May 19, 1953 T. F. BARNES 2,638,820

CYLINDRICAL CONTAINER AND METHOD OF MAKING SAME

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Fig. 1.

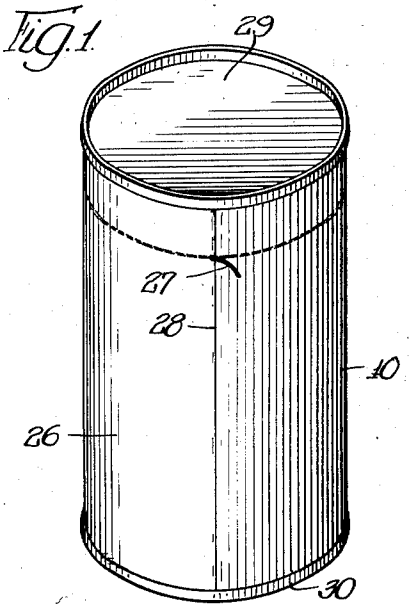

Fig. 2.

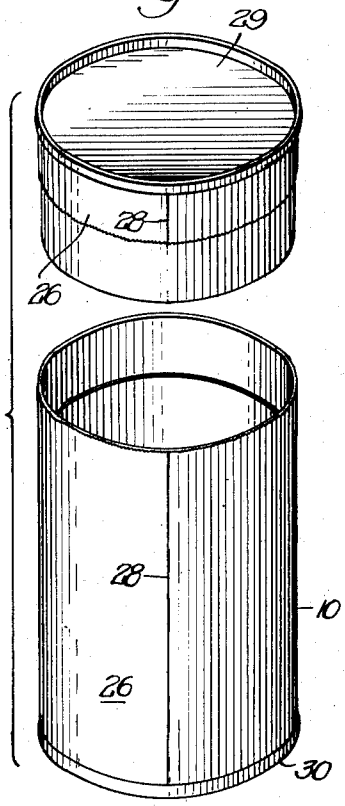

Fig. 3.

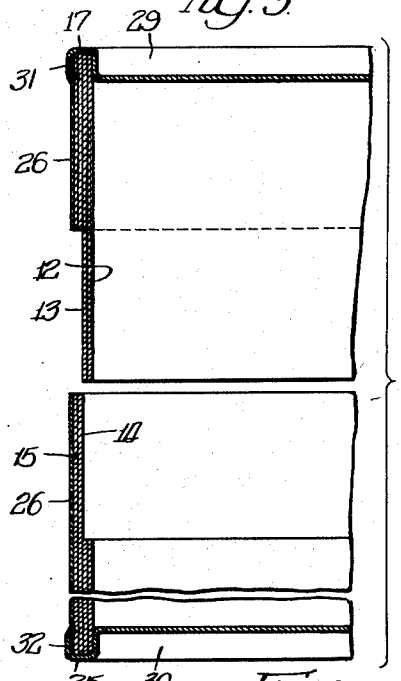

Fig. 9.

