

Feb. 13, 1962

R. K. POTTLE ET AL

3,021,048

CONTAINER

Filed March 24, 1959

2 Sheets-Sheet 1

Fig. 1

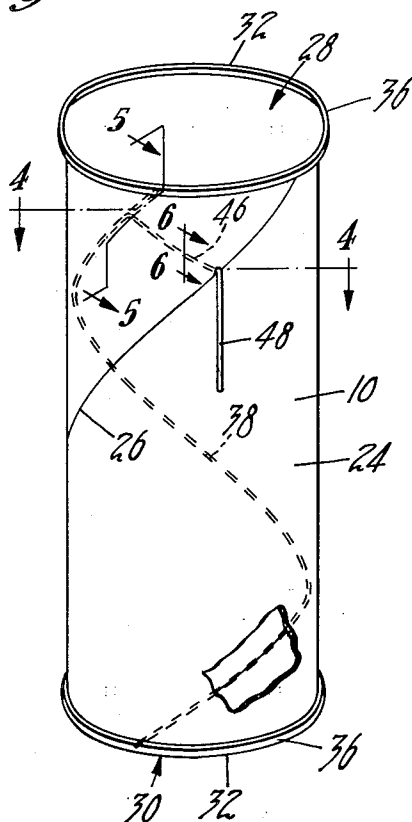


Fig. 2

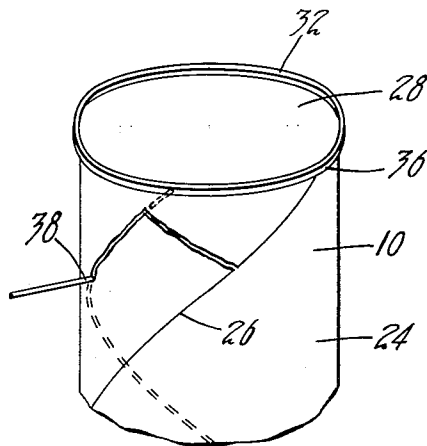
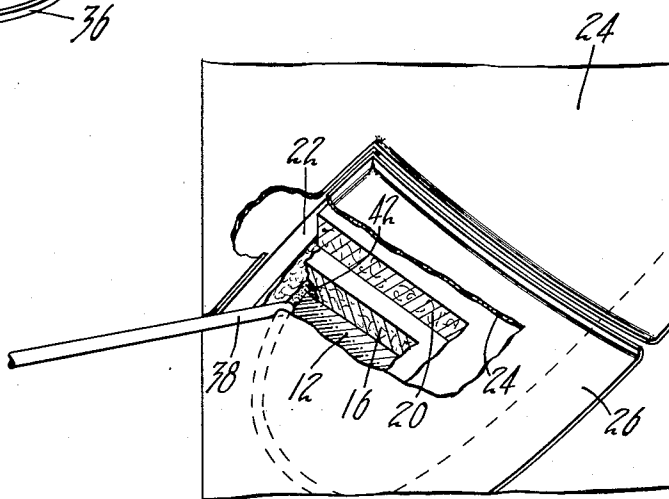


