Nov. 20, 1945. W. A. RINGLER 2,389,547

CYLINDRICAL CONTAINER AND THE LIKE

Filed Dec. 1, 1942 2 Sheets-Sheet 1

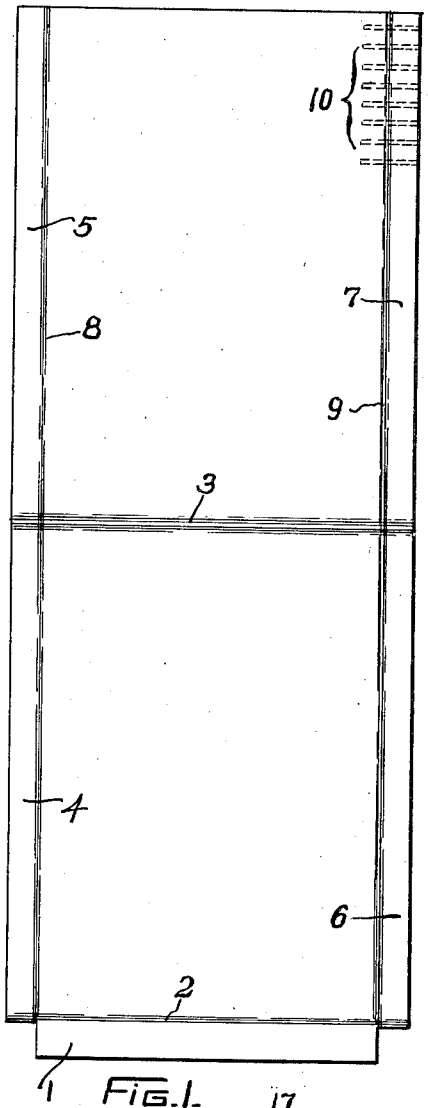


FIG. 1.

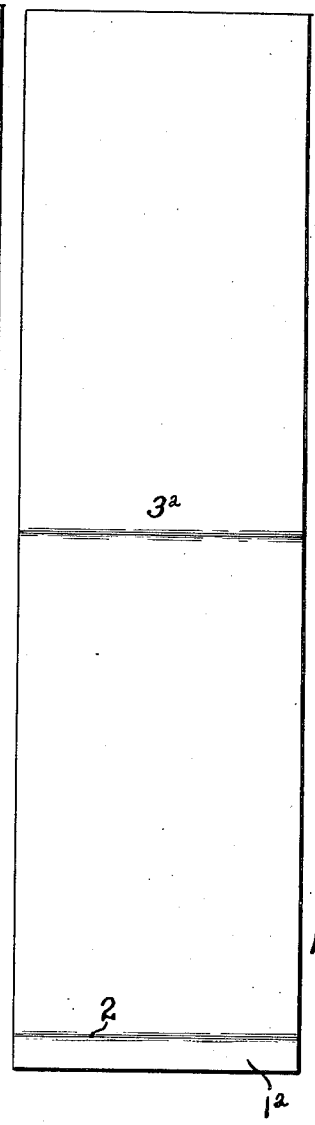


FIG. 2.

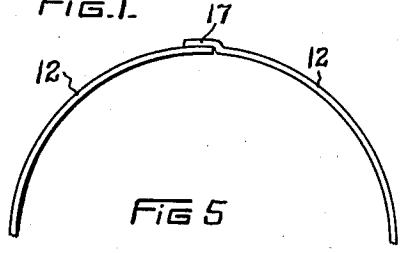


FIG 5



FIG. 6.

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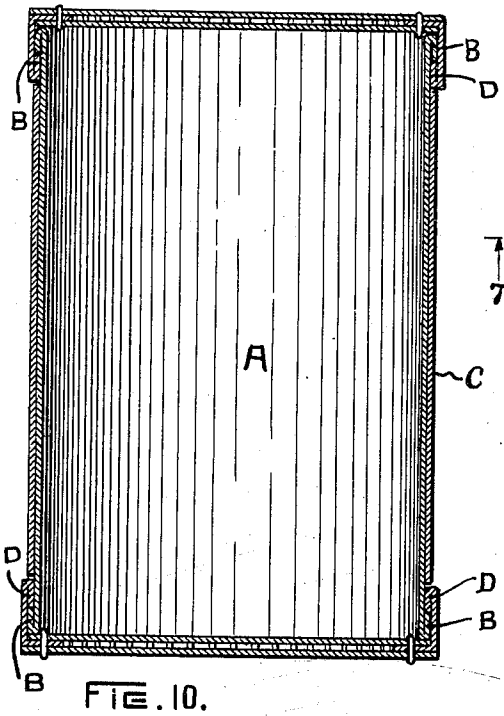


FIG. 10.

