

[54] **MOISTURE-IMPERMEABLE PACKAGE**

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[51] Int. Cl. **B65h 1/00**

[58] Field of Search 221/33-63,
221/303, 307, 309; 150/0.5

[56] **References Cited**

UNITED STATES PATENTS

2,730,267	1/1956	Marcalus	221/48
2,975,931	3/1961	Harrison	220/24 R
3,065,525	10/1962	Deinert	150/0.5 X
3,193,137	7/1965	McCarthy	221/48

Primary Examiner—Robert B. Reeves

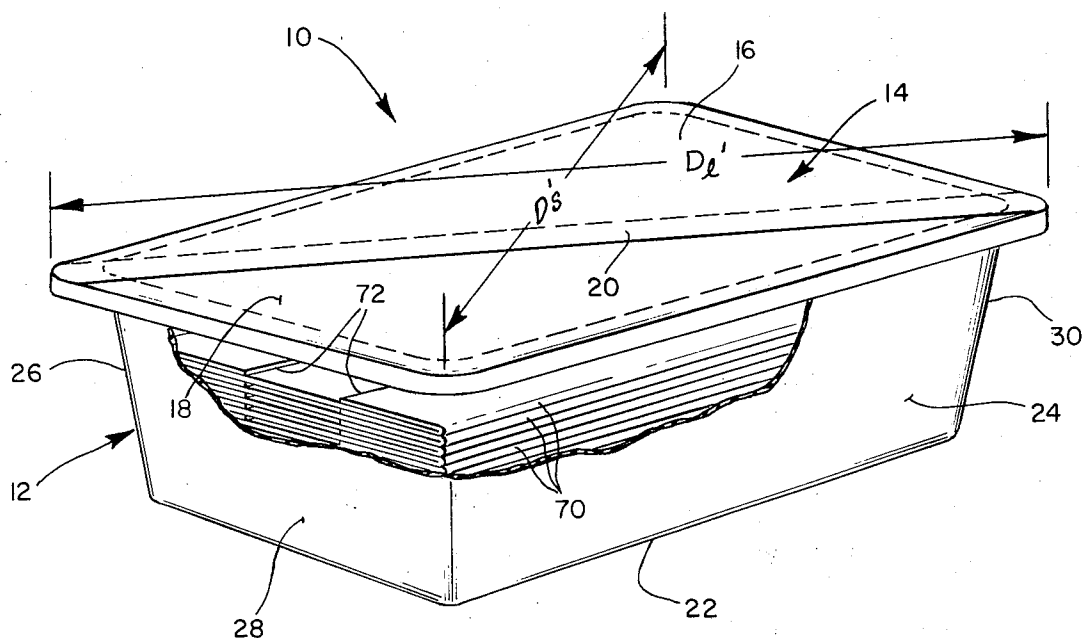
Assistant Examiner—Thomas E. Kocovsky

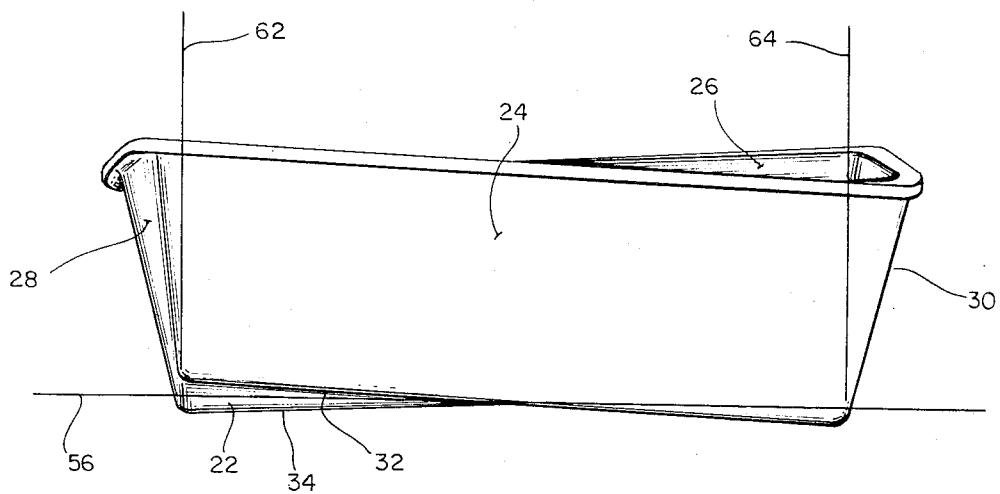
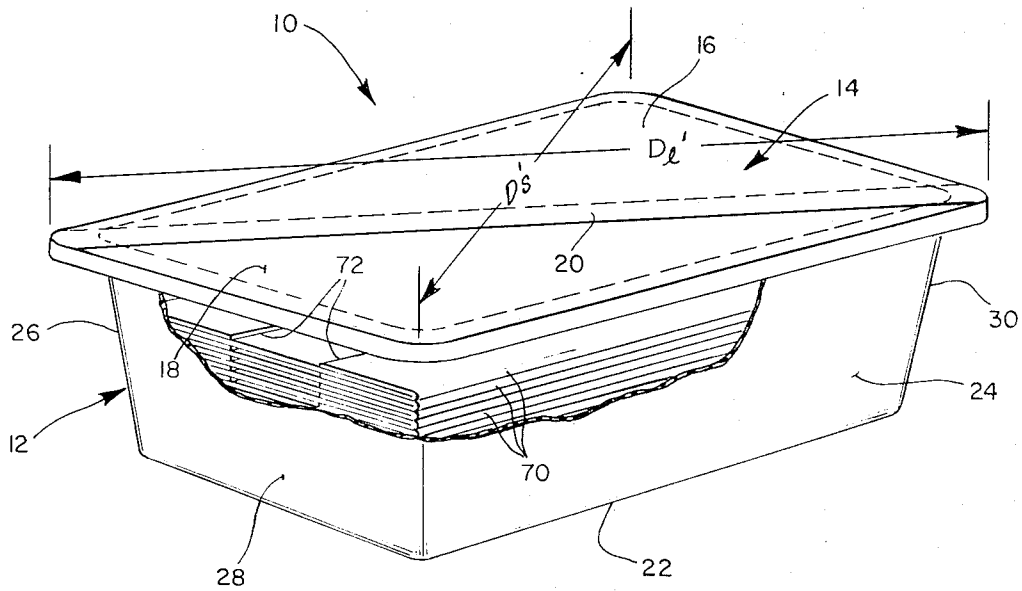
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[57] ABSTRACT

A moisture-impermeable package including a flexible container having a bottom wall and side walls extending upwardly from the bottom wall. The side walls terminate in upper marginal ends which define an opening into the container. A thin, flexible, substantially non-stretchable closure is secured to the container and extends over the opening defined by the marginal ends. The closure has overlapping sections which define a slit that is elongate in a predetermined direction, and the container is in a differentially stressed condition to apply slit-sealing tension forces to the closure in the direction of slit elongation whereby the overlapping sections of the closure defining the slit are maintained in sealing relationship for establishing a substantially moisture-impermeable closure.