Fig. 3



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Fig. 5

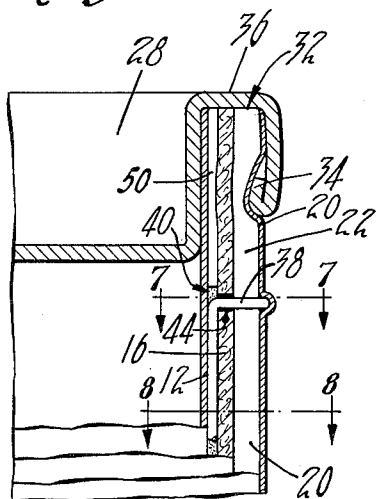


Fig. 6

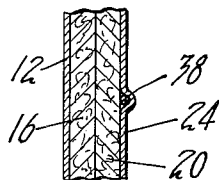


Fig. 7

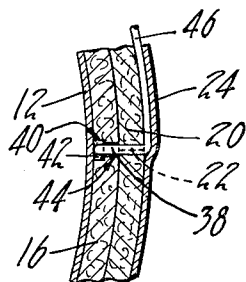


Fig. 4

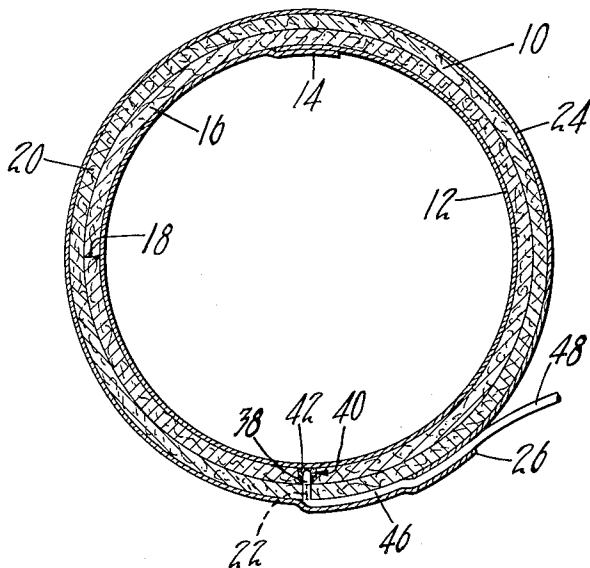
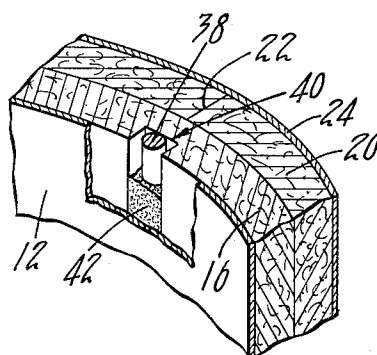


Fig. 8



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3,021,048 CONTAINER

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Filed Mar. 24, 1959, Ser. No. 801,647
9 Claims. (Cl. 229—51)

The present invention relates to multi-ply, spirally wound, fibre tear string containers, and has particular reference to a container that is useful in holding unbaked biscuit dough cakes.

This invention is an improvement over the invention disclosed in Ralph K. Pottle et al. application Serial No. 729,366, filed April 18, 1958, and entitled "Container."

In order to successfully hold a product such as raw biscuit dough, a fibre container body must meet certain specifications. It must be strong enough to hold the internal pressure generated by the leavening action of the baking powder during the proofing and handling periods. Its external surfaces must be moistureproof and waterproof in order to prevent softening of the container body by the condensation of atmospheric moisture on the chilled container surfaces which occurs during refrigerated storage of the filled container. In like manner, the internal surfaces of the container must be moistureproof and waterproof in order to prevent the moisture in the dough from reaching and softening the inner plies of the can body. Also, the container must be easily openable by the consumer without requiring resort to opening tools.

The present container is capable of meeting all of these requirements. It is particularly advantageous in that it embodies a tear string which is so positioned that complete severance of all of the major plies of the body wall, except the inner liner, is ensured when the string is pulled by the ultimate consumer to open the container.

To obtain this result, the tear string is disposed on the inner surface of the inner body ply in inward registration with a line of opening, which usually is a butt joint, formed in the outer body ply. The tear string passes through an opening in this inner body ply, then between the abutted edges of the line of opening in the outer ply, and then extends circumferentially beneath the outer foil label, passing to the outside of the body through the label lap joint.

As a consequence of its passing between the abutted edges of the outer body ply, the string when pulled by the consumer to tear open the body wall, follows along these abutted edges, and the latter thus functions as a passage or guideway for the string, thus ensuring that the tear which is made in the inner ply by the string lines up with and forms an inward continuation of the line of opening of the outer ply. Thus, complete severance of both plies of the body is positively obtained and reliability of opening is ensured.

An object of the invention therefore is the provision of a spirally wound multi-ply fibre container body construction which embodies a substantially foolproof string opening feature.

Another object is the provision of a two-ply container body wherein a spiralled string is so located in the inner body ply that when the string is pulled to open the container, registration of the tear in the inner ply with a line of opening in the outer body ply is ensured.

Still another object is the provision of a container having a body comprising at least two comparatively heavy spirally wound body plies, and wherein a butt joint in the outer body ply is utilized as a guideway along which the tear string travels as it creates a line of tear in the inner body ply.

Yet another object is the provision of a spirally wound

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two ply container body provided with a pull string disposed inwardly of both plies to ensure complete tearing through of the body and having a free end which is made accessible to the consumer.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

FIGURE 1 is a perspective view of a container constructed according to the principles of the present invention, parts being broken away;

FIG. 2 is a view of the upper portion of the container shown in FIG. 1, showing the initial stage of the opening action of the tear string, parts being broken away;

FIG. 3 is an enlarged fragmentary perspective detail of a portion of the container shown in FIG. 2, parts being broken back to show more clearly how the tearing action of the string opens up the container body wall;

FIG. 4 is an enlarged sectional view taken substantially along the line 4—4 in FIG. 1;

FIGS. 5 and 6 are enlarged sectional views taken substantially along the lines 5—5 and 6—6, respectively, in FIG. 1;

FIG. 7 is an enlarged sectional view taken substantially along the line 7—7 in FIG. 5; and

FIG. 8 is an enlarged perspective detail, taken through a portion of the container body of the instant invention, the plane of the detail being indicated by the line 8—8 in FIG. 5, parts being broken away.

