United States Patent

[11] 3,580,468

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[21] Appl. No **847,561**
[22] Filed **Aug. 5, 1969**
[45] Patented **May 25, 1971**
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[54] **NESTABLE DOUBLE-WALLED DISPOSABLE CONTAINER**
5 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **229/14,** 220/97, 229/1.5
[51] **Int. Cl.** **B65d 15/02,** B65d 3/22
[50] **Field of Search** ..... 229/1.5 B, 14, 14 B, 14 BI, 14 H; 220/97 C, 97 F

[56] **References Cited**

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Attorney—Greist, Lockwood, Greenawalt & Dewey

ABSTRACT: Composite frustoconical nestable, double-walled, disposable (i.e. inexpensive) containers (cups in the smaller sizes, tubs in the larger sizes) are formed by combining conventional outer paper cups and inner liner cups formed of thin-walled thermoformed seamless plastic. The outer paper cups have plain or straight (i.e. uninterrupted) sidewalls from top to bottom with outwardly curled rims or lips at the top and recessed bottoms resulting in a continuous rim at the bottom of each cup. The plastic inner liner cups also have frustoconical sidewalls which are somewhat smaller than the sidewalls of the outer paper cups so as to leave in each cup a space between the interfitting sidewalls. Each inner liner has a rim or lip at the top which is curled over, around and under the rim of the outer paper cup so as to snugly embrace the same. A short distance below the rim each plastic inner liner has a continuous, inwardly opening, circumferential lid-receiving groove, the outer periphery of which engages the surrounding inner surface of the sidewall of the outer paper cup so as to act as a spacer between the sidewalls. Adjacent the bottom of each inner liner cup there is a series of circumferentially spaced stacking indentations integrally formed partially in the lower sidewall and partially in the bottom of the liner cup. The segments of the sidewall intermediate the stacking indentations flare outwardly in respect to the frustoconical sidewall so as to join the liner bottom in circumferentially spaced arcuate corners which rest and engage in the continuous circumferential inner corner formed between the bottom and sidewall of the outer paper cup. The stacking indentations have generally horizontal top shelves or shoulders which are engaged by the bottom rims of the outer paper cups when the composite containers are in nested condition.

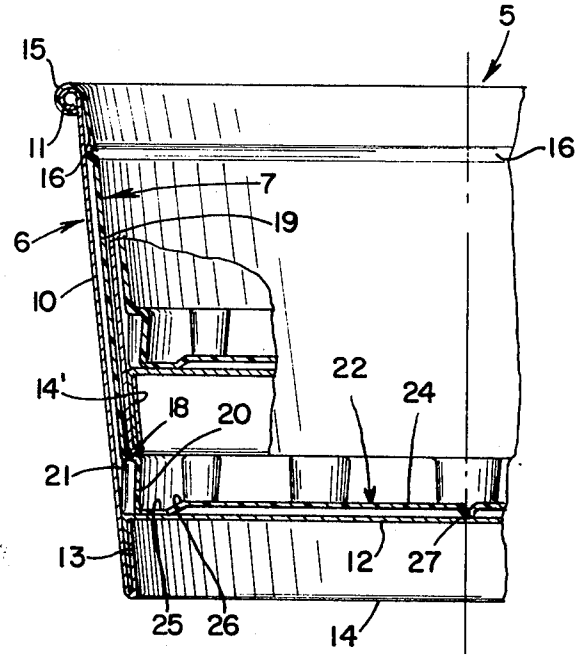


FIG. 1.

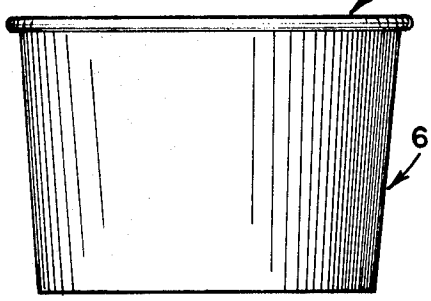


FIG. 4.

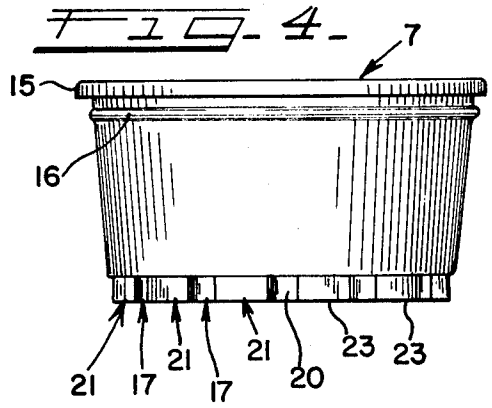


FIG. 2.

