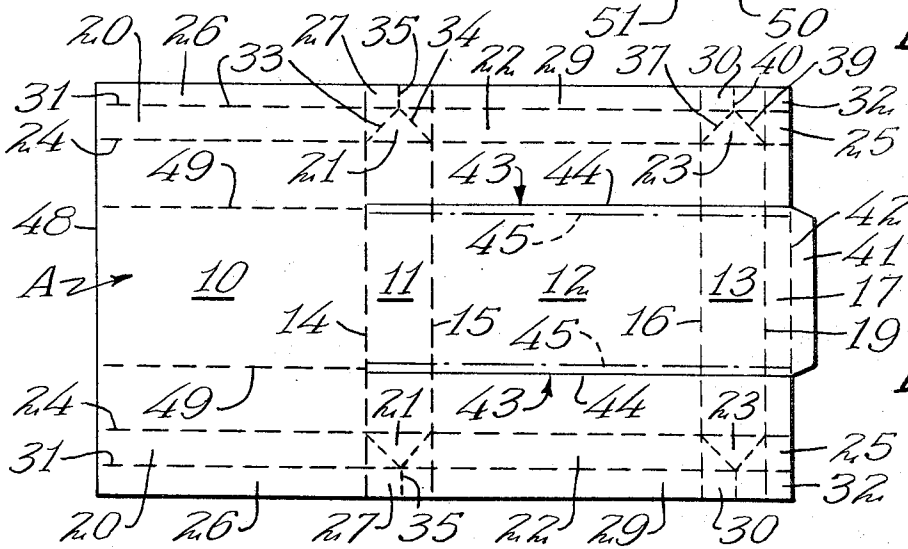


FIG. 6

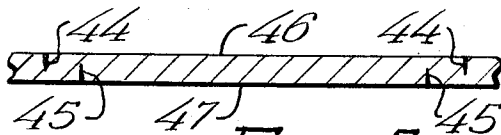


FIG. 5

INVENTOR

HAROLD R. JAESCHKE

BY

Robert M. Dunning

ATTORNEY

Sept. 1, 1970

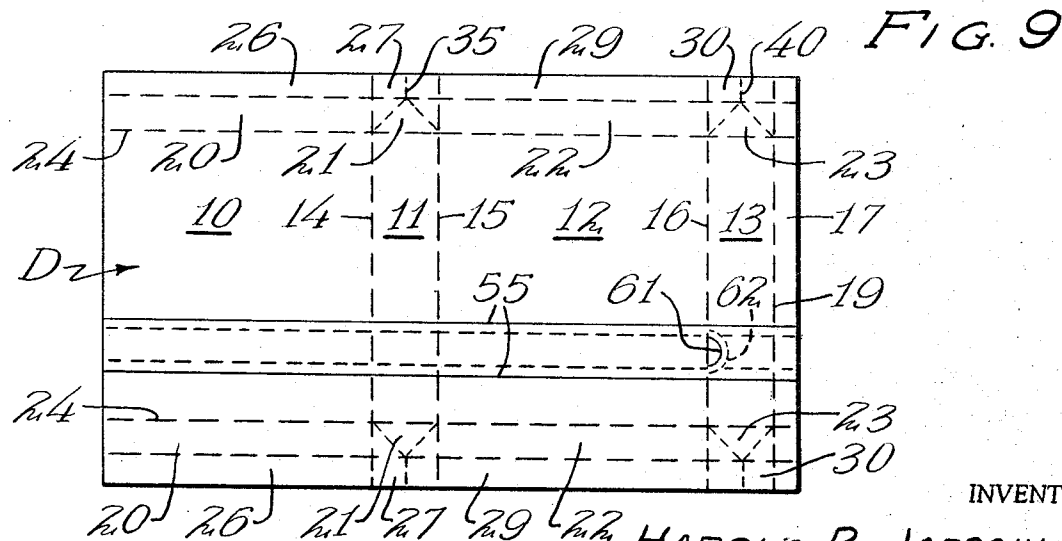
