

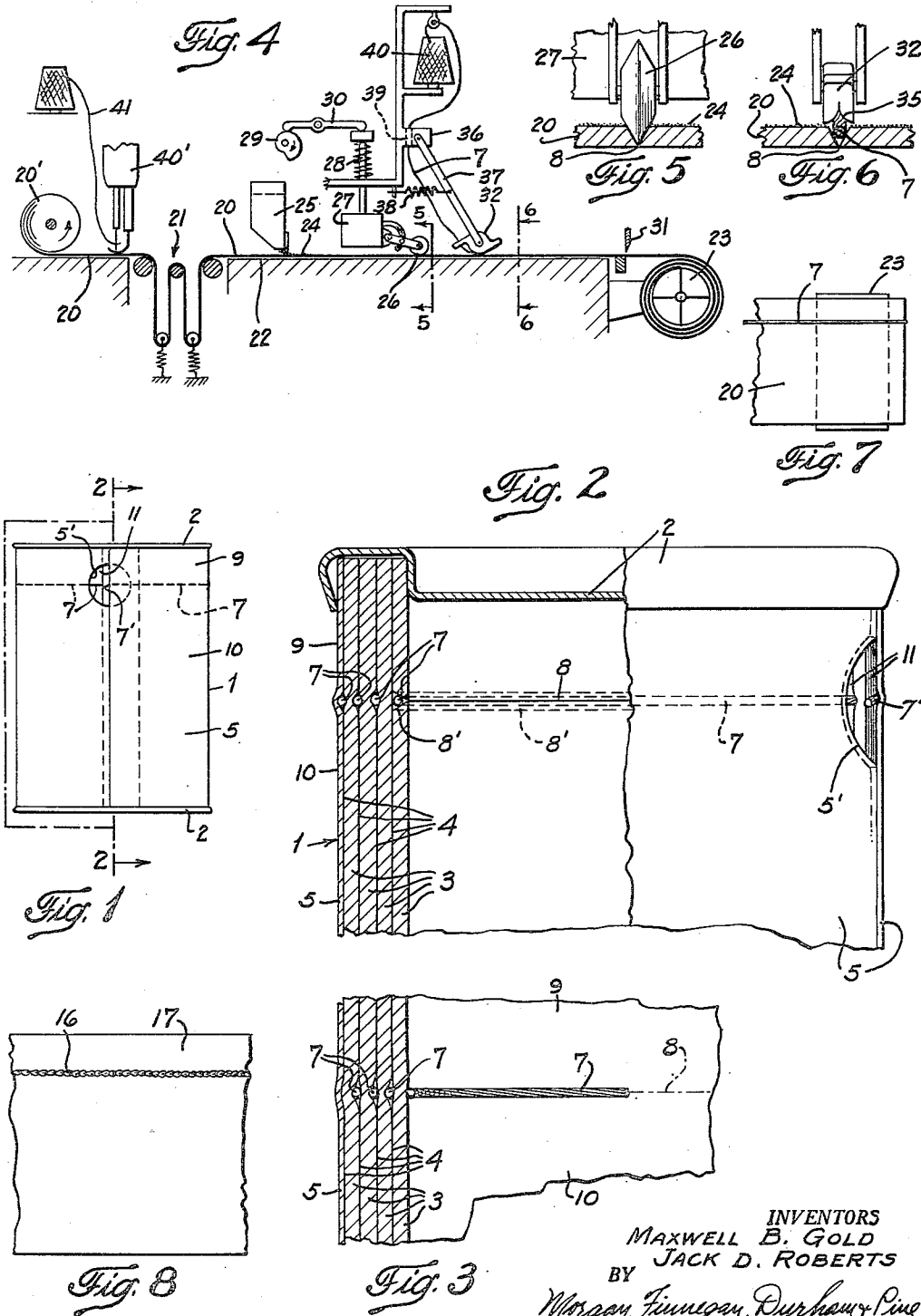
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STRING-OPENING CONTAINER AND METHOD OF FABRICATING THE SAME

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STRING-OPENING CONTAINER AND METHOD OF FABRICATING THE SAME

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This invention relates to containers, cans or canisters, particularly those made of paper, foil, or other thin sheet material, including laminates of paper, foil, and thin sheet material, and relates more particularly to wound containers, single ply or multi-ply, and to methods of fabricating such containers.

It is an object of this invention to enable opening of a wound single or multi-ply container to be effected quickly, easily and without the need of accessory opening devices, or the possibility of damaging the container contents, through the provision of an opening string or rip-cord which in the case of a single-ply container is attached to the ply, and in the case of a multi-ply container is disposed between the container plies.

