

# UNITED STATES PATENT OFFICE.

EDWARD S. JUDGE, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN THE MANUFACTURE OF DOLL-HEADS, &c.

Specification forming part of Letters Patent No. **166,111**, dated July 27, 1875; application filed June 18, 1875.

*To all whom it may concern :*

Be it known that I, EDWARD S. JUDGE, of Philadelphia, county of Philadelphia and State of Pennsylvania, have invented certain Improvements in the Manufacture of Doll-Heads and other articles of papier-maché, of which the following is a specification :

My invention relates to a process of treating paper with paste, in combination with mechanical action, in order to reduce it to such a plastic condition that it can be molded with correctness and sharpness of outline into doll-heads and other like structures.

That process is as follows: Take paper of about the thickness of commercial writing-paper, preferably, of the kind known as Manila paper, almost, if not entirely, unsized, and of medium length of fiber, and coat one side of a sheet of it with any suitable viscid paste, when warm, by means of a brush or other suitable implement or machine; then lay another sheet that is dry upon the coated side of the first; then coat the upper side of the second sheet in a similar manner; then lay on a third dry sheet, and coat it likewise until the pile of sheets shall be as thick as may be requisite for the article to be molded. For convenience of handling, the top and bottom sides of the pile may be left free from paste. For this purpose I should prefer a paste made of about one pound of good glue dissolved in twelve pints of water, to which should be added, say, six pounds of wheat-flour, one pound of Manila-paper pulp, and a sufficient quantity of gilder's whiting to give the whole mixture the thickness requisite for the paste, and then may be added one gill of carbolic acid. But any other gelatinous viscous composition will answer the purpose, which is, that the sheets may be allowed to slip over each other in the operating of molding, wherein the paper saturated with paste will be forced into the depressions of the die of the molds. The condition of the paper, which allows the sheets to slip easily over each other, together with the elasticity imparted to the sheets by the paste, enables the paper to be forced into irregularities of the matrix without much tearing of the sheets, the paste fills up such internal breaks and interstices as may be

made in the act of molding, and the outer surface of the doll-head is left even and smooth.

The pile of sheets when prepared with paste, as above specified, will be allowed time to cool, but not to dry; and, to prevent the material from adhering to the molds, both sides of the pile may be dusted over with whiting or pulverized soap-stone. This dusting over is not an essential part of my process, however. Then the whole pile should be thoroughly manipulated and crushed to render the paper uniformly supple and soft without tearing it. By manipulation and crushing I mean the bending and forcing the pile into a variety of shapes with the hands, folding it up into the form of a cube, or a globe, and then unfolding it and forming with it other shapes, so that the paper will become thoroughly pliable and thoroughly saturated with the paste; but this mechanical treatment may precede the application of the paste, and in such case the paste will the more readily penetrate the paper, which should by no means be torn. This operation will cause it more readily to enter into the depressions in the matrix, and result in sharp outlines in the figures cast. Portions are then taken off from the entire thickness of the pile, which may range in thickness from three sheets upward, and placed in a die taken from a model of a doll-head, (or other article to be cast,) and then by means of a core placed upon the material, and sufficient force applied, the cast is made.

I cast my doll-heads in two parts or sections, the front part of the head in one, and the back part in the other. The two sections are united by a lap-joint, the joining-edge of one entering within the joining-edge of the other, the entering section being provided with a margin of from a quarter of an inch to an inch in width for that purpose. The margin of this section need not be trimmed at all, but the margin of the inclosing section is trimmed or shaved down to a feather edge by means of steel cutters or punches formed to correspond with the irregularities of the outline of the margin of the section. The two sections are then cemented together by means of strong thick glue or other quickly-acting cement, and the head will be almost as neat and strong

as if it was cast in one piece. Neither the treatment of the paper before molding nor the cementing the sections together requires much waiting, or waste of time. After paper is treated, it requires but a little time to cool, and before the joining of the sections it will be only necessary to allow them a short time to become partially dry.

I am aware that long ago articles have been manufactured of paper in layers or thicknesses of it, and cemented in various ways, and that Benedict Albano, of London, in the year 1844, obtained an English patent for a method or process of that character. But my process of treating the paper and making the casts and cementing them together are entirely different from his in all substantial particulars, and requires much less time, labor, and expense.

I am also aware of the American patent of Ludwig Greiner, dated March 30, 1858, for "a new and improved mode of making doll and other figure-heads." But Greiner's process is an entirely different one from mine, and I therefore disclaim it.

I am also aware that doll-heads have been made of a dough or putty composed of wheat flour, glue, and paper-pulp, which is pressed with the fingers into molds, and I disclaim this process also; but—

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The process of treating paper with paste, and bending, wrinkling, and folding without crushing it to render it uniformly supple and pliable for molding it into sections of doll-heads, and other like structures, substantially as set forth.

2. As a new article of manufacture, a doll-head made of sheets or layers of paper laid one upon another, manipulated and treated as herein described, cemented, pressed and molded into form, in sections, such sections being united to form the completed head, substantially as described.

EDWARD S. JUDGE.

Witnesses:

P. O. DONNELL,  
JOHN REIF.