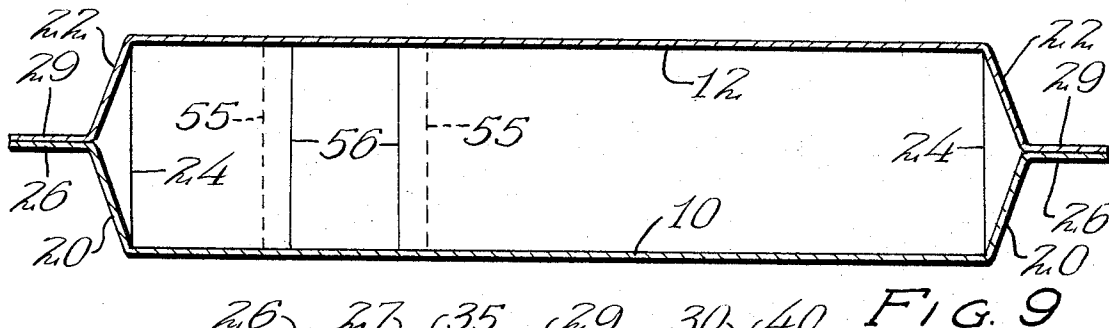
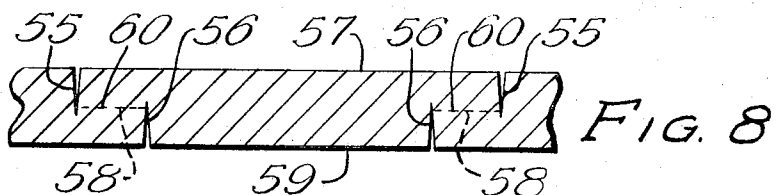
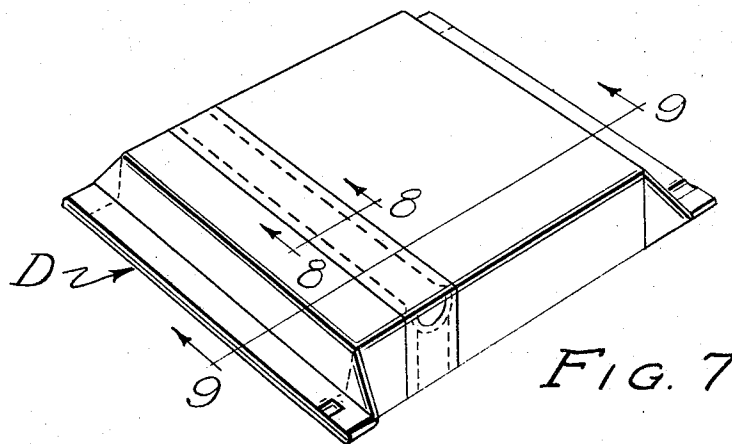
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INVENTOR

