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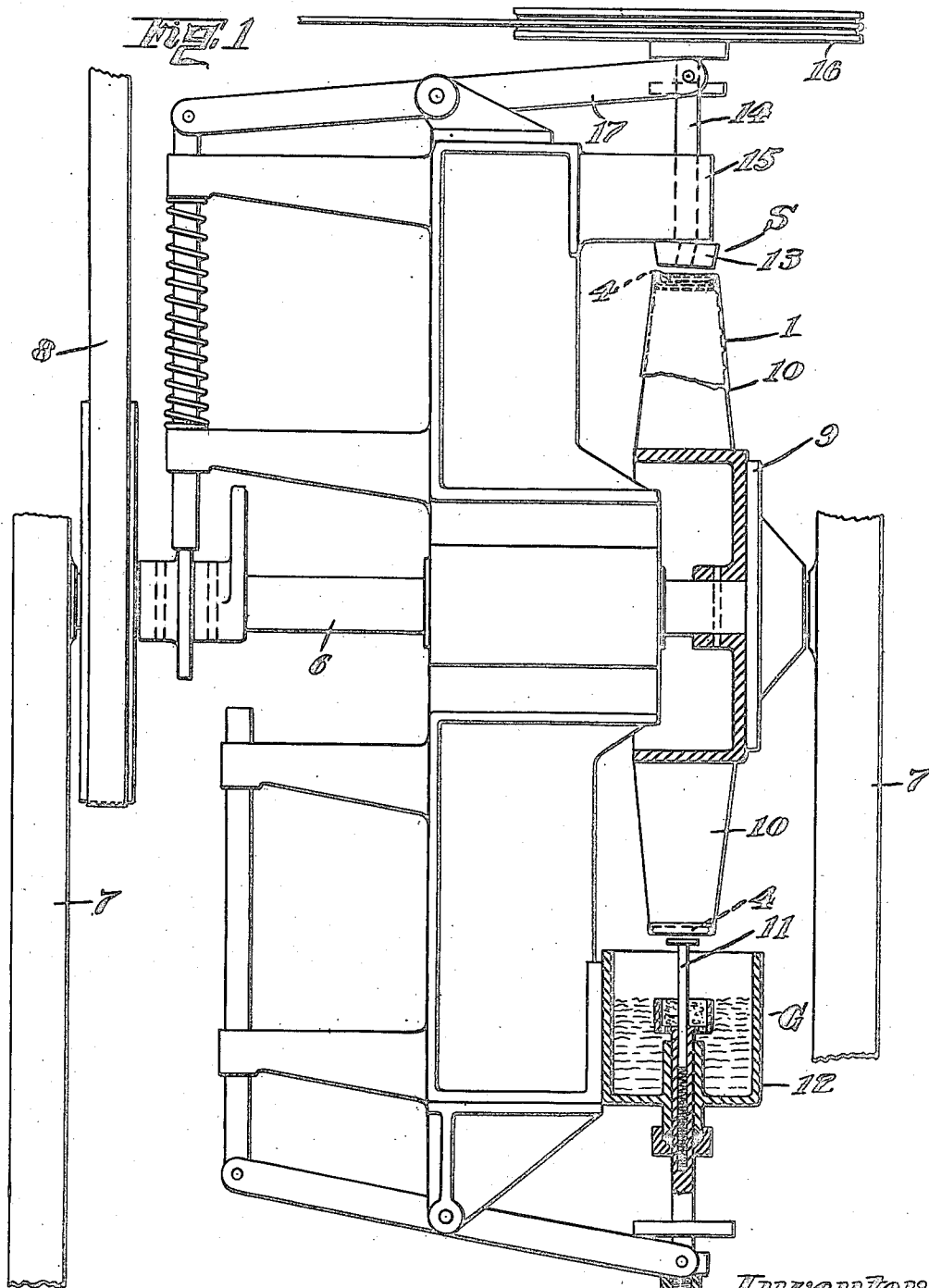
W. E. BENSON

