March 3, 1936. C. L. SHUEY 2,032,815

CUP CONSTRUCTION

Filed Jan. 9, 1933

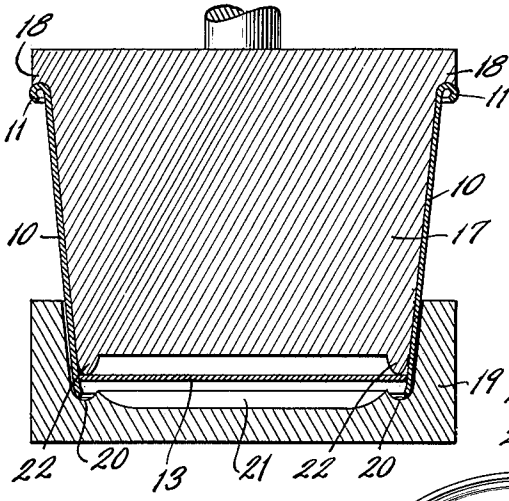


Fig. 1.

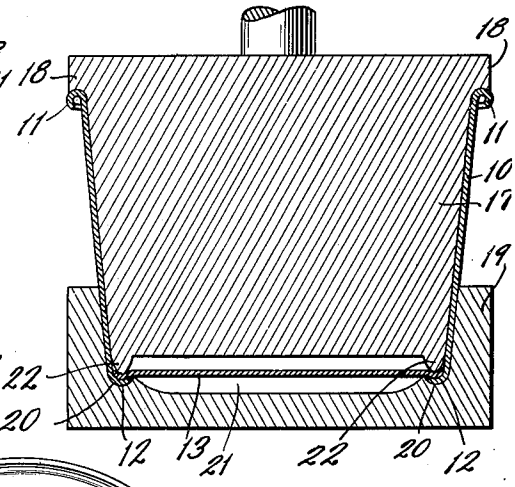


Fig. 2.

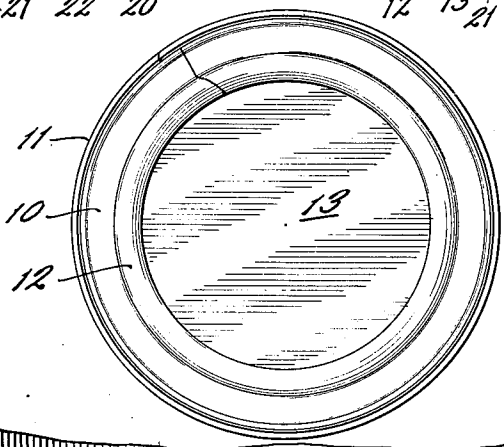


Fig. 3.

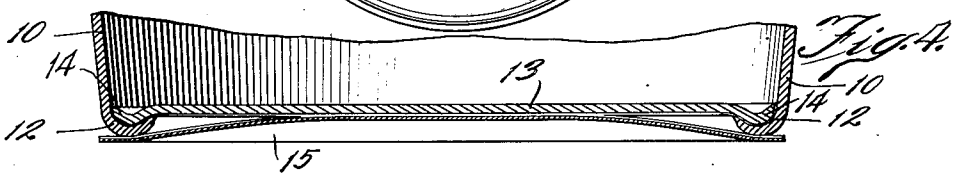


Fig. 4.

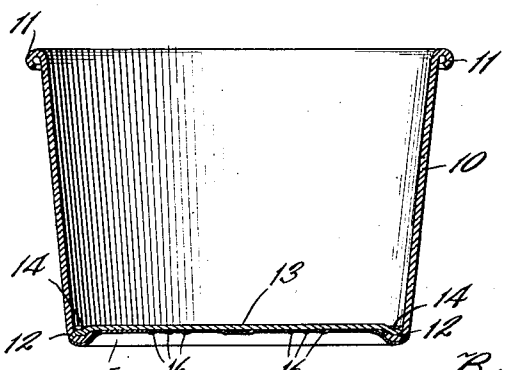


Fig. 6.

