April 19, 1949. J. COYLE 2,467,930

PAPER CONTAINER STRUCTURE AND METHOD OF FORMING SAME

Filed Jan. 14, 1944

FIG. 3.

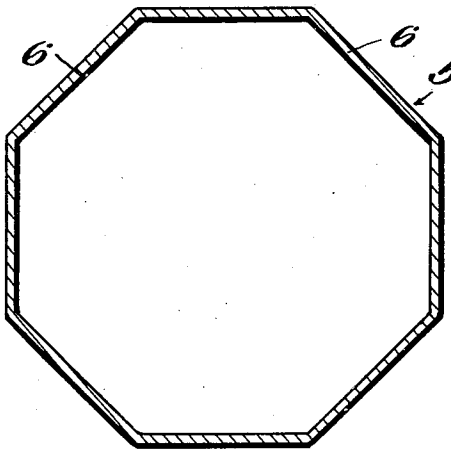


FIG. 1.

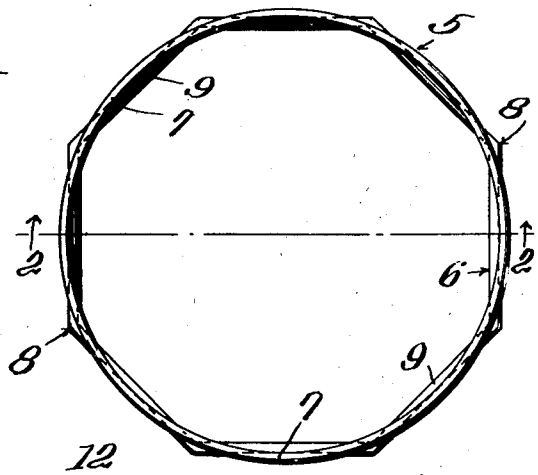


FIG. 2.

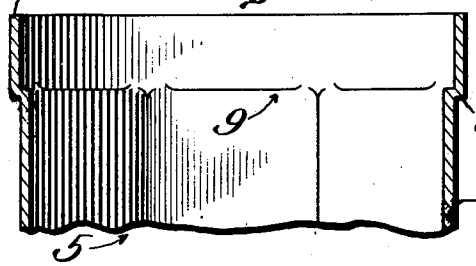


FIG. 4.

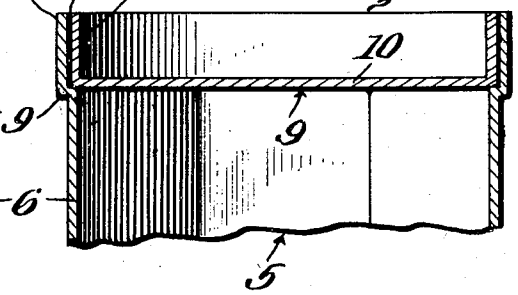
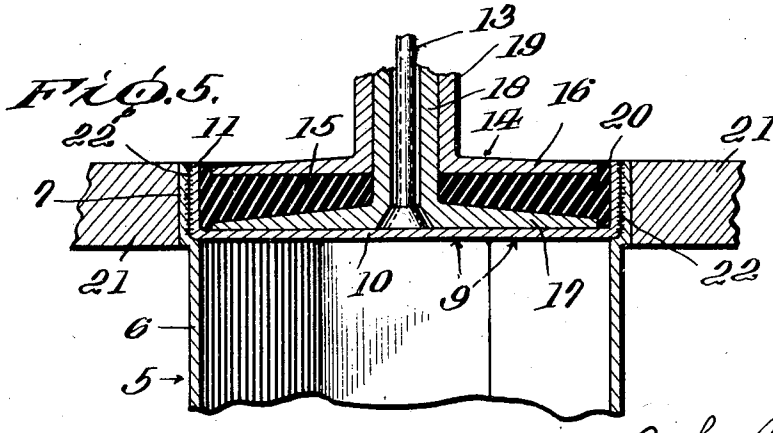


FIG. 5.



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PAPER CONTAINER STRUCTURE AND METHOD OF FORMING SAME

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Application January 14, 1944, Serial No. 518,296

5 Claims. (Cl. 229—5.5)

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The invention relates generally to container structures formed of paper and primarily seeks to provide a novel form of container structure having a paneled or polygonal main body portion and cylindriform end portions in which the end closures are adhesively attached, and a novel method of forming said container structure.

It has been found desirable, in some cases, to provide container structures which are polygonal and present a number of panels or faces. Such containers present some advantages of strength, appearance and resistance to free rolling, but manufacture thereof has been attended by numerous difficulties such as the shaping of the polygonal bodies themselves, and also the necessity of orienting end closures for insertion and attachment in said bodies and the difficulties attending such orientation and the provision of a perfect seal. It is the purpose of the present invention to avoid these difficulties by providing a container structure having a main body portion which is paneled or polygonal so as to obtain all advantages inherent in such paneled structures, and end portions which are cylindriform in shape so as to avoid all problems of end closure orientation and facilitate the provision of a perfect seal.

