

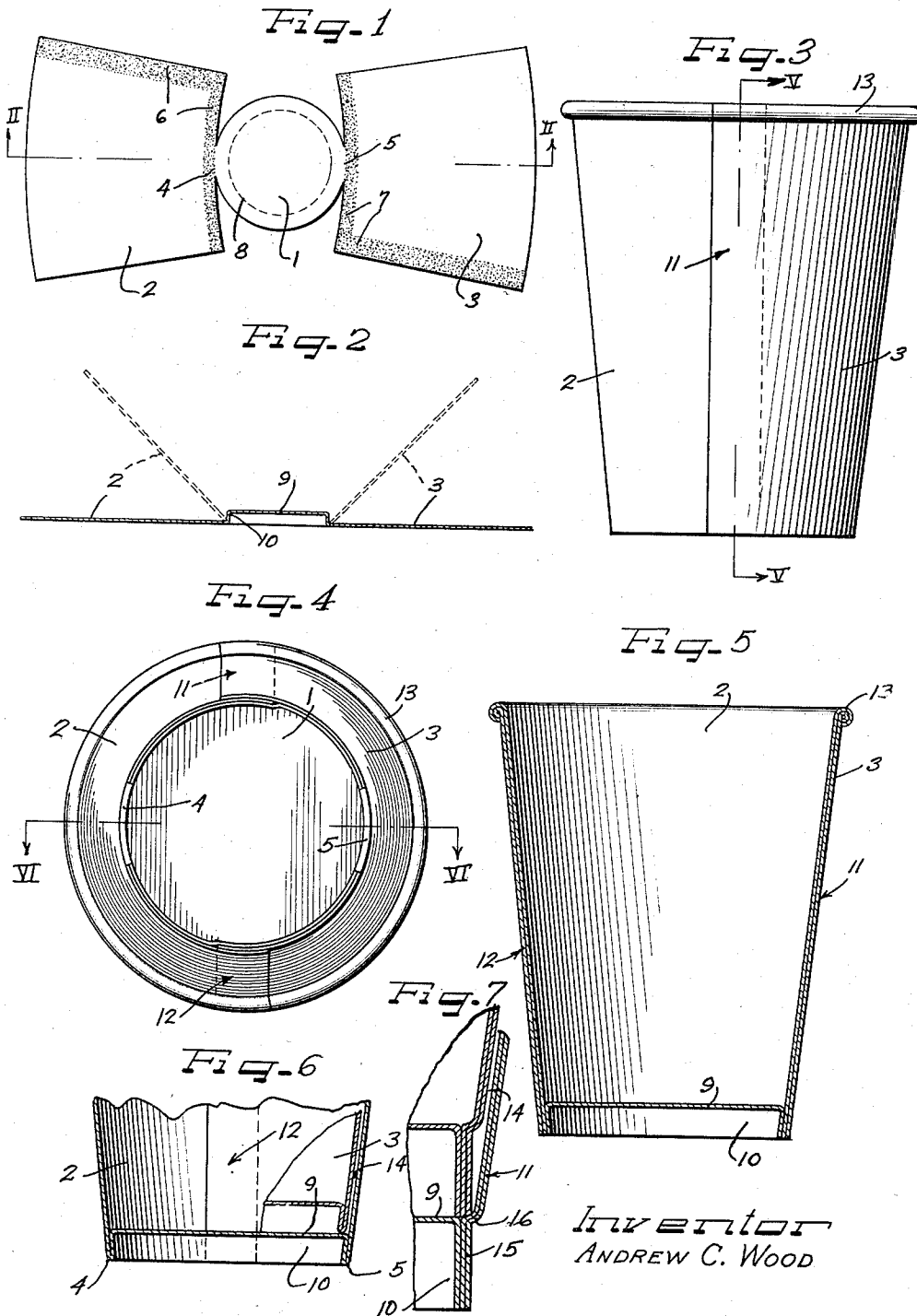
Feb. 16, 1960

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2,925,208

ONE-PIECE FLAT BOTTOM PAPER CUP

Filed Oct. 19, 1956



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1

2,925,208

ONE-PIECE FLAT BOTTOM PAPER CUP

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Application October 19, 1956, Serial No. 616,970

