

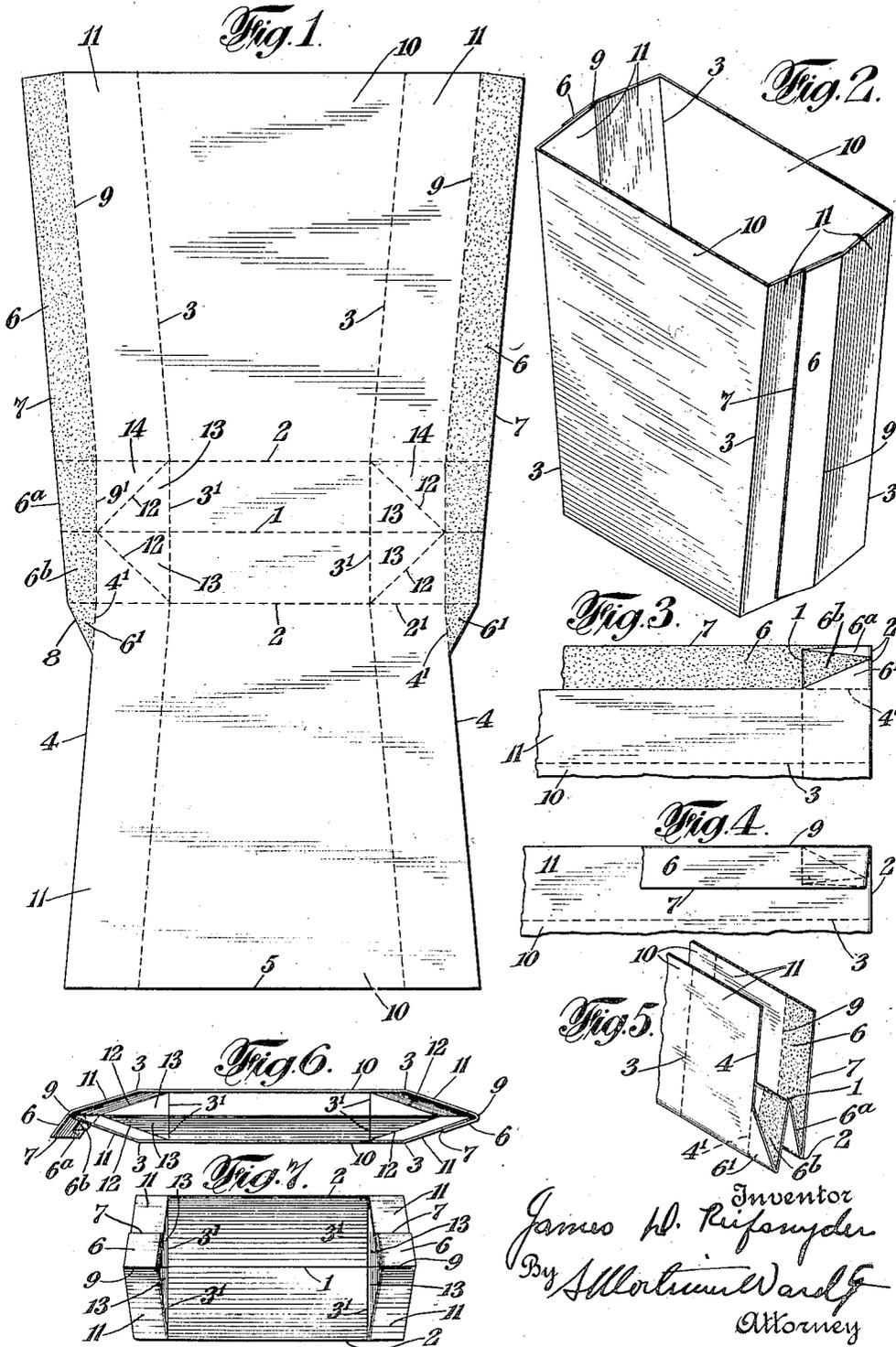
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J. D. REIFSNYDER

COLLAPSIBLE CUP

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# UNITED STATES PATENT OFFICE.

