TEAR-OPEN PACKAGE
14 Claims, 16 Drawing Figs.

ABSTRACT: A package formed by a sheet of flexible packaging material having a tear-open seam extending across a face or along an edge thereof. The tear-open seam is characterized by a flap formed by an edge of the package sheet and a tearable insert strip which secures the flap to the adjacent sheet edges.

The method of making the package includes the steps of applying spaced transverse stripes of adhesive to a continuous flat web of packaging material, depositing articles to be packaged on the web between the applied adhesive stripes, folding the package web so that the edges thereof are disposed in overlying relation, introducing an adhesive coated insert web between the overlying web edges, sealing the transverse adhesive stripes, and cutting the web along the sealed adhesive stripes.
TEAR-OPEN PACKAGE

The present invention relates generally to packages formed of flexible packaging material and relates specifically to a novel tear-open package and a method of making said package.

The invention includes a tear-open seam construction which is particularly adapted for use with flat paper packages such as the type employed for the packaging of bandages and the like. A novel method of making such a package incorporating the present tear-open seam is included in the present invention.

Packages of the general type described incorporating tear-open flaps have previously been used. However, in the conventional package, the tear-open flap is adhesively secured. The opening of such a package is, as a result, somewhat unpredictable due to the vagaries of the adhesive bond. The amount of force required to tear open the adhesive-bonded seam is not uniform over the length of the seam and ripping of the flap may consequently occur.

In the present tear-open package, the tear is effected along a narrow, relatively low-strength area, such as a fold or score line, of an insert strip of tearable material and thus can be accomplished with a uniform force without danger of tearing the flap. The package comprises a tear-open seam which extends across a face or along an edge of the package and includes a flap formed by an edge of the package sheet and a tearable insert strip which secures the flap to the adjacent sheet edge. The insert strip is adhesively secured to each of the adjacent sheet edges preferably with a score or fold line therebetween along which the insert strip will predictably part upon application of force to the overlying flap. The adhesively secured insert strip portions serve to reinforce the adjacent sheet edges and accordingly prevent tearing of these edges.

The present method of making the described package from a continuous web of packaging material includes in brief the steps of applying spaced transverse stripes of adhesive to a continuous flat web of packaging material, deposing articles to be packaged on the web between the applied adhesive stripes, folding the package web so that the edges thereof are disposed in overlying relation, introducing an adhesive-coated insert web between the overlying web edges, sealing the transverse adhesive stripes, and cutting the web along the sealed adhesive stripes to separate the filled packages.

It is accordingly a first object of the present invention to provide a package of flexible packaging material having a tear-open seam which may be easily opened along its entire length by application of a moderate and uniform opening force.

Another object of the present invention is to provide a package as described wherein the tear line is accurately established and wherein the regions adjacent thereto are reinforced to prevent inadvertent tearing thereof.

A further object of the invention is to provide a package as described which may with its contents be readily sterilized, and which will not jeopardize the sterility of the contents during opening of the package and removal of the contents.

Still another object of the invention is to provide a package as described which is adapted for manufacture from continuous webs of packaging material.

A still further object of the invention is to provide a method of making the described package in a rapid, economical and uniform manner.

Additional objects and advantages of the invention will be more readily apparent from the following detailed description of the embodiments thereof when taken together with the accompanying drawings in which:

FIG. 1 is a perspective view showing a package formed in accordance with the present invention with one end edge unsealed to reveal the configuration of the tear-open seam;

FIG. 2 is a perspective schematic view illustrating the present method of forming the package shown in FIG. 1;

FIGS. 3—6 are sectional views taken respectively along lines 3—3, 4—4, 5—5 and 6—6 of FIG. 2 showing the successive steps of folding the package web and insert web to form the desired sectional package configuration;

FIG. 7 is a plan view of the present package illustrating the manner in which the package is opened;

FIG. 8 is a sectional view taken along line 8—8 of FIG. 7;

FIG. 9 is a plan view of a modified form of the package, showing the package in the partially opened condition;

FIG. 10 is a sectional view taken along line 10—10 of FIG. 9;

FIG. 11 is an enlarged view of the cirked area of FIG. 10;

FIG. 12 is a plan view of a further modified form of the invention also shown in the partially opened condition;

FIG. 13 is a sectional view taken along line 13—13 of FIG. 12;

FIG. 14 is a sectional view showing still another modified form of the present package;

FIG. 15 is a schematic elevational view further illustrating the novel method of making the preferred form of the invention; and

FIG. 16 is a schematic plan view showing a modified method of forming the present package.