1 Claim. (Cl. 229—1.5)

This invention relates to improvements in a one-piece flat bottom paper cup of the type highly desirable for the service of various types of beverages either domestically or commercially, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

Heretofore, flat bottom paper cups have, in all instances of which I am aware, been made with at least two initially separate pieces of material, namely a bottom blank, and a blank for the formation of the side wall of the cup. It has been customary to form the side wall of the cup around the mandrel, with a bottom blank in position at the end of the mandrel, and during the formation of the body wall, to secure overlapping marginal portions of the body wall together as well as secure the body wall to a skirt or flange on the bottom blank, thus forming the completed flat bottom paper cup. Such procedure, obviously, is objectionably expensive in that separate blanks of material must be severed from a stock strip, separate blanks must be initially handled by adequate mechanism, and then the two blanks joined to form a paper cup. With the use of separate blanks cut successively from stock strips, wastage of paper is multiplied, and in the manufacture of paper cups, the paper cost is in most cases the highest cost to be considered in the manufacture of the cup.

With the foregoing in mind, it is an object of the instant invention to provide a flat bottom paper cup made from a single piece blank.

Another object of the invention resides in the provision of a flat bottom paper cup made from an economically cut single piece blank that is readily and economically folded into cup shape.

Still another feature of the invention resides in the provision of a flat bottom paper cup made from a single piece blank which may be folded into cup shape by the simple expedient of compound punch dies operated in a simple and rapid manner.

Another feature of the instant invention is the provision of a single simply formed blank of material from which a flat bottom conical cup may be made, such blank including a bottom portion and a side wall portion for the cup, the bottom portion being shaped into a cup bottom with a depending flange, and the side wall portion being reversely folded at its junction with the flange, and then turned laterally to circumscribe the flange and provide overlapping side seam secured together to maintain the cup in shape.

Also a feature of the instant invention is the provision of a single piece flat bottom paper cup formed from a blank comprising a pair of side wings or flaps connected by an integral bottom portion, the entire blank being easily formed upon a die into a bottom with the side wall flaps turned upwardly and secured together in overlapping marginal portions to hold the cup in shape.

A further object of the instant invention is the pro-

2

vision of a flat bottom paper cup made from a single piece blank comprising a bottom portion and a pair of opposed side flaps secured at least partially to the bottom portion, which blank is simply folded by punch die means by upsetting the bottom portion to provide a cup bottom with a skirt therearound, and reversely bending the side flaps at their junction with the skirt and turning them laterally to circumscribe the skirt and form overlapping marginal portions all of which are secured to each other to maintain the cup in shape.

Still another object of the instant invention resides in the provision of a flat bottom paper cup made from a single piece blank which may be formed by compound die means into cup shape in substantially a single simple operation.

It is also an object of this invention to provide a new and novel method of making a flat bottom paper cup from a single piece blank.

While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawing, in which—

Figure 1 is a plan view of a single piece blank from which a flat bottom paper cup embodying principles of the instant invention may be formed;

Figure 2 is a transverse vertical sectional view through the blank of Fig. 1, taken substantially as indicated by the line II—II of Fig. 1, looking in the direction of the arrows, and illustrating a further step in the formation of the blank;

Figure 3 is a side elevational view of a finished cup embodying principles of the instant invention;

Figure 4 is a bottom plan view of the cup of Fig. 3;

Figure 5 is a vertical sectional view through the cup taken substantially as indicated by the line V—V of Fig. 3;

Figure 6 is a fragmentary vertical sectional view taken substantially as indicated by the line VI—VI of Fig. 4, with parts broken away, and also showing a pair of cups in nested relationship; and

Figure 7 is a fragmentary view similar in character to Fig. 5, but showing a different bottom shaping for the cups.