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## COLLAPSIBLE CUP.

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*To all whom it may concern:*

Be it known that I, JAMES D. REIFSNYDER, a citizen of the United States, and a resident of Weehawken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Collapsible Cups, of which the following is a specification.

The invention relates to collapsible drinking cups which may each be formed of a paper blank, suitably creased or scored and secured together to form a cup; the cup being characterized by its ability to stand on its own bottom when extended to be collapsed into flat form with one of its side portions lying on the other, and to be opened by inward pressure on the opposite edges thereof.

The chief object of the invention is to provide an effective device of the character referred to which may be manufactured in a simple and inexpensive manner, and which shall be water-tight. Other objects of the invention consist in the improved construction of elements and combinations of parts, all as will be more fully set forth in the following specification and particularly pointed out in the appended claims.

A particular feature of the invention is the provision of a gumming or securing flap or flange so arranged as to prevent leakage of the cup when the blank therefor is somewhat inaccurately stamped.

In order that the invention may be more clearly understood attention is directed to the accompanying drawings forming part of this application and illustrating one embodiment of the invention. In the drawings,

Fig. 1 represents a blank from which a cup embodying the invention may be formed;

Fig. 2 is a perspective view of one of the completed cups in extended position;

Figs. 3 and 4 are partial views of the blank illustrating certain steps in the folding of the same to form a cup;

Fig. 5 is a partial perspective view of a cup in partly collapsed condition, partly broken away;

Fig. 6 is a top view of the cup in partly collapsed condition, one of the gumming flanges being shown extended; and

Fig. 7 is a bottom plan view of the cup in extended position.

Referring to the drawings, the cup may

be formed of a blank of paper or other suitable material. This blank is adapted to be creased along transverse lines 1 and 2, 2, these lines preferably being slightly scored. Longitudinal lines 3, 3, are also provided, parallel, generally speaking, to the side edges 4, 4, and 7, 7. The line 1 is parallel to and intermediate the end edges 5, 5, of the blank.

The blank is provided with extensions 6, 6, at each side thereof, these portions preferably extending from one end to a point a short distance beyond the more distant of the two scored lines 2. Each side extension 6 is bounded by a side edge 7, which extends from the top edge 5 to the more distant of the two scored lines 2, beyond which point an end portion 6<sup>1</sup> of each extension 6 is formed, this portion 6<sup>1</sup> having an outside edge 8 which may, as shown, extend inwardly and downwardly at an inclination from the junction of the edge 7 with the line 2, to a point on the outside edge 4 a short distance below the line 2.

Each side extension 6 has an inner edge formed by a scored line 9 which extends from the top edge 5, parallel to the outside edge 7 until the nearer of the two lines 2 is reached. From this point the scored line 9 continues across the blank, preferably at a somewhat different inclination, as is indicated at 9<sup>1</sup>, until the opposite line 2 is reached, and from this intersection the scored line continues, as is indicated at 4<sup>1</sup>, to the intersection of edges 4 and 8, the portion 4<sup>1</sup> of the scored line forming a continuation of the edge 4. It will be understood that a tapered cup is indicated in the drawings and accordingly the side edges 4 taper downwardly and outwardly and the side edges 7 and crease lines 9 taper outwardly and upwardly in a symmetrical manner, the upper portion of the blank being wider than the lower by the width of the two gumming flaps 6.

The longitudinal crease lines 3 are parallel to crease lines 9 and outside edges 7 at the upper part of the blank and are parallel to the outside edges 4 at the lower part of the blank. Between transverse lines 2, 2, lines 3 are parallel to the lines 9<sup>1</sup>, as is indicated at 3<sup>1</sup>. The lines 3<sup>1</sup> and 9<sup>1</sup> are preferably formed vertically on the blank. When the latter is bent along the various

crease lines to form the cup, the bottom of the extended cup will comprise the rectangle included between the lines 2, 2, and 3<sup>1</sup>, 3<sup>1</sup>. Each of the side walls 10 of the cup will have a width extending from one of the lines 3 to the opposite line 3 and the end walls of the cup will comprise the portions 11, 11, which are bounded at the sides by the lines 3 and 9, and lines 3 and edges 4, 10 the side extensions 6 constituting gumming flanges, or flaps, which are bent about lines 9 and secured to the edge portions of the lower end of the blank, adjacent the edges 4 thereof.