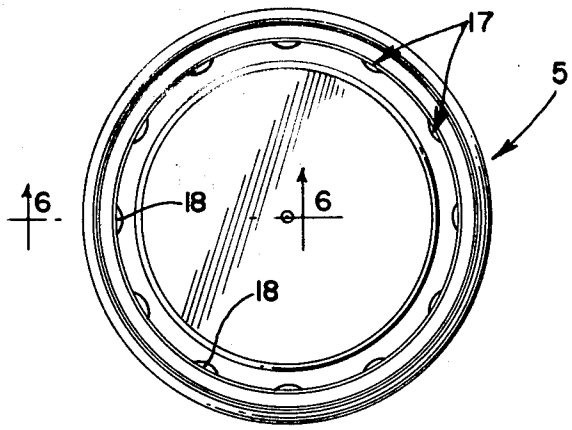


FIG. 3.

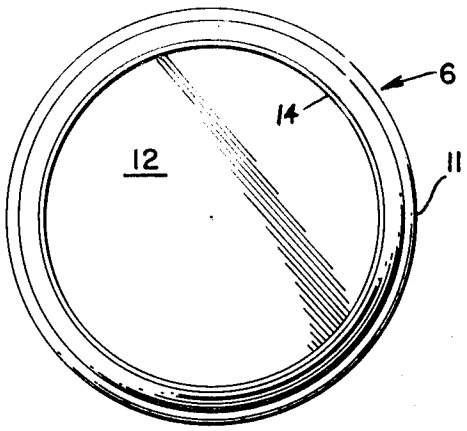


FIG. 6.

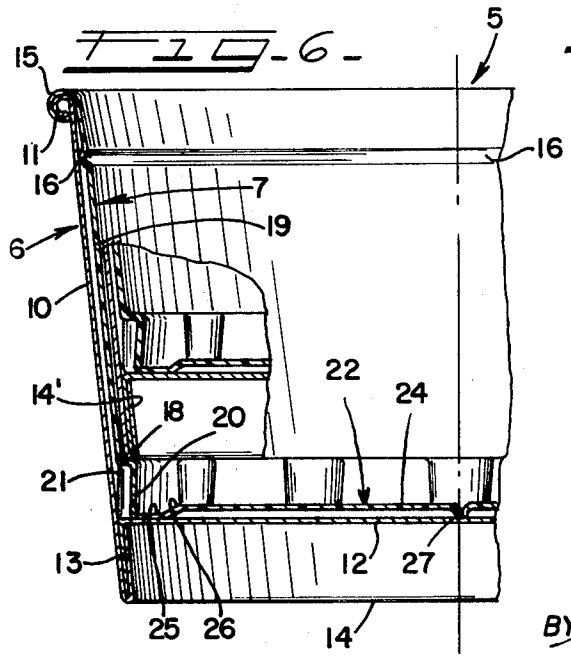
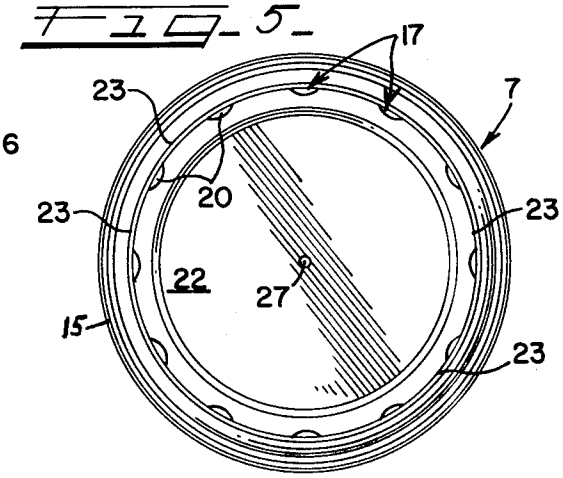


FIG. 5.



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NESTABLE DOUBLE-WALLED DISPOSABLE CONTAINER

The object of the invention, generally stated, is the provision of inexpensive or disposable nestable, double-walled containers which are particularly suited for containing food products, such as carryout foods, requiring some insulating value in the containers.

An important object of the invention is the provision of containers of the class described which are composed of outer paper cups of conventional construction and inner liner cups formed of integral thin-walled thermoformed seamless plastic.

Another important object of the invention is the provision of inexpensive or disposable nestable, double-walled disposable containers which combine all of the advantages that characterize conventional plain paper cups and also those which characterize seamless thin-walled thermoformed plastic cups while the disadvantages and imperfections which tend to be characteristic of such paper and plastic cups do not come into play since they are overcome or offset in the combination.

Certain other objects and advantages of the invention will in part be obvious and will in part appear hereinafter.

