

Jan. 14, 1936.

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2,027,484

METHOD OF MANUFACTURING PAPER BOTTLES

Filed May 5, 1934

3 Sheets-Sheet 1

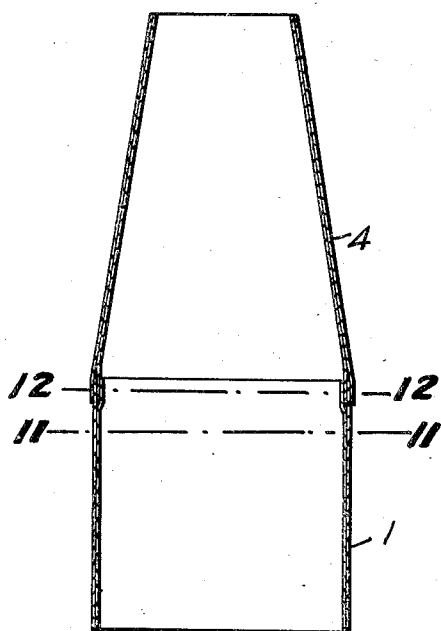


FIG. 1.

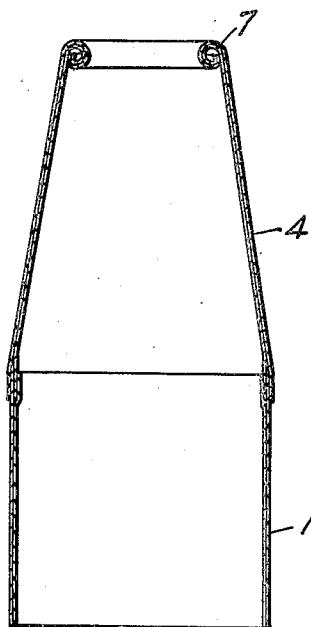


FIG. 2.

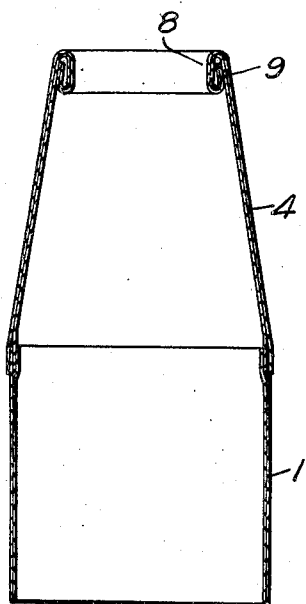


FIG. 3.

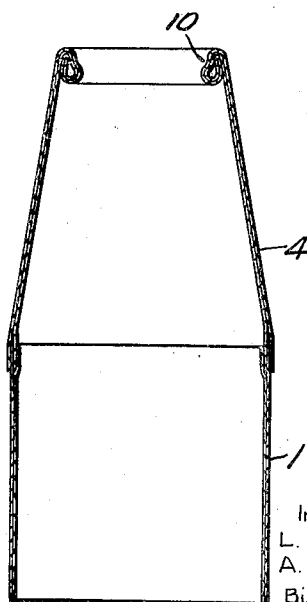


FIG. 4.

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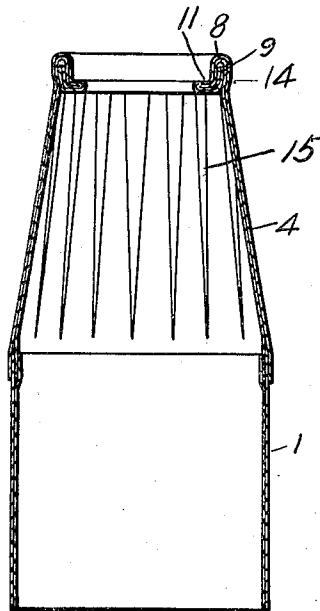


FIG. 5.

