H. A. HOUSE.

PROCESS FOR THE MANUFACTURE OF PAPER RECEPTACLES OR DRINKING VESSELS OR CUPS.

APPLICATION FILED JUNE 20, 1913.

1,189,822. Patented July 4, 1916.

Fig: 1.

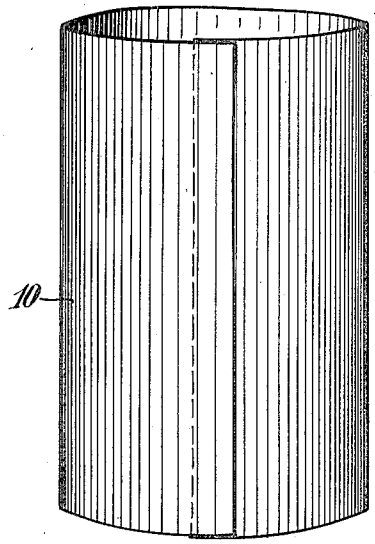


Fig: 2.

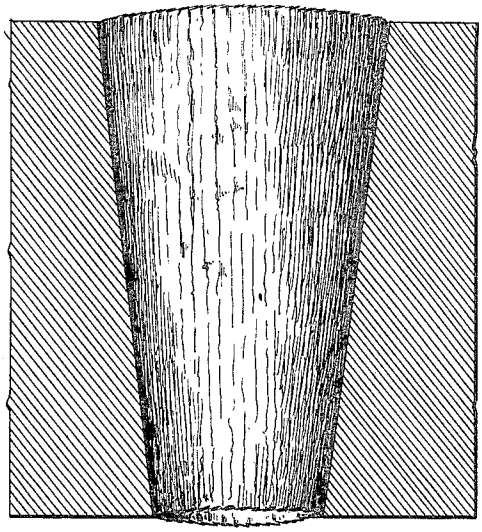


Fig: 3.

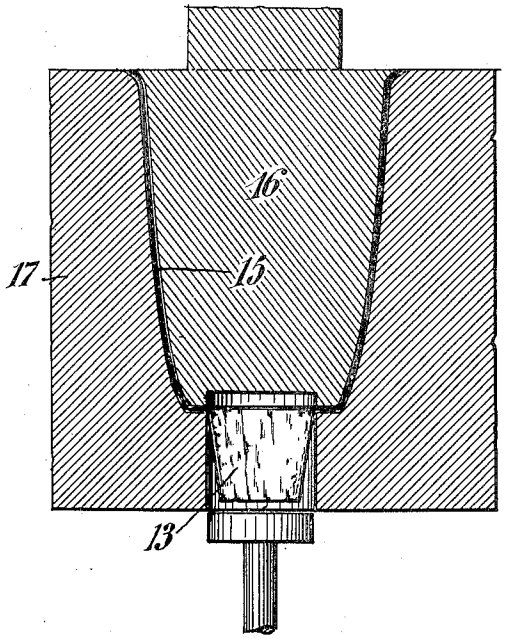
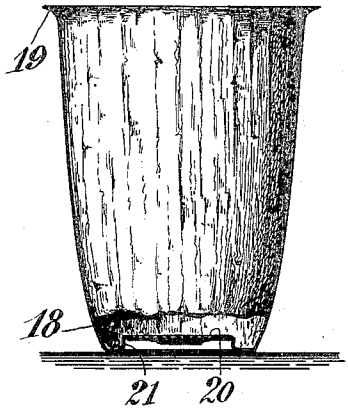


Fig: 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PROCESS FOR THE MANUFACTURE OF PAPER RECEPTACLES OR DRINKING VESSELS OR CUPS.

1,189,822. Specification of Letters Patent. Patented July 4, 1916.

Application filed June 20, 1913. Serial No. 774,768.

To all whom it may concern:

Be it known that I, HENRY A. HOUSE, a citizen of the United States, residing in Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Processes for the Manufacture of Paper Receptacles or Drinking Vessels or Cups, of which the following is a specification.

This invention relates to process for manufacturing paper receptacles to be used for drinking cups or the like made of one piece of paper, and has for its object to provide an improved cup of simple construction and great durability, especially at the bottom thereof.

The invention comprises for this purpose a drinking cup made of a single strip or sheet of paper joined at its adjacent edges and then crimped or fluted to tapering form, and moistened, heated and compressed into cup form, with the lower part upset on itself to form a bottom of several thicknesses.

In the accompanying drawing, Figure 1 shows a piece of paper folded into position with the free edges abutting to form a cylinder, Fig. 2 is a perspective view of the folded paper after crimping, and showing a portion of the crimping mold in cross-section, Fig. 3 is a section of the paper after molding to shape, and Fig. 4 is an elevation of the cup produced after upsetting the lower portion to form the reinforced bottom, and showing the cup ready for use, showing the bottom in section.

