Feb. 16, 1943. R. C. CARLSON 2,311,291

CONTAINER

Filed Jan. 2, 1940

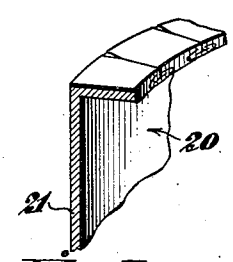


Fig. 7

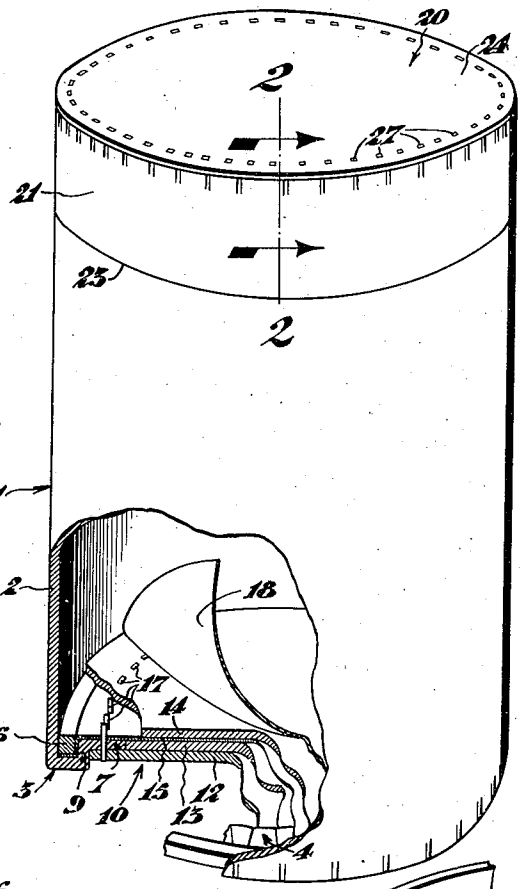


Fig. 1

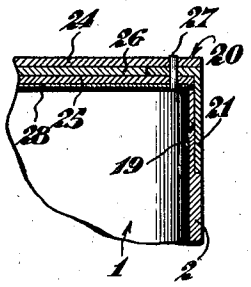


Fig. 2

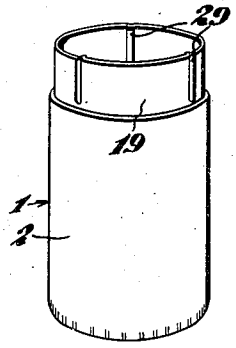


Fig. 8

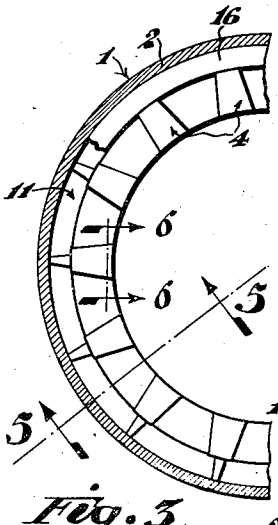


Fig. 3

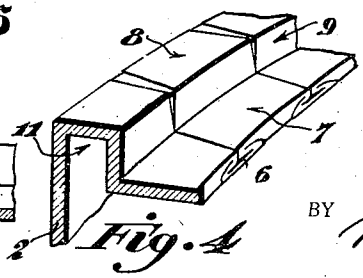


Fig. 4

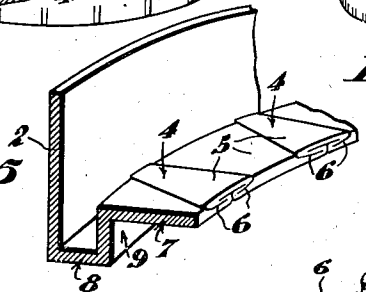


Fig. 5

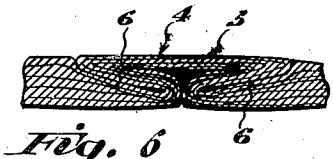


Fig. 6

INVENTOR.
Robert C. Carlson
BY
Wood & Wood
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,311,291

CONTAINER

Robert C. Carlson, Terrace Park, Ohio, assignor to John J. Emery, doing business as Emery Carpenter Container Company, Cincinnati, Ohio

Application January 2, 1940, Serial No. 312,061

8 Claims. (Cl. 229—67)

This invention relates to containers which are made of fiberboard, paperboard, or like material. The invention is directed particularly to a container which is of generally cylindrical form of the type adapted for use in the shipping of chemicals, colors, powdered substances and like materials.