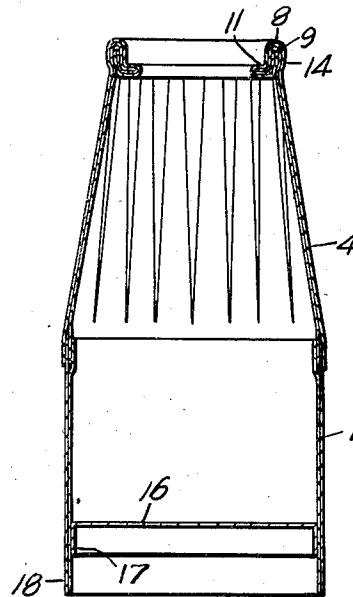


FIG. 6.

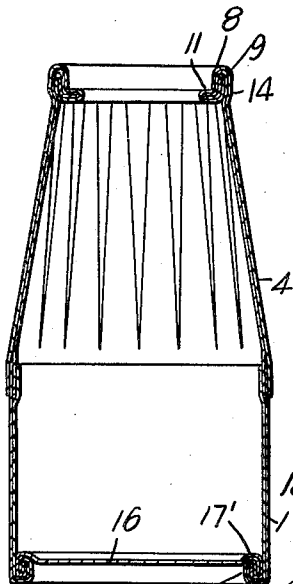


FIG. 7.

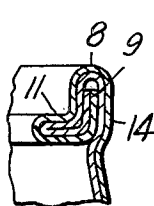


FIG. 9.

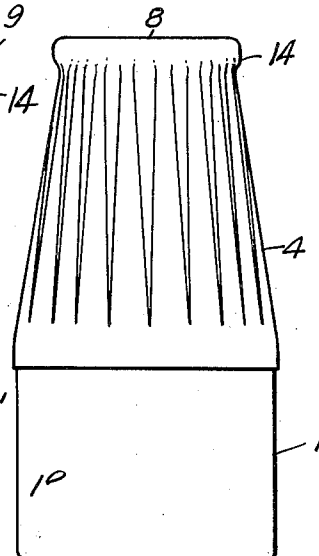


FIG. 8.

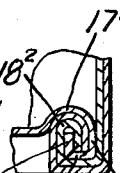


FIG. 10.

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3 Sheets-Sheet 3

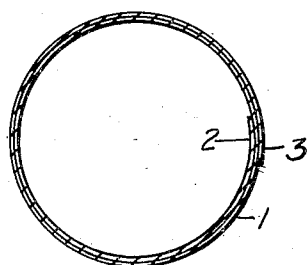


FIG. 11.

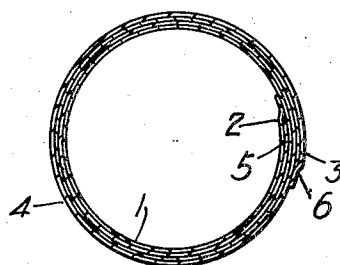


FIG. 12.

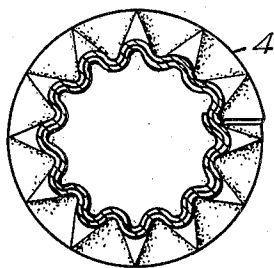


FIG. 13.

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METHOD OF MANUFACTURING PAPER
BOTTLES

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inforced Paper Bottle Corporation, New York,
N. Y., a corporation of Delaware

Application May 5, 1934, Serial No. 724,032

7 Claims. (Cl. 93—39)

Our invention relates to improvements in the method of manufacturing paper bottles and particularly to the method of forming up the mouth and neck end, the central portion and the bottom and it consists of the various steps hereinafter set forth.

The difficulty heretofore has been to produce a bottle in which the lip formed at the mouth would be strong and durable and form a perfect seat for the ordinary circular cap, to strengthen the neck so that there is no liability of its collapsing, to strengthen the mid section and to produce a bottle the bottom of which will be leak proof.

To overcome these defects or difficulties we follow the various steps which we shall presently describe.