It is still another object of this invention to provide a wound multi-ply container adapted to be easily separated into sections along an intended severance line, by means of an inter-ply string or rip-cord disposed along or substantially along the severance line and between the plies, the inner ply or plies of the container being, preferably, weakened along the intended severance line as by cutting, scoring, or perforating so as to enable the sections to be broken apart easily after the outer plies have been severed by the rip-cord, and the outer plies of the container being, preferably, left unweakened along the severance line so as to preserve the full strength of the outer plies and prevent accidental separation into sections during handling, shipping, etc. of the container.

It is another object of this invention to provide a new, useful and improved string-opening wound container and a method of manufacturing such containers.

Other and further objects of this invention will appear from the following description, the accompanying drawing and the appended claims.

To the accomplishment of the foregoing ends and objects and in accordance with one embodiment of this invention, a string or rip-cord is disposed and arranged on a length of the ply material, either before or during the winding and gluing together of the container plies, so as to lie between and be attached to the plies of the container when formed, along a severance line, dividing the container into sections which are in initially integral but separable relation to each other. By reason of this construction and arrangement the string or rip-cord, which is of a length preferably coextensive with that of the length of ply material, is adapted to function to sever the container plies successively and circumferentially of the container and along the severance line, from the outside to the inside of the container, as the cord is unwound.

In the fabrication of the container one or more of the plies may be scored sufficiently as to be cut through or substantially through along the severance line, some of the plies being left uncut however so as to preserve the strength of the container. In such case, the scored ply or plies of the sections at opposite sides of the line will be held together, if at all, by whatever uncut fibres may remain and by whatever glue layer traverses the severance line and joins the plies to each other. Since the rip-

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cord is disposed between the plies along or substantially along this line in the glue layer therebetween, unwinding of the cord will serve to rupture or sever the glue layer at the same time it severs the plies, and the scored ply or plies will permit the sections to be separated cleanly from each other. Preferably, only the inner ply is scored so as to preserve the strength of the container.

The inter-ply rip-cord may be applied to either the outer or the inner perimeter of each ply of paper as the canister is wound. In the former case, a terminal portion of the cord in the finished product is necessarily exposed over the outer perimeter of the outer ply. Hence, if a label is applied to the outer perimeter of the canister and over this exposed terminal portion of the cord, the label can be severed by unwinding the terminal portion of the cord. Once the label has been severed, continued unwinding of the cord severs the underlying uncut plies successively from outside to inside of the canister so that when the scoring is reached the container sections may be easily broken apart along the severance line.

In the case where the rip-cord is continuous with and applied to the inner perimeter of each ply of the canister from the inside to the outside, it will be apparent that the terminal portion of the cord, that is, the final outer turn, is not circumferentially exposed and a label, if applied over the canister perimeter, will be severed simultaneously with the severing of the outer ply of the canister, as the cord is unwound. Score cutting of the inner ply is not required in such case but is preferred to ensure clean separation of the sections at the inner ply.

In either of the above cases the rip-cord may be stitched to the ply material before winding, the line of stitching coinciding with the desired severance line of the canister. Thus, by taking hold of the outer end of the stitch cord and pulling out the line of stitching around the perimeter of the canister, the ply material will be ripped apart along the severance line so as to sever the plies successively from the outside to the inside and separate the sections from each other. Preferably, the stitching is of the lock-stitch type so that as the stitches are successively pulled out they will also rip the ply material apart progressively along the severance line. It will be apparent moreover that the glue layer by which the plies are bonded to each other will also serve to fasten the individual stitches to the ply material so as to facilitate the ripping of the ply material as the stitches are successively pulled out. In the case of a single ply container, that is, a container having a single turn of ply material, such a stitching enables the single ply to be cut through circumferentially in a simple and expeditious fashion as the stitching is pulled out around the container.

The overlying label, if used, is preferably die-cut to provide a cut-out section spotting and providing access to the outer end of the cord, and exposing the chipboard and/or the ply scoring, if any. Furthermore, in order to present a better appearance and better to spot, for the consumer, the place on the canister where the latter is to be opened, the chipboard exposed by the cut-out section may be colored.