HAROLD R. JAESCHKE

FIG. 10

BY

Robert M. Dunning

ATTORNEY

Sept. 1, 1970

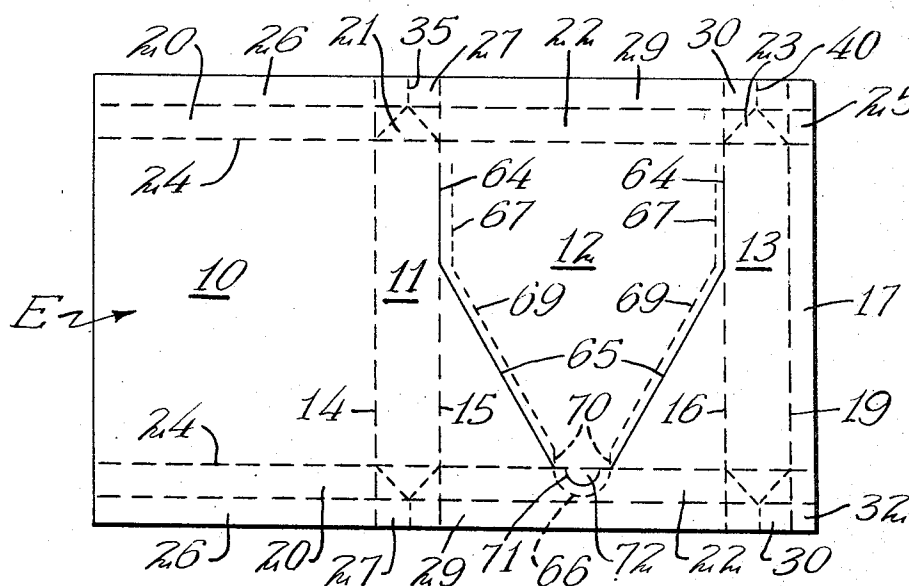
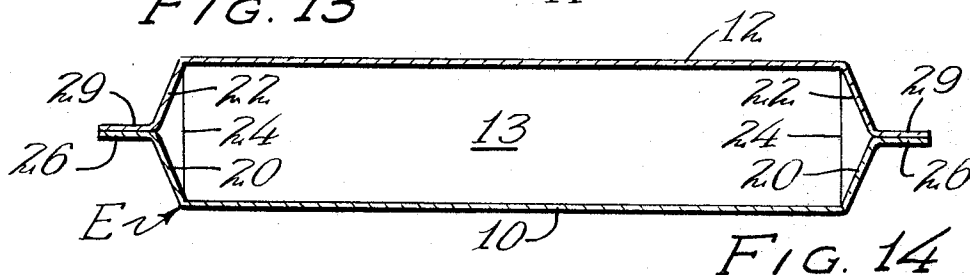
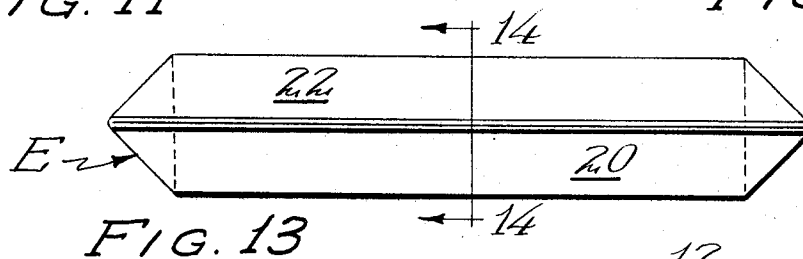
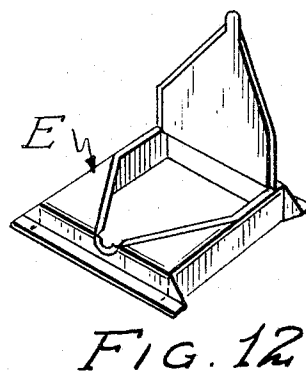
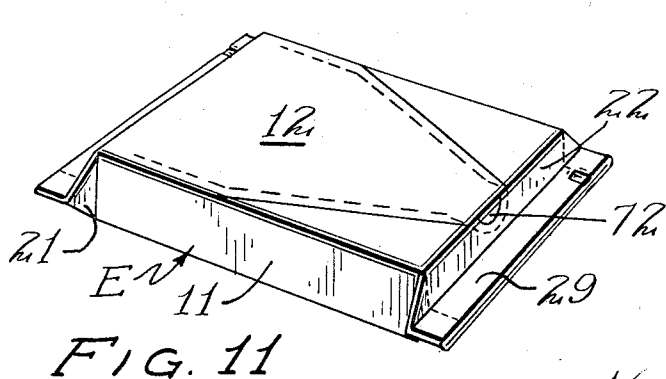
H. R. JAESCHKE

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STERILE PACK CARTON

Filed April 9, 1968

3 Sheets-Sheet 3



INVENTOR

HAROLD R. JAESCHKE

BY

Robert M. Dunning

ATTORNEY

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3,526,353

STERILE PACK CARTON

Harold R. Jaeschke, Milwaukee, Wis., assignor to Hoerner
Waldorf Corporation, St. Paul, Minn., a corporation
of Delaware

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Int. Cl. B65d 5/54

U.S. Cl. 229—51

10 Claims

ABSTRACT OF THE DISCLOSURE

The invention discloses a tubular sleeve having end closures including closure flanges and sealing flanges. The closure flanges on the top and bottom panels are folded into end abutting relation, and the sealing flanges are sealed in face contact. The closure flanges on the side walls are diagonally creased so that the sealing flanges may be folded flat to provide double thickness struts which project from the carton ends and extend beyond that carton side walls. Opening means are provided which are so arranged that the sterile contents may be removed without becoming contaminated.

