

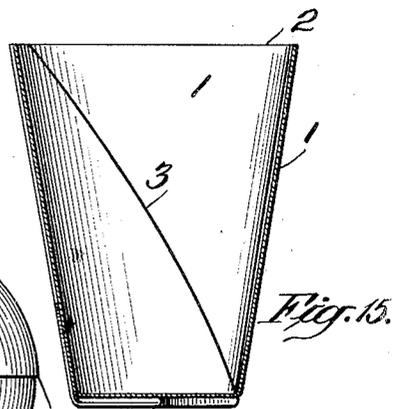
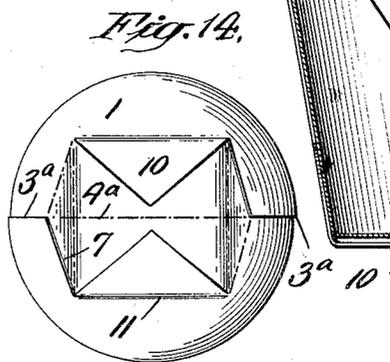
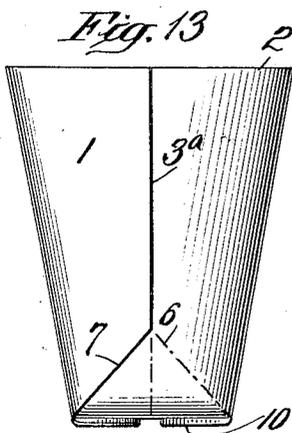
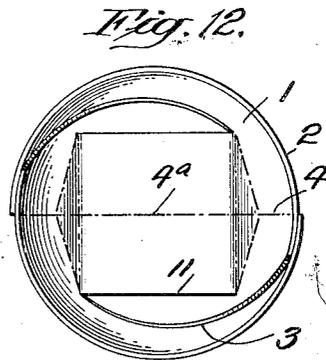
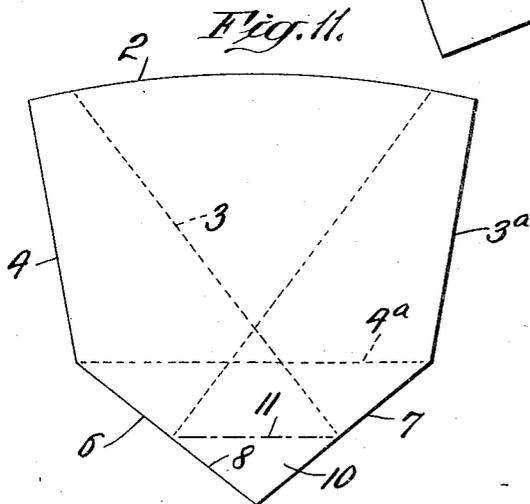
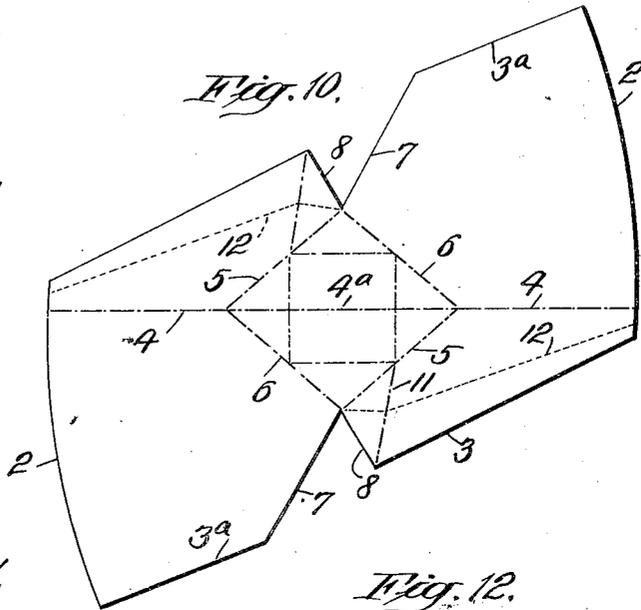
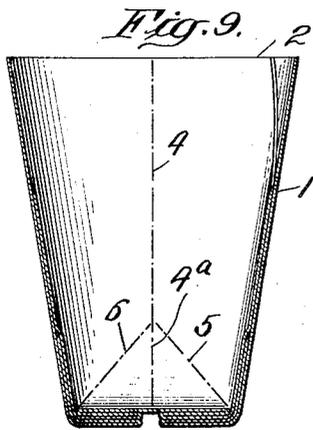
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COLLAPSIBLE PAPER CUP

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COLLAPSIBLE PAPER CUP

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My invention relates more particularly to collapsible paper cups, which, when opened for use, have substantially square bottoms, while the bodies of the cups are round, and substantially frusto-conical in shape.

