April 17, 1962 P. W. STUMP 3,030,001

SPIRALLY WOUND CONTAINER

Filed April 16, 1959 2 Sheets-Sheet 1

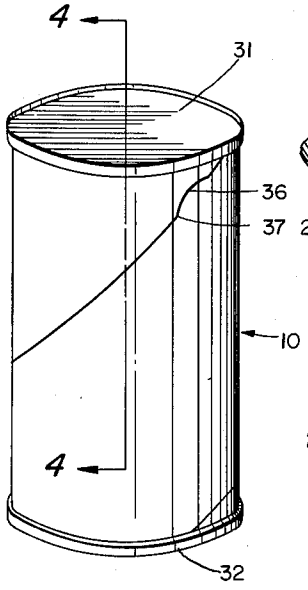



Fig. 1

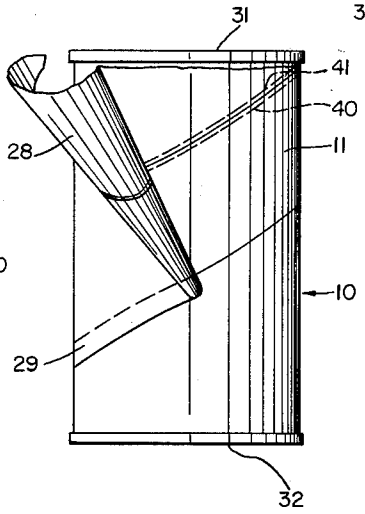



Fig. 2

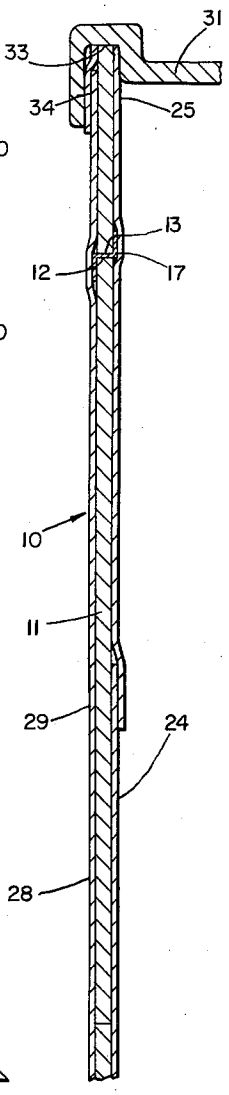



Fig. 4

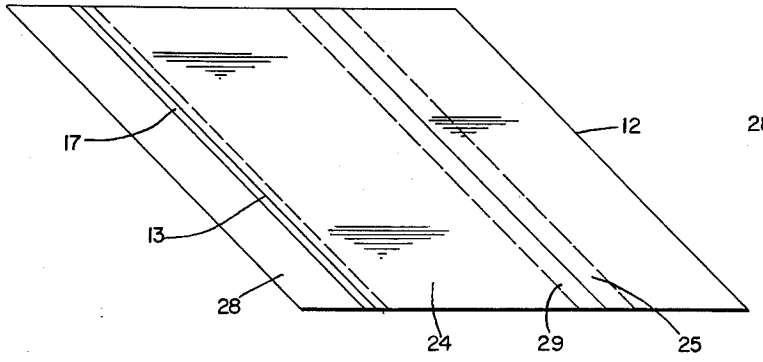



Fig. 3

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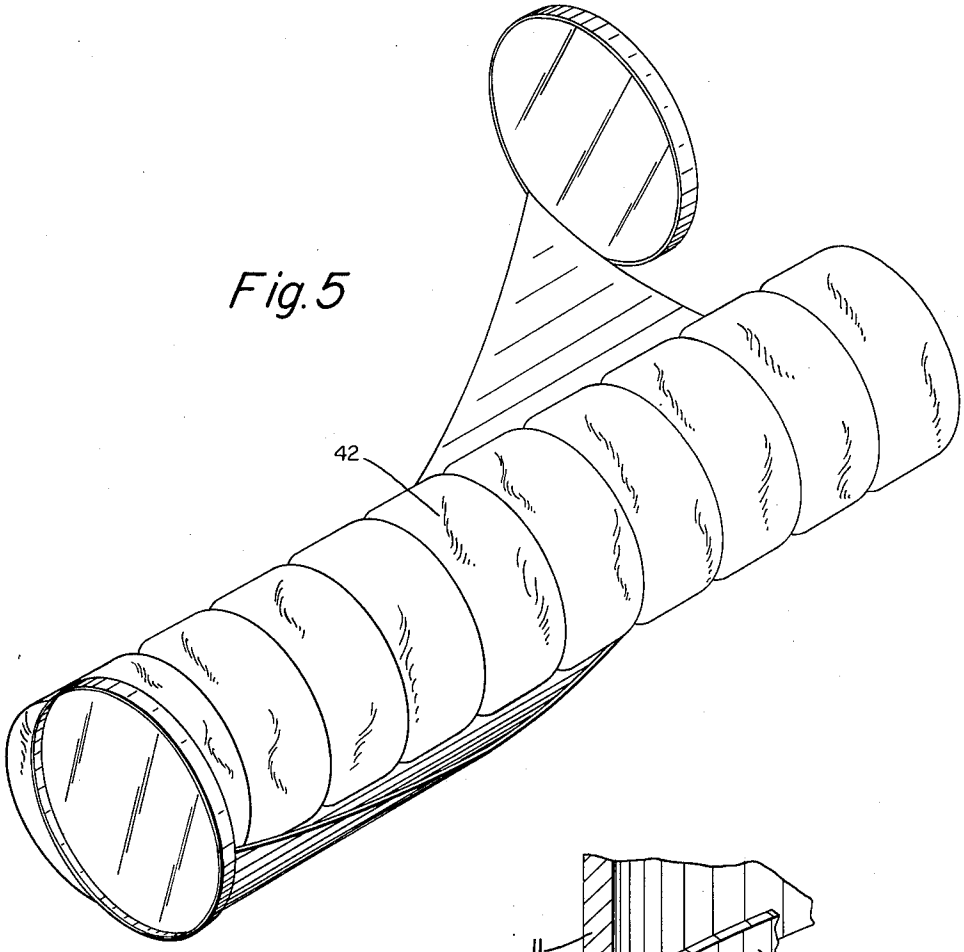
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Fig. 5



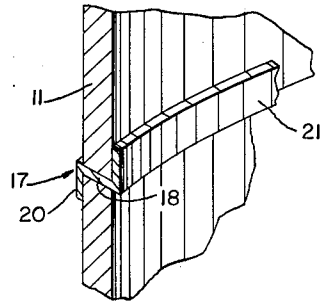




Fig. 6

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United States Patent Office 3,030,001 Patented Apr. 17, 1962



3,030,001

# SPIRALLY WOUND CONTAINER

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Filed Apr. 16, 1959, Ser. No. 806,816
8 Claims. (Cl. 229—51)

This invention relates to containers of the type which have been found particularly useful in the packaging of food products under pressure, as, for example, ready-to-bake rolls, biscuits and the like. Obviously, however, the container herein shown finds useful application in various other fields as well.

For many years the industry has searched for a container which meets the necessary prerequisites of strength, ability to seal against pressure and oil leakage around or through the container seams, and which at the same time is easily openable by the ordinary housewife. This situation presented somewhat of a paradox, as the industry discovered, for until now containers which possessed the proper strength characteristics were too difficult to open, and conversely, containers which were easy to open fell short of strength requirements or failed to seal properly against pressure and oil leakage. As an added problem, it was necessary to develop a container which could be manufactured economically enough in order to be commercially feasible, and a great number of the prior containers were too expensive to find wide acceptance.