In the accompanying drawings which form part of the instant specification and are to be read in conjunction therewith and in which like numbers refer to like parts throughout the several views:

Fig. 1 is a view in elevation of a multi-ply container in accordance with a preferred embodiment of this invention in which the inter-ply rip-cord is applied to the outer perimeter of the plies;

Fig. 2 is a somewhat enlarged, fragmentary, part-sectional view of the container of Fig. 1 taken generally along the line 2—2 of Fig. 1, and showing details of the rip-cord arrangement;

Fig. 3 is a fragmentary enlarged view of a multi-ply container in accordance with a modified embodiment of this invention in which the rip-cord is applied to the inner perimeter of the plies;

Fig. 4 is a schematic showing in elevation of one form of apparatus for carrying out the method of this invention;

Fig. 5 is a fragmentary and somewhat enlarged view of a detail of the ply-scoring device of the apparatus system of Fig. 4, taken along the line 5-5 of Fig. 4;

Fig. 6 is a fragmentary and somewhat enlarged view of the cord-applying device of the apparatus of Fig. 4 taken along the line 6-6 of Fig. 4;

Fig. 7 is a fragmentary view in plan of the system of Fig. 4 taken at the container-forming end of the system, the view showing the disposition of the rip-cord on the outer perimeter of the container; and

Fig. 8 is a fragmentary view of a section of pre-stitched container ply in accordance with this invention.

Referring now more particularly to the accompanying drawing, and especially to Figs. 1 and 2 thereof, a length of thin sheet material, such as chipboard, is convolutely wound into a multi-ply open-ended container body 1 which is depicted as sealed at each end by suitable metal closures 2.

The body 1 as shown is cylindrical in contour but may be of rectangular or other suitable contour as desired. It may comprise as many individual plies 3 as necessary for the strength required in the type of service to which the container is to be put. As here preferably embodied it comprises four plies each bonded to the next by a continuous layer 4 of adhesive into a single unit. The outer surface of this unit as shown is covered by a suitable label 5 bonded to the outer ply by the outer layer 4 of adhesive. It will be understood that the label 5 may be omitted if desired.

A string or rip-cord 7 is located between each pair of the plies 3 and between the outermost ply and the label 5. The rip-cord consists of a single length of relatively small diameter cord material and lies between the plies along a continuous severance line 8 marking and dividing the container into sections 9 and 10 in initially integral but separable relation to each other.

The innermost ply is preferably completely score cut as at 8' in Fig. 2 to provide opposing cut edges of the sections 9 and 10 which are united, if at all, only by adhesive which has flowed from between the plies into the scoring and set around the cord 7.

The remaining plies are preferably not scored at all along the severance line so that the sections 9 and 10, as respects the outer plies, are integral with each other along the severance line so as to preserve the desired strength of the container. Moreover the score 8' along the inner ply provides a trough for the rip-cord 7 in the fabrication of the container, and a continuous pocket for the adhesive by which the plies are united. Scoring of the label 5 is not necessary since the label material is easily severed by the rip-cord.

The cord 7 is preferably coextensive in length with the length of ply material which forms the several plies and terminates in end portion 7' by which the cord may be pulled and unwound so as to sever the label and the container plies successively and circumferentially of the container along the severance line 8 from the outside to the inside of the container.

The overlying label 5 depicted in Figs. 1 and 2 is preferably die-cut to provide a cut-out section 5' spotting and providing access to the terminal end 7' of the cord and exposing a portion 11 of the immediately underlying ply 3. Preferably, the exposed portion 11 is of a color different from that of the immediately surrounding area of the label so as to present a better appearance and better to spot for the consumer, the place on the container where the latter is to be opened.

In order to open the container of Figs. 1 and 2 the

terminal end 7' of the cord 7 is grasped manually and the cord unwound. The unwinding of the first turn severs the convolutely wound label 5. The second turn severs the first ply along the severance line 8, and so on, working from outside to inside until the last ply is reached. As previously noted, the last ply in the embodiment of Fig. 2 is cut through along the severance line 8 so that when the last ply is reached, the container sections may be easily broken apart along the severance line to provide access to the container interior and its contents. By reason of the uncut outer plies the container retains a high degree of strength until the cord is unwound, thus ensuring that it will not be broken easily into sections as would be the case were the outer plies also cut and the rip-cord not adhesively bonded to the plies along the severance line.

