J. R. VAN WORMER.

PROCESS OF MAKING PAPER BOTTLES.

APPLICATION FILED DEC. 1, 1911.

1,083,263.

Patented Dec. 30, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

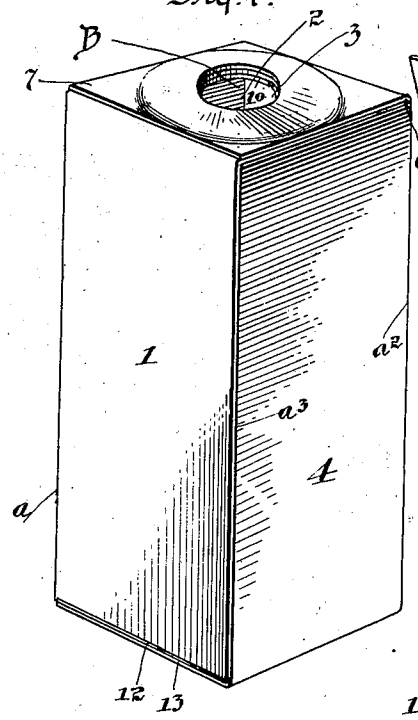


Fig. 2.

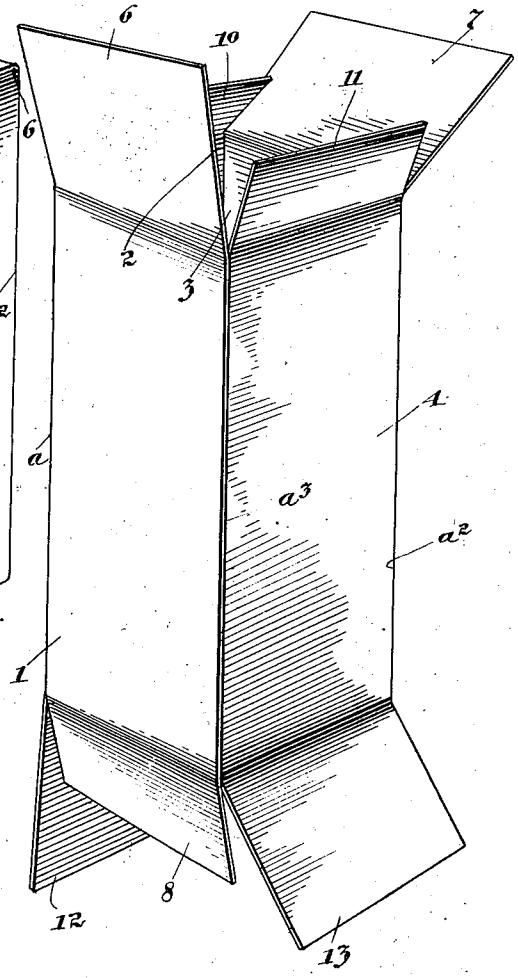
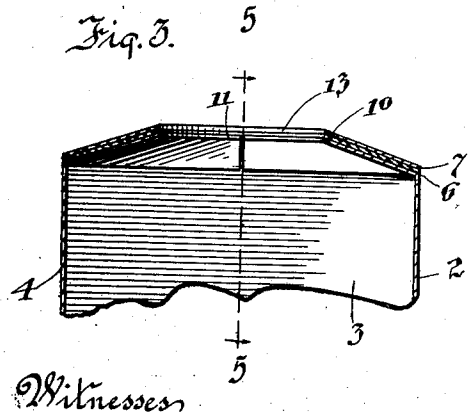