10 Claims, 4 Drawing Figures





SHEET 2 OF 2

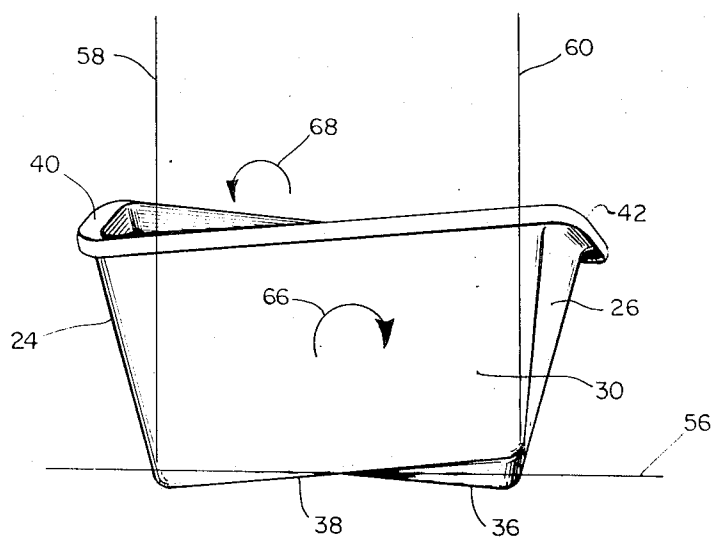


Fig. 3

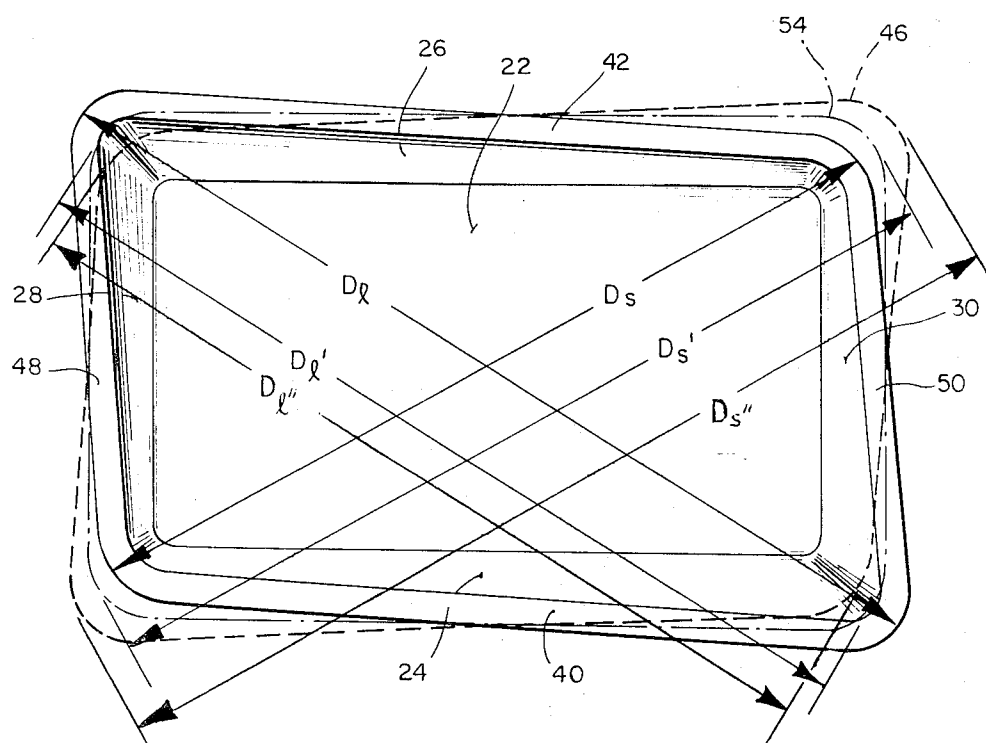


Fig. 4

MOISTURE-IMPERMEABLE PACKAGE**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates to a moisture-impermeable package, and more specifically to a moisture-impermeable package for retaining pre-moistened fibrous webs therein and for permitting easy removal of said fibrous webs therefrom.

2. Description of the Prior Art

Pre-moistened wipers are extremely popular for cleansing many portions of the human body. For example, such wipers have provided the means for cleansing parts of the human body under conditions where water, towels and the like are not available. One specific use for pre-moistened wipers is for cleansing excreta from the human anus, and usually after toilet paper has been used in the normal manner. In such an application, the wiper normally is not a substitute for toilet paper, but provides the final cleansing operation after the bulk of the excreta has been removed in the usual manner. Pre-moistened wipers have many other applications. For example, they can be used to cleanse parts of the body other than the anus, such as under the arms, face, and/or neck.