For a more complete understanding of the nature and scope of the invention reference may now be had to the following detailed description thereof taken in connection with the accompanying drawings wherein:

FIG. 1 is a side elevational view of a completely formed nestable, double-walled disposable container made in accordance with the present invention;

FIG. 2 is a top plan view of the container as shown in FIG. 1;

FIG. 3 is a bottom plan view of the container as shown in FIG. 1;

FIG. 4 is a side elevational view of a thin-walled thermoformed seamless plastic liner cup before it is inserted into and combined with the outer paper cup;

FIG. 5 is a bottom plan view of the inner liner cup as shown in FIG. 4; and

FIG. 6 is a fragmentary sectional view on double scale taken on line 6–6 of FIG. 5 and showing a fragmentary portion of a second double-walled container nested therein.

The composite cup indicated, generally, at 5 in the drawings is formed of an outer paper cup 6 and a thin-walled seamless thermoformed plastic inner liner cup 7.

The outer paper cup 6 is of conventional two-piece commercial construction well known in the art as a single wrap paper cup or tub produced on conventional equipment at high speeds. The outer paper cup 6 has a straight or plain frustoconical sidewall 10 with an outwardly rolled bead 11 formed at the top and an inset or recessed bottom 12.

In accordance with conventional construction the bottom 12 has a down turned flange 13 at the periphery which is engaged from opposite sides by the double-backed or folded bottom end portion of the sidewall 10 thereby providing a bottom rim 14. The advantages of single wrap paper cups or tubs of this type are: they can be inexpensively produced on high-speed conventional cup forming equipment; the paper can be preprinted with high fidelity and over-lacquered with protective coating at low cost; the printing can extend the full length or height of the sidewall; and, the paper cup has stiffness and strength both in respect to inner and outer radial or horizontal pressures and particularly in respect to compression forces in a vertical direction, thereby imparting excellent filling and capping characteristics to the composite cups as well as handling and shipping characteristics both in the nested empty condition and the filled stacked condition.

The disadvantages and imperfections that characterize paper cups such as the problem of leakers and difficulty in precision forming the rolled rim do not appear or come into play in the finished containers because of the presence of the inner plastic liner cup. Likewise, the problem of proper lid fit associated with paper containers is eliminated and by omitting a lid bead receiving groove in the sidewall whereby the full strength of an unbroken frustoconical sidewall is retained.

The inner plastic liner cup 7 may be inexpensively thermoformed on a volume production basis on high-speed thermoforming equipment of known type as described for example in U.S. Pat. Nos. 2,967,328 and 3,346,923. Different types of plastic sheet material may be utilized such as polystyrene, polyethylene, polycarbonate, nylon, acetate, polyvinyl chloride, saran, etc. By selecting the desired plastic sheet material and further selecting the appropriate properties for the selected material, the inner liner cup can be formed of a material that is tailored to the product end use, i.e. to retaining the contents to be put into the container. No rim curling is required of the inner plastic cups until they are assembled in the outer paper cups and then the curl or bead can be formed with accuracy by a heated beader of known type utilizing the bead 11 of the outer paper cup as a mandrel and thereby locking the inner and outer cups firmly together at the bead.

One of the further advantages of the inner plastic liners is the ability to form them inexpensively at high production rates with practically no "leakers" being made.

As shown in FIG. 4 the upper end of the inner liner cup 7 is thermoformed so as to have an open downwardly turned bead or lip 15 which is later heat-curled or beaded around and under the bead 11 of the paper cup as shown in FIG. 6. A short distance below its bead or rim 15 the liner cup 7 is provided with a circumferential concavo-convex lid receiving groove 16 which opens inwardly with the outer periphery thereof engaging against the inner sidewall 10 of the outer paper cup as shown in FIG. 6. The groove 16 thus serves as a spacer for separating, in the vicinity thereof, the sidewall 19 of the inner liner cup 7 from the sidewall 10 of the outer paper cup 6.

At the bottom of the inner liner cup 7 a plurality of stacker indentations 17–17 are formed, partially in the lower end of the sidewall 19 and partially in the bottom 22 of the liner 7. Each of the stacker indentations 17 has an arcuate shoulder or shelf portion 18 at the top and a curved support portion 20 which is inwardly inclined toward the top and center of the cup 7 at a small angle (e.g. 2°—3°) (FIG. 6). Intermediate each pair of adjacent circumferentially spaced stacking indentations 17 the sidewall 19 of the inner liner cup breaks or flares from the taper or frustoconical shape of the sidewall 19 so as to be flared outwardly with respect to the frustoconical surface as indicated at 21 (FIG. 6). In certain instances it may be desirable to have the portions or segments 21 vertical in which case they will also be outwardly flared with respect to the sidewall 19. These segments 21 join the margin or annular periphery of the bottom wall 22 of the inner liner cup to form circumferentially spaced arcuate corners 23–23 which engage in and rest on the continuous circumferential corner formed between the sidewall 10 of the outer paper cup and the indented bottom 12 thereof.