As a preferred or exemplary embodiment of the invention, the drawings illustrate a container comprising four body plies helically wound in the same direction at the same winding angle and glued together to form a solid moisture and waterproof body 10. Reading from the inside out these plies comprise first, an inner liner 12, preferably composed of aluminum foil prelaminated to a paper backing in the usual manner, and having its spiralled edges overlapped to form a lap joint 14 which prevents leakage of gases, grease or moisture into the interior body plies.

The liner 12 is glued to a first main body ply 16, preferably formed of comparatively heavy stock such as chipboard or kraft and having its edges juxtaposed to form a butt joint 18 which is circumferentially offset from the liner joint 14.

The first main body ply 16 is glued to a second main body ply 20, which is formed of stock similar to that of the first main body ply, and which has its edges juxtaposed to form a second butt joint 22 which is circumferentially offset from the butt joint 18 of the first main body ply 16. It is this butt joint 22 which forms the line of opening in the ply 20, as will be hereinafter more fully explained.

The second main body ply 20 is in turn adhesively secured to an outer label ply 24 which has its spiralled edges lapped in a lap joint 26 which is of sufficient width to shield the second body ply 20 against the penetration of any external water which might condense on the outer surface of the label 24. This lap joint 26 is circumferentially offset from the butt joint 22 of the second body ply 20 for a reason which will be more fully explained. The label ply 24 is preferably made of thin aluminum foil prelaminated to a paper backing for additional strength in the usual manner, and may carry a printed design on its exposed surface.

The container body 10 is preferably closed by means of upper and lower end members 28, 30 formed with U-shaped peripheral channels 32 which receive the ends of the body. The outer flanges of the channels 32 are preferably provided with hemmed edges 34 which bite

into the body to compress the same and form tight end seams 36.

As seen in FIG. 5 the liner ply 12 and the label ply 24 extend fully into the end seams 36 so that the raw cut edges of the first and second main body plies 16, 20 are shielded from any moisture which might be present either within or without the container. The described construction thus provides a strong rigid container which is substantially impervious to the moisture normally encountered under commercial conditions.

In order to provide the means to permit the consumer to open the container without tools, a tearing string 38 is positioned in a spiral groove 40 which is milled into the inside surface of the first main body ply 16 in inward registration with the spiral butt joint 22 of the second main body ply 20. The tear string 38 is preferably held in place in the groove 40 by a fillet 42 of a suitable adhesive material such as paraffin or microcrystallin wax. The fillet 42, in addition to holding the string 38 in place, also serves as a caulking compound which restores the internal surface of the ply 16 to its original smooth contour to thus prevent any danger of the inner ply 12 being ruptured by reason of its being pressed against the sharp edges of the groove 40 by the product, as might otherwise occur.

The string 38 extends spirally around the container inwardly of the butt joint 22 from the bottom of the container, where it preferably extends into the bottom seam 36 and is thereby anchored against longitudinal movement, to a point adjacent the upper end seam 36 of the container. At this point, the string passes radially through a small cut or perforation 44 formed in the inner body ply 16 and then passes between the abutting edges of the butt joint 22 of the outer body ply 20. A portion 46 of the string 38 then extends in a lateral direction, generally circumferentially of the container, beneath the label ply 24 and through the label joint 26 to the outside of the container where it terminates in a free end 48 which dangles from the body of the container and is visible to the ultimate consumer.

As seen in FIG. 5, a short separate section 50 of string extends upwardly into the upper end seam 36 from a point adjacent the perforation 44. This section 50 is merely incidental to the manufacture of the container and serves no function in opening the container.

The free end 48 of the string 38 is sufficiently long to be grasped securely by the consumer. When the latter desires to open the container, he or she grasps the projecting string end 48 and pulls it in a direction substantially radially of the container, thus tearing through the label 24 from the lap joint 36 to the point at which the string passes through the butt joint 22 of the second body ply 20. From this point on, continued pulling of the string results in the creation of a downwardly extending helical line of tear through the body ply 16 in inward registration with the butt joint 22 of the body ply 20, and in a similar line of tear in the label ply 24 in outward registration with the butt joint 22. This opening action is clearly depicted in FIGS. 2 and 3.