This invention relates to an improvement in sterile packages and deals particularly with a paperboard carton containing sterile dressings and the like.

For many years sterile dressings have been contained in pouches made of foil or similar material which must be individually opened as required. Packages of this type must normally be sterilized before use in order to prevent contamination by contact of the dressing with the outer surfaces of the pouches, or else must be opened with extreme care to avoid the possibility of contamination due to contact with the outer surface of the pouch.

It has long been considered desirable from a standpoint of economy and for other reasons to package such dressings in paperboard cartons. One of the biggest difficulties is the difficulty of sealing such cartons so that the contents remain sterile during shipment and handling. Another difficulty lies in producing a package of this type from which the sterile contents may be removed without contact between the contents and the exterior surface of the package. The outside surfaces of the packages are normally not sterile, and it is necessary for the nurse or doctor to contact the outer surfaces of the packages in order to open them so that the hands or gloves become contaminated by contact with the cartons. It is the purpose of the present invention to provide a paperboard carton which may be used to contain sterile dressings or the like and from which the contents may be removed without contaminating the contents by contact with the outer surfaces of the cartons. Alternatively, it is an object of the present invention to provide a package which may be opened up to expose the contents without actually coming in contact with the contents, and from which the contents may be removed without contaminating the gloves or hands or the operator.

A feature of the present invention resides in the provision of a tubular paperboard carton having end closures including end flanges connected to the top, bottom, and side walls of the tube, and having sealing flange hingedly connected to the end closure flanges. The end closed flanges are preferably approximately one-half the height of the side walls so as to meet in abutting relation. The sealing flanges of both the side and end walls are folded flat and sealed together under heat and pressure. The end flanges secured to the side walls are diagonally folded along fold lines converging from the corners of the top and bottom panels to the hinge line connecting the side wall end flange to the side wall sealing flanges. As a result, sufficient sealing

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pressure may be applied to the sealing flanges to hermetically seal the contents.

A further feature of the present invention resides in the provision of a glue flap which is hinged to one of the side walls and is secured in face contact to the adjacent edge of a top or bottom wall. This glue flap is provided with an end flange and sealing flange which are secured to the end flange and sealing flange of the wall which the glue flap overlaps. The inner opposed surfaces of the sealing flaps are preferably provided with heat activatable adhesive which functions when the sealing flaps are clamped together to form an air tight seal between the sealing flaps. In order to eliminate any air channel adjoining the edge of the glue flap where an air passage would normally be formed at the transition from the area of three thicknesses to the area of two thicknesses, the sealing flaps are embossed inwardly, causing the adhesive to flow against the edge of the top wall sealing flange in this area and to prevent the air passage from being formed.

A further feature of the present invention resides in the provision of a carton of the type described which, in its preferred form, includes a handle flange or tab providing an extension of the glue flap and overlying the central portion of the panel to which the glue flap is secured. Weakened lines of separation extend from opposite ends of this handle flap across the glue flap, across the side wall to which the glue is hinged, across the panel opposite that to which the glue flap is adhered, and across the second side wall. By grasping the handle flap and tearing the paperboard across three walls of the carton, the entire central portion of the contents is exposed without the contents ever coming into contact with the hands or the external surface of the carton. The contents may then be removed using sterile gloves or hands.

The opening of the carton in the manner described provides an arrangement which comprises a pair of opposed hollow rectangular end caps connected by a flat connecting panel. By providing score lines across this panel on opposite sides of the open area, the end may engage and the end caps hinged in such a manner that the contents may be dropped upon a sterile tray or other support if it is desired. This operation is simplified by the fact that the sealing flanges form oppositely directed struts which may be grasped to simplify the handling operation.

A further feature of the present invention resides in the provision of a device of the type described in which the weakened lines of separation defining the carton opening are formed by cut lines extending partially through the paperboard from opposite sides thereof. The cut lines in the inner surface of the cartons are closer together than the cut lines in the outer surface thereof. While weakened lines of this type are well known in the art, they provide a particular advantage in the present construction. When the detachable portion of the carton has been opened, the opening is encircled by a lip having on its inner side the sterile inner surface of the package and having as its outer surface an intermediate layer of the paperboard which was previously between the inner and the outer surfaces. As a result, in the removal of the contents from the carton, the contents are protected by the sterile peripheral lip and may be readily removed without contact with the exterior surface of the carton itself.