Fig. 1 is a vertical section showing the first step of the method.

Fig. 2 is a similar section showing the first step in forming the mouth.

Fig. 3 is a similar view showing the second step in forming the mouth.

Fig. 4 is a similar view showing the third step in forming the mouth.

Fig. 5 shows the final step in forming the mouth.

Fig. 6 is a similar view to Fig. 5 showing the preliminary step in forming the bottom.

Fig. 7 shows the final step in forming the bottom.

Fig. 8 is an elevational view of the bottle complete.

Fig. 9 is an enlarged sectional detail showing the formation of the mouth and lip.

Fig. 10 is an enlarged sectional detail showing in the formation of the bottom.

Fig. 11 is a sectional plan showing the joint in the lower cylindrical portion on the line 11—11 Fig. 1.

Fig. 12 is a sectional plan showing the form of joint between the upper and lower portion of the bottle on the line 12—12 Fig. 1, and

Fig. 13 is a sectional plan showing the formation of the corrugated neck.

In the drawings like characters of reference indicate corresponding parts.

The present application is a continuation in part of application Serial Number 551,752 filed on the 18th of July, 1931, and the bottle is formed up of an arc shaped upper portion to form the neck and a rectangular blank to form the cylindrical lower portion of the bottle.

Both the arc shaped portion and the rectangular portion are wound upon themselves to

a double thickness, being secured by paste which is applied previous to being wound.

In our method we wind both portions together upon a mandrel, which it is not necessary to describe here, but it will be understood from Fig. 11 that the ends of the rectangular portion 1 when wound overlap each other as at 2 and 3 shown in Fig. 11.

At the same time that the rectangular portion is wound it necessarily follows that we wind the overlapping portion 4 which is tapered by reason of its being arc-shaped as set forth in application #551,752. The overlapping is at 5 and 6 as indicated in Fig. 12 and such overlapping 5 and 6 is radially opposite the overlaps 2 and 3 and thereby strengthens the bottle intermediate of its length as well as from the top to the bottom.

After this winding has been completed by the mandrel so that the bottle is in the form shown in Fig. 1, we then spin an annular curl as indicated at 7, Fig. 2.

Following this we further spin the top edge of the neck into oval form with a flat interior rim as indicated at 8, Fig. 3, with an upturned lip 9.

We then, by a suitable spinner, form an annular depression 10 in the flat interior rim 8 and at the same time shorten the depth of the rim, thus partially forming an annular ledge.

By further utilizing a spinner of suitable form, we are enabled to form a flattened ledge 11, the base of the rim 8 forming the flat bottom of the ledge and the end edge of the lip 9 remaining turned up behind the vertical portion of the rim and forming practically, therefore, a solid rim and edge.

Practically at the same time an annular outer enlargement 14 is formed and also the corrugations 15 which accentuate or help to form the annular enlargement and at the same time materially strengthen the neck portion of the bottle.

It will be understood that although we say that the annular enlargement and the corrugations are formed at the same time, the corrugations are affected by the mandrel being provided with ribs whereby the corrugations may be formed upon the completion of the annular enlargement and that such corrugations extending up into the annular enlargement thereby materially strengthen the neck and mouth of the bottle which is an important consideration.

After the neck portion has been formed up we then proceed to form the bottom. We insert the bottom 16 through the open bottom of the bottle, such bottom 16 being provided with

a depending flange 17. It is essential in order to produce a strong bottom and connection to the body of the bottle to be sure that the flange 17 is inserted a sufficient distance so that the bottom edge of the bottle may be interwound with the flange 17. The bottom edge of the bottle we designate 18. As the wall of the bottle is a double wall, or of a double thickness, and as the bottom is of a single thickness preferably, it is necessary to spin the bottom edge of the bottle first so that it forms a lower portion 18', an inner vertical portion 18'', and a depending portion 18''' which interlocks with the overriding edge portion 17' which is preferably an edge groove and which portion extends downwardly at 17' and then horizontally at 17'' and then vertically at 17''', at which latter point it extends up within the depending portion 18'''. Thus a complete interlock is formed which by spinning is rendered so close as to make the bottom completely leak-proof.