One object of this invention, therefore, is to provide a container which is strong, durable, easy to open and economical.

Another object of this invention is to provide a container which satisfactorily seals against oil leakage around the seams thereof.

Still another object of the invention is to provide a container which directs and controls leakage of pressure through desired avenues of escape.

A still further object of this invention is to provide a container with novel means to increase the ease with which the label thereof may be peeled away when the can is being opened.

Other objects and advantages of my invention will be apparent from the detailed description to follow.

In the drawings:

FIG. 1 is a perspective view of the unopened container;

FIG. 2 is a perspective view of the container with the label peeled partly away;

FIG. 3 shows a development of the container without the end caps;

FIG. 4 shows, on an enlarged scale, a longitudinal section of a portion of the container;

FIG. 5 shows an enlarged perspective of the opened container with its contents exposed; and

FIG. 6 shows an enlarged view of the seam, partly in longitudinal section and with parts broken away, and without the inner ply and the outer layer.

Referring now more particularly to the drawings, I have shown a container, indicated generally at **10**. The sides of the container are formed by a base ply **11** of spirally wound chipboard which, in developed form as seen in FIG. 3, is in the general shape of a parallelogram. In the wound condition, the end edges **12** and **13** of the



base ply **11** are disposed adjacent each other and in longitudinal section, as viewed in FIG. 4, lie in substantially the same plane in order to provide a relatively smooth transition.

