

*Hulbert & Follett,
Hat.*

No. 81089.

Patented Aug. 18. 1868.

Fig. 1.

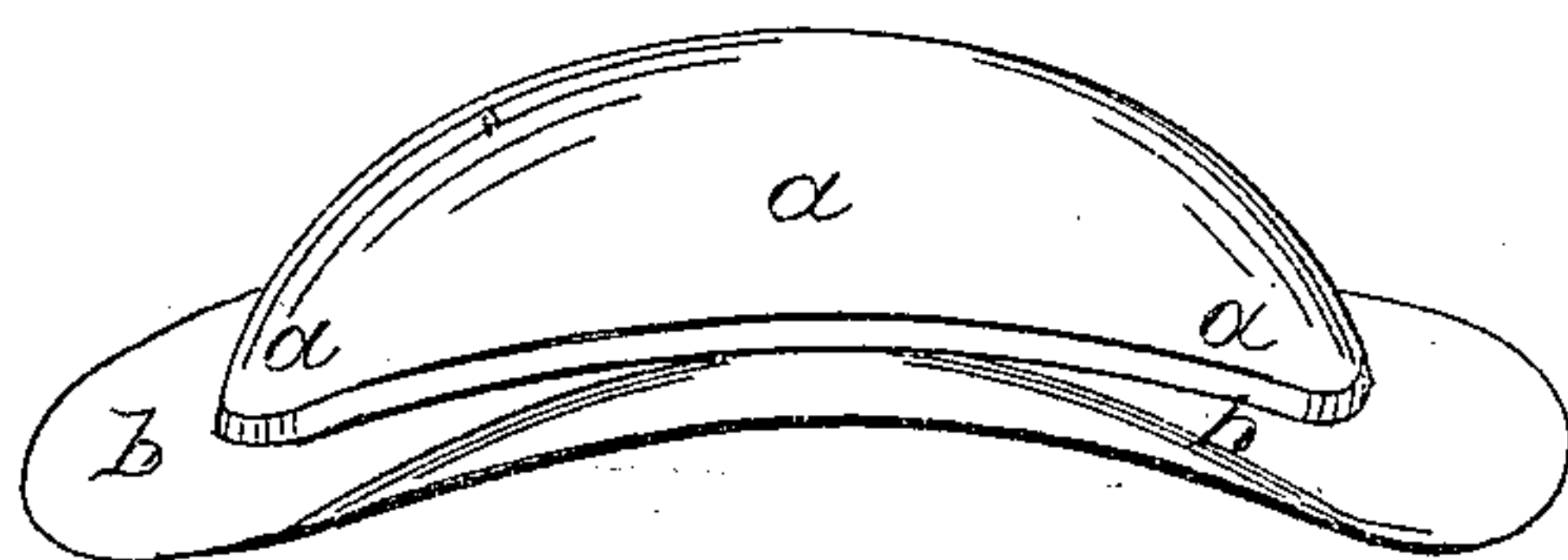
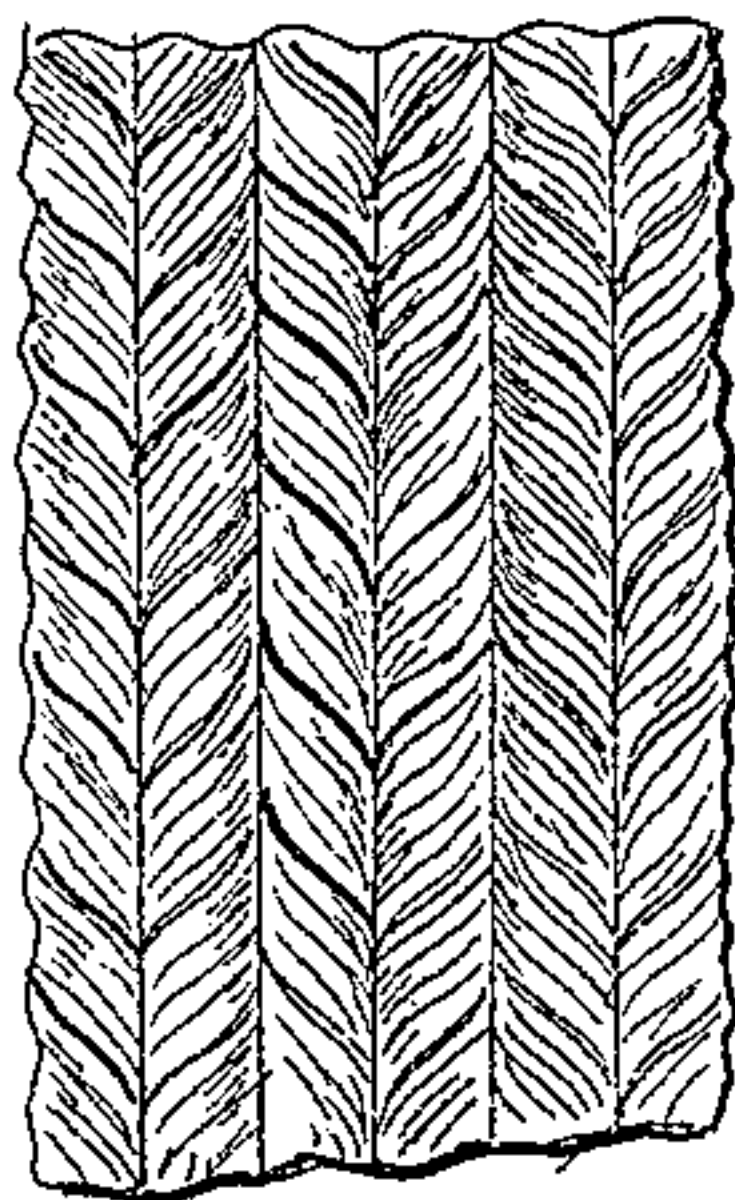