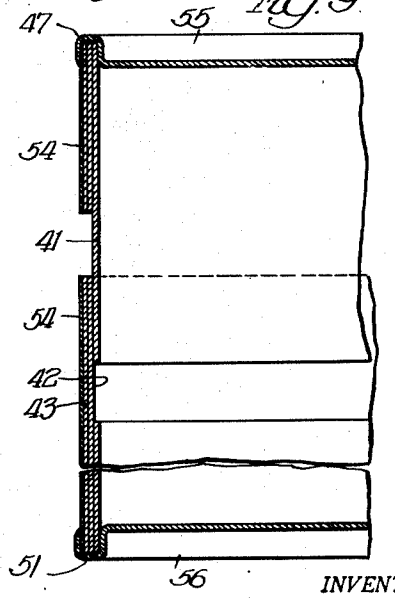

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Fig. 4

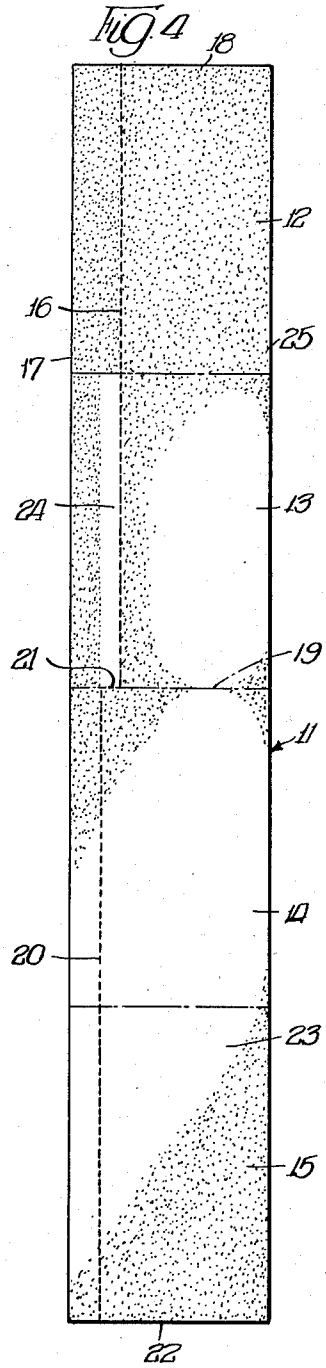


Fig. 5

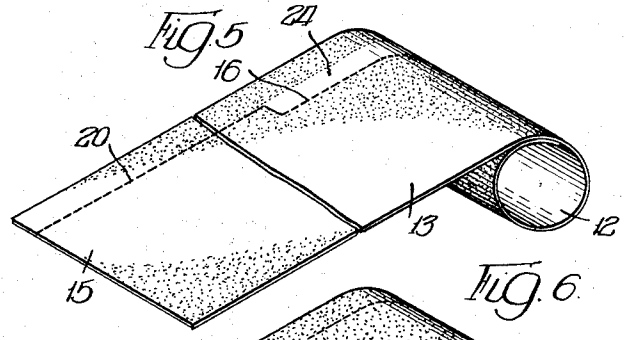


Fig. 6

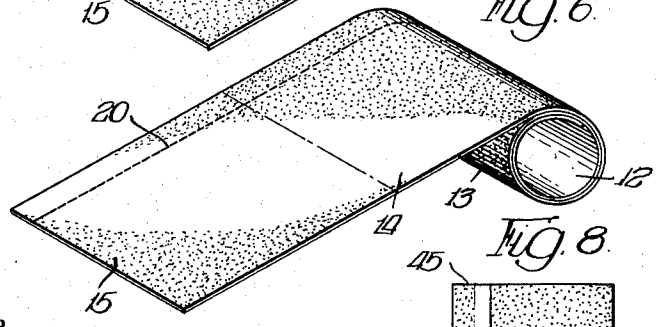


Fig. 7

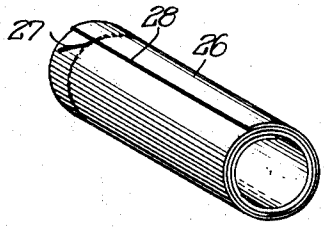
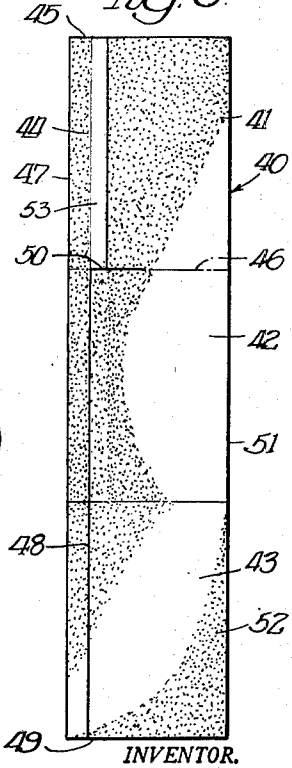


Fig. 8



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UNITED STATES PATENT OFFICE

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CYLINDRICAL CONTAINER AND METHOD OF MAKING SAME

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Application July 1, 1947, Serial No. 758,408

2 Claims. (Cl. 93—39.1)

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This invention relates to improvements in tubular containers which are formed from a plurality of plies of fibrous material.

This application is a continuation-in-part of copending application Serial No. 639,258, filed January 5, 1946, now abandoned.

It is an object of the invention to provide a tubular or convolute container which is formed of a plurality of plies of relatively flexible paperboard or similar material wherein the container is provided with a line of perforations adjacent one end thereof to permit the separation of that end of the container by tearing the material at the line of perforations and thereby forming a removable and replaceable cover member having a flange adapted to be engaged in telescoping relation with the remaining portion of the container.

Another object of the invention is to provide a tubular paperboard container of the type described having an outer label secured to the outer surface of the container, which label extends over the line of perforations, and a tear string secured beneath the label at the line of perforations, which tear string may be grasped at the exposed end thereof and pulled to sever the label whereupon the container top may be removed by twisting the same with sufficient force to separate the material as described.