A further feature of the present invention lies in the provision of a carton, the body of which is held out of contact with the walls of an enclosing container. The paperboard struts project from two opposed ends of the container, and the sides of these struts project beyond the carton side walls, holding the rectangular carton body spaced from any of the walls of an enclosing container.

These and other objects and novel features of the pres-

ent invention will be more clearly and fully set forth in the following claims.

In the drawings forming a part of the specification:

FIG. 1 is a perspective view of the sealed carton as it appears in shipment and storage.

FIG. 2 is a perspective view of the inverted carton after the package has been opened.

FIG. 3 is a diagrammatic side elevation view showing the manner in which the contents of the package may be dropped from the package onto a sterile tray or other support without contact with the contents.

FIG. 4 is an enlarged sectional view through the embossed area of the package, the position of the section being indicated by the line 4—4 of FIG. 1.

FIG. 5 is an enlarged sectional view through the panel of the package, the position of the section being indicated by the line 5—5 of FIG. 1.

FIG. 6 is a diagrammatic view of the blank from which the carton is formed.

FIG. 7 is a perspective view of a sealed container of modified form.

FIG. 8 is a greatly enlarged sectional view through the paperboard, the position of the section being indicated by the line 8—8 of FIG. 7.

FIG. 9 is a vertical section view through the sealed container, the position of the section being indicated by the line 9—9 of FIG. 7.

FIG. 10 is a diagrammatic view of the blank from which the carton of FIG. 7 is produced.

FIG. 11 is a perspective view of another modified form of the carton construction in sealed condition.

FIG. 12 is a perspective view of the carton of FIG. 11 in open position.

FIG. 13 is an elevational view of the carton shown in FIG. 11.

FIG. 14 is a vertical sectional view through the carton shown in FIG. 11, the position of the section being indicated by the line 14—14 of FIG. 13.

FIG. 15 is a diagrammatic view showing the blank from which the carton of FIGS. 11 through 14 is made.

The carton A is formed of the blank illustrated in FIG. 6 of the drawings. As indicated, the blank includes a top wall 10, a first side wall 11, a bottom wall 12, and a second side wall 13, the walls or panels being generally rectangular and being foldably connected along parallel fold lines 14, 15, and 16. The glue flap 17 is hingedly connected to the side wall 13 along a fold line 19. Obviously, the terms "top wall" and the "bottom wall" are merely for the purpose of orientation in description, as the carton may be inverted or otherwise supported.

End closure flanges 20, 21, 22, and 23 are foldably connected to the panels 10, 11, 12, and 13 along parallel fold lines 24. End closure flanges 25 are also provided on opposite ends of the glue flap 17 along extensions of the fold lines 25. The length of the end closure flanges 20 and 22 in a direction normal to the fold lines 24 is substantially equal to one-half the width of the side walls 11 and 13, or one-half the distance between the fold lines 14 and 15. As a result, when the closure flanges 20 and 22 are folded at right angles to the panels 10 and 12 to which they are hinged, these flanges extend in substantially end abutting relation. Sealing flanges 26, 27, 29, and 30 are hingedly connected to the end closure flanges 20, 21, 22, and 23 along common lines of fold 31. A sealing flange 32 is also secured to each glue flap end flange 25 along the continuation of a fold line 30.

Each side wall end flange 21 is divided in three triangular sections by a pair of diagonally extending converging fold lines 33 and 34 which converge from the intersections of the fold lines 14 and 24, and the fold lines 15 and 34 respectively. The diagonal fold lines 33 and 34 come to an apex at a corresponding fold line 31. A fold line 35 extends from the apex of the triangle formed by the converging fold lines 33 and 34, the fold lines 35 extending across the sealing flanges 27 parallel to, and

midway between, the fold lines 14 and 15. The side wall and closure flaps 23 are similarly divided into three triangular areas by a pair of converging fold lines 37 and 39 which converge from the junctures of the fold lines 16 and 24 and the fold lines 19 and 24 respectively. The fold lines 37 and 39 come to an apex of the fold lines 37 and 39 across the sealing flanges 30, the fold lines 40 being midway between, and parallel to, the fold lines 16 and 19.