Fig. 3.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

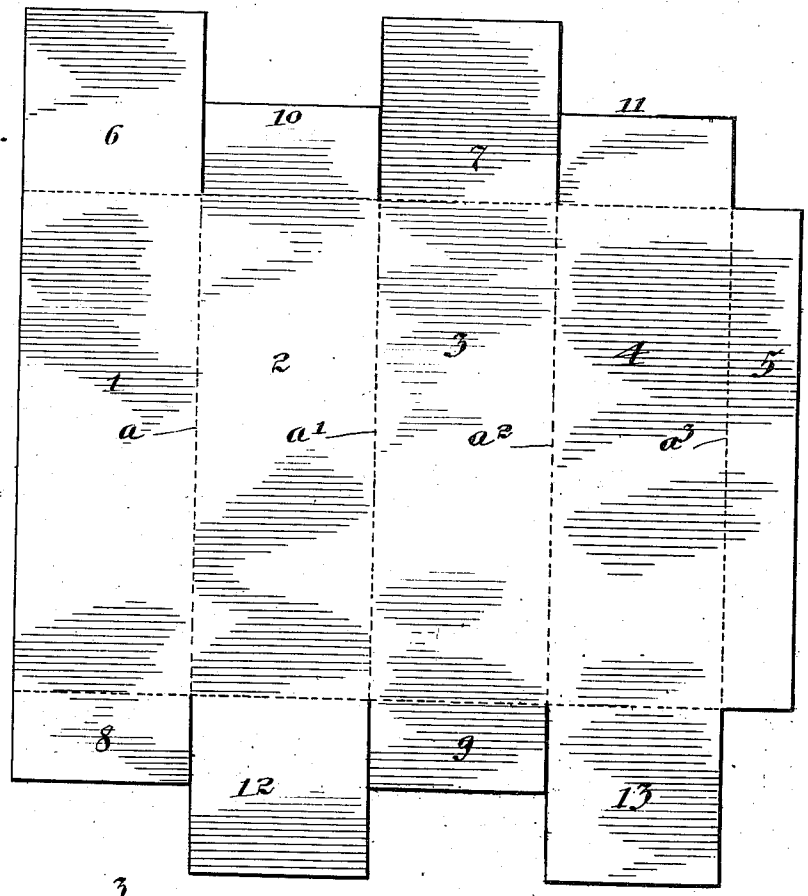


Fig. 5.

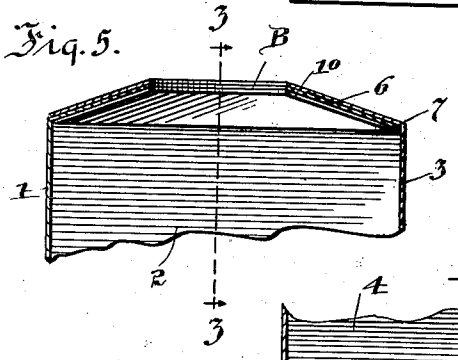
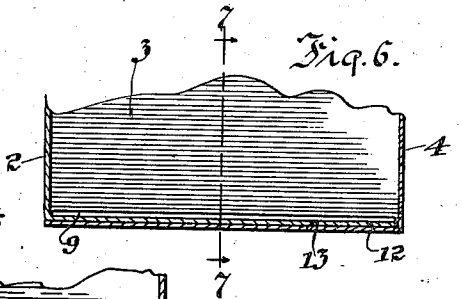


Fig. 6.



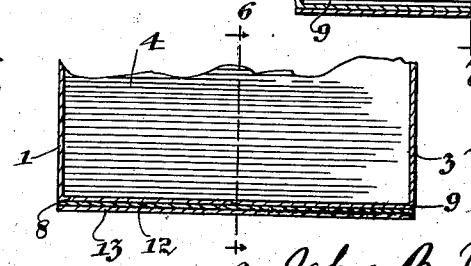


Fig. 7.

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PROCESS OF MAKING PAPER BOTTLES.

1,083,263. Specification of Letters Patent. Patented Dec. 30, 1913.

Application filed December 1, 1911. Serial No. 663,197.

To all whom it may concern:

Be it known that I, JOHN R. VAN WORMER, a citizen of the United States of America, and resident of Toledo, Lucas county, Ohio, have invented a certain new and useful Improvement in Processes of Making Paper Bottles, of which the following is a specification.

My invention relates to the manufacture of containers in general but more particularly to containers or receptacles made of paper, and more especially to those that are adapted for use as milk bottles.