In the container embodiment shown in Fig. 3, the rip-cord 7 is located along the severance line 8 on the inner perimeter of the container plies 3 beginning with the innermost ply, the plies and covering label shown being adhesively united each to the next by the layers 4 of adhesive as above mentioned. The cord 7 is coextensive in length with the length of ply material forming the several plies 3 and extends from the inside to the outside of the container along the continuous severance line 8 which marks the proposed line of separation between the container sections 9 and 10. The inner turn of the cord is adhesively attached to the ply material. The same condition obtains with respect to the outer turns of the cord. The cord 7 terminates at the exterior of the container with its cut end 7' flush or substantially flush with the end of the outer ply of the container. Unlike the container of Fig. 2 wherein the cord 7 on the outer perimeter of the plies is exposed over the outer ply except as covered by the label 5, the final turn of the cord 7 in the container of Fig. 3 lies between the outer ply and the next inner ply and not between the label 5 and the outer ply. Hence, in unwinding the cord, the first turn serves to sever the label and the first ply simultaneously. It will be understood that the label may be provided with a cut-out portion (not shown) corresponding to that of the container of Fig. 2, for marking the end 7' of the cord and spotting it for the consumer. As the cord is unwound it successively severs the plies from the outside to the inside of the container.

Instead of the rip-cord being located in and held by the adhesive along or substantially along the severance line 8, it may be stitched to the length of ply material along the proposed severance line, before the ply material is wound into container form. Such a construction is depicted in Fig. 8 wherein the rip-cord 16 is stitched to the ply material 17 along the intended line of severance. Such a mode of attaching the cord is particularly advantageous in connection with a so-called single-ply container, that is, a container having a single turn of ply material. The stitching circumferentially of the container along the desired severance line serves to sever the container sections from each other as the stitching is pulled out from end to end. A lock stitch ensures that the ply material will be separated along the severance line but this may be enhanced by the application of a coating of adhesive along the stitch line serving to lock the stitching and ply material together.

Referring now more particularly to Figs. 4 to 7, inclusive, there is depicted schematically one form of apparatus suitable for carrying out the method of this invention as applied particularly to the fabrication of the container of Fig. 2. In accordance with this invention, chipboard or other suitable ply material in continuous strip form is drawn from a roll 20', the strip 20 being conducted via a tensioning roller system 21 onto and along a work table 22. The leading edge of the strip is attached to a suitable winding mandrel 23 upon and by which the strip is convolutely wound into container form. The tensioning roller system serves in known manner to

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permit acceleration and deceleration of the strip between the roll 20' and the mandrel 23 without affecting the feed of material from the roll 20' which latter rotates at a suitable speed. A cylindrical mandrel is depicted in Fig. 4 but it will be understood that the mandrel may be of a contour to form a rectangular container or container of any other suitable contour.

The strip 20 in advancing along the table 22 passes through an adhesive applying zone wherein a layer 24 of adhesive is applied to the upper surface of the strip as by means of an adhesive applicator 25. The adhesively coated strip in advancing passes under a scoring wheel 26 which, preferably, is disposed to cut through the strip, as indicated in Fig. 5 from its leading edge over a length corresponding to the length of the first turn on the mandrel 23. The scoring wheel may be vertically adjustably mounted on carriage 27 which in turn is supported for vertical movement by means of a spring-pressed push-rod 28 adapted to be downwardly actuated by a cam 29 through a rocker 30. Rotation of the cam by suitable means, not shown, serves to move the carriage and hence the scoring wheel, downwardly to whatever elevation is required for either cutting or merely scoring the moving strip. The cam contour and angular motion are preferably suitably correlated to the angular motion of the mandrel 23 to achieve a complete cutting of the strip along the desired severance line for and only for a distance corresponding to the perimeter of the first or inner ply formed on the mandrel 23. This may be extended to effect the partial scoring of additional ply lengths, if desired. By raising the wheel 26 under the control of the cam 29, the material which is to form subsequent plies may be scored to whatever depth is required, in a manner which will be obvious to those skilled in the art.

The coated and scored strip advances from the scoring stations to and through a cord applying station wherein a cord applying head 32 operates to lay a length of string or rip-cord 7 along the desired severance line 8. To this end, the head 32 is recessed in its undersurface to provide a groove 35 (Fig. 6) in which the cord lies and is guided by the head onto the severance line 8. The head 32 is pivotally supported from a bracket 36 by arms 37 for movement in a vertical plane, the bracket 36 being adjustable transversely of the strip for laying the cord along the desired severance line. A spring 38 adjustable as to tension connects the arm 37 to the bracket 36 and serves to maintain the head 32 in suitable sliding contact with the moving strip of ply material. The cord 7 passes through a guide channel 39 in the bracket 36 to a cord supply cone 40. It will be understood that by reason of the layer 24 of adhesive material, the cord at the head 32 is caused to adhere to the strip 20 and be drawn from the head 32 as the strip advances.