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METHOD OF AND APPARATUS FOR PRODUCING WATERPROOFED RECEPTACLES

Filed Oct. 16, 1922

2 Sheets-Sheet 1



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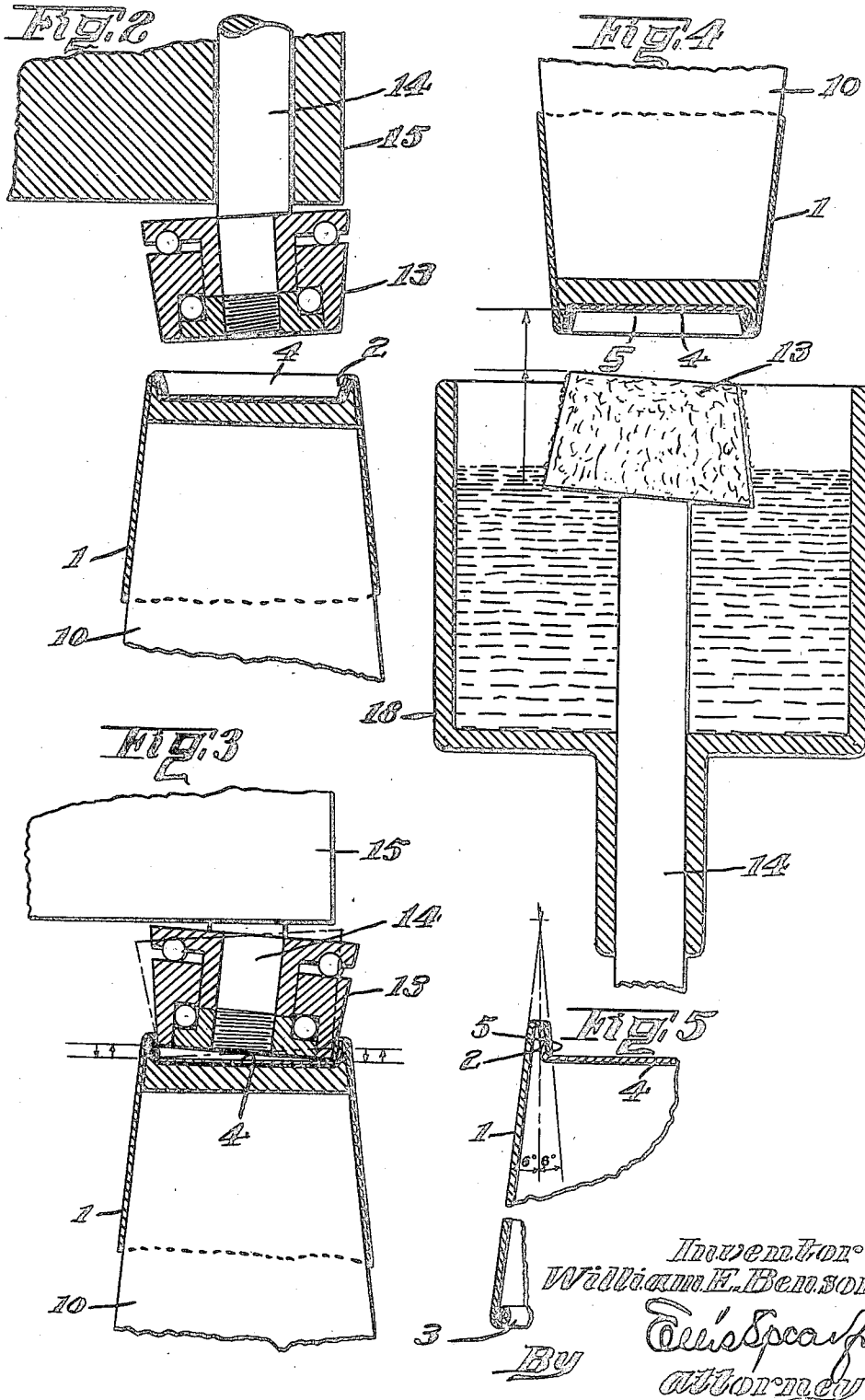
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UNITED STATES PATENT OFFICE.

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METHOD OF AND APPARATUS FOR PRODUCING WATERPROOFED RECEPTACLES.

Application filed October 18, 1922. Serial No. 594,775.

To all whom it may concern:

Be it known that I, WILLIAM E. BENSON, a citizen of the United States, residing at Wilmington, county of Middlesex, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Methods of and Apparatus for Producing Waterproofed Receptacles, of which the following is a specification.

This invention relates to a method of and apparatus for producing waterproofed paper receptacles, and particularly paper drinking cups of the type wherein the bottom closure is a separate piece sealed to the wall of the cup.

One characteristic difficulty in the production of cups of this type in commercial quantities consists in the union of the bottom closure to the cup wall. This is of necessity the area of greatest weakness in this type of cup, and is usually united by coating the contacting surfaces of the blank and closure with glue or paraffin and pressing them together to seal them.

