H. A. HOUSE.

Manufacture of Flanged Articles of Paper.

No. 209,686. Patented Nov. 5, 1878.

Fig. 1.

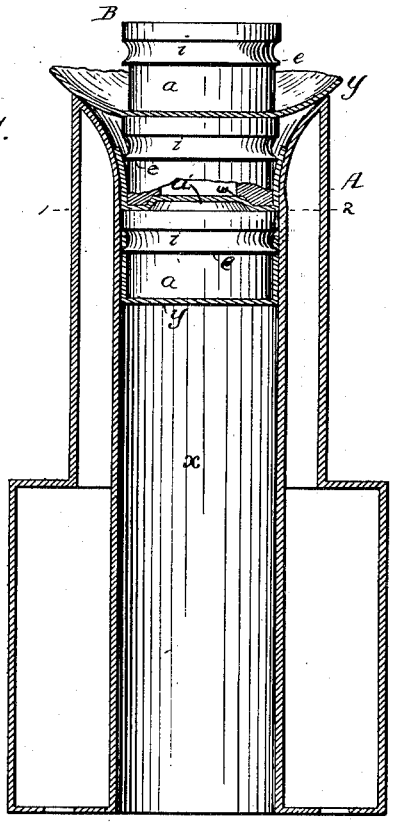


Fig. 2.

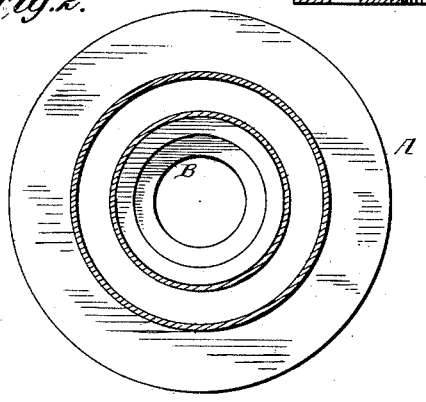
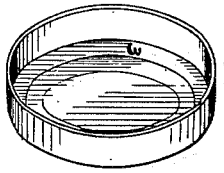


Fig. 3.



Attest:
Courtney A. Cofper
Ed Welsh

Inventor
Henry A. House
By his attorney
Charles E. Foster

UNITED STATES PATENT OFFICE.

HENRY A. HOUSE, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN MANUFACTURE OF FLANGED ARTICLES OF PAPER.

Specification forming part of Letters Patent No. **209,686**, dated November 5, 1878; application filed July 23, 1878.

To all whom it may concern:

Be it known that I, HENRY A. HOUSE, of Bridgeport, Fairfield county, Connecticut, have invented Improvements in the Manufacture of Flanged Articles of Paper, &c., of which the following is a specification:

My invention has for its object to produce articles of paper, or of paper and other material combined, (as, for instance, shallow box-lids, &c.,) drawn from a single sheet of material, with a flange at right angles to the bottom or top.

Heretofore such articles have been produced by forcing disks of paper through circular dies, or by uniting strips of paper to the edges of disks.

The first mode of manufacture will frequently tear or break the paper, and the article formed will not retain its shape, but flattens under the action of moisture. Moreover, the flange is irregular in thickness from the folding or wrinkling of the material as the flange is termed up, so that the articles can only be used for rough, cheap goods.

The second mode of manufacture is expensive, and produces an article lacking in strength, durability, and finish.

In order to produce a neat, strong, and durable article, I subject disks of the material to the action of heated drawing-dies, as described hereinafter, and illustrated in the accompanying drawing, forming part of this specification, and in which—

Figure 1 is a sectional elevation, illustrating one form of apparatus which may be used; Fig. 2, a transverse section on the line 1 2, Fig. 1; Fig. 3, a perspective view, showing a box-lid completed.

The material employed may be paper of any suitable texture, thickness, or quality, or paper and veneer, or other material, or a suitable composition—as for instance, paper-pulp or papier-maché combined with clay and rubber cement formed into sheets. Whatever be the material, it is first cut into pieces of the proper shape, and then, preferably after being dampened, subjected to the action of the dies or formers.