Another object of the invention is to provide a container formed of a plurality of plies of paper or similar material which is so constructed that one end of the container constituting the cover therefor may be removed by merely unwinding a tear string which severs the outer ply of the container and frees the cover for immediate removal.

Another object of the invention is to provide a container having a body portion and end closure members wherein the body portion is formed from a blank of relatively flexible paperboard or similar material, the blank being initially pre-cut along a staggered line intermediate the side edges thereof and being rolled upon itself to produce a container body having a plurality of plies or convolutions of the material, and wherein the container body is readily separable along the pre-cut line into separate container sections, one of which sections constitutes a removable and replaceable container top having a flanged edge or rim adapted to be engaged in telescoping relation with the remaining or other section of the container.

A further object of the invention is to provide a container which is produced by rolling or coiling a generally rectangular blank of flexible, fibrous material upon itself to form a tubular container body having a multiplicity of plies of material wherein the blank is initially pre-cut along a staggered line adjacent one edge thereof so that when it is formed into a tubular body and provided with end closure members a portion of one end thereof may be separated from the remainder of the container to thereby provide a flanged cover member, the container being also provided with a separate outer ply of material which initially secures the separable portions of the container and a tear string associated with the outer ply of material to provide for readily severing the outer ply along the line of separation of the container cover member and the remainder of the container.

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A further object of the invention is to provide a method of forming a tubular container having a body portion characterized by a plurality of plies or convolutions of material which comprises providing an adhesively coated, generally rectangular blank of paperboard or similar material of a length commensurate with the number of plies or thickness of container desired, the blank being pre-cut or perforated on a staggered line spaced intermediate the side edges of the same, winding or rolling the blank upon itself to form a multi-ply tubular body portion, providing top and bottom closure members of metal or other suitable material and crimping the same to the ends of the tubular body portion to complete the container.

A still further object of the invention is to provide a method of forming a container of the character described including securing to the tubular body of the container an outer label and a tear string for the same which tear string is secured beneath the label and along the pre-cut or perforated line separating the top and bottom portions of the container.

These and other objects of the invention will be apparent from a description of the containers and the methods of making the same which are shown, by way of illustration, in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a completed four-ply cylindrical container embodying the principles of the invention;

Fig. 2 is a perspective view of the container with the tear string removed and the flanged top separated from the remainder of the container;

Fig. 3 is a vertical section through the container with the top separated therefrom and with parts broken away;

Fig. 4 is a plan view of an adhesive coated

pre-cut blank prepared for forming the tubular portion of the container;

Figs. 5 and 6 are perspective views illustrating the method of forming the body of the container;

Fig. 7 is a perspective view of the completely formed container body with an outer label and tear string applied;

Fig. 8 is a plan view to a reduced scale of an adhesive coated pre-cut blank prepared for forming a three-ply cylindrical container embodying a modified form of the invention; and

Fig. 9 is a vertical section through the completed container formed from the blank shown in Fig. 8.

Referring to Figs. 1 to 7 of the drawings, the container 10 is formed from a generally rectangular paperboard blank 11 which is of sufficient length to provide, when rolled into tubular shape, a body having four plies or thickness of material. The blank 11 is divided, for convenience in illustration, into four sections or portions 12, 13, 14 and 15, each one of which constitutes approximately a single ply for the tubular container body.

The sections 12 and 13 of the blank 11, which form the inner plies of the container body, are perforated along the line 16. The perforated line 16 is spaced a substantial distance from the side edge 17 of the blank and extends from the inner end edge 18 thereof to approximately the center of the blank which is indicated by the broken line 19.

The sections 14 and 15 of the blank 11 are perforated along the line 20 which also extends parallel to the side edge 17 of the blank. The perforated line 20 is spaced a distance from the edge 17 which is somewhat less than the distance from the edge 17 to the perforated line 16. The inner ends of lines 16 and 20 are connected by a transverse line of perforations 21 at approximately the center line 19 of the blank. The perforated line 20 extends from the line 21 to the outer end edge 22 of the blank 11. The perforated lines 16, 20 and 21 constitute a staggered line of perforations extending the full length of the blank from the inner end 18 to the outer end 22 of the blank 11 and dividing the blank into two readily separable portions.

The blank 11 is completely coated with an adhesive material 23 except for the area indicated at 24 on the section 13 of the blank which area extends the length of the section 13 and a width corresponding to the difference in distance from the edge 17 of the perforated lines 16 and 20. The side edge 17 constitutes the top edge of the container body when it is formed, while the opposite side edge 25 constitutes the bottom edge of the same.