An object of the invention is to provide a container body in which the cylindriform end portions and the paneled main body portions are so formed that each said portion has substantially the same peripheral dimensions with portions of said main body portion offset inwardly with respect to the adjacent cylindriform end portions so as to provide end closure supporting shoulders.

Another object of the invention is to provide a method of forming a container body of the character stated in the practicing of which the paneled and cylindriform portions are formed by mere shaping and without expanding or contracting one said portion relative to the other, thereby to avoid weakening of the body wall structure and provide paneled and cylindriform portions having substantially identical peripheral dimensions.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more fully understood by following the detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings,

Figure 1 is an end elevation of a paper container body embodying the invention.

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Figure 2 is a fragmentary vertical cross section taken on the line 2—2 on Figure 1.

Figure 3 is a horizontal section taken through the polygonal multi-paneled main body portion of the container body.

Figure 4 is a view similar to Figure 2 with a cup shaped paper end closure inserted in the cylindriform end portion of the container body.

Figure 5 is a view similar to Figure 4 illustrating the employment of apparatus for completing the adhesive union between the end closure and the container body end by applying pressure at opposite sides of the engaging end closure and can body end portions.

In the example of embodiment of the invention herein described the container body generally designated 5 comprises a paper sleeve which may be convolutely or spirally wound from suitable paper stock. The sleeve may be wound about a polygonal core or otherwise shaped to provide a polygonal multi-paneled main body portion 6, said portion in this particular illustration being octagonal in shape.

The end portions of the container body or sleeve are displaced with relation to the main body portion 6 to provide a cylindriform, cup shaped end closure receiving end portion 7 at each end of said body. As stated, each end portion 7 is merely displaced or shifted with relation to the adjacent end of the can body portion 6 so as to avoid any expansion or contraction of the paper wall structure of the body which would tend to weaken said wall structure. In other words, the relative shifting of the cylindrical and polygonal portions 7 and 6 of the container body or sleeve is accomplished without changing the distance about the perimeter of either of said portions, and thus neither portion is placed under tension in any objectionable manner which would attenuate and weaken the fibers of the body stock. This particular formation of the end portions is best illustrated in Figures 1 and 2 of the drawings from which it will be observed that the panel corners 8 at the corner junction between each two adjacent panels project outwardly beyond the cylindrical end portions 7, and the central portion of each panel projects inwardly beyond the cylindriform portions in a manner for providing an end closure supporting shoulder 9.

The shifting or displacing of the end portions of the container body or sleeve relative to the polygonal body portion thereof without changing the distance about the perimeter of said end and body portions may be accomplished in various ways. An example formation is that of first pre-

paring the sleeve in the desired polygonal shape from end to end and then forcing into each end of the sleeve a cylindrical displacer or shifter plug of a proper length for forming a cylindriform end portion of the desired length, each said plug having an external dimension or circumference exactly the same as the distance around the inside surface of the plurality of panels jointly forming the polygonal body portion 6 and being tapered at its end extremity to facilitate entry into the end of the sleeve. In this manner the paper at each end portion will be shifted or displaced relative to the polygonal body portion to reshape the end portions in cylindrical rather than polygonal form without stretching said end portions so as to attenuate and weaken the fibers therein. Since the distances about the perimeter of each cylindrical end portion and the polygonal body portion remain the same, it will be noted by reference to Figure 1 that in the relative shifting of said portions the perimeter of the sleeve will move outwardly intermediately of each two adjacent panel junctures or corners 8, and inwardly over each said juncture or corner. The projection of the inner diameter of each cylindrical end portion outwardly beyoud the inner surface of each panel serves to provide the shoulders 9 in the manner clearly illustrated in Figures 2 and 4.

In completing the container structure, cup shaped end closures 10 are inserted within the cylindriform body end portions 7 in the manner illustrated in Figure 4, a suitable adhesive being interposed between the annular wall or skirt 11 of each end closure 10 and the opposing cylindriform body end portion 7. It is to be understood that the adhesive 12 may be applied to the external surface of the annular wall or skirt 11, to the internal surface of the cylindriform body end portions 7, or to both of said surfaces.