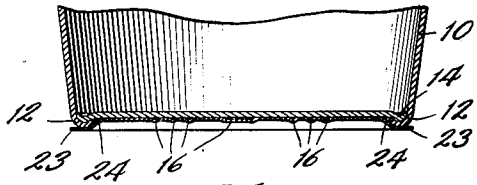


Fig. 5.

Inventor:
Clarence L. Shuey
By: Cox & Moore
Attys.

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CUP CONSTRUCTION

Clarence L. Shuey, Indianapolis, Ind., assignor to Beach & Arthur, Incorporated, Indianapolis, Ind., a corporation of Indiana

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4 Claims. (Cl. 229—5.5)

The present invention relates to the making of paper or fibrous receptacles and particularly to a bottom construction for such articles which is efficient, easy, and economical to manufacture, while at the same time providing a bottom construction which is durable and fluid-tight. One example of a construction embodying my invention is illustrated in the drawing as applied to a cup.

One object of this invention is to so form a flange on one end of the peripheral wall of the receptacle as to prevent the formation of ridges thereon due to the deforming and compressing of the paper or like material from which the receptacle is formed.

Another object of this invention is to provide a bottom construction for paper receptacles which includes a narrow peripheral flange extending inwardly, to which there are secured inner and outer bottom blanks, preferably heat-sealed to the flange.

Another object of this invention relates to a process for forming the flange and bottom in the manner hereinafter set forth and including particularly the novel steps of forming the inwardly turned flange which is integral with the peripheral wall of the receptacle, the flange being formed without ridges so as to provide a smooth uninterrupted surface against which the bottom sections of the receptacle may abut, the step of applying a bottom blank to one side of the flange and simultaneously with the formation of the flange applying a second bottom blank to the other side thereof. These last two steps preferably include the heat-sealing of the blanks to the peripheral flange, although it is to be understood that if desired, I may secure the blanks and flange together in any other desired manner.

A still further object of this invention is to provide a durable fluid tight bottom construction for a receptacle which is adapted to hold liquids or the like, and to provide a process for making the same.

Another object of this invention relates to a process for joining the peripheral wall of a container with the bottom or end thereof.

A further object of this invention is to provide a process for simultaneously forming the flange on the wall and sealing the bottom blank thereto.

A still further object of this invention is to provide a process for making a paper receptacle including a peripheral wall portion and a bottom portion from paper or like material in such a manner as to provide an efficient joint between said portions, and to provide a receptacle made according to said process.

Other objects of this invention will appear hereinafter as the description thereof proceeds, the novel features, arrangements and combinations being clearly set forth in the description and claims hereunto appended.

In the drawing:

Fig. 1 is a cross-sectional view, somewhat diagrammatic, of the beginning of the first step in the process of forming the bottom for the receptacle;

Fig. 2 is a view similar to Fig. 1, showing the completion of the first step in the formation of the receptacle;

Fig. 3 is a bottom plan view of the receptacle at the stage of the process indicated in Fig. 2;

Fig. 4 illustrates the next step in forming the bottom of the receptacle;

Fig. 5 illustrates the almost completed bottom for the receptacle after the trade-mark has been applied thereto; and

Fig. 6 shows the completed bottom for the receptacle.

Referring particularly to Fig. 6 which shows the completed receptacle in cross-section, the reference character 10 indicates the peripheral slightly conical wall of the receptacle, herein illustrated as a cup, on the upper edge of which is formed a bead 11. The bottom peripheral edge of the wall 10 is curved inwardly and upwardly to form a flange 12. The bottom of the cup is formed by an inner blank 13 which is secured to the inwardly curved flange 12 at its marginal portion, which marginal portion is shaped to conform to the shape of the flange 12, and as will be shown hereinafter, it is shaped at the same time as the flange 12. This marginal portion is indicated by the reference character 14. The bottom of the blank 13 has adhesive thereon and the blank itself is made of substantially the same thickness as the walls of the cup.