During the formation of these lines of tear, the pull string 38 travels along and is guided by the butt joint 22 since the butt joint offers less resistance to the string than does the solid ply material on either side of it. This is particularly true when the juxtaposed edges of the butt joint 22 are not in tight engagement and are slightly separated. However, it is still true even when such edges are tightly engaged. In such event, the movement of the string along the butt joint 22 has a tendency to open up this joint slightly, as seen in FIG. 3. As a result of the movement of the string 38 along the butt joint 22, the line of tear which is formed in the main body ply 16 always extends from the bottom of the groove 40 to the butt joint 22 and thus becomes in effect a continuation of the line of opening which is formed by the butt joint. Thus, there is no chance that the line of tear in the body

ply 16 will ever be unconnected with the butt joint 22. This is true even though the machines which manufacture these containers might produce slight inaccuracies in registration between the pull string 38 and the butt joint 22.

As seen in FIG. 3, the tearing action of the string 38 results in the formation of a helical line of tear around the container which extends through all of the container plies except the comparatively weak liner ply 12. This helical line of tear extends from the perforation 44 to a point adjacent the bottom seam 36. If the pressure within the container is sufficiently great, it will spontaneously rupture the unsevered liner ply 12 and thus produce complete severance of the body along the helical line of tear. Thereafter, the consumer need only grasp both ends of the container and twist in opposite directions to open up the body and lay it out flatly to expose its contents in substantially undeformed condition.

If the internal pressure is not sufficient to rupture the untorn liner ply 12, the twisting action alone usually is sufficient to do it. If it is not, rupture of the liner 12 may be effected by localized digital pressure adjacent the line of tear to initiate the tearing of the liner 12, which tearing is completed by the twisting action.

As seen in the drawings, the label lap joint 26 is circumferentially offset from the tear string 38 an appreciable distance. This offset distance is not critical but it should be great enough to prevent the possibility of moisture wicking along that portion 46 of the tear string 38 which is covered by the label 24 and reaching the butt joint 22. In addition, the off-set serves another purpose in that it makes it possible to minimize the length of the exposed free end 48 of the tear string 38. It is, of course, desirable to have this exposed end 48 as short as possible, since too long an end is unsightly, and the longer the end, the greater is the danger of its being accidentally snagged to prematurely open the container.

Since the initial tearing action of the string portion 46 through the comparatively thin label 24 requires only a small pulling force, the consumer's grip on the tear string need not be very great and consequently the exposed end 48 need only be long enough to enable it to be grasped between the thumb and forefinger of the consumer. However, the final helical tearing action through the body ply 16 and the label 24 requires considerably more force and consequently a better grip on the string. Thus, by making the offset distance sufficiently great, the length of string available for gripping at the start of the helical tearing action is considerably increased because of the exposure of the string portion 46. As a result of the increased length of the string thus available to him, the consumer is enabled to obtain the firm grip necessary to produce the final spiral tearing action. Thus, offset distance between the butt joint 22 and the label lap joint 26 is an important factor in determining the length of string available to the consumer at the initiation of the final helical tearing action through the body plies. It is obvious that this length can be increased without increasing the length of the exposed free end 48 by increasing this offset distance, and thus increasing the length of the string portion 46.

As will readily be seen, the principles of the instant invention are not limited to the construction disclosed in the drawings, and various modifications may be made in the container without departing from these principles. As an example, the frangible liner ply 12 may be eliminated and a lining or coating comprising a wax, a plastic, or other suitable impervious material may be substituted. It will be understood that the relative thickness and strength of the various body plies may be adjusted to secure the desired strength and opening characteristics, and that the term "tear string" as used herein includes any tearing or ripping element such as a cord, wire, narrow tape, etc. which would function in substantially the same manner as string 38. It is also obvious that the

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groove 40 may be eliminated or reduced in size so that it is entirely filled by the string 38; also that in some situations the adhesive material 42 could be dispensed with, or applied only at spaced intervals.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. A tear string container comprising a spirally wound fibre body composed of an inner and an outer body ply, a pair of end members secured to the ends of said body to close the same, a helical line of opening formed in said outer ply and extending around said body from one end to the other, and a tear string secured on the inner surface of said inner ply in a helical path substantially parallel with said line of opening and spaced radially inwardly therefrom by said inner ply, an end portion of said string passing radially outwardly through a perforation in said inner ply adjacent one end thereof and through said line of opening in said outer ply at a point spaced axially from one of said end members and terminating in a free end positioned exteriorly of said container, said line of opening in said outer ply thereby providing a guideway along which said string travels when said free end is pulled to ensure that said inner ply is torn along a neat line which follows the same helical path as said line of opening in said outer ply.