Disposed in spiral fashion and forming with the edges of the base ply **11** an interlocked butt joint is a strip indicated generally as **17**. The strip **17** is generally Z-shaped in cross section and includes a web portion **18** which lies directly between the adjacent edges of the wound base ply, an outer leg portion **20** which lies along the outer surface of one end edge portion of the base ply **11**, and an inner leg portion **21** which lies along the inner surface of the other end edge thereof. The length of the inner leg in cross section is preferably at least as great as that of the outer leg. The Z-shaped strip may be conveniently made of vegetable parchment, which is a substantially greaseproof material, and is bonded or otherwise attached to the inner and outer surfaces of the base ply **11**.

A liner ply **24** covers the inner surface of the base ply **11**, overlies the inner leg of the Z-shaped strip, and is bonded or otherwise attached to both. The inner ply may be aluminum or the like and has the general shape of a parallelogram in developed form. The inner ply is spirally wrapped in much the same manner as the base ply **11**, except that the end edges thereof are overlapped as at **25**. It will be noted that the butt joint between the end edges of the base ply **11** and the overlapped joint between the edges of the liner ply **24** are offset with respect to one another, as seen most particularly in FIGS. 2 and 4. This feature does not show in FIG. 3 since, in order to show the sides of the container in developed form, it is necessary to separate the inner ply along the butt joint between the end edges **12** and **13** of the base ply.

Covering the outer surface of the base ply and overlying the outer leg of the Z-shaped strip is an outer layer **28**, also of general parallelogram shape in developed form. The outer layer is spirally wrapped about the base ply with edges overlapping as at **29** and is bonded or otherwise attached to the outer surface of the base ply and the outer leg of the Z-shaped strip. The bonding agent is omitted from the portion **29** where the outer layer overlaps itself for reasons which will be explained later. The outer layer may carry printing and the like to thereby act as a label for the container. The overlapped joint **29** between the end edges of the outer layer is offset from the butt joint between end edges **12** and **13** of the base ply and additionally from the overlapped joint **25** between the edges of the inner ply, as best seen in FIG. 4. As can be seen, both the inner ply and the outer layer are relatively thin as compared to the base ply.

Caps **31** and **32** are provided for closing the ends of the container, and may include an annular recess as at **33** for receiving ends of the container sides. Provided at the periphery of each cap is a depending flange **34**, which is seamed or otherwise deformed over the outer surface of the sides of the container to complete the same.

The edge of the outer layer **28** is provided in the region of the overlap **20** with a relieved portion **36** located near one end of the container. I have illustrated the relieved portion as being generally semi-circular, but actually it could be of almost any shape so long as it presents a relatively sharp corner, as at **37**. As has been previ-

ously mentioned, the bonding means may be omitted from the overlapped portion 29 of the outer layer.

When it is desired to open the container, a fingernail or the like is slipped beneath the edge of the outer layer in the region of the corner 37. The outer layer is then peeled away from the outer surface of the base ply, as shown in an initial stage in FIG. 2. As the outer layer is peeled away from the base ply 11, the leg 20 of the Z-shaped strip is torn from the web 18 and is carried with the outer layer. This action is due to the fact that the backing material of the outer layer is less porous and has shorter fibers than the material from which the base ply is constructed. As a result, the bond between the leg 20 and the outer layer is stronger than the bond between the leg 20 and the base ply. The web 18 and inner leg are left in position, but the butt joint between the end edges 12 and 13 of the base ply and the web 18 is left completely exposed. Dotted line 40 in FIG. 2 represents the zone still occupied by the inner leg of the strip 17. After the outer ply has been peeled away from the base ply, the only means holding the end edges of the base ply together is the relatively thin inner ply 24. The inner ply is easily separated in the region of the butt joint between end edges 12 and 13 of the base ply by knocking the container against the edge of a table or the like. The container is then opened by a twisting motion and laid flat, thereby exposing the contents 42, as shown in FIG. 5.

Many advantages derive themselves from the novel construction which I have outlined above. By virtue of the fact that I omit the bonding agent from the overlapping portion 29 of the outer layer and provide a relief opening 36, the ease with which an initial purchase is gained on the edge of the outer layer during the opening process is greatly increased. It will be recognized that without such a relief opening there would be provided no sharp corner, such as at 37. The relatively smooth layer edge presented in such an instance would be considerably more difficult to grasp. Considerable advantage is present in my structure, even over the loose triangular flap employed in some containers, in that the outer layer is not as susceptible to accidental tearing as in the case of the loose triangular flap.