A stationary die, A, and a series of movable dies, B, are shown in the drawing, the stationary die A being secured to any suitable support, and having a central opening, *x*, flaring at the mouth, corresponding in shape and width with that of the article to be made. The die A is hollow throughout the whole or part of its extent, to receive superheated steam, or is provided with any suitable appliances, as gas-jets, for heating the same.

The dies B consist each of a ring or block having an extension, *a*, corresponding in size and shape with the interior of the article to be formed; and above the extension *a* are a sharp-edged rib, *e*, and a recess, *i*, for a purpose described hereinafter.

The disk *y*, of material to be formed into a box-lid or other article, is placed on the end of the die A, above the flaring mouth, and one of the dies B is placed centrally on the disk. Another disk *y* is then placed on the first die B, and another die B upon the last disk, and so on. The dies B are now forced downward, when the lower disk *y* will be carried into the flaring mouth of the opening *x*, and its edges will be thereby drawn or turned up. As the parts pass into the opening *x* any projecting portions of the turned-up edge more than is required to envelop the portion *a* of the die will be caught between the edge of the rib *e* and the side of the opening *x* and severed, the loose portion being received by the recess *i*. Each disk, successively, is thus turned up at the edge and trimmed as the dies pass downward, and the flanges thus formed are compressed, heated, dried, planished, condensed, and set in their shape between the two dies as the movements are continued, so that as each passes from the lower end of the die A the flanged article is complete.

The article thus made is distinguishable from those made in the ordinary modes by being generally in a single piece, by the absence of creases or wrinkles in the flange, and by the smooth planished outer surface and the stiffness of the flange.

It will be apparent that by treating the paper with shellac or equivalent sizing-solution before drawing, greater stiffness will be imparted to the article, the gum being melted and aiding in imparting "set" to the material.

In some instances the paper may be slit or

cut at the edges before folding; but this is more suitable for the manufacture of box-bodies, requires, generally, additional apparatus, and will be fully described in another application for Letters Patent for the manufacture of boxes.

Although I have shown apparatus adapted to make circular articles, the process is not confined to this shape, nor to articles having flanges of any particular depth, the latter depending upon the character of the material and its capacity to condense and support the strain. It will be apparent, however, that, by the use of dies constructed as described, there is little strain tending to tear the flange from the head, owing to the fact of the flange having its bearing at the edge against the under side of the rib *e*, which therefore forces the flange with the body without there being any action tending to separate the two.

A greater planishing effect may be obtained by turning the dies B as they descend, which may be done by making corresponding recesses in the tops and bottoms of the dies *a*, which emboss but do not break the material between them, and there imparting a twist to the last block of the pile.

It will be obvious that but a single block may be used; but more than one is much preferable, as a better set is imparted to the articles compressed between the blocks.

In order to give greater rigidity to the article, each die or block *a* may be provided at the top with a projection, *a'*, Fig. 1, and at the bottom with a corresponding recess, so as to form a depression and an abrupt shoulder or inner flange, *w*, in the top of the article. This inner flange, *w*, being molded under heat and pressure, possesses considerable stiffness and greatly increases the rigidity of the article, so that it is much better adapted for the purposes to which it is to be applied.

I claim as my invention—

1. The within-described mode of forming flanged articles of paper or other materials—that is, by drawing a sheet of material through a hollow heated die over a traversing former, upon which the edge of the material is folded to form the flange, and on which it remains during the passage of the same through the stationary die, as specified.

2. The mode of forming flanged articles, consisting in passing a series of independent dies, B, one after another, with intervening sheets of material, through the die A, substantially as specified.

3. The within-described flanged articles of paper or equivalent material, made of one piece with a flange, planished, and of uniform thickness, as set forth.

4. The die B, provided with a projection, *a*, corresponding in form with the article to be drawn, and with a rib, *e*, adapted to pass through the outer die, for the purpose set forth.

5. The die provided with a sharp-edged rib, *e*, and recess *i*, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY A. HOUSE.

Witnesses:

GEORGE A. BISHOP,

HARRY A. HOUSE.