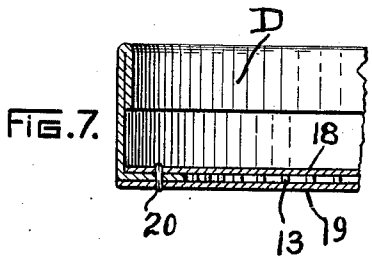


FIG. 7.

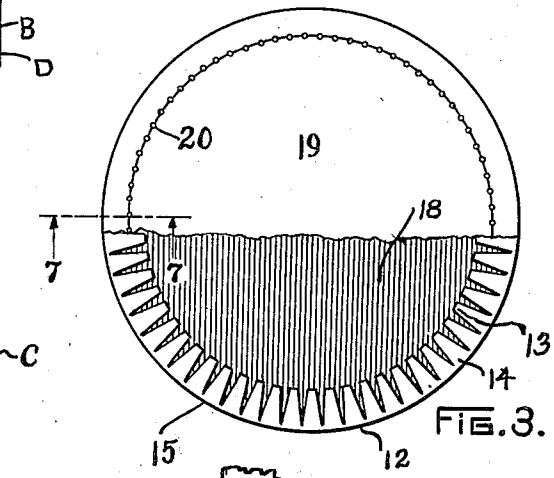


FIG. 3.

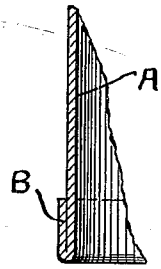


FIG. 8.

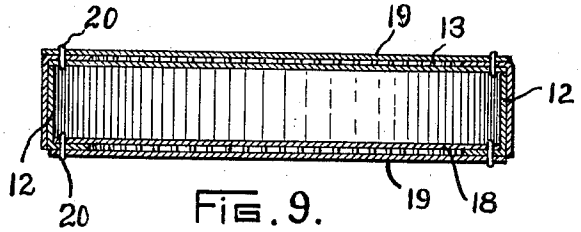


FIG. 9.

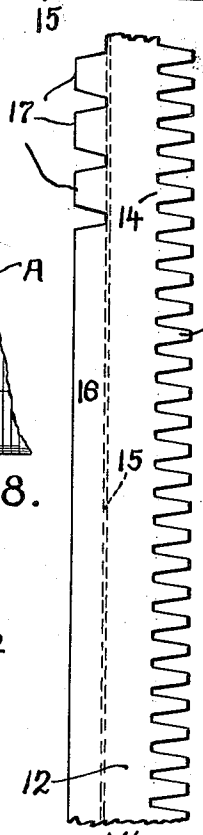


FIG. 4.

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UNITED STATES PATENT OFFICE

2,389,547

CYLINDRICAL CONTAINER AND THE LIKE

William A. Ringler, Wayne, Pa., assignor to The Gardner-Richardson Company, Middletown, Ohio, a corporation of Ohio

Application December 1, 1942, Serial No. 467,500

5 Claims. (Cl. 229—5.5)

My invention is addressed to improvements in containers of the general type in which a tubular body is fitted with cap-like end pieces. Such containers are known, including those wherein the body has outwardly and downwardly turned flanges at its ends while the cap-like closure members have inwardly turned flanges designed and positioned to lock therewith. Such containers are disclosed in my copending applications entitled Paper receptacles, Serial No. 412,170 filed September 24, 1941, and entitled Cylindrical containers, Serial No. 460,570 filed October 2, 1942.

The present invention, while applicable to such containers, is not confined thereto, but in one of its aspects may be applied to a type in which two cup shaped members telescope respecting each other to form both the body and the ends of a completed box. While I shall describe my invention in connection with containers having generally a cylindrical shape, it will be understood that this shape is not a necessary limitation upon my invention, and that the container may have other shapes including polygonal, oval and other sections.