A handle flap 41 is hingedly connected to the glue flap 17 along a fold line 32 which is parallel to the fold line 19 hingedly connecting the glue flap to the side wall 13. A pair of parallel weakened lines of separation 43 extend from opposite ends of the handle flap 41 across the glue flap 17, the side wall 13, the bottom panel 12 and the side wall 11. The weakened lines of separation are spaced inwardly from the fold lines 24 defining the ends of the carton panels, and the handle flap is of corresponding length. Each weakened line of separation includes a cut score line 44 which extends into the outer surface of the paperboard and extends partially through the thickness of the paperboard to terminate a short of the inner surface thereof, as is indicated in FIG. 5 of the drawings. A pair of parallel side by side cut score lines 45 extend into the paperboard on the inner surface thereof, the cut score lines 45 also extending at least half way through the paperboard but terminating short of the outer surface 46 of the board. As a result, the cut score lines 45 which extend into the inner surface 47 are between or inwardly of the cut score lines 44 and the outer surface 46 of the board. Score lines 49 form extensions of the weakened lines of separation 43 and extend in parallel relation across the top of panel 10.

The carton A is set up by adhering the glue flap 17 together with its closure flap 25 and sealing flap 32 in face contact with the outer surface of the top panel 10, the end closure flap 20 and the sealing flap 26 at each end thereof. In other words, the blank is secured together throughout its entire width. After the surgical dressings or other such means have been inserted into the carton, the various sealing flaps are folded into face contact, the end closure flanges 20 and 22 extending toward one another in substantially right angular relation to the panels to which they are hinged, and the triangular areas outwardly of the diagonal fold lines 33, 34, 37, and 39 form extensions of the closure flanges 20 and 22, as indicated in the drawings. The sealing flange structure is folded at its ends along the fold lines 35 and 40, and the sealing flanges are sealed together under heat and pressure. The contacting surfaces of the sealing flanges are preferably provided with heat activatable adhesive and will adhere together to form a pair of stiff struts at each end of the carton which are arranged on a plane substantially parallel to the planes of the top and bottom panels 10 and 12.

Due to the fact that considerable pressure may be applied to the sealing flaps, the flaps may be hermetically sealed together. The only area where much likelihood of air leakage may occur is along the hinged edge of the glue flap sealing flange 32 where it overlies the edge of 49 of the sealing flange 26 of the panel 10. It has been found that by embossing small areas of the paperboard together at the point, the adhesive connecting the sealing flanges will be forced against the edges 49 of the panel 10 to fill any small channel which might otherwise occur in this area. The numeral 50 indicates adhesive which has been forced against the edge 40 of the panel 10 by the inward embossing 51 of opposite sides of the sealing flanges 26 and 30. This embossing has been found to effectively seal any air channel so that the contents of the carton are hermetically sealed.

Now when it is desired to open the carton, the handle flap 41 is grasped and pulled back disconnecting the adhesive bond between the central portion of the glue

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flap 17 and the top panel 10. A continued outward pulling on the handle flap 41 will cause the carton to tear across the side wall 13. The carton may be inverted and the tearing continued across the panel 12 and the side wall 11. The container then appears as indicated in FIG. 2 of the drawings.

The dressings B may be removed from the package A when in the position illustrated in FIG. 2 due to the fact that only the portions of the carton engaged by the dressing during removal thereof are the inwardly projecting lips which are uncontaminated. If it is desired to completely remove the dressings, they may be placed on a sterile tray such as C by flexing the rectangular flaps upwardly in manner illustrated in FIG. 3 by engaging the struts formed by the sealed sealing flanges, and bending the panel 10 along the fold lines 49, the contents dropping under the tray as the carton is flexed.

FIGS. 7 through 10 of the drawings show a modified form of construction D which differs from the carton A only in the type of tear strip which has been employed to open the carton. In order to simplify the description the various panels and flanges have been given the same identifying numerals as were used in the carton A. The only difference between the general shape of the blank D and the blank A is the fact that the handle tab 41 is eliminated in the blank D.