It is intended that the container be provided with a cover suitably arranged so that the entire contents within the container can be sealed against exposure to the atmosphere or to the infiltration of dust or deleterious substances.

The primary object of the inventor has been to provide a container of this general type which is more suitable for use in the trade than those which heretofore have been available. More specifically, the object has been to provide a container which has a very firm base or bottom structure enabling the containers to be rolled upon their rims when they are being handled, and also enabling the containers to be stacked one on top of another without danger of them collapsing or buckling.

Another object, and one which is very important from the commercial point of view, has been to provide a container embodying these structural advantages as well as low cost of manufacture. While in some instances the containers are used repeatedly, they are, for the most part, discarded after one or two trips and, consequently, it is requisite that the cost of manufacturing them be as l as possible. The present invention embodies economy of manufacture with structural stability to a degree not heretofore achieved in articles for similar purposes.

Briefly, the containers of the present invention are formed of a cylindrical tube, or annular wall or body portion, which is made of fiberboard of suitable thickness, commensurate with the quantity or weight of material intended to be packaged. One end of the tube or body is shaped and configurated inwardly so as to provide a flange which forms a foundation for the base structure. This flange extends annularly within the cylindrical wall, leaving a central opening which is subsequently sealed. However, the inner periphery of the base flange is of lesser diameter and, consequently, lesser periphery than the body itself, so that the turning of the flange provides more material than that required for its formation. It is the concept of the present invention to employ the excess of material for forming pleats in the flange so that its structural stability is greatly improved against lateral or longitudinal collapse or rupture. The pleats are of radial corrugated formation and are widest at the inner edge of the flange, that is, at the portion which is normally weakest, and taper gradually in width as they approach the external surface of the drum, since at this area there is less difference in diameter and consequently less excess of material. The pleats are spaced about the flange uniformly, each strengthening the portions of the flange adjacent to it. Collectively, the pleats serve to reinforce the edge portion of the drum which is normally the weakest portion, and also to rigidify the entire base flange about which the bottom of the container is fashioned.

The center portion of the base flange preferably is so formed that it is offstet above the base, leaving an annular groove adjacent the internal surface of the body of the carton. A bottom disc is provided and wedged within this annular cavity of the base, and a filler disc is now installed within the opening in the flange itself. These two disc members are preferably glued together.

The next feature of the invention which is important when powdery or finely ground materials are to be shipped is the utilization of a sheet of relatively light weight extending across the bottom flange within the container and downwardly within and across the internal annular recess. For holding this disc sheet in place and for strengthening the bottom rim of the container, a ring is pressed and wedged into the annular recess in the bottom of the drum. This latter member serves to hold the bottom sheet in stretched position and seals any cavities through which the powdered material might tend to escape from the interior of the carton. A relatively heavy bottom disc is installed within the cavity over the sealing sheet so as to cover the sealing ring and sealing sheet and provide the container with a smooth bottom. If desired, a removable leaf or sheet may be installed over this heavier disc so as to protect the bottom disc of the container from becoming contaminated if the container is to be used for holding first one substance and then another.

The cover of the container is formed of a ring which is of substantially the same external diameter as the body of the carton, with the carton and the ring being counter turned or otherwise configurated so that the two telescopically engage one another and are flush at their outer surfaces. The upper portion of the cover ring, like the bottom of the container, is turned inwardly and pleats are formed of the excess of material so that the cover, like the bottom, is of a strengthened construction.

In the top structure, it is the recommended procedure to attach a member which is of the diameter of the ring to the inturned pleated flange and install discs within and about the flange aperture, all three being stitched or otherwise connected together. A removable leaf or sheet also can be installed in the cover if desired, so as to prevent the internal disc of it from becoming contaminated with chemicals if the container is intended for use in the transportation of different chemicals at different times.