The object of my present invention is to provide a cup in which the contacting surfaces of these parts will be positively pressed together and worked relative to each other in such manner as to cause them to firmly adhere to each other. To this end my invention consists in the novel method of and apparatus for accomplishing this object.

According to my invention this union is effected during the progress of the cup through the forming machine and as one of the series of operations performed on the cup in said machine. This is a feature of importance in that it does not slow down production by requiring that the blank be separately coated. As contemplated herein, the blank may be either glued or paraffined, or both, and where paraffined, the apparatus for working the contacting surfaces of the cup and closure is itself utilized as an applicator for the paraffine.

This object, and various other features of advantage which will appear more particularly hereinafter, are secured in the apparatus and method of the present invention.

The construction of my cup, and the manner of and apparatus for producing it are described and illustrated in the accompanying specification and drawings, throughout which like reference characters are employed to indicate corresponding parts, and the

characteristic features of novelty are particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is an elevation, partly in section, of apparatus for the practice of my invention, and showing the bottom closure of the cup being coated with adhesive.

Figs. 2 and 3 are partial sections, particularly illustrating the manner of working the contacting surfaces of the cup wall and bottom closure relative to each other to cause them to firmly adhere to each other.

Fig. 4 is a view similar to Fig. 2 and illustrating the adaptation of the apparatus shown in said figure as an applicator for paraffin in addition to its normal function of working the contacting surfaces of the cup wall and bottom closure relative to each other, and

Fig. 5 is a partial section through a finished cup particularly illustrating the angular relation of the cup wall to the flange thereof and also showing the inwardly rolled bead or rim at the upper edge of the cup.

In the type of cup selected herein as illustrative of the principles involved, the cup blank is dinked out of transparent paper stock, if desired, in an ordinary dinking press, glued along one vertical edge and then rolled upon a forming mandrel to lap its opposite vertical edge over said coated edge.

At this stage, the blank is formed to cup shape, as indicated at 1 in the drawings, but has not been bent at its bottom edge to provide the closure attaching flange 2 or rolled at its top edge to provide the turned bead or rim 3, Fig. 5. As here shown, the cup blank is cut on a curve so as to flare upwardly from bottom to top when rolled to cup form.

After the cup blank is rolled to form, it is transferred to a forming and sealing machine where the bottom closure 4 is united thereto. Preferably such machine consists of an intermittently revoluble spider and a plurality of operating station disposed about the orbital path of the spider and cooperating therewith.

The cycle of the machine, where glue is used to coat the flanges 5 of the bottom closures 4 is as follows:—

The closures 4 are first blanked out of a strip of suitable material and the flanges 5 simultaneously formed thereon. The next

step consists in applying glue to the inner faces of said flanges, after which the side wall of the cup is placed in the machine and the bottom edge thereof bent upwardly to form the flange 2 which is folded over the flange 5 of the bottom closure. The flanges 5 and 2 are next worked relative to each other to cause them to firmly adhere to each other, after which the cup with bottom attached is stripped from the machine and the bead 3 formed thereon, if a bead is desired, such bead being rolled either inwardly or outwardly as desired.

Where paraffin is used instead of glue, the gluing step is omitted and the paraffin is applied at the same station and by the same mechanism, which works the flanges 5 and 2 together.

For the purposes of this application, I have shown only such portions of my machine as are necessary to illustrate the novel steps in the method involved herein. Referring to Fig. 1, I have indicated at 6 the cam shaft of my machine which is journaled in spaced bearings 7 and is driven from any suitable power source, as indicated at 8. Fast on the shaft is a spider 9 carrying a plurality of radially disposed mandrels 10.

After the bottom closure 4 is blanked out and flanged by the machine, the mandrel 10 upon which said blank is held is revolved until opposite the gluing station G of the machine, where it pauses while a glue applicator 11 reciprocating through a glue pot 12 and operated in properly timed relation to the rest of the machine from the cam shaft 6, takes up a supply of glue and spreads it upon the inner face of the flange 5 of the bottom closure 4 while said closure remains opposite the gluing station. The cup blank is then slipped over the mandrel carrying the adhesively coated bottom piece 4 and the bottom flange 2 is formed thereon and folded over the flange 5 of said bottom piece, after which the spider 9 revolves until the mandrel carrying said blank and closure is opposite the seating station S of the machine, where it again pauses while a seating device 13 engages and presses the bottom piece 4 against the flange 2 to firmly unite said parts.