To form the container 10, section 12 of the blank 11 is first formed into a cylinder, with the adhesive coated side outermost, to provide the inner ply of the container body. The remaining blank sections 13, 14 and 15 are rolled or wound on section 12, as illustrated in Figs. 5 to 7, to provide a four-ply tubular or cylindrical container body, with section 15 forming the outermost ply thereof.

An outer label 26 is then applied to the outer surface of the cylindrical body formed from the blank 11. The label preferably extends the full length of the cylindrical body with a portion extending on both sides of the perforated line 20. A tear string 27 of sufficient length to leave one end extending beyond the outer or trailing edge 28 of the label 26 is wound around or arranged circumferentially of the cylindrical body between the label and the outer surface of the body and at the perforated line 20.

After the label 26 and tear string 27 have been applied the tubular body is closed at opposite ends by applying thereto a top closure member 29 and a bottom closure member 30. The closure members 29 and 30 are provided with flanged or re-bent edges 31 and 32, respectively, which are crimped to embrace the top and bottom edges 17 and 25 of the cylindrical body. The container may be filled prior to the application of either the top 29 or the bottom 30. One of the closure members 29 and 30 may be provided with an independent opening by means of which the container may be filled with the product which is being packaged.

The completed container may be separated into two sections to obtain access to the contents by first pulling on the tear string 27 and severing the label 26 along the perforated line 20 after which the top and bottom of the container may be grasped in the hands and twisted in opposite directions to break the remaining uncut fibers of the wall material along the perforated lines 16, 20 and 21 and thereby permit the top and bottom sections of the container to be separated from each other by movement in an axial direction. This provides a top section which constitutes a flanged re-closeable cover for the bottom section of the container, as illustrated in Fig. 2. The perforations or weakened indentations in the lines 16, 20 and 21 may be such that very little force is required to sever the uncut fibers and separate the two sections of the container. The space 24 being free of adhesive permits the separation of the two sections of the container on the stepped or staggered line provided by the lines of perforation 16, 20 and 21 so that the cover member is provided with a projecting rim or flange which is telescoped within the bottom of the container when the sections are reassembled to close the container.

The label 26 may be printed or otherwise supplied on its outer surface with decorative or descriptive material to identify the contents of the container and to lend a pleasing and attractive appearance to the same. Label 26 also further insures the retention on the container of the flanged cover until after the label is severed by removal of tear string 27.

In Figs. 8 and 9 another form of the container is illustrated. In this form the blank 40 is of sufficient length to provide three thicknesses or plies of material in the walls of the tubular body portion of the container. The blank 40 is illustrated as divided into three sections which are indicated at 41, 42 and 43, each section being approximately the length required to form a single ply of material circumferentially of the container. The section 41 is adapted to form the inner ply of the container, while the sections 42 and 43 are adapted to form the outer plies thereof. Section 41 of the blank 40 is pre-cut on the line 44 which extends from the inner edge 45 of the blank to the line 46 which indicates the end of the section 41. The line 44 is parallel to and spaced from the top or side edge 47 of the blank 40. The sections 42 and 43 are pre-cut on the line 48 which extends from the line 46 to the outer end edge 49 of the blank 40. The line 48 is parallel to the top edge 47 of the blank and is spaced a somewhat lesser distance from the edge 47 than the line 44. The blank 40 is also pre-cut on a transverse line 50 which

is approximately along the line 46 dividing the blank sections 41 and 42 and which joins the lines 44 and 48. The side edge 47 of the blank 40 forms the top edge of the completed container body while the opposite side edge 51 forms the bottom edge thereof. The pre-cut lines 44, 48 and 50 form a stepped or staggered line extending from the inner end 45 to the outer end 49 of the blank 40 and divide the blank into two separate sections or portions. The blank 40 is coated on one side with an adhesive material 52 which substantially completely covers the blank except for the area indicated at 53 on section 41 which is free of the adhesive. The non-coated area 53 extends inwardly along the line 44 substantially the full length of the section 41 and is of a width corresponding approximately to the difference in distance of the lines 44 and 48 from the edge 47.

To form the cylindrical container body, the section 41 of the blank 40 is coiled or formed into cylindrical shape so that the inner edge 45 does not extend beyond the line 46. Section 41 then forms the inner ply of the container body. Section 42 is rolled around the same to form the second ply, after which section 43 is rolled thereabout to form the outer ply of the container body. The sections are coiled or rolled so that the area 53 which is free of adhesive will extend entirely around the full circumference of the container and permit the top to be freely removed without any interference or sticking due to overlapping of the sections, that is, the sections 41 and 42 are rolled so that the pre-cut line 50 will fall within the non-adhesive area 53 at the outer or trailing end of the section 42. When the blank has been rolled into cylindrical or convolute form to produce the body of the container, the label 54 and a tear string associated therewith, as in the four-ply form of the container, are secured on the outer surface of the cylindrical container body with the tear string along the line 48. The top and bottom closure members 55 and 56 are crimped to the top and bottom edges 47 and 51, respectively, to complete the container.