As shown on the drawings:

It will be understood that the instant invention may be made from a blank of various shapes. For example, the blank may have one bottom portion and a single side wall portion attached thereto. However, the most economical form of blank is one which possesses a bottom portion 1, with a pair of side flaps or wings 2 and 3 integrally connected with a part of the periphery of the bottom portion as indicated at 4 and 5, respectively. It is not significant whether both margins of one of the side flaps are disposed inside or outside the corresponding margins of the other side flap when the body part of the cup is formed. In order to make a more uniform cup, however, and one that is more evenly balanced, it is preferable in forming the overlapping marginal portions to have one side margin of one flap disposed inside the corresponding side margin of the other flap, and the opposite margin of the first flap disposed outside the corresponding margin of the other flap. With this thought in mind, the blank may be provided with a strip of adhesive or plastic material 6 extending along one side margin of the blank and across the base edge of the side flap as seen clearly in Fig. 1 for the side flap 2, and a similar but oppositely disposed adhesive strip 7 may be provided on the side flap 3.

With reference more particularly to Fig. 1, it will be noted that each side flap 2 and 3 has outwardly diverg-

ing side edges so that the flap flares laterally, and has a curvate bottom edge and a curvate outer edge, so that the resultant cup will have an outwardly tapering side wall and intimately fit in an even circle around the bottom portion and also provide a smooth circular mouth portion.

In forming a paper cup from the blank illustrated in Fig. 1, the blank is placed in proper position with suitable punch die mechanism, which may be of the compound character. The first step is to upset the bottom portion 1 by folding the same along an imaginary circular line 8 to provide a flat cup bottom 9 seen in Fig. 2 with a depending skirt 10 therearound. At this time the skirt 10 may be cylindrical. Thereafter, a reverse fold is made at the junctions 4 and 5 between the side flaps and then the free edge portion of the skirt 10, and the side flaps are turned upwardly so that the lower marginal portion thereof overlies the skirt, as indicated by the dotted lines in Fig. 2 showing the side flaps in a partially upward position. As the side flaps are brought upwardly to form the wall of the cup, they are also turned or curved laterally so as to intimately circumscribe the skirt 10 and form overlapping marginal portions to provide side seams, generally indicated by numerals 11 and 12, in the side wall of the finished cup. These side seams 11 and 12 are secured to the skirt 10 by means of the angular strips of adhesive or plastic material 6 and 7 seen in Fig. 1. In the event the securing means is adhesive, the overlapping marginal portions forming the side seams are pressed together, and the lower margins of the side flaps are pressed around the skirt 10 to secure the adhesive. In the event the material used for sealing is a plastic material, then the parts are pressed together with an application of heat in order to heat seal the blank into finished cup shape. It will be understood too, of course, that the entire blank may be coated with a plastic material, and then there will be no need to provide particular strips of adhesive or plastic, but the cup in the overlapping marginal portions may be heat sealed by virtue of the plastic material already on the blank.

The upsetting of the bottom part 1 as indicated in Fig. 2 results in drawing the inner edges of the side flaps 2 and 3 closer together, and at a distance approximately equal to the bottom diameter of the resultant cup, so they are disposed in the correct position for these side flaps to be bent upwardly at an angle approaching 90° and wrapped around both a form mandrel and the skirt 10 on the bottom. This forming movement, of course, is one continuous smooth operation, and the side flaps automatically assume the desired position to form the diametrically opposed seams 11 and 12. When the parts of the blank are effectively sealed in finished cup position, there is a firm bottom or base for the finished cup formed by the skirt 10 and the side flaps circumscribing the same and secured thereto all the way around.

At any time during the forming of the cup from the single piece blank it may be provided with a rolled rim bead 13 around the mouth edge thereof, if so desired. This may be accomplished by any suitable rim rolling mechanism.