Referring to the drawings, a package 20 illustrating a preferred form of the invention is shown in FIGS. 7 and 8 and also, with one end unsealed, in FIG. 1. The package is formed of a rectangular sheet 22 of flexible packaging material having side edges 24 and 26 and end edges 28 and 30. The sheet 22 is folded along parallel fold lines 32 and 33 parallel to and spaced from the side edges 24 and 26 to form a flattened tube, the side edge 26 overlapping the side edge 24. The fold lines and sheet edges thus define a package back panel 34, outer front panel 35, and inner front panel 36. The end edges 28 and 30 are respectively sealed by adhesive layers 38 and 40 which preferably form peel-open bonds, thereby effectively sealing the package except for the overlapped side edge region. It is in this region that the novel tear-open seam construction is employed.

In the preferred embodiment, the tear-open seam includes an insert strip 42 of tearable material which extends the full length of the overlapped side edges. The strip 42 is longitudinally folded into a U-shape along a medial fold line 43 and the oppositely facing panels 44 and 45 thereof are adhesively bonded to the adjacent surfaces of the overlapped sheet side edges. The folded edge 43 of the insert strip is directed inwardly so that the outer edge 26 of the package sheet forms a flap 46 in conjunction with the strip panel 44 which may be conveniently grasped to open the package.

FIGS. 7 and 8 illustrate the manner in which the tear-open seam is opened. The package is gripped adjacent the fold line 33 with one hand and by the flap 46 with the other hand. Upon movement of the hands apart with a moderate uniform force, the insert strip will tear cleanly along its fold line 43. The insert strip will tear at its fold line along the entire length of the seam since in view of the adhesive attachment of the adjacent insert strip panels to the sheet edges, this is the weakest point of the insert strip.

After the insert strip has been completely severed, the entire outer front panel 35 may be fully opened by peeling open the associated portions of the end seams 38 and 40 to expose the package contents. By positioning the insert strip 42 in outwardly spaced relation from the sheet edge 24, an inwardly extending flap 48 formed by the sheet edge will, after opening of the tear-open seam, prevent contact of the packaged article with the insert strip during removal of the article from the package. It is thus possible to remove sterile articles from the package without contamination.

A novel method of making the above-described package is illustrated in FIGS. 2—6 and FIG. 15. In this method, the package sheet 22 and the insert strip 42 are supplied in continuously moving web form and the package is filled and formed in a continuous operation. Referring to FIG. 15, the package web 22 is advanced by feed rolls 50 into an adhesive applicator 52, in which a heat-sensitive adhesive is applied in spaced transverse strips 54 to the upper surface of the web. The web then passes beneath the feeder 56 which sequentially deposits articles 58 to be packaged on the web surface between the adhesive strips 54. The package web bearing the articles to be packaged is then passed through the formers 63,
of the package is effected in the manner shown in FIGS. 7 and 8, the tearing of the insert strip taking place along the score line 42b.

From the foregoing description of embodiments of the invention, it can be understood that the insert strip tear occurs along a narrow region of the strip which is not adhesively bonded to a package edge, which region may include a fold line or score line. The unsecured region is relatively weak compared to the adjacent adhesively bonded portions, particularly if folded or scored, and the strip will thus tear evenly along this narrow region.

The materials from which the package sheet and insert strip can be formed encompass a wide variety of flexible packaging materials such as paper, foils, films and the like. The insert strip is preferably of a weaker material than the packaging sheet although it could be of the same material if it may be readily torn.

The adhesives utilized in forming the package similarly may be of any suitable type and need not be limited to the liquid and heat-sealable adhesives described.

The shape, size and type of package with which the present tear-open seam is employed may of course be varied from that of the illustrated embodiments. Two or more tear-open seams of the type described could be employed in the same package panel to permit the complete removal of the panel to provide access to the package contents. Similarly, although the tear-open seam of the illustrated embodiments is a straight line seam, the seam could have a curved configuration or could continue around several edges of the tear-open panel.

Manifestly, changes in details of construction can be effected by those skilled in the art without departing from the spirit and scope of the invention as defined in and limited solely by the appended claims.