The Z-shaped strip 17, being preferably made of vegetable parchment, as I have mentioned, is less porous than the chipboard and thereby effectively prevents or reduces the wicking action of oils around the butt joint between the edges of the chipboard base ply. This wicking action is quite common in heretofore known containers, and is undesirable in that it can weaken the butt joint and destroy its pressure sealing capabilities. Additionally, any liquid, in order to leak through the butt joint must follow a leakage path of considerable length due to the fact that it must follow the contour of the Z-shaped strip. This in itself offers a considerable impediment to leakage.

In cases where biscuits and the like are packed in containers of the general type disclosed, fermentation releases considerable quantities of carbon dioxide, thus building up a pressure in the container. This pressure, of course, must be relieved or else in some instances the container may explode. It is preferable that this pressure be relieved by leakage through the ends of the container around the closure caps in order to prevent possible rupture of the container sides. Before now, it has been practically impossible to direct pressure leakage in the desired direction because of the poor sealing properties of previously known butt joints. The novel manner in which I join the end edges of the chipboard base ply now allows pressure leakage to be directed in the desired direction, that is, around the closure caps of the container, because of the outstanding pressure sealing characteristics of the butt joint.

Additionally, the container of this invention is much easier to open because by use of the Z-shaped strip I provide a container which has satisfactory strength characteristics without the necessity of using plural plies of chipboard which are hard to tear through. The omission of all but one chipboard ply also reduces the cost of each container. A further advantage of this structure is that, by virtue of the exceptional strength of the novel butt joint embodied in the invention, the outer layer need not be relied on for strength contribution and it may therefore be reduced in thickness, resulting in an added saving in material costs.

While I have shown my invention as being included in a particular embodiment for ease of description, it will be obvious that many permutations and combinations of the illustrated embodiment may be made which fall within the spirit of the invention. It is my wish, therefore, to be limited only by the scope of the appended claims.

I claim:

1. In a multi-ply, spirally wound tubular container, a wall construction which is at least semi-rigid, said wall construction being comprised of but a single base ply of somewhat flexible material, said base ply being wound with edges thereof opposed to each other and presenting inner and outer surfaces of substantially uniform diameter, a tearable strip disposed between said edges and having portions thereof overlying and adhesively attached to an outer surface of said base ply adjacent one said edge, and other portions thereof overlying and adhesively attached to an inner surface of said base ply adjacent another said edge, said strip and said edges forming together a generally spirally extending butt joint, a thin outer layer overlying the butt joint and attached to the portion of said strip overlying an outer surface of said base ply.

2. A device as claimed in claim 1 in which said strip is generally Z-shaped in cross section with one leg thereof being the portion overlying the said inner surface of said base ply, and the other leg thereof being the portion overlying the said outer portion of said base ply.

3. A device as defined in claim 1 characterized in the attachment between the outer layer and said strip being stronger than the attachment between the base play and said strip.

4. A device as defined in claim 1 in which the portions of said outer layer which are attached to said strip have shorter fibers and are less porous than the portions of the base ply to which said strip is attached.

5. A device as claimed in claim 1 including a thin inner ply superposed upon the base ply and in which said inner ply and said outer layer are spirally wound in the same direction as said base ply with edges overlapping, said inner ply and said outer layer substantially covering said base ply and being bonded thereto, said overlapping edges of both said outer layer and said inner ply being offset from said butt joint.

6. A device as outline in claim 5 in which the overlapped edges of said outer layer are free from bonded attachment with each other, and in which the edge of the outer layer is formed with a relieved portion.

7. In a multi-ply spirally wound tubular container, a wall construction which is at least semi-rigid, said wall construction being comprised of but a single base ply wound with edges thereof opposed to each other, a tearable strip disposed between said edges and being generally Z-shaped in cross-section with one leg thereof overlying and adhesively attached to the outer surface of said base ply adjacent one said edge, and the other leg thereof overlying and adhesively attached to the inner surface of said base ply adjacent another said edge, said strip together with said edges forming together a generally spirally extending butt joint extending for a major portion of the extent of said container, a thin inner ply overlying the butt joint and attached to the portion of said strip overlying an inner surface of said base ply, and a

thin outer layer mounted in position overlying said butt joint and said one leg of the Z-shaped strip.

8. The container described in claim 7 in which the inner ply, the base ply, and the outer layer are spirally wound in the same direction, with adjacent edges both of the inner ply and of the outer layer overlapping, the inner ply and the outer layer susbtantially covering the base ply and being bonded thereto, said overlapping edges of the outer layer and the inner ply being offset from said butt joint.



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