Principally it is an object of my invention to simplify and cheapen the manufacture of containers while at the same time providing structures of greater inherent strength and stiffness. By way of a single example, motion picture films for projection in theaters have hitherto regularly been shipped in stamped or fabricated metal containers. Obviously, the requirements for strength and protection in such a service are very great. With present metal shortages, however, the usual cans or metal containers are becoming increasingly difficult to obtain and in many cases are not available. Certain objects of my invention will be understood when I point out that by the practice of it I am able to supply paperboard containers having adequate strength for such a service.

Another object of my invention is the provision of structural improvements in the general class of containers to which reference has been made first above.

Yet other objects of my invention have to do with the provision of structures in containers of the general type to which reference has been made, which structures facilitate the use of heavier boards. It is another object of my invention to facilitate and cheapen the operation of the manufacture of the cup shaped closure members by providing a construction which facilitates and cheapens assembly while at the same time increasing strength. An ancillary object of my invention is the provision of a closure structure of generally cup or cap shape wherein the depending skirt portion is stiffer than in other structures and is able in itself to contribute importantly to the strength of the finished container. Yet another object of my invention is the provision of a mode of reinforcing the body structure of containers of this general type.

These and other objects of my invention which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that arrangement of parts and in that procedure of which I shall now describe certain exemplary embodiments. Reference is made to the drawings which form a part hereof and in which:

Figure 1 is a plan view of a body blank for a container.

Figure 2 is a plan view of another form of body blank which also may be employed, if properly dimensioned, as a reinforcement for the body of Figure 1.

Figure 3 is a plan view of a closure member with certain parts broken away to show the interior structure.

Figure 4 is a plan view of a type of toothed strip from which my closure member may be fabricated in part.

Figure 5 is a partial plan view of a closure member from the side opposite that shown in Figure 3, and illustrating the lapping of the band member.

Figure 6 illustrates a score.

Figure 7 is a partial sectional view of a cover taken along the line 7—7 of Figure 3.

Figure 8 is a corresponding partial sectional view of the body of the container.

Figure 9 is a sectional view through one type of my finished containers.

Figure 10 is a sectional view through another type of my finished containers.

The body of the container is formed from a strip or sheet of board at one end of which is provided a glue flap 1 or 1*a*, as in Figures 1 and 2, demarked from the body of the blank by a score line 2 or 2*a*. The blank will be tubed and the flap 1 or 1*a* attached to the opposite end of the blank by gluing, riveting, stapling, stitching or the like. Where the blank is to be of a polygonal cross section it will be provided with an appropriate series of intermediate score lines. For a cylindrical container I provide a single intermediate score line 3 or 3*a* on which the blank may be folded. When the blank is tubed as has

already been described, it will be in a flat form for shipment.

The body blank shown in Figure 1 is characterized by laterally projecting flap portions 4, 5, 6 and 7 which when outturned will form the locking flaps on the body of the container which have already been described. These flaps are demarked from the body of the blank by score lines 8 and 9. They may be continuous or divided at the score line 3. In boards of relatively light gauge, these score lines may be of ordinary form, or may be somewhat wider as shown in Figure 6. In the heavier types of boards cut scores may be employed, by which I mean a score which instead of indenting the board cuts part way through the thickness of it, leaving however, an unsevered layer of board of sufficient thickness to provide adequate strength.

I have also found it advantageous to form a plurality of transverse score lines 10 in the blank. These extend the width of the flaps 4, 5, 6 and 7, at least, and preferably extend into the body of the blank a distance substantially equivalent to the width of the flaps. In Figure 1 part only of these score lines are shown. They are formed at relatively closely spaced intervals, say ½ or ¾ inch apart; but this may be widely varied depending on the die-maker's skill and the necessary estimate of the cost of the die. They have the advantage of making the flaps conform more readily to the desired configuration of the body when the body is erected, and they also form a more perfect lock, for by increasing the effective thickness of the flaps they increase the efficacy of the flap edges as abutments. They make also for a more perfect and tighter fit of the closure members over the body.

In Figures 8 and 10, the body of the container is indicated generally at A and the outturned flaps at B. Not all uses for containers of this type require the interlocking flanges. Thus the body blank of Figure 2 is shown without them and may be employed as the body of a cylindrical container over the ends of which the cup shaped closures are slipped but with which they do not have interlocking engagement. Or where a container is to be opened and closed repeatedly, the interlocking flap engagement which has already been described may be provided at one end only, the other end of the body being without an outturned flap and having merely a telescoping engagement with the closure member.