It is well known that the envelope type of cup has a wide use and an extensive sale, because of its cheapness and convenience, but it is objectionable in that, when the cup is distended or opened for use, it does not have a flat bottom, so that the cup can be set down or made to stand, after it is filled. Many varieties of collapsible cups have been devised for overcoming this difficulty and providing a flat folding cup, which, when opened, will have a bottom and be capable of being set down on the bottom when filled.

Therefore, one object of my improvement is to construct a flat collapsed or folding cup, which, when collapsed, has substantially the appearance of the envelope type of cup, but is provided with a saddle fold, at the bottom, adapted, when the flat cup is pressed on its lateral edges, to open and form a substantially square bottom; at the same time the upper body portion of the cup will be distended to form a round frusto-conical cup in appearance.

A further object is to produce such a cup from a special blank, approximately in the shape of a parallelogram and folded, in a reverse fold, along a longitudinal line at an angle to the side edges of the blank, such that when folded, the end portions on the same side of the longitudinal line of fold, will overlap and preferably diagonally opposite side edges are brought to the longitudinal line of fold, thus forming the seams at the lateral edges of the flat folded cup.

Another object is to so dispose the surplus paper in the folding of the blank that the side walls adjacent the square bottom of the cup will be reinforced and the overlapping tabs are folded and secured against the wall of the blank in such a manner that the joints are sealed and the cup will not leak.

In producing this particular style of fold, I have found it desirable to show two forms of blanks and the cups produced therefrom. The two forms are similar in external appear-

ance, but one of them has a certain portion of the surplus paper removed, so that there are fewer plies in the tabs and overlapping folds at the bottom. In the accompanying drawings, Fig. 1 represents the blank from which one form of my improved cup is folded; Fig. 2 shows the blank of Fig. 1, in perspective, partially folded; Fig. 3 shows the blank in further process of folding; Fig. 4 shows a side elevation of the folded and cemented blank of Fig. 3 in flat form; Fig. 5 is a vertical cross section of the folded partially completed cup of Fig. 4; Fig. 6 is a side elevation of the completed flat folded cup with the lower tabs or points folded inward; Fig. 7 is a vertical transverse section through the completed cup, as shown in Fig. 6; Fig. 8 is a top plan view of the opened cup; Fig. 9 is a transverse vertical section of the opened cup of Fig. 8; Fig. 10 shows the shape of a modified blank adapted to be folded substantially the same as the blank in Fig. 1, but eliminating surplus paper; Fig. 11 shows the first step or reverse folding of the blank of Fig. 10; Fig. 12 shows the opened finished cup from the blank of Fig. 10; Fig. 13 shows the opened cup in side elevation; Fig. 14 is a bottom view of the cup of Fig. 12; and Fig. 15 is a vertical transverse section on the folding line of the cup shown in Fig. 12.

Referring to the drawings, it will be seen from Fig. 1 that the blank 1, from which the cup is to be formed, is substantially an acute angled parallelogram, with the ends 2 arc-shaped to form the lip of the frusto-conical cup. The lateral edges 3-3^a of the blank are parallel, and a folding line 4, which may be scored, extends longitudinally of the blank at an angle to the edges thereof, the two portions of the blank on each side of the fold line 4 being substantially equal, but tapering or truncated wedge shaped toward opposite ends. The fold line 4 preferably meets the curved ends 2 at the same angle as side edge 3^a meets it, or the same as the acute angle of the parallelogram, thus forming or indicating the full width of the flat side of the folded cup. The principal fold lines, including the line 4, are indicated on the draw-

ings by dash and dot lines, the fold on the line 4, being a reverse fold on each side of the middle portion 4^a of the line, the latter forming the apex of a saddle fold at the bottom of the cup. Extending on each side of the saddle fold line 4^a, are indicated fold lines 5 and 6, which, as shown in Fig. 1, form a diamond with the line 4^a extending longitudinally through the points thereof. Beyond the points of intersection of the fold lines 5 and 6 to the edges of the blank, there are indicated fold lines 7 and 8, which with the edge 3 of the blank, form triangles.