In order to open the carton D, a tear strip is provided which preferably extends entirely about the blank. A pair of parallel cut score lines 55 extend across the blank D in spaced relation, these cut score lines being shown nearer one end fold line 24 of the panels than the other. As indicated in FIG. 8 of the drawings, these cut score lines 55 extend into the outer surface of the paperboard and preferably extend slightly more than one-half the thickness of the paperboard, but terminates short of the inner surface of the sheet. A second pair of cut score lines 56 are arranged in the inner surface of the paperboard in side by side relation to the cut score lines 55, but are somewhat closer than the cut score lines 55 and are inwardly thereof. As is well known in the art, when the portion of this tear strip between the cut score lines 56 is grasped and pulled outwardly, the paperboard splits intermediate the outer surface 57 of the sheet and the inner surface 59 thereof, presenting an inwardly extending lip along each edge of the space produced by removal of the tear strip.

It will further be noted that the lips such as 59 formed by splitting the paperboard along the broken lines 60 are sterile in view of the fact that no part of this lip has become contaminated due to contact with other objects. This is of importance as the sterile lip acts to prevent the contents of the package from being contaminated upon removal from the carton.

An arcuate or U-shaped cut line 61 is provided in the outer surface of the paperboard, and an arcuate or U-shaped cut score 62 of somewhat larger radius but having a common center with the cut score line 62 as provided in the inner surface 59 of the board. This arrangement of arcuate cut score lines is shown as being in the side wall panel 13 closely adjacent to the fold line 16 connecting the side wall 10 to the panel 12. The arcuate cut score line defines a tab which may be pushed inwardly to provide a means of grasping an end of the tear strip permitting the tear strip to be removed completely out of the package. It is recognized that some difficulty sometimes is experienced in disconnecting the double thickness areas of the carton where the glue flap overlies the panel 10. However, by this time the carton has been opened across three of the four walls, the carton may be flexed or bent in order to assist the separation.

In this arrangement, the two end portions of the carton may be completely separated to permit the dressings or other contents of the carton to be dropped onto a sterile tray such as C without having the carton contents come

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into contact with the hands or with any portion of the outer surface of the carton.

FIGS. 11 through 15 of the drawings show another modified form of carton which is indicated in general by the letter E. For the purpose of simplifying the description the various panels forming the blank have been given the same identifying numerals as the corresponding panels of the blanks A and D. The various wall panels, end closure flanges, sealing flanges, and the like are identical to those of the blank B.

The carton E is normally used where it is desired to retain the sterile contents of the carton in the carton until they are removed for use. Actually, the carton E may be reclosed if desired without contaminating the contents. As indicated in FIG. 15 a pair of cut score lines 64 coincide with the fold lines 15 and 16 in the outer surface of the paperboard from the fold line 24 which is uppermost in FIG. 15 for a distance of perhaps one-third to one-half the length of panel 12. Converging cut score lines 65 also in the outer surface of the paperboard extend from the lower ends of the cut score lines 64 to terminate in spaced relation at the lower score line 24. An arcuate or U-shaped cut score line 66 is provided in the inner surface of the paperboard connecting the ends of the cut score lines 65, the cut score line 66 being in the end flange 22.

A pair of cut score lines 67 are provided in the inner surface of the paperboard extending in closely spaced relation to each cut score line 64 and being of substantially equal length thereto. Converging cut score lines 69 in the inner surface of the paperboard extend in parallel closely spaced relation to the cut score lines 65 and are located inwardly thereof. The cut score lines 69 at their lower ends are preferably parallel as indicated at 70 to extend directly beneath the location of the ends of the cut score lines 65. A semi-circular cut or U-shaped score line 71 which is concentric with the cut score line 66 is provided in the outer surface of the paperboard terminating at the lower fold line 64. The arcuate cut score line 71 is of smaller radius than the inner cut score line 66.

When the carton has been filled and sealed in the manner which has been described in conjunction with the carton A, the contents will remain hermetically sealed during shipment and storage. However, when it is desired to open the carton, inward pressure is applied to the semi-circular area 72 within the cut score line 71. This inward pressure causes the paperboard to split between the inner and outer surfaces thereof, providing a tab, the periphery of which is sterile. Once the pad has been pushed in, the area adjoining the tab may be grasped and pulled upwardly, the panel 12 opening in the manner illustrated in FIG. 12 of the drawings. It will be noted that the area encircling the opening is encircled by the sterile inwardly projecting lip and the inner sterile surface of the opened flap so that the dressings or other contents may be removed through the opening by a person using sterile gloves or hand without forming contact between the contents and the exterior contaminated surface of the carton.