But Figure 2 is also illustrative of a type of reinforcement for the body of a container, the use of which I have shown in Figure 10. It will be noted upon comparing Figures 1 and 2, the blank of the latter figure is slightly longer than the blank of Figure 1, and that the score lines 2*a* and 3*a* are slightly displaced with reference to the score lines 2 and 3. This gives a structure so dimensioned as to slip over the structure formed from the blank of Figure 1 when the latter is erected. The over structure is shown at C in Figure 10 where it reinforces and strengthens the body of the container. It will be noted in that figure that the length of the reinforcement C is less than the length of the body A by approximately the overlap of the skirts of each of the end closure members. It thus contributes to the longitudinal as well as the transverse stiffness of the container without increasing its effective bulk.

My containers will be made of a weight of body appropriate to the service which will be required of them, but in general, for heavy duty they will be made of heavy board, say 50-point board or heavier, either such a board as may be manufactured on the multi-cylinder or other board machines or a composite board made by pasting or combining pre-made boards of lesser thickness. The scores, as shown at 11 in Figure 6, may be of a depth and configuration appropriate to the character of board used. Normally they will be of greater depth and width than the scores employed with ordinary folding cartons, but will be generally of that type rather than of the double type employed with solid fiber shipping cases, excepting, as indicated, in the case of the score lines 8 and 9 which may be cut scores.

In the manufacture of the end closure members of my containers I provide a strip 12 (Figure 4) which along one of its edges is cut out to provide a plurality of tapering teeth 13. The angularity of the tapering sides of these teeth will preferably be related to the diameter or other configuration of the desired closure member. The teeth may be in the form of triangles or they may be truncated and polygonal in cross section, as shown. A score line 14 is preferably formed continuously along the base line of the several teeth. Where the closure is to have an inturned flange, as illustrated at D in Figure 7, another longitudinal score line 15 is formed in the strip.

The strip of Figure 4 may be made if desired on the usual cutting and scoring press and by the technique appropriate to that apparatus, but they may also be made by a continuous apparatus involving rotary dies or the like, as will be readily understood. The width of the body portion of the strip 12 will, of course, be the desired width of the skirt of the closure member exclusive of the teeth 13 and a flange portion (if there is one); and its width may be increased as desired to form a body of sufficient depth as in the structure of Figure 9 hereinafter to be described. Where a locking flange is employed with the heavier boards, score lines similar to the scores 10 in Figure 1 may be employed in the strip, and for a similar purpose; but I prefer to divide the flange portion 16 into tongues 17 as partially shown in Figure 4. These can be turned in readily when the closure is in final form, and employed for locking purposes.

The strips are cut to desired lengths and bent to the desired configuration which will be the cross sectional shape of the box of the container. The ends of the strips are lapped and joined as at 17 in Figure 5. They may be adhesively secured, stitched, stapled, or otherwise; and where the end closure member is to slip over a body or another closure member, the lapped joint may be offset, as shown in Figure 5, outwardly. Otherwise it may be offset inwardly.

Further, in forming the closure, the teeth 13 are bent over along the score line 14 so as to lie substantially in a single plane. This will be clear from Figure 3. A disk or other appropriate shape of boxboard 18 is placed within the band and against the turned over teeth 13. Then another and preferably slightly larger disk 19 is placed over the teeth and the structure sewn together by one or more lines of stitching 20 following generally the periphery of the closure. This gives not only a neat but a strong closure which, nevertheless, is very easy to produce. The container end portion thus is formed of two thicknesses of material 18 and 19 between which the teeth 13 are caught and held by the line of stitching.

The stitching 20 is a continuous line of stitch-

ing effected by a sewing machine making a single, double or multiple thread stitch. It will be usual to keep the line of stitching as close to the periphery of the cover as the mechanism will permit. The stitching may be passed a plurality of times about the periphery of the cover if desired, but this is not necessary, and a single continuous line with such overlap as may be thought desirable is usually all that is required. It is well, however, to gauge the length of the stitches with due regard to the width of the teeth 13. These teeth should be caught in the stitching; but the stitch length should not be so short that the teeth are subsantially weakened or severed by many needle perforations.