2. The container of claim 1 wherein said tear string is disposed in a groove formed on the inside of said inner ply in substantially inward registration with said outer ply butt joint.

3. The container of claim 2 wherein said tear string is held in place by an adhesive material which substantially fills said groove to restore the normal inside contour of said inner ply.

4. The container of claim 3 wherein the ends of said body are closed by means of metal ends crimped thereto, and wherein the end of said tear string opposite its free end is clamped against longitudinal movement by one of said metal ends.

5. A tear string container comprising a fibre body composed of an inner and an outer helically wound body ply, said outer body ply being provided with a helical butt joint extending from one end of said body to the other, a helically wound label wrapped around said outer body ply and having its edges overlapped to form a lap joint offset from said butt joint, a groove formed in the inside surface of said inner body ply in inward registration with said butt joint, and a tear string disposed in said helical groove and extending from one end of said body to a point adjacent the other end of said body and then passing through said inner body ply and said butt joint to the outside of said outer body ply and thence extending substantially circumferentially of said body between said outer body ply and said label and passing through said label lap joint and terminating in a free end positioned exteriorly of said label, whereby when said free end is pulled said string tears circumferentially through said label to said helical butt joint and thereafter follows along said helical butt joint while creating lines of tear in said inner body ply and said label in registration with said butt joint to ensure opening of said container body.

6. A tear string container comprising a fibre body composed of an inner and an outer helically wound body ply, the helical edges of each of said body plies being abutted to form a helical butt joint in each of said body plies, the butt joint in said outer body ply being offset from the butt joint in said inner body ply, a liner covering the inner surface of said inner body ply, a helically

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wound label covering the outer surface of said outer body ply, the helical edges of said label being overlapped to form a lap joint offset from the butt joint in said outer body ply, a groove formed in the inside surface of said inner body ply in inward registration with the butt joint in said outer body ply, an opening formed in said inner body ply in registration with said butt joint of said outer body ply, a pair of end members secured to the ends of said fibre body, and a tearing string disposed in said groove and extending from one end of said body helically along said groove to said opening and passing through said opening and thence between the abutted edges of the butt joint of said outer body ply and thence extending circumferentially of said body between said outer body ply and said label and passing through said label lap joint and terminating in a free end disposed exteriorly of said label, whereby when said tear string is pulled the label alone is torn from its lap joint to said perforation and thereafter a helical line of tear is created in said inner body ply and said label in registration with the butt joint in said outer body ply as said tear string follows along said outer ply butt joint.

7. The container of claim 6 wherein said groove is filled with an adhesive which holds said tear string in position therein and which restores the normally smooth contour of said inner body ply.

8. A tear open container having a tubular body comprising an outer helically wound body ply having its edges abutted in a helical line of opening, an inner helically wound body ply having a groove formed in its inner surface in inward registration with said line of opening of said outer body ply, said inner body ply being cut through adjacent an end thereof and in alignment with said line of opening of the outer body ply, a tear string positioned in said groove and having a portion extending through said cut in said inner body ply and between the abutted edges of said line of opening of said outer body ply and terminating in a free end disposed exteriorly of said outer body ply, said tear string being held in said groove by an adhesive material which substantially fills said groove, and a frangible inner lining covering the inner surface of said inner ply, whereby when said tear string is pulled, it follows along said line of opening of said outer body ply while tearing an inwardly aligned line of tear in said inner body ply leaving only said frangible inner lining intact until broken readily by relatively light pressure applied thereto for releasing the contents of the container.

9. The container of claim 8 wherein there is provided a helically wound label covering the outer surface of said outer ply with the helical edge of said label overlapped to form a helically lapped joint offset from said line of opening, and said tear string extends from said line of opening substantially circumferentially of the body between said outer body ply and said label, passes through said lapped joint of said label and terminates in a free end disposed exteriorly of said label whereby, when said tear string is pulled, the label alone is first torn along a line extending from its lapped joint to said line of opening and thereafter said tear string follows along said line of opening of said outer body ply while creating an inwardly aligned line of tear in said inner body ply and an inwardly aligned line of tear in said label leaving only said frangible inner lining intact until broken readily by relatively light pressure applied thereto for releasing the contents of the container.

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