In the preferred form of the invention it is desirable to have the lower end of the cup, that is where the side flaps are joined to the skirt 10, at the same inclination as the side wall of the cup. In other words, the side wall is not changed in character but continues its taper clear to the bottom of the skirt, and accordingly the skirt must taper inside the side wall at the same angle. This may readily be accomplished by using an expanding bottom die during the forming operation. The taper of the skirt is clearly seen in Figures 5 and 6.

The advantage of thus having the taper of the cup continue clear to the lower end thereof is to provide a smaller outside bottom edge diameter than the inside bottom diameter of a cup at the bottom 9 whereby,

when the cups are stacked in nested relationship there is free stacking or nesting with the bottom edge of the upper cup resting freely on the inside bottom 9 of a lower cup as shown in Figure 6. This arrangement provides what is known in the trade as "bottom space control nesting," and when the cups are nested the spacing between the mouth ends of the cups is controlled by contact of the lower edge of an upper cup with the bottom 9 of the next lower cup. The arrangement also eliminates frictional side wall contact between nested cups, so that dispensing, particularly from an automatic dispensing machine, is simple and sure, with only one cup at a time being dispensed. As illustrated in Figure 6, assuming the cups to be the accurately disposed, there would be a space 14 or a diametral free space between the inside cup and the outside cup all around. It is obvious, therefore, that during a dispensing operation the lower cup is free to fall without any tendency to adhere to the cup nested therein.

In Figure 7 I have illustrated another bottom formation which also provides the free stacking above discussed. In this instance, a straight cylindrical punch die is utilized at the bottom rather than an expanding die, and the skirt 10 of the cup bottom 9 is formed cylindrical. The same is true with the adjacent wall portion of the cup as indicated at 15. The cup wall above the bottom is supported by the forming mandrel with the lower portion of the cup wall in juxtaposition with the skirt 10 of the bottom. Any suitable means are utilized to diametrically compress the lower portion of the wall and form the external annular shoulder 16 and thus provide the aforesaid diametral free space 14 between the walls of adjacent stacked cups.

The space 14 may be controlled by increasing or decreasing the height of the skirt 10 and the part of the cup wall in juxtaposition with the skirt.

Obviously, with either construction there is freedom between adjacent cups in a stack of nested cups, so that dispensing is easy. The cup shown in Figures 5 and 6 may be more desirable when used alone, while the type of cup shown in Figure 7 may be more desirable when used with certain types of cup holders, whereby a pleasing appearance is always presented to the user.

My novel method of forming a flat bottom paper cup from a single piece blank of material is believed to be sufficiently apparent from the foregoing as to warrant no further description herein.

From the foregoing it is apparent that I have provided a novel flat bottom paper cup made from a one-piece blank of stock, which blank may be cut so as to be economical in avoiding an objectionable amount of waste, and which blank may be formed into a paper cup exceedingly rapidly and with simple die mechanism. No delay is caused in sealing overlapping portions of the single blank together to maintain the cup in shape. In the event adhesive is used, the parts are automatically pressed together where the adhesive is disposed between overlapping portions, and the parts are likewise pressed together in the event a plastic material is used, and it is a simple expedient to electrically apply heat to the parts at the proper moment for setting the plastic material. The finished cup is firm, more than amply rigid, and stable in character. It is also leakproof, and is obviously at least as long lived and as efficient in operation as flat bottom cups heretofore made of a plurality of initially separate blanks. The economy of the instant invention is at once realized by the simple striking of the blank from a stock strip, and the simple die mechanism used in forming the cups rather than complicated cup making machines of the character heretofore known.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

75 A one-piece flat bottom paper cup comprising a single

5

blank having a bottom portion and a side wall portion, the bottom portion being shaped to define a flat bottom with a depending skirt therearound, the wall portion being integrally joined to a part of the free end of said skirt and reversely folded at that location, said wall portion being curved laterally to intimately surround all said skirt and provide overlapping margins in the wall portion, and said wall portion being secured to said skirt therearound and said margins being secured together, said skirt and side wall portion being cylindrical where joined and said side wall portion outwardly flaring thereabove.

5

10

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