The object of my invention is to provide a process or method of manufacture whereby a paper blank may be folded and secured together to form a square bottle having a flat bottom and a top with an opening therein, involving the use of pressure on the inner and outer surfaces of the bottom in gluing or otherwise fastening the flaps thereof in place, which internal pressure is exerted over an area greater than the area of said opening, whereby the medium for producing the internal pressure must be capable of expanding after it is introduced into the container through said opening, or at least of contraction to pass out of said hole, and whereby a paper milk container is made with a restricted mouth through which paraffin or the like may then be introduced to seal all of the cracks and render the bottle capable of use for holding milk or other liquids, the exterior of the bottle being similarly treated to give it a waterproof surface.

The nature and advantages of my improved process will, however, hereinafter more fully appear.

In the accompanying drawings—Figure 1 is a perspective of a paper container or milk bottle of the kind produced by my improved process. Fig. 2 is a perspective of the blank partially folded. Fig. 3 is a detail vertical section of the upper end of the finished bottle on line 3—3 in Fig. 5. Fig. 4 shows the blank spread out flat. Fig. 5 is a section on line 5—5 in Fig. 3. Fig. 6 is a vertical section of the bottom or lower portion of the bottle on line 6—6 in Fig. 7. Fig. 7 is a vertical section on line 7—7 in Fig. 6.

As thus illustrated, the blank A has four parallel score lines a, a', a^2 and a^3 which divide the blank into five sections 1, 2, 3, 4 and 5. The sections 1 and 3 have their ends provided with long and short flaps 6, 7, 8, and 9, and the sections 2 and 4 have their ends provided with short and long flaps 10, 11, 12 and 13. When folded, the sections 1, 2, 3 and 4 form the sides of the bottle, the narrow section 5 being glued inside of the section 1. The flaps 10 and 11 are folded inward, and the flaps 6 and 7 are then folded upon each other, thus forming a three-ply top for the bottle, the hole B being cut or punched at the same time, or afterward if desired, and the material being pressed upward to form a raised area around the said hole, as shown in Figs. 1 and 3. This raising of the top can be done at any time, as, for example, when the gluing is done, or when the punching is done, or at a different time. The flaps 8 and 9 are then folded inward, and the flaps 12 and 13 are then folded upon each other, thus forming a three-ply bottom. Afterward, the bottle thus made is treated inside and out with paraffin or the like.

Now, as the container is to be used as a milk bottle, it is evident that the bottle must be made and fully completed before the contents is poured in or otherwise introduced through the top opening or mouth. It becomes a problem, therefore, how to exert internal weight or pressure sufficient for gluing or otherwise securing the top and bottom flaps together, and this is especially true of the bottom. While the top is being made, the bottom is entirely open, and it is comparatively easy to glue the flaps and punch the hole in practically one and the same operation, or the hole can be made afterward, as the machine has easy access for this purpose through the open bottom of the bottle. Also, it is possible to form the raised area around the mouth of the bottle, as access to the interior of the bottle at this time may be had through the bottom. With the bottom, however, the situation is different, as when this is made the bottle is closed except for the opening B in the top, and this opening is of less area than the area or extent of internal pressure necessary on the bottom to produce the desired result. My invention contemplates, therefore, the introduction through the restricted mouth or opening B of a pressure means or medium which will expand and exert pressure over the inner surface of the bottom to an extent greater than the area of the opening. For this purpose shot or the like can be used, these small objects

being introduced through the said opening and then allowed to expand over the inner surface of the bottom of the bottle. Other medium, such as compressed air, mercury, or even a mechanical device or expanding tool which will open up or enlarge after passing through the said opening, can be used if such is desirable and expedient. Having thus supplied a pressure over the inner surface of the bottom, or over a portion thereof which is of greater area than the opening B, a counter pressure from the outside can now be exerted on the bottom to compress the flaps together with glue or other adhesive between them. After this, the bottle is then ready for treatment with paraffin or the like.