A wet wiper packaging system normally is prepared for dispensing by removing an overwrap material, or other primary seal. After the primary seal has been removed the packaging system still must be capable of retaining the wet-wipers at an acceptable moisture level during the period of time required to use all of the wet-wipers, i.e., 30-60 days.

One wet wiper packaging system presently on the market is sold under the trademark WET ONES by Lehn & Fink Products Division of Sterling Drug, Inc. The moisture-impermeable package of this system employs a container having a main body member and a separate lid member. The lid member is provided with cross-slits through which wet wipers can be removed, and a cap forms a part of the lid member for sealing the cross-slits. In the event a user of the system fails to properly close the cap, the wet wipers may dry out prior to use. In addition, the packaging system is sold with an aluminum foil sheet covering the open end of the main body member of the container. To use the system a mother must remove the lid, break the aluminum seal and feed a lead end of a continuous roll of wet wipers through the cross-slits. These preparatory operations are somewhat cumbersome.

Other moisture-impermeable packages have been designed for products such as pills, tablets and the like. These packages normally include a main body portion and a lid pivotally secured thereto. The lid is pivotal between an open position for permitting the removal of pills and/or tablets, and a closed position to seal the package. In the event the lid is not properly closed, moisture can seep into the package to thereby adversely affect the product contained therein.

U.S. Pat. No. 3,401,498 issued to Garvin, discloses and claims a method for capping or closing a container suitable for use in vending machines. According to the Garvin method an unsupported end portion of the container is placed under heat and pressure to uniformly deform it in all directions as a plastic cover material is secured over one end thereof. After the cover is secured to the container the pressure on the container is removed to permit the container to spring outwardly

and apply tension to the cover uniformly in all directions. This construction, while providing a moisture-impermeable packaging system, is not associated with a package having a slit therein for permitting the removal of contents from within the package while maintaining the package in a moisture-impermeable condition during non-use.

U.S. Pat. No. 2,975,931, issued to Harrison, relates to a container provided with a Mylar covering material thereover. The container has a tapered skirt portion with a maximum width in the midsection thereof, and this maximum width section applies tension to the covering material. The covering material is not provided with a slit therein to permit the removal of contents from within the container. Stating this another way, the Harrison construction is in no way related to a moisture-impermeable package which is maintained in a moisture-impermeable condition under normal conditions, and which has a slit in a covering through which product can be removed when use of the product is desired.

SUMMARY OF THE INVENTION

A moisture-impermeable package includes a flexible container having a bottom wall and side walls extending upwardly from said bottom wall, said side walls terminating in upper marginal ends defining an opening into the container. A thin, flexible, substantially non-stretchable closure is secured to the container over the opening thereof, and the closure has overlapping sections which define a slit that is elongate in a predetermined direction. The container is differentially stressed for applying slit-sealing tension forces to the closure in the direction of slit elongation to maintain the overlapping sections of the closure in sealing relationship for establishing a moisture-impermeable package.

In the preferred embodiment of this invention the container is molded in a configuration such that the upper marginal ends define a quadrilateral (preferably a parallelogram) in plan view. The parallelogram preferably is in the form of a rhomboid having a long diagonal dimension and a short diagonal dimension. The container is twisted into a differentially stressed condition in which the upper marginal ends define a rhomboid which is canted in the opposite direction from its initially formed direction, as a result of which the long diagonal dimension is foreshortened. The closure is adhered, with some slack therein, to the twisted container with the direction of slit elongation along the foreshortened diagonal dimension of the container. The twisting force applied to the container is then removed, and the somewhat slack condition of the closure permits the container to move slightly in a direction opposite to its twisted direction to assume an equilibrium position in which the foreshortened diagonal dimension is lengthened and the upper marginal ends of the container define a substantially rectangular configuration in plan view. In this manner, potential energy is stored in the twisted container to impart the slit-sealing tension forces to the closure in the direction of slit elongation.