In effecting the desired closure of an end of the container, the end closure 10 is inserted in the container end in the manner illustrated in Figures 4 and 5, a suction tube 13 being utilized to control the positioning of said closure. An apparatus such as is illustrated in Figure 5 may be inserted in the depression in the end closure and utilized to apply pressure in a radial outwardly direction in the mananer illustrated in Figure 5 for forcing the closure wall or skirt 11 into intimate adhesive union with the surrounding cylindriform body end portion 7. The apparatus generally designated 14 includes a deformable disk, preferably formed of rubber or a suitable substitute, and dimensioned so that when it is in repose it will freely fit within the skirt 11 of the end closure 10. The disk 15 is mounted between upper and lower presser plates 16 and 17, the latter being mounted at the lower end of a tube carrier 18, and the former being mounted at the lower end of a tube carrier 19 which telescopically surrounds the tube 18. It will be obvious by reference to Figure 5 that both of the tubes 18 and 19 surround the suction tube 13. It will be obvious also that when the plates 16 and 17 are moved relatively to reduce the space between them, the disk 15 will be deformed, as at 20, so that the periphery thereof will exert radial outward pressure against all portions of the surrounding end closure skirt 11 so as to tightly press it against the contacting cylindriform end portion 7. The outward pressure of the disk 15 is opposed by half-mold members 21 which are shaped to externally embrace the cylindriform end portion 7 in the manner clearly illustrated in Figure 5.

The apparatus comprising the parts designated 13 through 21 forms no part of my present invention and is covered in my copending application for United States Letters Patent application Serial No. 518,295, filed January 14, 1944, now Patent No. 2,423,965, issued July 15, 1945.

By tightly pressing the opposing end closure and container body wall portions 11 and 7 one against the other in the manner illustrated in Figure 5, the adhesive between said wall portions is forced into the paper stock as indicated at 22 in a manner for assuring the provision of a very efficient seal at the end of the container.

It will be apparent by reference to Figure 1 of the drawing that by reason of the relative shaping of the polygonal multi-paneled main body portion 6 and the cylindriform end portions 7 without the expansion or contraction of these parts which might result in providing any substantial differential between the peripheral dimensions of said portions, it is possible to provide a container which is cylindriform at the ends and polygonal between the ends, thereby to provide the desired polygonal main body shape and also the desired cylindriform end closure receiving portions without in any way weakening the wall structure of the paper container body.

It is to be understood that the details of construction of the cooperating parts can be variously changed without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. The herein described method of forming a paper container body which comprises, shaping a paper sleeve to provide a polygonal main body portion composed of a plurality of rectangular joined panels and at least one cylindriform end portion by merely displacing the paper in said body and end portions relatively without expansion or contraction of the perimeter of either of said portions such as will result in any differential between the peripheral dimensions of said body and end portions, thereby causing the panel corners at the juncture of each two adjacent panels to project outwardly beyond the cylindriform end portion, and the central portion of each panel to project inwardly beyond said cylindriform end portion and form an end closure supporting shoulder.

2. The herein described method of forming a paper container which comprises shaping a paper sleeve to provide a polygonal main body portion composed of a plurality of rectangular joined panels and at least one cylindriform end portion by merely displacing the paper in said body and end portions relatively without expansion or contraction of the perimeter of either of said portions such as will result in any differential between the peripheral dimensions of said body and end portions, thereby causing the panel corners at the juncture of each two adjacent panels to project outwardly beyond the cylindriform end portion, and the central portion of each panel to project inwardly beyond said cylindriform end portion and form an end closure supporting shoulder, and adhesively attaching a cup shaped end closure in said end portion in abutting contact with the supporting shoulders.

3. The herein described method of forming a paper container which comprises shaping a paper sleeve to provide a polygonal main body portion composed of a plurality of rectangular joined

panels and a cylindriform end portion at each end thereof by merely displacing the paper in said main body and end portions relatively without expansion or contraction of the perimeter of either of said portions such as will result in any differential between the peripheral dimensions of said body and end portions, thereby causing the panel corners at the juncture of leach two adjacent panels to project outwardly beyond the cylindriform end portions, and the central portion of each panel to project inwardly beyond said cylindriform end portions and form an end closure supporting shoulder, and adhesively attaching a cup shaped end closure in each said end portion in abutting contact with the supporting shoulders at the particular end.

4. A paper container body comprising a sleeve having a polygonal main body portion composed of a plurality of rectangular joined panels and at least one cylindriform end portion, each said panel merging into said end portion and being parallel the axis of said end portion throughout the full length of the panel, said body and end portions being of identical peripheral dimensions with the corners provided at the juncture of each two adjacent panels projecting outwardly beyond the cylindriform end portion where said panels merge into said end portion and the central portion of each panel projecting inwardly beyond said end portion where said panel merges into said end portion and providing an end closure supporting shoulder.

5. A paper container comprising a sleeve having a polygonal main body portion composed of a plurality of rectangular joined panels and at least one cylindriform end portion, each said panel merging into said end portion and being parallel the axis of said end portion throughout the full length of the panel, said body and end portions being of identical peripheral dimensions with the corners provided at the juncture of each two adjacent panels projecting outwardly beyond the cylindriform end portion where said panels merge into said end portion and the central portion of each panel projecting inwardly beyond said end portion where said panel merges into said end portion and providing an end closure supporting shoulder, and a cup shaped end closure adhesively attached to said cylindriform end portion against said panel end shoulders.

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