In this way I am enabled to produce a square paper container having a small or restricted mouth and adapted for use as a milk bottle. As the mouth or opening is comparatively small, it is practical and possible to seal it effectively, in any suitable manner, after the bottle has been filled with milk or other liquid. Thus a perfect and inexpensive bottle is made from a single paper blank.

An important consideration of my improved process is the paraffining of the container after it is made and fastened together. In this way a container made from a single folded paper blank, and previously of a character not suitable for holding liquids, is produced for satisfactory use as a milk bottle. The paraffining must be internal as well as external, and hence the flaps must all be in place before this part of the process is carried out. The top is, therefore, as explained, made first to provide a permanent opening through which pressure can be introduced to hold the bottom flaps in place while the latter are being glued or otherwise fastened together.

The form of the blank shown economizes the paper, as there is less waste when the blank is cut with the long flaps at one edge opposite the short flaps at the other edge. It will also be seen that the shot or other medium can be introduced through the bottom while the latter is still open. In any event, though, the pressure means must pass out through the hole or opening in the top.

As shown, the top and bottom are each formed by three layers glued or pasted together, whereby each end wall of the bottle is three-ply in thickness throughout the area thereof. The punching or cutting of the mouth of the bottle, after the top is made, produces an opening with a clean and true edge, which is important in the subsequent sealing of the bottle. This punching or cutting is done, of course, while the bottom is open to afford access to the interior of the bottle for this purpose. The pressure means for forming the bottom is not introduced into the bottle until after the top is made and the said opening formed therein. It is the compression of the three bottom layers flatwise between the external and internal pressure that produces the desired result, which is the last step. Then the bottle with flat sides of one thickness and top and bottom of three thicknesses each is paraffined inside and out in any suitable manner.

What I claim as my invention is:

1. The process of making a container, such as a paper milk bottle having a top provided with a restricted mouth of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom, which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, the internal pressure being exerted over an area larger than the area of the said mouth, and then removing the internal pressure through said month.

2. The process of making a container, such as a paper milk bottle having a top provided with a mouth of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom, which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, the internal pressure being exerted over an area larger than the area of the said mouth, by pressure means introduced through said mouth and expanded within the container, and then removing the internal pressure through said mouth.

3. The process of making a container, such as a paper milk bottle having a top provided with a mouth of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom, which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal pressure being exerted over an area larger than the area of the said mouth, removing the internal pressure through said mouth, and then providing the container inside and out with a suitable coating.

4. The process of making a container, such as a paper milk bottle having a top provided with a mouth of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom, which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, the internal pressure being exerted over an area larger than the area of the said mouth, removing the internal pressure through said mouth, and then applying melted paraffin to the inner and outer surfaces of said container.

5. The process of making a container, such as a paper milk bottle having a top provided with a mouth of less area than the bottom of said bottle, which comprises the cutting and folding of the blank to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom, which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, the internal pressure being exerted over an area larger than the area of the said mouth, and then removing the internal pressure through said mouth, the said flaps being thus subjected to compression with an adhesive between their opposing surfaces.

6. The process of making a container, such as a paper milk bottle having a top provided with a mouth or opening of less area than the bottom of said bottle, which comprises the folding of the blank to form the sides of the container, securing certain flaps together to form the said top, by an operation requiring the introduction and withdrawal of pressure means through the said bottom which is still open to afford access to the container for this purpose, punching the said opening in the top, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, the internal pressure being exerted over an area larger than the area of the said opening, and then removing the internal pressure through said opening.

7. The process of making a container, such as a paper milk bottle having a top provided with a mouth or opening of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, the internal pressure being exerted over an area larger than the area of the said mouth, by pressure means introduced and expanded within the bottle after the completion of the said top, and then removing the internal pressure through said mouth.

8. The process of making a container, such as a paper milk bottle having a top provided with a mouth or opening of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, and then removing the internal pressure through said mouth.

9. The process of making a container, such as a paper milk bottle having a top provided with a mouth or opening of less area than the bottom of said bottle, which comprises the cutting and folding of the paper to form the sides and mouth of the container, the said top being produced by an operation requiring the introduction and withdrawal of pressure means through the said bottom which is still open to afford access to the interior of the container for this purpose, folding the flaps for the bottom and securing the same together by internal and external pressure thereon, by pressure means inserted through the said mouth, and then removing the internal pressure through said mouth.