It may not be apparent that the steps of the method which we have described consecutively are essential but after a great deal of experiment we have found that they must be followed exactly in order to insure a perfect bottle being produced.

What we claim as our invention is:

1. The method of producing a paper bottle consisting in first winding the bottle into body form, inturning the upper edge of the upper portion into a curl circularly then inturning further to form a rim oval in cross section, then swedging further to complete the seat and simultaneously impress into the top of the body opposite the oval form an exterior circumferential reinforcement with longitudinal strengthening grooves and ribs extending up into the same.

2. The method of producing a paper bottle consisting in first winding the bottle into body form, inturning the upper edge of the upper portion into a curl circularly, then inturning further to form a rim oval in cross section, then swedging to form the inside of the rim into a partial seat, then swedging still further to complete the seat and simultaneously impress into the top of the body opposite the oval form an exterior circumferential reinforcement with longitudinal strengthening grooves and ribs extending up into the same.

3. The method of producing a paper bottle consisting in first winding the bottle into body form, inturning the upper edge of the upper portion into a curl circularly, then inturning further to form a rim oval in cross section, then swedging further to complete the seat and simultaneously impress into the top of the body opposite the oval form an exterior circumferential reinforcement with longitudinal strengthening grooves and ribs extending up into the same, then inserting into the open bottom a disc with a depending circumferential flange and finally spinning the lower edge of the bottom intimately into the flange so that the inner upturned edge of the flange of the bottom locks with the in-

turned upper end of the flange of the bottom edge of the bottle.

4. The method of producing a paper bottle consisting in first winding the bottle into body form, inturning the upper edge of the upper portion into a curl circularly, then inturning further to form a rim oval in cross section, then swedging to form the inside of the rim into a partial seat, then swedging still further to complete the seat and simultaneously impress into the top of the body opposite the oval form an exterior circumferential reinforcement with longitudinal strengthening grooves and ribs extending up into the same, then inserting into the open bottom a disc with a depending circumferential flange and finally spinning the lower edge of the bottom intimately into the flange so that the inner upturned edge of the flange of the bottom interlocks with the inturned upper end of the flange of the bottom edge of the bottle.

5. A method of producing a paper bottle as herein set forth consisting in winding a paper neck portion and a rectangular lower portion so that the edges of the blanks overlap each other and have the overlaps of the upper portion opposite the overlaps of the lower portion both inside and out, and so that the lower edge of the upper portion overlaps the upper edge of the lower portion, then spinning the top edge of the body first in an annular curl, then in a flattened annular rim, then in a contracted partially formed ledge and then in a complete ledge.

6. A method of producing a paper bottle as herein set forth consisting in winding a paper neck portion and a rectangular lower portion so that the edges of the blanks overlap each other and have the overlaps of the upper portion opposite the overlaps of the lower portion both inside and out, and so that the lower edge of the upper portion overlaps the upper edge of the lower portion, then spinning the top edge of the body first in an annular curl, then in a flattened annular rim, then in a contracted partially formed ledge, then in a complete ledge and then forming the annular enlargement and producing corrugations to reinforce it.

7. A method of producing a paper bottle as herein set forth consisting in winding a paper neck portion and a rectangular lower portion so that the edges of the blanks overlap each other and have the overlaps of the upper portion opposite the overlaps of the lower portion both inside and out, and so that the lower edge of the upper portion overlaps the upper edge of the lower portion, then spinning the top edge of the body first in an annular curl, then in a flattened annular rim, then in a contracted partially formed ledge, then in a complete ledge and then spinning the bottom so that the bottom edge of the body is curled up and intimately interlocked by the edge portion of the bottom hooking into the hooked upturned edge of the bottom edge of the bottle.

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