Crease lines 12, 12, are also provided on the blank extending from the intersections of each crease line 9<sup>1</sup> with line 1 to each of the intersections of lines 2 and 3. Accordingly there will be provided at each side of the blank a pair of triangular spaces 13, each of which is bounded by crease lines 12, 1, and 3<sup>1</sup>, with a pair of triangular spaces 14, each of which is bounded, the upper one by the lines 9<sup>1</sup>, 12, and the upper line 2, and the lower one by the line 9<sup>1</sup>, the lower line 12 and the lower line 2.

With a blank scored, or otherwise marked, in the manner indicated, a cup is formed in the following manner. The blank is first 30 folded along line 1 so that the opposite end portions thereof will extend downwardly therefrom. The portions of the blank which are adapted to form the sides and ends of the cups, that is, the portions between the end edges 5 and the adjacent lines 2, are then bent upwardly about lines 2, so that the portion of the blank bounded by the two lines 2 will extend upwardly in inverted V formation between the sides, as is indicated in Fig. 5, to form a bellows fold.

The blank is then folded flat in the manner indicated in Fig. 3 with the portion bounded by lines 2, 2, pressed down between the upper and lower side portions. The portion 45 of flange or flap 6 which extends from the upper edge 5 to the upper line 2, referring to Fig. 1, will extend along an edge of the under portion of the blank so folded. When the blank is folded along lines 1 and 2, 2, as described, the flange 6 will, of course, be folded along the same lines and accordingly there will be several portions of this flange superposed one on the other. Referring to the portion of flange 6 which extends from 55 upper line 2 to line 1, as 6<sup>a</sup>, and the portion of the flange which extends from line 1 to the lower line 2, as 6<sup>b</sup>, it will be evident that there will be four thicknesses of the material comprised in this flange adjacent to line 2, as shown in Fig. 3. These are the 60 triangular flap 6<sup>1</sup> uppermost, portions 6<sup>b</sup> below the same extending to the left from line 2, referring to Fig. 3, then portions 6<sup>a</sup> below that extending to the right from line 1 and the main portion of the flange 6

below flange 6<sup>a</sup>, extending to the left from its line 2.

To complete the cup it is only necessary to fold the flange 6 at each side of the construction about the adjacent edge 4, down on the adjacent portion 11 of the structure and secure the same in position by adhesive material. This operation is indicated in Fig. 4. In the usual manner of preparing the cup, adhesive is applied to the gumming flanges 75 or flaps before the blank is bent along the crease lines, the surfaces to be covered by adhesive material being indicated in the drawings by stippling.

The cup so formed will lie in a flat form until opened for use. This may be easily accomplished by pressing the opposite edges 9, 9 between the thumb and forefinger, whereupon the cup will immediately open up into the position indicated in Fig. 2, in 85 which the cup may stand upon the rectangular bottom bounded by lines 2, 2 and 3', 3'. When the cup is being opened up there will be a bending along lines 12, 12 and 3' and 1, the triangular portions 14 and 13 being opposite to each other during the opening movement, leverage being exercised by the pressure through the triangular portions 14, 13.

It will be noted that in the construction 95 described the triangular portions 6' at each side of the cup are folded between the adjacent portions 11 and 6<sup>b</sup>, the portions 6<sup>a</sup> and 6<sup>b</sup> also being folded between portion 11 and the main portion 6 of the gumming flange. This arrangement insures against leakage, which might otherwise occur at the bottom of the cup in case the blank were stamped out somewhat inaccurately at this 100 portion. For example, if the gummed flange was intended to terminate at lower line 2, and in stamping out the blank flange 6 was cut the slightest bit short or rough at this end, or if cut exactly right, it did not adhere tightly to the side 11 right at the very bottom, or if the adhesive for any reason were to develop a defect at the extreme inner point of the bottom of flap 6, then in one of such events the cup would leak at this 110 point because it would not be properly closed; but these contingencies are avoided by carrying flap 6 some distance below the lower line 2, as is indicated at 6<sup>1</sup>.