10. The process of making a bottle, which comprises the folding of a blank to form the four flat sides of the bottle, folding the flaps for the top, punching or cutting a mouth in the said top, and then securing the bottom flaps together by an operation including the use of internal pressure, involving the introduction and withdrawal of the pressure means through said mouth.

11. The process of making a bottle, which includes the folding of a blank to form the sides of the bottle, folding certain flaps to form the top, and then making the mouth of the bottle by punching or cutting out a disk to form the said top from an opening having a clean and true edge, by an operation requiring access through the bottom of the bottle which is still open for this purpose.

12. The process of making a bottle with a restricted mouth in the top thereof, which

comprises the cutting and folding of sheet material to form the said mouth and the four flat sides of the bottle, and then securing the bottom flaps together by an operation requiring the introduction of pressure means through one end of the bottle and the withdrawal of the same through said mouth.

13. The process of making a bottle with a restricted mouth in the top thereof, which comprises the cutting and folding of sheet material to form the said mouth and the four flat sides of the bottle, the flaps for the said top being secured together by an operation including access through the bottom of the bottle which is still open for this purpose, and then securing the bottom flaps together by an operation requiring the introduction of pressure means through one end of the bottle and the withdrawal of the same through said mouth.

14. The process of making a bottle, which comprises the folding of a blank to form the flat sides of the bottle, folding the flaps for the top, punching or cutting a mouth in the said top, and then securing the bottom flaps together by an operation including the use of internal pressure, involving the introduction and withdrawal of the pressure means through said mouth.

15. The process of making a bottle with a restricted mouth in the top thereof, which comprises the cutting and folding of sheet material to form the said mouth and the flat sides of the bottle, and then securing the bottom flaps together by an operation requiring the introduction of pressure means through one end of the bottle, and the withdrawal of the same through said mouth.

16. The process of making a bottle, which comprises the folding of a blank to form the four flat sides of the bottle, folding the flaps for the top, punching or cutting a mouth in the said top, and then securing the bottom flaps together by an operation including the use of internal pressure, involving the introduction and withdrawal of the pressure means through said mouth, the making of the said top also requiring access through the bottom of the bottle to form a raised area around the said mouth.

17. The process of making a bottle with a mouth in the top thereof, which comprises the cutting and folding of a blank to form the mouth and four flat sides of the bottle, and then securing the bottom flaps together by an operation requiring the introduction of pressure means through one end of the bottle and the withdrawal of the same through said mouth, the making of the said top also requiring access through the bottom of the bottle to form a raised area around the said mouth.

18. The process of making a bottle, which comprises the folding of a blank to form the four flat sides of the bottle, folding the flaps for the top, punching or cutting a mouth in the said top, and then securing the bottom flaps together by an operation including the use of internal pressure involving the introduction and withdrawal of the pressure means through said mouth, and then introducing a water-proof substance through said mouth to coat the interior of the bottle.

19. The process of making a bottle with a restricted mouth in the top thereof, which comprises the cutting and folding of a blank to form the said mouth and the four flat sides of the bottle, and then securing the bottom flaps together by an operation requiring the introduction of pressure means through one end of the bottle and the withdrawal of the same through said mouth, and then introducing a water-proof substance through said mouth to coat the interior of the bottle.

20. The process of making a bottle having a restricted mouth in the top thereof, which includes the punching and folding of a blank to form the sides and top of the bottle, said punching serving to make holes in the blank for the mouth of the bottle, folding and securing together certain flaps to form the permanently closed bottom of the bottle, by pressure means introduced through one end of the partially formed bottle, after the completion of the top thereof, and withdrawing said means through said mouth.

Signed by me at Monroe, Michigan, this 27th day of Nov. 1911.

JOHN R. VAN WORMER.

Witnesses:
GEORGE K. DENTET,
ALBERT G. WUEST.