It is preferable in the manufacture of the containers of the present invention to pleat the flanges while the material undergoing configuration is in a relatively moist condition, so as to permit its fibers to slip relatively over one another and be compressed together. In the construction, the pleated material is subjected to pressure so that the surfaces of the pleated areas are flush with the surfaces of the adjoining portions. Each pleat is of such dimension that collectively the excess of material resulting from the difference in peripheries between the inside and outside diameters of the flanges is entirely consumed. The dimensions, of course, depend largely upon the flange diameters and the number of pleats to be utilized.

The method of forming the pleats is disclosed and claimed in my copending application, Serial No. 351,820. However, for the purpose of enabling the present invention to be readily understood from the present disclosure, the method of forming the pleats at spaced intervals comprises generally pressing against the terminal edge of one end of the body as with fingers extending radially from the body of the container, so that the localized pressures serve initially to kink the material as well as bend it inwardly. The material, once kinked, forms itself conveniently into uniform pleats when it is subjected to further pressure and configurating operations.

A preferred type of container manufactured in accordance with the present invention is disclose in the accompanying drawing. The various modifications to which the structure is adapted readily will be understood by those skilled in the art.

In the drawing:

Figure 1 is a drum constructed in accordance with the invention. The wall is broken away to illustrate the details of the end portion.

Figure 2 is a fragmentary view in cross section taken on line 2—2 of Figure 1.

Figure 3 is a fragmentary view in cross section showing the bottom flange and bead in plan.

Figure 4 is a fragmentary perspective view of the bottom bead and flange. In this instance, the drum is upside down.

Figure 5 is a fragmentary perspective view of the flange and bead shown in an upright position taken on line 5—5 of Figure 3.

Figure 6 is a cross sectional view taken on line 6—6 of Figure 3.

Figure 7 is a fragmentary perspective view of the flange shown in Figure 2.

Figure 8 is a perspective view of the container showing the cover removed.

In the drawing, the body of the drum is indicated generally at 1 and comprises a cylindrical wall 2 which preferably is made up of layers or laminations (not shown) of paper appropriately glued together in the manner understood by those skilled in the art.

At the one end of the tubular section a flange, indicated generally at 3, is turned laterally from the wall to extend inwardly of the body and form a foundation for closure of the tube or body portion. The inturned flange 3 is integral with the wall 2 and is characterized chiefly in that it is made up of pleats or corrugations 4, each consisting of surface portions 5 overlapping surface connecting portions 6. The pleats are in spaced circumferential relationship, as shown in Figure 3, the number being adjusted in accordance with the difference between the inner and outer peripheries of the flange; or in other words, in accordance with the quantity of material to be gathered up in pleats, in much the same manner that a dressmaker adjusts the pleats to accommodate the difference in diameters between the waist and the bottom of a lady's skirt. The pleat lines thus converge as they approach the drum wall 1.

Since the paperboard is of substantial thickness, the overlapping thicknesses, when first formed, cause the surfaces of the flange to be quite rough and corrugated. However, to overcome this formation the ability of the paperboard to be swaged is utilized. By the application of pressure upon the surfaces of the flange, particularly when the material is moist, the raised overlapping portions are squeezed and the intermediate areas are upset. In this manner, the pleat surfaces and the surfaces of the portions intermediate them are brought into flush relationship as shown in Figure 6.

It is preferable to turn in so much of the wall of the container as is necessary to form a flange having an inner diameter which is approximately half the diameter of the container itself. These dimensions are not requisite. It may be pointed out that if the flange is very narrow the foundation, even though corrugated, tends to be relatively weakened, and if the flange be of greater width the increased expense is not commensurate with the gain in strength.

The turning in of the flange and the pleating operation by which the flange is configurated and the surfaces of it made smooth are utilized in the construction of both the bottom and the top of the container, and for this reason the flange utilized in the formation of the cap or lid or cover for the container is not described in detail.

At the bottom of the container, however, it is preferable that the flange be configurated to provide a central portion indicated generally at 7, residing in a plane parallel to but spaced inwardly from the marginal portion of the flange which is indicated generally at 8. In other words, the container is provided with an annular bead 8 extending beyond the central portion of the flange 7 with an interconnecting wall 9 between the two. A central recess which is indicated generally at 10 (Figure 1) is provided in this manner.