In order to give a finished appearance to the cup, and to further seal the joint between the marginal portion 14 and flange 12, there is applied to the bottom of the flange 12 an outer bottom blank 15 which also has a layer of adhesive thereon opposed to the layer of adhesive on the under side of the blank 13. This outer blank 15 is heat sealed to the blank 13 and the under side of the flange 12 to finish off the bottom of the cup. This blank 15 is preferably relatively thin so as to give the finished appearance hereinbefore referred to. Simultaneously with the sealing of the blank 13 to the blank 15, I may

impress on the blank 15 a trade-mark indicated by the raised projections 16 in Figs. 5 and 6.

The flange 12, it will be noted, is relatively short and therefore when it is formed, there is little tendency for the paper to form ridges about the periphery of the flange and whatever slight ridges are formed are compressed during the formation of the flange to form substantially smooth unbroken surfaces to which the blanks 13 and 15 may be applied. Thus when the blanks 13 and 15 are heat sealed to the flange 12, there are no small crevices through which the liquid in the cup may escape. The process for forming this container is as follows.

The outer cylindrical wall 10 of the cup and the bead 11 may be formed in any suitable manner and after they are formed, the cylindrical wall of the cup is placed on a die such as 17 with the bead 11 abutting against an overhanging ledge 18. A cooperating die 19 is formed with an annular recess 20 and a central recess 21. The lower side of the die 17 is provided with an annular bead 22 which is adapted to press the marginal edge of the bottom blank 13 into the annular recess 20 and against the flange 12 which is simultaneously formed by the recess 20 as the die 17 moves downwardly to press the lower peripheral edge of the wall 10 against the curved surface of the recess 20. With the parts in the position illustrated in Fig. 1, it will be noted that the lower peripheral edge of the wall 10 has just begun to be curved inwardly by the annular recess 20. The bottom blank 13, which was previously placed within the cup wall 10 before the wall 10 was arranged about the die 17, abuts against the annular bead 22 but at this stage of the process remains substantially unchanged in its shape. It, however, is carried downwardly toward the die 19 as the die 17 moves downwardly. As the die 17 continues its downward movement to the position illustrated in Fig. 2, the lower edge of the wall 10 curves inwardly more and more until the die 17 reaches its lowermost position at which time the lower edge of the wall 10 is provided with an inwardly and upwardly curved flange 12. During the last part of the movement of the die 17 into the position shown in Fig. 2, the marginal edge of the bottom blank 13 is forced against the flange 12 and given substantially the same shape as the flange 12 and the adjacent die sections.

The bottom of the blank 13 has a coating of an adhesive thereon which is heat softenable. The dies themselves are heated so that when the die 17 moves into the position shown in Fig. 2, the heat from the dies softens the adhesive on the blank 13 and causes the marginal edge of the blank to adhere to the inwardly turned flange 12, thus providing a seal for the joint between the flange and the marginal edge of the blank. The pressure of the dies also tends to form the smooth unbroken surfaces on the opposite sides of the flange 12 and since the flange 12 and marginal edge of the blank 13 are formed simultaneously, their adjacent surfaces will be practically co-mating and therefore will form a very effective seal. The cup is then ready to have the outer bottom blank secured thereto. This outer blank 15 is also provided with a layer of adhesive thereon and the blank itself is relatively thin so that it will readily take the impression of the trade-mark die and give a finished appearance to the cup. The adhesive tends to fill the spaces beneath the ridges 16 indicating the raised portions of the trade-mark.