In this form of container the cylindrical body portion consists of three plies of material, whereas in the form illustrated in Figs. 1 to 7 it consists of four plies of material. The container may be formed with a larger number of plies of material if desired, depending upon the strength and rigidity required. In the form illustrated in Figs. 8 and 9, the top is readily removed from the bottom of the container by merely removing the tear string and axially separating the top from the bottom. The pre-cutting of the blank along the lines 44, 48 and 50 permits separation of the top and bottom container sections without any twisting or tearing of the material and the staggered or stepped relation of lines 44, 48 and 50 provides a top member having a flanged lip or rim which is readily insertable in the bottom of the container in telescoped relation, thereby providing a rigid cylindrical container of great strength which will not leak, which is not broken in handling, and which is provided with a readily separable and re-usable top.

The containers illustrated in the drawings are both provided with a body portion which is cylindrical in cross section. The invention is equally applicable to the production of containers having other than a cylindrical cross section. The tubular body portion may be shaped to provide any cross section desired, such as square, rectangular, hexagonal, etc.

While specific details of construction and materials have been described in illustrating the invention, it will be understood that other details of construction and other materials may be resorted to within the spirit of the invention.

I claim:

1. In the art of making tubular containers comprising a tubular body having a tubular portion thereof in telescopic engagement with a tubular portion of a cover, the method of simultaneously making the tubular portion of the body and the tubular portion of the cover in assembled telescopic engagement which comprises: applying adhesive to the major portion of one surface of an elongated rectangular web of paperlike material, leaving a generally rectangular area free from adhesive, said adhesive-free area extending longitudinally of the web and being spaced from a lateral edge of the web, said adhesive-free area also being spaced from one end of the web a distance at least as great as the periphery of the container to be made, and having a length at least as great as the periphery of the container to be made and a width at least as great as the distance that the body and cover parts are to telescope one within the other; cutting the web to separate it into two sections having complementary edges without substantially moving the separate sections relative to one another, the lines of the cut comprising two offset lines parallel to the lateral edge of the web, which are spaced from each other a distance substantially equal to the width of the adhesive-free area, and which extend from the opposite ends of the web to a locus near one end of the adhesive-free area, and a line connecting the inner ends of the parallel lines; simultaneously winding both web sections into cylindrical form with the adhesive-coated surface outermost and without substantial lateral displacement of the two sections; and applying a paper label around the cylinder to cover the exposed cutting line.

2. A method of forming a container from a one-piece rectangular blank of paperlike material which container when completed is characterized by a multi-ply cylindrical body having in each ply thereof a line of division intermediate the ends of said body and extending around the periphery of the container with the dividing line in at least the innermost ply offset relative to the dividing lines in the remaining plies whereby to divide said body into two parts, with cooperating flange sections on each part of said body in initially telescoped, assembled relation permitting the cylindrical body to be separated when desired into its two parts, said method comprising dividing the blank into two separate portions by cutting on lines which extend inwardly from both end edges in generally parallel offset relation and which are joined intermediate the ends of the blank by a generally transverse cutting line, said first mentioned cutting lines being parallel to and spaced from a side edge of said blank, applying an adhesive to the blank with an adhesive-free area on said blank which adhesive-free area extends from said transverse cutting line towards one end of the blank a distance approximately equal to the desired circumference of the container and which has a width approximately the distance between said offset parallel cutting lines, forming said blank into a multi-ply cylindrical body without separa-

tion of the blank along said cutting lines, applying end closures to the cylindrical body and applying a label over the exposed cutting lines on the outside of the cylindrical body.

THOMAS F. BARNES.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
934,266	Bartlett	Sept. 14, 1909
1,961,559	Hermann	June 5, 1934
1,963,994	Hermann	June 26, 1934
2,188,497	Calva	Jan. 30, 1940
2,215,705	Lenz	Sept. 24, 1940
2,260,137	Donnelly	Oct. 21, 1941
2,299,461	Clanon	Oct. 20, 1942
2,314,338	Graves et al.	Mar. 23, 1943
2,325,145	Marlin	July 27, 1943
2,373,554	Finlay	Apr. 10, 1945