The annular bead is of such width that it provides an annular recess 11 internally of the container, that is, a recess bounded by the bead walls 8 and 9 and the wall 2 of the container. Since the flange is turned inwardly from the body of the container all of the portions of this formation are integral with one another. In the preferred structure the offset portion is formed in the pleated flange by an upsetting operation.

The end of the container is closed by means of disc members 12, 13 and 14. The disc 12 resides within the bottom recess 10 and is wedged against the wall 9 of the annular bead. The disc 13 is cut to fit within the aperture in the bottom flange and is preferably of paperboard which is of substantially the same thickness as the flange.

The disc member 14 is dimensioned to fit snugly the interior diameter of the body so that it is free to be pressed in position.

However, intermediate the disc members 13 and 14 a sealing member 15 is installed. This comprises a sheet which may be of relatively thin material disposed over the surface of the disc 13 and over the surface of the flange, so as to extend downwardly within the annular recess 11, that is, adjacent the interconnecting wall 9 and preferably across the bottom of the recess. If desirable, it may also extend upwardly along the wall of the container.

The sealing sheet 15 is wedged in position by a ring 16 cut of paperboard or like material and dimensioned to fit snugly within the recess and press the material of the sealing sheet against the interconnecting wall 9 of the annular bead. This ring is of such thickness that its upper surface resides in flush relationship with the surface of the sealing member 15, so that when the bottom disc 14 is installed within the container a firm foundation for it is provided.

All of these members may be cemented in position by means of glue or suitable adhesive and it is also desirable in most instances to stitch annularly, as at 17, through the disc members 12, 14 and 15 and the central offset portion of the bottom flange.

As previously explained, to prevent contamination of the bottom member 14 in those instances where chemicals of different types are shipped one after another in the container, a napkin sheet 18 may be disposed across the face of the bottom disc 14. The end of the wall of the body opposite the bottom is provided with a counterturned extension 19. This may be formed either by an actual turning operation or simply by omitting material at this point when the cylinder for the container is made up of the laminations of paper.

The cover of the container which is indicated generally at 20 is comprised of an annular wall portion 21 which is of the same diameter as the body of the container; the internal diameter of the cover ring is such that it fits telescopically over the counterturned portion 19. This arrangement provides a joint line 23 at the exterior of the container around which a strip of adhesive tape may be attached, so as to seal the joint.

As previously explained, the top of the container is provided with an inturned flange made similarly to that utilized at the bottom, but in this instance the flange need not necessarily contain the central offset portion. Instead, this flange extends laterally from the wall of the cover and to it are attached cover members 24 at the outside and 25 at the inside. In the aperture at the inturned flange at the cover a filler disc 26 is utilized and the disc members 24, 25 and 26 all preferably are adhesively united. As in the construction of the bottom, an annular row of stitches 27 extends through the disc members 24 and 25 and the inturned flange, so as firmly to unite all of these parts. The portion 19 of the body fits well up into the ring and terminates adjacent or in abutment with the surface of the cover top.

The disc 24 preferably extends to the periphery of the outer cover, and the disc 25 fits snugly against the internal surface of the cover wall. A sealing sheet or napkin 28 also is positioned against the internal face of the disc member 25 to finish the interior of the top.

The neck 19 of the body, which extends within the cover, is indented as at 29, with vent flutes arranged to permit air to pass into or out of the container when the cover is removed or placed in position. Several of these flutes spaced about the periphery of the neck, make the installation or removal of the cover an easy operation.

At the bottom of the container the weight of the contents tend to exert a bulging pressure upon the bottom members, while at the top the only pressure which is subjected upon the structure is localized at the rim portion, as in the instance when the containers are stacked one upon another in a pile. The annular bead at the bottom withstands the bulging action since the stitches interconnect the pleated flange and the disc members which bridge the opening.

The annular ring 16, in turn, rigidifies the bead structure and prevents this bead from becoming flatted at localized portions of its periphery, so that no difficulty is encountered in rolling the container or drum along the bead in the manner which is usually followed by freight handlers as the drum is being filled with heavy material. The pleats, in turn, further strengthen the structure against lateral distortions so that the container, even though constructed of materials of standard weight and thickness and strength, is capable of carrying heavier loads than those of a similar size, made in accordance with the standardized specifications which have been adopted in the industry.