The blank 15 which may be simultaneously cut and applied to the inner blank 13 or it may be formed in a separate die and later adhered to the blank 13, is shown in Fig. 4 as attached only at a central portion to the blank 13 by a mechanism which seals and centers the outer blank with respect to the inner blank. With the central portions of the blanks 13 and 15 adhering to each other as illustrated in Fig. 4, the cup is now ready for the application of the trade-mark to the blank 15 and for the adhering of the remaining portions of the blank 15 to the blank 13 and the flange 12. This is accomplished by means of a suitable die formed with a trade-mark centrally thereof or located in any position desired. This die together with a cooperating die on the inside of the cup are moved toward each other to press the blank 15 against the inner bottom blank 13 and against the outer surface of the flange 12 to give the container the appearance illustrated in cross-section in Fig. 5 in which ridges 16 represent raised portions of the trade-mark which has been applied. Subsequently another die is used to shape the outer marginal edges of the blank 15 indicated at 23 in Fig. 5, and move them firmly against the flange 12 to form the finished cup illustrated in Fig. 6. By leaving the marginal edge 23 of the blank 15 extending in the manner illustrated in Fig. 5 before moving it against the flange 12, it is possible to move substantially the entire central portion of the blank opposed to the blank 13 firmly against the latter blank so that at the points 24, the marginal edge of the flange 12 and the adjacent portions of the blanks 13 and 15 meet substantially along a single line without placing too much strain on the portion of the blank 15 which extends around the flange 12. This free marginal portion 23 can thereafter be moved upwardly and around the curved edge of the flange 12 to finish off the bottom of the cup and give a neat finished appearance to the bottom construction. The resulting structure is quite fluid-tight and since the flange 12 is formed substantially without any ridges, there is very little chance of liquid leaking out of the bottom of the container. The blank 13 is made sufficiently large so that the outer marginal portions, after they are formed and set, tend to press against the inner peripheral wall of the container so that even though no adhesive were used, an efficient fluid-tight joint would be formed.

Obviously those skilled in the art to which this invention pertains may make various changes in the construction without departing from the spirit of this invention and therefore I do not wish to be limited except as hereinafter set forth in the appended claims.

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

1. A cup construction comprising an annular paper wall formed with a short, continuous, and integral inwardly and upwardly extending curved flange turned from the material of said wall and substantially free from radial irregularities on the surface thereof, said flange being of unreversed curvature, a bottom section having an annular portion co-mating with the inwardly turned flange, and a layer of adhesive between said flange and annular portion for holding said bottom in leak-proof engagement therewith.

2. A cup comprising an annular paper wall formed with an inwardly turned flange free from

radial ridges and substantially arcuate in cross section and of unreversed curvature, inner and outer bottom sections secured to opposite sides of said flange each having peripheral portions shaped to the same shape as the adjacent side of said flange with which said bottom section engages so as to lie in intimate contact therewith, and a layer of adhesive between said bottom sections and between each of said sections and the adjacent engaged portions of said flange, whereby said sections are secured in liquid tight engagement with each other and with said flange, the peripheral edges of said inner and outer bottom sections extending to but not substantially overlapping the inner and outer walls, respectively, of the annular portion of said cup.

3. A paper cup construction comprising an annular paper wall having formed at the lower edge thereof a continuous inturned flange, said flange being arcuate in cross section and of unreversed curvature and being short relative to the diameter of the annular wall so that no radial creases are formed on the flange, an upper circular bottom member having its peripheral edge abutting said annular wall and its annular portion adjacent said edge glued upon the upper side of and arcuately shaped to conform to said flange, said upper bottom member being substantially flat except at said arcuately shaped annular portion, and a lower circular bottom member substantially thinner than said wall and upper bottom member having its peripheral edge coextensive with the lower edge of said wall and being glued over its entire surface to the lower side of said flange and upper bottom member, and being shaped to intimately conform thereto.

4. In a cup construction, in combination with a peripherally extending wall portion, having an inwardly and upwardly turned flange, said flange being unreversely bent and being continuous but relatively narrow to avoid radial creases therein, an inner bottom section contacting peripherally with the inner wall of said cup and the upper surface of said flange, adhesive means arranged between said flange and inner bottom section for securing the same together, an outer bottom section readily conformable to the adjacent surfaces when pressed thereagainst, contacting with said flange on the lower side thereof, and an adhesive layer arranged between said outer bottom section and said flange.

CLARENCE L. SHUEY.