It will be appreciated that other stacking configurations may be used at the bottom inner liner cup 7 such as the continuous Z-stacker shown in U.S. Pat. No. 3,139,213 (FIG. 5).

Each of the inner liner cups is not only securely locked in place within an outer paper cup 6 at the composite lip or bead 11—15 but also has supporting engagement therewith in two places, i.e. (1) at the engagement of the lid-receiving groove 16 with the sidewall 10, and (2) at the engagement of the arcuate corner portions 23–23 in the inner bottom corner of the outer cups. This arrangement provides substantial strength to the composite cups, both when empty and when filled.

The bottoms 22 of the plastic inner liner cups 7 are formed with a raised main central portion 4 24 (FIG. 6) connected to an annular supporting marginal portion 25 by an inclined annular shoulder 26. The annular marginal portion 25 rests on the top of the bottom 12 of the outer paper cup as shown in FIG. 6. Preferably, at its center, the bottom 22 of each inner liner cup is formed with a supporting dimple or button 27.

The manner in which the double-walled containers nest with each other empty as illustrated in FIG. 6 which shows the bottom rim 14' of an upper nesting cup resting on the upper shoulders or supporting surfaces 18 of the stacker indentations 17. It will be understood that the cups are so dimen-

sioned that they can readily nest in this manner without becoming wedged or telescoped together.

The resulting double-walled composite cups are very economically assembled together in automatic equipment. In this connection it will be understood that the outer paper cups 6 themselves are nestable and readily separated without wedging and likewise the inner liner cups 7–7 are also nestable without wedging. Accordingly, stacks of the both components may be loaded into a machine in such manner that as each outer paper cup 6 is automatically fed from the lower end of a stack it moves under a stack of the liner cups 7 and one is automatically dispensed from the bottom of that stack. The resulting loose fitting assembly passes into an automatic heat curling or beader station where the bead 15 on each plastic liner cup is curled around and under the bead 11 on the mating paper cup 6. Thereafter the completely formed double-walled cups are discharged and collected in nested condition in stacks of desired heights.

I claim:

1. A nestable double-walled container comprising an outer paper cup of frustoconical configuration having a plain uninterrupted sidewall with an outwardly rolled bead defining the top rim and having the bottom spaced above a lower rim, and a thin-walled thermoformed seamless plastic inner liner cup of frustoconical configuration the sidewall of which has (1) a top rim in the form of a bead snugly embracing said bead of said outer paper cup, (2) an inwardly opening circumferential lid-receiving groove spaced below said top rim with the outer periphery of said groove engaging the inner surface of said outer paper cup and thereby serving as a spacer between the upper sidewall portions of said outer cup and inner liner cup, and (3) stacking means integrally formed adjacent the bottom of said inner liner cup with at least portions of the bottom periphery of said inner liner cup engaging and resting in the continuous circumferential inner corner formed between said bottom and sidewall of said outer paper cup.

2. The nestable double-walled container of claim 1 wherein the the central portion of the bottom of said plastic inner liner cup is spaced above the bottom of said outer paper cup.

3. The nestable double-walled container of claim 2 wherein the bottom of said plastic inner liner cup has an annular margin and a center button which engage the bottom of said outer paper cup and serve to separate said central portion of said inner liner cup bottom from the bottom of said outer paper cup.

4. A nestable double-walled container comprising an outer paper cup of frustoconical configuration having a plain uninterrupted sidewall with an outwardly rolled bead defining the top rim and having the bottom spaced above a lower rim, and a thin-walled thermoformed seamless plastic inner liner cup of frustoconical configuration the sidewall of which has (1) a top rim in the form of a bead snugly embracing said bead of said outer paper cup, (2) an inwardly opening circumferential lid-receiving groove spaced below said top rim with the outer periphery of said groove engaging the inner surface of said outer paper cup and thereby serving as a spacer between the upper sidewall portions of said outer cup and inner liner cup, and (3) a series of circumferentially spaced stacking indentions integrally formed at the bottom of the inner liner cup with each indention being partly formed in said sidewall and partly in the liner bottom with the segments of the sidewall intermediate said indentations being flared outwardly from the straight sidewall and joining said liner bottom in circumferentially spaced arcuate corners which rest on and engage in the continuous circumferential inner corner formed between said bottom of said outer paper cup and the sidewall thereof, the upper ends of said stacking formations serving as stacking abutments for the bottom rim of said outer paper cup and, the main portion of the sidewall of said inner liner cup which extends below said groove being spaced from the surrounding sidewall portion of said outer paper cup.

5. The nestable double-walled container of claim 4 wherein said upper ends of said stacking formations are substantially horizontal.