As here shown, the seating device 13 is eccentrically mounted on a shaft 14 which is rotatably and slidably mounted in a bearing 15 on the machine frame. The shaft 14 is rotated by the belt and pulley 16, Fig. 1, and is moved towards and from the mandrel of the spider 9 by a lever 17 operated in properly timed relation to the rest of the machine from the cam shaft 6.

The eccentric mounting of the revoluble seating device 13 causes said device to oscillate or rock when engaged with the bottom closure 4, as indicated diagrammatically in Fig. 3, and such weaving motion works the

flanges 5 and 2 relative to each other to cause them to firmly adhere to each other.

Where paraffin is used instead of glue, the seating device 13 is arranged to operate through a paraffin pot 18, Fig. 4, which is electrically or otherwise heated to maintain the paraffin in a liquid state. The seating device therefore takes up a supply of liquid paraffin as it is moved towards the mandrel and spreads such paraffin onto the bottom piece 4 upon engagement therewith and then works the paraffin into the flanges 5 and 2 by reason of its oscillatory or weaving motion.

While I have shown an eccentrically mounted device having a weaving motion, it will be understood that the union of the flanges 5 and 2 may be otherwise effected.

Various modifications in the construction of my receptacle, and in the manner of and apparatus for producing it, may obviously be resorted to within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. The method of manufacturing a water-proofed paper receptacle having a side wall and a flanged bottom closure, consisting in adhesively coating the flange of said bottom closure while said closure is retained on a forming mandrel, in applying the side wall to said mandrel, in folding the lower edge of said side wall to provide a flange enclosing said bottom closure flange, and in internally expanding the bottom closure flange against the side wall flange to cause said flanges to adhere to each other.

2. The method of manufacturing a water-proofed paper receptacle having a side wall and a flanged bottom closure consisting in adhesively coating the flange of said bottom closure while said closure is retained on a forming mandrel, in applying the side wall to said mandrel, in folding the lower edge of said side wall to provide a flange enclosing said bottom closure flange, and in bringing a seating device having a weaving motion against the bottom closure flange to work said flange relative to said side wall flange whereby to cause said flanges to adhere to each other.

3. The method of manufacturing a water-proofed paper receptacle having a side wall and a flanged bottom closure, consisting in assembling a flanged bottom closure on a forming mandrel, in applying the side wall to said mandrel, in folding the lower edge of said side wall to provide a flange enclosing said bottom closure flange, in moving a seating device through a coating substance to apply a coating to the bottom closure flange, and in imparting a weaving motion to said seating device when in contact with said bottom closure flange whereby to work said flange relative to said side wall

flange and cause said flanges to adhere to each other.

4. The method of uniting the flanged bottom closure of a waterproofed paper receptacle to the flanged side wall of said receptacle, which consists in adhesively coating the bottom closure flange, and in bringing a seating device having a weaving motion against said bottom closure flange to work said flange relative to said side wall flange whereby to cause said flanges to adhere to each other.

5. The method of uniting the flanged bottom closure of a waterproofed paper drinking receptacle to the flanged side wall of said receptacle, which consists in assembling said side wall and closure upon a mandrel with said side wall flange enclosing said bottom closure flange, in moving a seating device through a coating substance to apply a coating to said bottom closure flange, and in imparting a weaving motion to said device when in contact with said bottom closure flange whereby to work said flange relative to said side wall flange and cause said flanges to adhere to each other.

6. The method of uniting the flanged bottom closure of a waterproofed paper drinking receptacle to the flanged side wall of said receptacle, which consists in assembling said side wall and closure upon

a mandrel with said side wall flange enclosing said bottom flange and in moving an eccentrically mounted rotatable seating device through a coating substance to apply a coating to said bottom closure flange and to work said flange relative to said side wall flange and cause said flanges to adhere to each other.

7. Apparatus for the manufacture of a waterproofed paper receptacle having a flanged side wall and a flanged bottom closure, comprising a mandrel upon which the side wall and bottom closure are assembled with the side wall flange enclosing said bottom closure flange, a container for a coating substance, a shaft rotatably and slidably mounted through said container, and a seating device eccentrically mounted on said shaft and effective to slide through said container and take up and apply a coating to the bottom closure flange and to work said flange relative to the side wall flange with a weaving motion effective to cause said flanges to adhere to each other.

In testimony whereof I affix my signature in presence of two witnesses

WILLIAM EVERET BENSON.

Witnesses:

BARCLAY FERNALD,
MAY NOONAN.