The seal which is established in the package of this invention is effective to maintain the wet wipers at a functional moisture level for the period of time required to utilize all of wipers, i.e., 30-60 days. The package does not have a separate pivotal lid member which, as a result of improper closure thereof, can re-

sult in moisture escaping from the web to render the product unacceptable prior to use thereof.

A wet wiper most easily is removed from the package of this invention by placing the thumb and forefinger through the slit in the closure to engage the uppermost wet wiper within the container. The container is sufficiently flexible to flex to accommodate the opening of the slit resulting from fingers being inserted there-through. After the fingers and engaged product are removed from the confines of the slit, the container returns to its equilibrium position to cause the overlapping sections of the closure to engage each other and provide a moisture-impermeable seal. The non-stretchable nature of the closure further assures that an impermeable seal will be maintained after repeated insertion of the fingers into the package. Preferably, the closure is transparent to permit the user to view into the package while removing a wet wiper.

Other objects and advantages of this invention, including a better understanding thereof, can be had by referring to the detailed description which follows, taken in conjunction with the drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of a moisture-impervious package according to this invention with parts broken away to show wet wipers packaged therein;

FIG. 2 is a side elevation view of the container employed in this invention in its originally molded configuration without the closure adhered thereto;

FIG. 3 is an end elevation view of the container employed in this invention in its originally molded configuration without the closure adhered thereto; and

FIG. 4 is a plan view of the container employed in this invention wherein the configuration of the container in its originally molded configuration is shown in solid lines, and the outer boundaries of the container as the closure is adhered thereto, and in its equilibrium position are shown in phantom lines.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

Referring to FIG. 1, a moisture-impermeable package 10 according to this invention includes a flexible container 12 and a thin, flexible, non-stretchable closure 14 secured to the container over an open end thereof. The closure 14 is formed of overlapping non-stretchable plastic sheets 16 and 18, and the overlapping sections of these sheets define a slit 20 extending in a predetermined direction. In the preferred embodiment of this invention the slit 20 extends along diagonal D_1 .

The container 12 includes a bottom wall 22, opposed long side walls 24 and 26, and opposed short side walls 28 and 30. The long and short side walls extend upwardly and diverge outwardly from the bottom wall 22. The long side walls 24 and 26 are joined to the bottom wall through lower rounded edges 32 and 34 (FIG. 2), respectively. The short side walls 28 and 30 are joined to the bottom wall through lower rounded edges 36 and 38, respectively (FIG. 3). Referring to FIGS. 3 and 4, the long side walls 24 and 26 terminate in upper marginal ends 40 and 42, respectively. Referring to FIGS. 2 and 4, the short side walls 28 and 30 terminate in upper marginal ends 48 and 50, respectively.

Each of the side walls 24, 26, 28 and 30 is generally in the shape of a trapezoid wherein only the lower

rounded edges and upper marginal ends are substantially parallel. The opposed long side walls 24 and 26 are canted in opposite directions relative to a horizontal plane 56 in the initially molded configuration of the container 10 (FIG. 2). In addition, these long side walls are canted in opposite directions relative to vertical planes 58 and 60 (FIG. 3). In this manner, the opposed long side walls 24 and 26 are substantially inverted mirror images of each other.

The same canted relationship exists between the opposed short side walls 28 and 30. More specifically, the short side walls 28 and 30 are canted in opposite directions relative to the horizontal plane 56 (FIG. 3), and are canted in opposite directions relative to vertical planes 62 and 64 (FIG. 2).

As a result of the canted relationship of the side walls, the bottom wall 22 is nonplanar and is disposed in canted relationship with respect to horizontal plane 56.

The upper marginal ends 40, 42, 48 and 50, in the form of flanges extending outwardly from the side walls, define an opening into the container 12. Preferably the outer end of the flanges extend downwardly to enhance the rigidity of the upper end of the container. As a result of the above described construction of the container, in its initially molded configuration, the upper marginal ends define a rhomboid in plan view having a long diagonal dimension D_1 and a short diagonal dimension D_2 (FIG. 4).