When the blank is folded, as shown in Fig. 2, the portions between the lines 4, 6, 7 and 3^a and between the lines 4, 5, 8 and 3, are folded upward toward each other on the lines 4, 5 and 6, while the portions within the diamond (5, 6, 5, 6) are folded downward on the line 4^a to form a saddle fold. The triangular portions between the lines 7, 8 and the edge 3 are folded inward on the line 7 and outward on the line 8, as the different elements of the blank are folded to the position indicated in Fig. 2 of the drawings. Further folding to the flattened position brings the line 8 or the folded edge on this line to the dotted line position shown in Fig. 4, while the fold line 7 overlies the edge of the fold on the line 5. The rear side of the blank, on the portions thereof between the lines 4, 5, 8 and the edges 3 is preferably gummed as indicated at 9, in Fig. 2, so that when the triangular portions 7, 8, 3 and the other portions are completely folded or brought flatly together from the position shown in Fig. 3 to the position shown in Fig. 4, the different portions will be secured together to form the body of the cup, the overlapping portions being indicated by dotted lines. From an examination of Fig. 4 and a comparison with the fold lines of Fig. 1, it will be seen that the portions of the blank between the lines 4, 6, 7 and 3^a, outline the shape of the flat sides of the cemented cup, as shown in Fig. 4. The respective edges 3^a of the blank, therefore, coincide with or lie over the fold line 4, beyond the saddle fold line 4^a, of the opposite halves of the blank when the cup is completed, thus presenting a smooth unbroken surface on the flat sides of the folded cup.

The folded blank and the relations of the various elements thereof will be seen in Fig. 4, and more particularly in the section in Fig. 5 of the drawings. The next step is to fold the tabs 10, preferably inward on the line 11 and secure them to the underside of the saddle fold, substantially as indicated in Figs. 6 and 7; the latter showing a vertical section through the tabs. A top plan view of the opened cup, shown in the flat in Fig. 6, is shown in Fig. 8. By this construction, the walls of the cup are double thickness, in part, thereby reinforcing the material so that the cup may be readily opened by pressing on

the lateral edges represented by 3^a and the fold line 4 in Fig. 6 of the drawings. When pressure is thus applied near the lower corners, the cup will be readily opened to the position shown in Fig. 8 and when filled with liquid will be substantially frusto-conical in shape, with a flat bottom.

In the form of cup just described, it will be noted that the tabs 10, represent a four-ply thickness of material, which must be folded in against the bottom ply of the saddle fold, as indicated in Fig. 7 of the drawings. It is, therefore, desirable to obtain the reinforcing effect of the double wall along the fold 11 of the tab, without the surplus paper forming the multiplicity of plies in the tab. Therefore, in the blank shown in Fig. 10 of the drawings, a triangular portion of the paper, corresponding substantially to the triangle between the lines 7 and 8 of Fig. 1, has been removed, thus removing several plies in the tabs 10 of the finished cup and at the same time producing a flat folding, reinforced cup, which, when opened, is water-tight or leak-proof.

The form shown in Figs. 10 to 15 is scored and folded substantially the same as the previously described form and the corresponding edges and folding lines of the blank are given the same reference numerals as the corresponding elements in the form shown in Figs. 1 to 9. From an examination of the blank shown in Fig. 10, however, it will be seen that the portions of the blank between the fold lines 4, 5, 8 and the edges 3 are slightly narrower than the corresponding portion of the blank in Fig. 1. The object of this is to reduce the overlapping portions of the blank; and preferably the length of the notch line 8 of Fig. 10 is approximately half the length of the line 6, so that the corner between 8 and 3 will, when folded, come to the center of line 6, and thus meet the corner of the bottom of the cup on the fold line 11, substantially as indicated by dotted lines in Fig. 11 of the drawings. The elements of the blank shown in Fig. 10 are folded substantially as previously described for the blank shown in Fig. 1 and the successive steps would be the same as shown in Figs. 2 and 3, with the triangular portions between the lines 7 and 8 removed. The edges 3^a of the blank, when folded and secured together, meet the fold lines 4, thus presenting a smooth face on each flat side of the folded cup. The tabs 10, as represented in Fig. 11, are then folded inward and secured against the bottom of the cup as more particularly shown in Figs. 13 and 14. Fig. 14 shows a bottom view of the cup in its opened position and Fig. 12 is a top view looking into the cup.

In this form of cup, the double thickness side wall does not extend beyond the side or corner of the square bottom and, in some cases, if so desired, may be made even less by trim-

ming the blank to the dotted lines 12 in Fig. 10. This latter construction would, of course, still further reduce the amount of overlap between the edges 3^a and 12. The form shown by solid lines, however, in Fig. 10 is preferable, in that it carries the reinforcement of the double thick wall, out to the corner of the fold line 11, where the saddle fold breaks to form the bottom of the cup when opened.