In accordance with the patent statutes, I have described the principles of construction and operation of my improvement in tape holding rolls; while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made without departure from the spirit of my invention.

I claim:

1. A package for sterile dressings and the like including: top, bottom, and side walls of paperboard connected in tubular relation, end wall flanges hinged to the ends of said top and bottom and side wall and being of a length substantially one-half the width of said side walls, said end wall flanges of said top and bottom walls meeting in end abutting relation, sealing flanges hingedly secured to said end wall flanges and sealed in face contact,

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the end wall flanges of said side walls being diagonally creased along converging fold lines extending from the corners of the top and bottom walls to the center of the fold lines connecting said side wall end wall flanges to said sealing flanges,

a fold line extending across said sealing flanges from the apex of each pair of converging flanges parallel to the connected edges of said top, bottom, and side walls along which said sealing flanges are folded into face contact,

said sealing flanges projecting from the ends of said walls on a plane substantially parallel to the planes of said top and bottom walls and the portions of said side wall end wall sealing flanges on opposite sides of said last named fold lines extending laterally beyond said side walls to provide double thickness protective struts projecting beyond said top and bottom walls and laterally of said side walls.

2. The structure of claim 1 and including a glue flap on one side wall overlapping one of said top and bottom walls and including glue flap extensions secured in face contact with the end wall flange and sealing flange hinged to said one wall.

3. The structure of claim 2 and including a potential opening in at least one of said walls, said opening being defined by double cut lines comprising side by side cut lines extending into the paperboard from the outer and inner surfaces thereof, the cut lines in the inner surface being inwardly toward one another from the adjoining cut lines in the outer surface.

4. The structure of claim 2 and including a tear strip extending across at least three of said walls at right angles to the fold lines connecting said walls in tubular relation, said tear strip, when removed permitting the opening up of the carton to permit removal of the carton contents by grasping the struts at opposite ends of the carton.

5. The structure of claim 1 and including a glue flap secured to one of said side walls and secured in overlapping relation with one of said top and bottom panels and outwardly on the surface thereof, a handle flap terminating short of the ends of said one panel, and weakened lines of separation extending across said glue flap at the ends of said handle flap, across the side wall to which said glue flap is secured, across the other of said top and bottom walls, and across the other of said side walls.

6. The structure of claim 5 and including score lines extending across said one wall from the ends of said weakened lines in said other side wall to the ends of said handle flap.

7. The structure of claim 5 and in which said weakened lines of separation comprise side by side cut lines extending partially through the paperboard from opposite surfaces thereof, the cut lines in the inner surface being

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closer together than the cut lines in the outer surface whereby when the carton is torn along its weakened lines, the inner edges of the opening thus formed remains sterile.

8. The structure of claim 2 and in which the contacting surfaces of said sealing flanges are coated with a heat activatable adhesive sealed by heat and pressure.

9. The structure of claim 2 and in which the contacting surfaces of said sealing flanges are coated with heat activatable adhesive, and in which the portions of said sealing flanges adjoining the edge of said glue flap are embossed toward one another to force adhesive along the edge of said glue flap to provide a hermetic seal.

10. A carton opener for use in paperboard cartons having a pair of connected wall panels having the opener including:

a pair of weakened lines of separation extending into one of said panels from the edge thereof foldably connecting said panels,

each said weakened line including side by side cut score lines extending into the paperboard from opposite surfaces thereof, the cut score lines in the inner surface being closer together and between, the cut score lines in the outer surface,

a generally U-shaped cut score line in the inner surface of the other panel having its ends substantially coinciding with the ends of said cut score lines in the outer surface of said one panel at said edge thereof, and a U-shaped cut score line of smaller size in the outer surface of said other panel within the confines of said U-shaped cut score in the inner surface and spaced therefrom.

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D. T. MOORHEAD, Primary Examiner

U.S. Cl. X.R.

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