To form the package 10 elastically deforming twisting forces, as indicated by arrows 66 and 68 (FIG. 3), are applied to the flexible container 12 to reorient the upper marginal ends into a rhomboid which is canted in the opposite direction from its initially deformed disposition, as indicated at 46 in broken line representation in FIG. 4. The twisting of the container can be accomplished by inserting it into a mold cavity having the appropriate configuration. By twisting the container as indicated above, the long diagonal dimension D_1 is foreshortened to a new dimension D_1'' and the short diagonal dimension D_2 is lengthened to a new dimension D_2'' (FIG. 4). With the container maintained in its reoriented condition, the plastic sheets 16 and 18 are adhered to the marginal ends 40, 42, 48 and 50 by any suitable means. For example, an adhesive which is compatible with both the container and the plastic sheet can be utilized, or a hot pressure bonding technique can be utilized. The specific means of attaching the plastic sheets to the container is not limiting on the present invention.

The sheets 16 and 18 are adhered to the container in a slack condition while the container is maintained in its deformed condition, and the overlapping sections of the sheet define the elongate slit 20 which is disposed along the foreshortened diagonal dimension D_1'' of the container. After the plastic sheets 16 and 18 are adhered to the container 12, the deforming forces are removed from the container, and the container will move toward its initially formed condition which causes the diagonal dimension D_1'' to lengthen. The container 12 will continue to move toward its initially formed condition until the plastic sheets become sufficiently taut to provide an effective seal, as a result of the continual lengthening of the diagonal dimension D_1'' . In the taut condition of the plastic sheets 16 and 18 the package 10 assumes an equilibrium condition in which the upper marginal ends of the container 12 define a sub-

stantially rectangular configuration in plan view, as indicated at 54 in dot-dash representation (FIG. 4). In this equilibrium condition, the diagonal dimension along the slit direction is indicated as D_1 (FIG. 4) and is greater than D_1' but less than D_1 . Potential energy is stored in the plastic container in the equilibrium condition, as a result of its elastic memory for its originally formed condition. This potential energy is responsible for applying continuous tension forces to the plastic sheets in the direction of slit elongation to maintain the overlapping sections of the plastic sheets in sealing relationship with respect to each other. If desired any suitable adhesive or self-stick material can be included on one or both of the plastic sheets in the overlapping section (5) to assure that an effective seal is established between the overlapping sections.

In the preferred embodiment of this invention, the moisture impermeable package 10 is utilized to retain a plurality of premoistened fibrous webs 70 therein, such as the pre-moistened wipers disclosed in U.S. Pat. application Ser. Nos. 263,145, filed June 15, 1972; and 237,859, filed Mar. 14, 1972, both of which are assigned to Scott Paper Company (FIG. 1). These webs 70 can be folded in any conventional manner and stacked upon each other. Preferably, the webs are folded to provide gripping edges 72 on the side of each web closest to the flexible closure 14. A pre-moistened wiper is removed most easily by inserting the thumb and forefinger through the slit defined by the overlapping sections of the plastic sheets 16 and 18 to thereby grip an edge 72 of the uppermost wiper 70.

The container is sufficiently flexible to reorient itself to accommodate the opening of the slit by the fingers. After a wiper has been removed, the package will return to its equilibrium condition to cause overlapping sections of the plastic sheet 16 and 18 to engage each other and form a moisture-impermeable seal. The establishment of the moisture-impermeable seal after repeated insertion of the fingers into the container is further assured by the fact that the plastic sheets are substantially non-stretchable.

The container 12 preferably is constructed of a plastic material which is flexible and self-supporting. Exemplary materials which can be used to form the container 12 are polypropylene and polyvinyl chloride, as well as laminated constructions of these and other plastic materials. Other flexible materials can be utilized provided they are compatible with the items contained within the container 12, and are sufficiently self-sustaining. Preferably, the container is made in a thermo-forming operation from 30 mil thick plastic sheet material.