Suitable knife means 31 are disposed adjacent the mandrel 23 for severing the strip and its applied cord after the requisite length of ply material has passed by. It will be understood that suitable feeding means (not shown) are provided for advancing each strip length in suitably timed relation to operation and cycling of the mandrel 23, and affixing the leading edge of each strip to the mandrel for the winding of the container thereon. As will be seen from Fig. 7, the strip material and the applied cord 7 are simultaneously convolutely wound on the mandrel 23, the cord being on the outer perimeter of each ply as formed. If a label 5 is to be applied to the container, wrapping of the label 5 (Fig. 2) on the formed container over the outer ply and exposed cord may be accomplished by suitable label wrapping devices well known in the art, care being taken however that in applying and winding the label, the cut out section of the label is disposed to expose the terminal (or free) end of the cord as shown in Fig. 2.

Instead of applying the cord by means of the applying head 32, the cord may be stitched beforehand to the ply

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material. To this end, as indicated in Fig. 4, a sewing machine 40' is disposed in suitable relation to the roll 20 of strip material to operate on the moving strip and stitch the cord 41 thereto along the proposed line of severance longitudinally of the strip after the manner of the stitched strip depicted in Fig. 8. The subsequent coating of the strip with the glue will serve to bind the stitching securely to the ply material so that in unwinding the line of stitching to open the container, the stitching and glue adhesively bonding the stitching to the ply material will together function to sever the ply material along the established severance line. If desired the stitching may be applied in spaced apart parallel rows defining a narrow strip therebetween which will be stripped out of the ply material as the stitch rows are unwound together. It will be understood that in either of such cases the head 32 may be dispensed with although the scoring wheel 26 may continue to function as before. In order to maintain a steady movement of the strip material under the sewing machine 40' two tensioning take up systems such as are indicated at 21 may be employed between the mandrel 23 and roll 20', one in connection with the stitching machine and one in connection with the coating and scoring heads of the machine.

Thus it will be seen that the objects of this invention have been accomplished. The container with its interply rip-cord may be neatly and simply severed into sections lying at either side of the established severance line merely by unwinding the rip-cord. By reason of the innermost ply being scored so as to be cut through or substantially through beforehand the last ply will break apart easily after the outer plies have been severed by the interply rip-cord, and the sections cleanly and easily separated. Where the plies have merely been scored to varying degrees and not completely score cut or are entirely uncut or unscored, the cord will serve to sever the plies successively as it is unwound along the severance line. A multi-ply container in accordance with this invention is characterized particularly by the fact that it possesses substantially all of its potential strength by reason of the fact that, contrary to the construction of conventional or score-cut containers, the outer plies are uncut and are in initially integral and severable relation and are severable along a determined severance line by means of an interply rip-cord.

The invention in its broader aspects is not limited to the specific steps, combinations and improvements described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. A container comprising a multi-ply wound container body having a severance line extending circumferentially thereof and dividing said body into sections in initially integral and separable relation along said line, the inner ply of said body being weakened along said severance line; a label covering the outer ply of said body along said line; and, a rip-cord running along said line between said label and the outer ply and between the remaining plies from the outside to the inside of said body, for severing said label and plies so as to separate said sections along said line, said rip-cord being secured to said plies.

2. A container comprising a multi-ply wound container body having a severance line extending circumferentially thereof and dividing said body into sections in initially integral and separable relation along said line, the inner ply of said body being weakened along said severance line; a label overlying the outer ply of said body along said line, said label having an opening exposing a portion of said outer ply along said line; and, a rip-cord located in part between said label and said outer ply and in part between said plies, said rip-cord running along said severance line from the outside to the inside of said body for

severing said label and plies so as to separate said sections along said line, said cord being secured to said plies and having its outer end located in the opening in said label.

3. A container comprising a multi-ply wound container body having a severance line extending circumferentially thereof and dividing said body into sections in initially integral and separable relation along said line, the inner ply of said body being weakened along said severance line; and, a rip-cord located between said plies and running along said severance line from the outside to the inside of said body, for severing said plies so as to separate said sections along said line, said rip-cord being secured to said plies.

4. A container in accordance with claim 3 wherein said container body is convolutely wound.

5. A container in accordance with claim 3 wherein said rip-cord is located on the inner perimeter of the respective plies including the inner perimeter of the inner ply.

6. A container in accordance with claim 3 wherein said rip-cord is located on the outer perimeter of the respective plies.

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