1. In a package formed of flexible packaging material and including adjacent parallel edges, the improvement of a tear-open seam comprising an insert strip of tearable material adhesively bonded to each of said adjacent edges, said insert strip having an unsecured region extending longitudinally thereof between the regions of adhesive attachment to said edges, one of said edges forming a flap which may be grasped to tear open said seam along the unsecured region of said insert strip said flap including a portion of said insert strip, the package side edges and the edges of said insert strip being mutually reinforced by their adhesive attachment thereby restricting the tearing of the seam to the unsecured region of said insert strip.

2. The invention as claimed in claim 1 wherein said insert strip includes a longitudinal score line in said unsupported region.

3. The invention as claimed in claim 1 wherein said insert strip includes a fold line in said unsupported region.

4. The invention as claimed in claim 1 wherein said edges are in overlapped relation with said insert strip being bonded between the overlapped portions thereof.

5. The invention as claimed in claim 4 wherein said insert strip is folded along a longitudinal fold line in said unsupported region into a U-shape, said fold line being directed inwardly of said seam.

6. The invention as claimed in claim 5 wherein the underlying edge extends inwardly of said insert strip to prevent contact of the package contents with said insert strip during removal thereof.

7. A tear-open package comprising flexible packaging material having a pair of parallel side edges and a pair of parallel end edges perpendicular thereto, said material being folded along each of a pair of parallel fold lines parallel to and spaced from said side edges to provide an overlapping of said side edges, means forming a tear-open seam along said overlapped side edges, said means comprising an insert strip of tearable material disposed between and adhesively bonded to each of said overlapping side edges, said insert strip extending the length of said side edges and having an unsecured region extending thereof along a narrow region of the strip which is not adhesively bonded to a package edge, which region may include a fold line or score line. The unsecured region is relatively weak compared to the adjacent adhesively bonded portions, particularly if folded or scored, and the strip will thus tear evenly along this narrow region.
tending longitudinally thereof between the areas of adhesive attachment to said side edges, one of said said edges and a portion of said insert strip forming a flap which may be grasped to tear open said seam, said side edges and the edges of said insert strip being mutually reinforced by their adhesive attachment to thereby restrict the tearing of the seam to the unsecured region of the insert strip, and means for sealing the end edges of said package.

8. The invention as claimed in claim 7 wherein said means for sealing the end edges of said package provides a peel-open seal of said edges.

9. The invention as claimed in claim 7 wherein said insert strip is folded along a longitudinal fold line in said unsupported region into a U-shaped, said fold line being directed inwardly of said seam.

10. The invention as claimed in claim 9 wherein the underlying side edge extends inwardly of said insert strip to prevent contact of the package contents with said insert strip during removal thereof.

11. The invention as claimed in claim 7 wherein said insert strip includes a longitudinal score line in said unsupported region.

12. A tear-open package comprising a sheet of flexible packaging material having a medial fold line therein defining one package edge, the sheet edges parallel with said fold line being in parallel overlying relation and comprising a tear-open seam, said tear-open seam comprising an insert strip of tearable material disposed between and adhesively bonded to each of said overlying side edges, said insert strip being folded along a longitudinal fold line into a U-shape, said fold line being directed inwardly of said seam, each of said sheet side edges and a portion of said insert strip forming a flap which may be grasped to tear open said seam along the fold line of said insert strip, and means for sealing the end edges of said package sheet.

13. A tear-open package comprising a sheet of flexible packaging material having a pair of parallel side edges and a pair of parallel end edges perpendicular thereto, said sheet being folded along each of a pair of parallel fold lines parallel to and spaced from said sheet side edges to form a package back panel and a pair of package front panels, one of said front panels being folded along a line parallel with said fold lines to form an outwardly overlying flap portion thereof, said latter fold line overlying the side edge of the other of said front panels, a strip of tearable material extending longitudinally along and adhesively bonded to each of said front panels, said strip extending the length of said side edges and having an unsecured region extending longitudinally thereof between the areas of adhesive attachment to said front panels, said strip being attached to said one panel along the flap portion thereof, said front panels and the edges of said strip of tearable material being mutually reinforced by their adhesive attachment whereby the application of force to said flap causes a tearing of said sheet along the unsecured region of said strip, and means for sealing the end edges of said package sheet.

14. The invention as claimed in claim 13 wherein said strip includes a score line in said unsecured region.