Having described my invention I claim:

1. A paperboard container which is comprised of a cylindrical body portion made up of laminations of paper material having a marginal laminated portion at one of its ends turned inwardly to provide an integral flange, the said flange being made up of interconnecting pleats formed by interconnected reverse folds, the said pleats symmetrically overlapping the material contiguous therewith and extending radially toward the body portion in spaced circumferential relationship, the said pleats being embedded in pressed relationship in recesses in said flange such such that the faces of said flange are flat and smooth.

2. A paperboard container which is comprised of a cylindrical body portion made up of laminations of paper material having a marginal similarly laminated portion at one of its ends turned inwardly to provide an integral flange, the said flange being made up of interconnecting pleats extending radially toward the body portion in spaced circumferential relationship, the said pleats substantially symmetrically overlapping the portions of the flange which are contiguous to the pleats and which interconnect the pleats and residing in pressed relationship with one another such that the faces of the flange are flat and smooth and means fastened to said flange providing therewith a closure for the end of the body.

3. A paperboard container which is comprised of a cylindrical body portion made up of laminated paper material having a marginal similarly laminated portion at one of its ends turned inwardly to provide an integral flange, pleats formed by interconnected symmetrically reverse folds oppositely arranged in said flange, the respective folds at one surface of the flange overlapping the corresponding reverse folds at the other surface of the flange, and the said pleats residing in pressed relationship with one another such that the faces of the flange are flat

and smooth, and disc members attached to the inner aud outer faces of said flange.

4. A paperboard container which is comprised of a cylindrical body portion having a marginal portion at one of its ends turned inwardly to provide an integral flange of substantial thickness, the said flange being made up of interconnecting pleats extending radially toward the body portion in spaced circumferential relationship, the said pleats having marginal portions symmetrically overlapping the contiguous portions of the flange interconnecting the pleats at the opposite sides thereof, the central portion of the flange being offset inwardly from the circumferential portion whereby an annular rim is delineated upon the body of the container beyond the flange, and disc means providing a closure for said body carried by said flange within said rim.

5. A paperboard container which is comprised of a cylindrical body portion having a marginal portion at one of its ends turned inwardly to provide an integral flange of substantial thickness, the said flange being made up of interconnecting pleats extending radially toward the body portion in spaced circumferential relationship, the central portion of the flange being offset inwardly from the circumferential portion of the flange to provide an annular rim upon the exterior of the body and an annular recess within it, ring means wedged within said recess and disc means providing a closure for said body carried by said flange.

6. A paperboard container which is comprised of an annular disc comprised of interconnecting pleats extending radially in spaced relationship toward the periphery of the disc, of a circumferential portion extending in a plane parallel with but offset from the central portion of the disc, a wall portion circumferentially integral with the offset portion of the annular disc and extending laterally therefrom to form a container body portion, and to provide relatively offset portions of said disc, an annular recess internally of said body, disc means attached to the central portion of said disc and forming a body closure, and a ring wedged with said recess.

7. A paperboard container which is comprised of a circular wall portion of laminated paper material forming a container body, and an inturned flange portion integral therewith and forming a laminated foundation for a closure for the body, the flange portion being made up of interconnected pleats extending radially toward the wall portion in spaced circumferential relationship, the said pleats having the marginal portions thereof at the opposite edges symmetrically overlapping the respective contiguous portions of the flange interconnecting the pleats, the said pleats residing in a plane substantially flush with the plane of the interconnecting portions of the flange, and also in pressed relationship to one another to form a flange having flat faces, the said flange formed by the pleats having a central aperture, and disc members positioned with said aperture and upon the flat faces of said flange respectively.

8. In a paperboard container which is comprised of a circular wall portion forming a container body, and an inturned flange portion integral therewith and forming a foundation for a closure for the body, the flange portion being made of pleats which are integral with one another and extend radially toward the wall portion in spaced circumferential relationship, the central portion of the flange being parallel to but in a plane offset inwardly from the circumferential margin of the flange portion and providing, with the wall portion, an interior annular recess, with the disc members fastened upon opposite faces of said flange and providing a closure for the body, and a ring member wedged within the annular recess.

ROBERT C. CARLSON.