Even where the board is of laminated construction, the sewing prevents delamination of the disks as well as of the teeth, and provides a strong yet essentially flexible construction. The band portion is of continuous character and has not been subjected to operations which would tend to cause delamination or impairment of the quality of the board. It forms a stiff skirt on the cup-shaped end closure adapted to contribute importantly to the strength of the container. It may have the inturned flange D which has already been described in several forms and which will interlock with the flanges B as clearly shown in Figure 10. The container of that figure is one which, among other uses, can be employed to contain a plurality of reels of motion picture film, being long enough to accommodate them while yet adequately strong.

Where a single reel of motion picture film is to be shipped or stored or where any other package is to be produced which has relatively a short length in comparison with its breadth or diameter, a complete container may be formed as shown in Figure 9 where two of my cup-shaped end pieces, appropriately dimensioned, have been telescoped together.

Containers of any desired length can, of course, be made in this way simply by increasing the width of the skirt portion of the inner container. Such containers may be given the locking feature, by providing the skirt of the inner closure member with an outturned flange, and the skirt of the outer closure member with an inturned flange in any of the ways heretofore described. Where large containers having long bodies are to be made at one point and shipped to another point for use, however, the shipping advantage lies with the type shown in Figure 10, having shallow closure members and a collapsible body.

Modifications may be made in my invention without departing from the spirit of it. Where protection from actinic light, by way of example, is important, the board from which my containers are made may be black or may contain a layer of black substance such as a layer of asphalt. Where proofness against vapor or water is desired, the board may be itself appropriately proofed. The needle holes produced by the stitching may be filled by dipping the closure in a bath of substance which will fill up these holes and which may be at the same time providing protection against both light and moisture. A second disk of board of the same approximate size as the disk 13 may be employed within the cup-shaped end closure where it will cover the needle holes and line of stitching and where it may be left loose or cemented in place. The container may be printed as desired.

Having thus described my invention in certain exemplary embodiments, what I claim as new and desire to secure by Letters Patent is:

1. A heavy duty cylindrical container formed of heavy paperboard and comprising a flat-folding body portion which is a blank having an attachment flap articulated at one end and an intermediate score line, together with top and bottom out-turned flange portions articulated by means of longitudinal scores, said attachment flap being attached to the opposite end of said blank to form a tubular structure erectable from the flat-folded condition to a cylindrical condition, together with end closure members for said body portion, each of said end closure members having a band portion of heavy paperboard with an attachment flap at one end, said attachment flap being joined to the other end of said band to cause said band to assume a circular configuration, one edge of said band portion having a plurality of tapered teeth sufficiently narrow at their bases to permit bending into a plane transverse said band portion without destroying the substantially circular configuration thereof, a disc of paperboard within said band portion and conforming thereto, said teeth being bent over against said disc, a second disc overlying said band, and the said discs and teeth being joined by a line of stitching with thread passing through and engaging said discs and teeth, the said attachment flap being articulated to said band portion by an offset score line whereby to preserve the circular configuration of the inner surface of the band portion, said band portion at its other edge having in-turned flange means to engage with the out-turned flange means of said body portion.

2. The structure of claim 1 wherein the in-turned flange means on the said band are a series of teeth substantially wider than the first mentioned teeth.

3. The structure of claim 1 wherein the said body portion has an over-sleeve of paperboard in flat-folding, tubular form, said over-sleeve being less in length than the said body portion by the width of the out-turned flange portions of said body portion plus the width of the in-turned flange means on the said band portion, said over-sleeve lying substantially in the plane of said out-turned flange portions.

4. The structure of claim 1 wherein the said body portion has its ends softened and rendered resilient by a series of closely spaced score lines extending transversely of said flange portions and into the remainder of the blank, but less in length than the width of the blank.

5. The structure of claim 1 wherein the said body portion has its ends softened and rendered resilient by a series of closely spaced score lines extending transversely of said flange portions and into the remainder of the blank, but less in length than the width of the blank, and wherein the said body portion has an over-sleeve of paperboard in flat-folding, tubular form, said over-sleeve being less in length than the said body portion by the width of the out-turned flange portions of said body portion plus the width of the in-turned flange means on the said band portion, said over-sleeve lying substantially in the plane of said out-turned flange portions.

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