The portions 6<sup>1</sup> of the gumming flange 120 which are shown in Figs. 3 and 5 ordinarily are not gummed, since these surfaces are portions of the side opposite to the gummed surface shown in Fig. 1, and portions 6<sup>1</sup> are held in place without gumming by the superposed portions 6<sup>b</sup>. Portions 6<sup>1</sup> may, of course, be gummed by a special operation, if 125 desired.

While I have described my invention with particularity in connection with the present preferred form thereof, it will be obvious to 130

those skilled in the art, after understanding my invention, that changes and modifications may be made without departing from the spirit and scope of the invention, and I do not want to be understood as limiting myself other than as indicated in the appended claims.

What I claim is:—

1. A collapsible cup having side and end walls and a bottom on which it is adapted to stand when extended, the bottom having a bellows fold and the end walls, when the cup is collapsed in flat form, folding along vertical lines intermediate the side edges thereof, each end wall being formed of two vertically extending portions, one having a side flap lapped over and secured to the other, said other portion having a side flap extension adjacent the bottom thereof, bent over and secured between the lower outer part thereof and said first named flap.

2. A collapsible cup having side and end walls and a bottom, formed of a blank having one end portion wider than the other, the blank having a transverse crease line intermediate its ends, and transverse crease lines above and below the same for the side edges of the bottom, longitudinal crease lines for the intersections between the side and end walls and longitudinal crease lines adjacent the sides of the first named end portion extending from the outer end thereof across said transverse lines as continuations of the outside edges of the other end portion, and gumming flaps at the outer sides of said last named longitudinal crease lines extending across said transverse lines and for a short distance beyond the last one of said lines.

3. A collapsible cup having side and end walls and a rectangular bottom on which it is adapted to stand when extended, the bottom having an upwardly extending bellows fold, and the end walls, when the cup is collapsed in flat form, folding along vertical lines intermediate the side edges thereof, the bottom having extensions at the ends thereof divided by diagonal crease lines into inner and outer triangular spaces, adapted to fold upwardly with the bottom when the cup is collapsed and to fold vertically inside the ends when the cup is open, with the

said inner and outer triangular spaces engaging each other, said inner and outer triangular spaces constituting continuations of the end walls and acting jointly, when the cup is opened, to transmit pressure to the bottom to open the bellows fold of the same, each end wall being formed of two vertically extending portions, one having a side flap lapped over and secured to the other.

4. A blank from which a paper cup is to be formed, said blank comprising portions for forming the side walls of the cup, portions for forming the end walls of the cup each of which end walls will have two upright portions normally folded one upon the other, portions for forming a bellows-like bottom for the cup, which portions are marked by lines along which the respective portions of the blank are to be folded, and sealing flaps at the sides of the blank for sealing up the end walls of the cup, each flap continuing down along one end wall portion across the portions forming the bellows-like bottom and somewhat beyond the same.

5. A foldable paper cup comprising in combination side walls, a bellows-like bottom having adjacent portions normally folded one upon another but adapted to bend along their line of division running substantially parallel to the side walls so as to be extended into a flat bottom for supporting the cup, end walls each comprising two upright portions respectively contiguous with the side wall portions and adapted to be bent outwardly therefrom along their respective lines of division with said side walls, one end wall portion toward the other to form an angle therebetween, at each end of the bottom of the cup a portion forming a continuation of the upright end walls and of the bottom of the cup, said portion being marked out into triangles substantially as shown in the drawings to permit the flattening of the bottom and side walls of the cup in opening up same, and a closure flap for each end of the cup adapted to seal the ends and having a portion extending across the ends of the bottom of the cup and upwardly beyond each side of the bottom.

In testimony whereof, I have signed my name to this specification.

JAMES D. REIFSNYDER.