Similar letters of reference indicate corresponding parts throughout the various figures.

In the drawings, the plain sheet 10 of paper forms the basis of the cup, which sheet is cut off from a roll of stock paper and folded on itself as shown, to form a cylinder. This paper may be of any desired thickness and quality, suitable for the purposes intended. The sheet 10 is crimped or fluted by a suitable machine or other means into approximately the conical form shown in Fig. 2. The crimping is so done that a greater gathering of the material is produced at the lower part than at the upper, hence the sheet is given a conical shape, converging as shown. The fluting or crimping may be done so that the paper is crimped regularly, or irregularly, in minute folds, thus producing a crimped sheet of smaller diameter than the original uncrimped sheet. From this open-ended, conical member of crimped paper, the cup is produced by application of moisture, heat and pressure, followed by an application of waterproofing material, such as paraffin.

Any suitable dies may be employed for exerting the heat and pressure on the crimped paper cone, according to the form which it is desired the cup shall have. One such set of dies is shown in Fig. 3. The cone 15 to be worked is of greater height than the walls of the vessel to be made, hence extends and is folded upon itself at the bottom end 13 so as to form said bottom. Before compression, the cone is moistened with water, or with any suitable size or other liquid adapted to penetrate the paper and cause the same to readily yield and adapt itself to the mold, and to assist in causing the several layers of the cone-wall to cohere and form a substantially homogeneous mass after compression. The moistened cone is compressed between the dies 16 and 17, which are at the same time heated to any suitable temperature, and any desired pressure is exerted. By the combination of moisture, considerable heat, and high pressure, the paper sheet is reduced to a substantially homogeneous mass composed of a single layer of hard material of the desired shape, the crimping enabling the member to be readily formed into shape, since it permits expansion at the top and bottom as required.

The heat and pressure are continued as long as desirable for causing the cup to have permanent form, after which it is removed from the dies and provided with a coating 18 of waterproofing material, such as paraffin, which protects the material of the cup against wear and moisture, and strengthens the cup, particularly at the rim where it forms a strengthening bead 19.

The cup at the bottom has a raised or offset portion 20, which is struck up by the dies, and by reason of the upsetting of the lower end of the cup, increases the total thickness of the bottom, and adds to the strength of the cup at the base and by providing a recess 21 enables the cup to be set securely on uneven surfaces, thus increasing its stability.

It is obvious that the cone may be made so as to extend from the sides over only a

portion of the bottom, instead of over the whole, as described. When this is the case, a separate bottom of paper, composed of several layers, may be placed at the bottom of the die, and becomes welded to the sides of the vessel during the application of heat, moisture, and pressure, to the whole.

Owing to the uniform distribution of paper in the wall, less paper is required, the saving being approximately one-half, over plaited cups. Less machinery and that of a more simple character, is required, than for the manufacture of plaited cups, thus saving largely in cost of manufacture and enabling the cups to be used for purposes for which they were otherwise not available.

I claim:

1. In the art of making paper receptacles, the method which consists in folding a flat piece of paper to cylindrical form of greater length than the paper receptacle, molding said member to partial shape by application of moisture, heat and pressure to form the sides and the outer part of the bottom, with a part of the member extending in unformed condition beyond the so molded outer part of the bottom, and then upsetting this unformed part back on itself to complete the bottom.

2. In the art of making paper receptacles, the method which consists in folding a flat piece of crimped paper to cylindrical form of greater length than the paper receptacle, molding said crimped member to partial shape to form the sides with one end thereof to an open flared lip, and the other end thereof to the outer part of the bottom, with a part of the member extending in unformed condition beyond the so-molded outer part of the bottom, then upsetting this unformed part back on itself to complete the bottom, and coating the whole with a preserving material.

3. In the art of making paper receptacles, the method which consists in folding a flat piece of crimped paper to cylindrical form of greater length than the paper receptacle, molding said crimped member to partial shape with the bottom thereof open, and a part of the member extending beyond the bottom in unformed condition, a length greater than the radius of the opening remaining in the bottom, and then upsetting the unmolded and unformed part back on itself to close the opening and form a reinforced bottom.

4. In the art of making paper receptacles, the method which consists in folding a flat piece of crimped paper to cylindrical form of greater length than the paper receptacle, molding said crimped member to partial shape to form an annular portion forming part of the bottom, with the portion within the annular portion open, and a part of the member extending beyond the annular portion in unformed condition, a length greater than the radius of the opening remaining in the bottom, and pressing said upset portion inwardly to form a circular dished portion inwardly of the annular portion of the bottom first formed.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

HENRY A. HOUSE.

Witnesses:
JOHN MURTAGH,
F. HOGG.