The forms of my improved cup, as herein shown and described, are particularly desirable, in that they can be readily and cheaply manufactured by suitable machinery and produced in flat form, so that they will pack compactly without injury thereto, and when desired, for use, can readily be opened by pressure upon the lateral edges and the opened cup will have a satisfactory bottom, permitting the cup to be set down either when filled or not, and when filled, it will assume substantially a frusto-conical shape.

It will be understood that while I have shown my improved cup in the preferred form, the amount of overlap and position of the seam may be varied, therefore, I do not wish to be limited to the specific details of construction or folding, for obviously, various modifications therein may be made without departing from the spirit and scope of the invention.

I claim:—

1. A collapsible paper cup, comprising an elongated substantially parallelogrammatical blank, adapted to be folded on a line extending longitudinally of the blank at an angle to the longitudinal edges thereof to form a saddle fold at the bottom of the cup with reverse folds at each end of the saddle fold, the longitudinal fold line being so located that the overlapping edges of the side walls of the blank meet the opposite reverse fold lines above the ends of the saddle fold.

2. A collapsible paper cup, comprising an elongated substantially parallelogrammatical blank, folded in a reverse fold on a line longitudinally of the blank at an angle to the edges thereof, the angle of the fold line to the longitudinal edges of the blank being such that the width of the sides of the flat folded cup are represented and lie between the longitudinal fold line and the edges of the blank at opposite ends thereof and on opposite sides of said fold line.

3. The collapsible paper cup as claimed in claim 2, in which diamond-shaped fold lines at the middle portion of the blank outline a saddle fold, and when the blank is folded along the diamond-shaped fold line and the longitudinal fold line in a reverse fold, the bottom will be formed with a saddle fold and the edges of the portions of the blank forming the flat sides of the cup will be brought to the longitudinal line of fold above the ends of the saddle fold, in which position the overlapping wall portions are secured together.

4. A collapsible paper cup, comprising an irregularly shaped blank, substantially a parallelogram, folded in a reverse fold, on a line extending longitudinally thereof at an angle to the longitudinal edge and on lines near the middle of the blank, forming a diamond on the longitudinal line of fold, so as to form a saddle fold of the material outlined by the diamond-shaped fold lines, with the other portions of the blank in a reverse fold to form the body of the cup in flat form, the longitudinal fold line being at such angle to the edges of the blank that when the blank is folded, the edges of the flat side walls of the cup on each side extend to said longitudinal fold line at the fold edge of the opposite side wall.

5. The collapsible cup, as claimed in claim 4, in which the amount of material of the blank on each side of the longitudinal fold line at each end of the blank is different and when the blank is folded, the wider portion is adapted to overlap the narrower portion of the opposite end and to be secured thereto to complete the cup.

6. A collapsible paper cup, comprising a substantially parallelogrammatical blank, which is folded in reverse folds along a line extending longitudinally of the blank and at an acute angle to each of its side edges, said fold line being so located that when the blank is folded, diagonally opposite portions of the blank between the fold line and the side edges of the blank form the sides of the cup in flat folded form.

7. A collapsible cup, comprising an elongated blank, formed substantially as an acute angled parallelogram, which is folded, in a reverse fold, on a longitudinal line forming, with the ends of the blank, angles substantially equal to the acute angles of the blank, the portions of the blank between said fold line and the edges of the blank adjacent the acute angle being adapted to form the flat sides of the cup when folded.

8. The collapsible cup as claimed in claim 7, in which opposite acute angle portions of the folded blank overlap the obtuse angle portions on the same side of the blank and are secured thereto to complete the cup.

9. A collapsible cup comprising a blank formed as an elongated parallelogram, and which is folded, in a reversed fold, on a diagonal longitudinal line dividing the blank into two equal wedge-shaped portions, the reverse fold taking place at each end from the middle of the blank, so that the middle is formed as diamond-shaped saddle fold for the bottom of the cup, while opposite ends of the wedge-shaped portions of the blank, on the same side of the longitudinal line of fold, are brought into overlapping position and secured together to form the body of the cup.

10. The collapsible cup as claimed in claim
9, in which the lower tab points of the dia-
mond-shaped saddle folds are folded and se-
cured to the bottom wall thereof to deter-
mine the lateral edges of the bottom of the
5 cup.

11. The collapsible cup as claimed in claim
9, in which triangular notches are formed
near the middle of each long edge of the
blank to remove surplus material.

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