The flexible closure preferably is constructed of thin plastic laminates such as mylar laminated to polyethylene. The mylar is tough and non-stretching, to thereby impart the non-stretchable characteristics to the closure. The polyethylene has excellent heat sealing properties, and is disposed adjacent the surface of the container when a heat sealing operation is utilized to secure the film to the container. Other materials can be utilized for the closure, provided that such materials can be utilized to form a closure which is substantially non-stretchable, and which can be adhered to the container 12 by the means desired.

Although one specific pre-shaped configuration of a container 12 has been described, other pre-shaped configurations can be utilized, depending upon the shape of the items to be packaged within the container. The

important criteria is that the container be preshaped such that upon applying elastically deforming forces thereto; the container is differentially stressed into a condition such that slit-sealing tension forces are applied to the closure after removal of the elastically deforming forces. For example, the container can be formed into a configuration wherein the upper marginal ends define an ellipse having a long major axis, and a shorter minor axis. In such an arrangement, the elastically deforming forces would be applied to cause the container to assume a new configuration in which the upper marginal ends define an ellipse with its major and minor axes disposed 90° to the respective major and minor axes in the originally formed container. The non-stretchable plastic material would be adhered to the container with the slit oriented in the direction of the foreshortened major axis, i.e., the minor axis in the elastically deformed container. When the elastically deforming forces are removed, the container will tend to move toward its originally formed condition, to thereby cause a lengthening of the foreshortened direction to create a taut condition in the closure to effect the moisture-impermeable seal.

What is claimed is:

1. A moisture-impermeable package comprising:
 - A. a flexible container having a bottom wall and side walls, said side walls extending upwardly from said bottom wall and terminating in upper marginal ends which define an opening into the container;
 - B. a thin, flexible, substantially non-stretchable closure secured to said container and extending over the opening therinto, said closure having overlapping sections defining a slit which is elongate in a predetermined direction; and
 - C. said container being in an equilibrium, differentially stressed condition for applying slit-sealing tension forces to said closure in the direction of slit elongation, whereby the overlapping sections of said closure defining the slit are maintained in sealing relationship with respect to each other to establish a substantially moisture-impermeable closure for the container.
2. The package according to claim 1, including moistened fibrous webs within said container.
3. The package according to claim 1, wherein the upper marginal ends of said side walls define a quadrilateral in plan view, said slit being oriented in a diagonal direction of said quadrilateral.
4. The package according to claim 3, wherein said quadrilateral is substantially rectangular in plan view.
5. The package according to claim 1, wherein said container is pre-shaped in a configuration different from the equilibrium configuration which is established with the closure adhered thereto.
6. The package according to claim 5, wherein the upper marginal ends of said side walls define a quadrilateral in plan view, said slit being oriented in a diagonal direction of said quadrilateral.
7. The package according to claim 6, wherein the upper marginal ends of the side walls of the pre-shaped container generally define a rhomboid in plan view, said upper ends being disposed in a substantially rectangular configuration in plan view when the container is in an equilibrium condition with the closure secured thereto.
8. A moisture-impermeable package comprising:

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A. a flexible container having a bottom wall and side walls extending upwardly from said bottom wall and terminating in upper marginal ends which define a quadrilateral in plan view, said container being in an equilibrium, stressed condition in which one diagonal dimension of the quadrilateral is shorter, and the other diagonal dimension is longer than the corresponding diagonal dimensions of the unstressed container; and
B. a thin, flexible closure secured to said container and extending over the opening into said container,

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said closure having overlapping sections defining a slit which is elongate along the shortened diagonal dimension of the stressed container.

9. The package according to claim 8, wherein the quadrilateral defined by the upper marginal ends of the stressed container is substantially rectangular.

10. The package according to claim 9, wherein said side walls include opposed substantially parallel long side walls and opposed substantially parallel short side walls.

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