Fig. 2.



Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY C. HULBERT AND ALONZO FOLLETT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN HATS.

Specification forming part of Letters Patent No. **81,089**, dated August 18, 1868.

To all whom it may concern:

Be it known that we, HENRY C. HULBERT and ALONZO FOLLETT, both of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Coverings for the Head, such as bonnets and hats; and that the following is a full, clear, and exact description and specification of our said invention.

Our invention consists, first, of the combination of a body of stockinet or looped fabric, of the form of the required head-covering, with a pliable coating, the combination being consolidated by pressure between dies.

Our invention consists, further, of the combination of the cloth body with an embossed coating containing india-rubber, or equivalent gum, as a constituent, by the use of which the head-covering produced is rendered water-proof, and the finished article is not liable to crack when bent out of its normal form.

The accompanying drawing represents, at Figure 1, a head-covering made according to our invention; but the scale upon which it is drawn is too small to enable the embossed surface to be represented. Fig. 2 represents a small fragment of stockinet cloth, such as we have used, and before it is napped. Fig. 3 represents a magnified view of the said cloth.

The mode in which we have produced our new combinations with success in manufacturing ladies' hats is as follows: We procure stockinet cloth, such as is represented at Fig. 2, formed by knitting cotton yarns by means of knitting-machines, in the usual manner. This material is napped in the piece by the ordinary machinery and process employed for producing the nap upon the article generally known as "cotton-flannel" or "Canton flannel;" but we prefer to have the cloth napped on both sides. The napped stockinet cloth is sized in the piece by brushing it with a size which is composed of glue, starch, and water, in the proportions of one pound of glue and one of starch to two quarts of water. The size is prepared by heating the materials, and it is applied in a warm state to the fabric. The sized fabric is hung up in a warm room until it is dry; then it is dampened by sprinkling it with water, rolling it up, and permitting it to lie in the piece.

The damp fabric is cut into circular pieces, of suitable size for the hats to be made, and is

pressed into the shape of a hat by subjecting it to the action of a pair of hot dies similar to those used in pressing bonnet-frames. In this operation the sheet of fabric is strained into shape over the convex die, and the concave die is brought down upon it by means of a treadle. The bodies thus produced have the general form of the finished hat.

The bodies being thus prepared, we coat them with a composition prepared as follows, viz: White French zinc, eight ounces; india-rubber, twelve ounces, dissolved in one gallon of benzine; benzine Dammar varnish, eight ounces.

The French zinc is first ground up with castor-oil, a sufficient quantity of the latter being used to make the mixture of about the same consistency as that of the paints sold in the market as ground in oil; then the French zinc, so ground, and the other materials are thoroughly mixed together, and white French zinc is added in quantities sufficient to impart to the composition the desired whiteness, the quantity used for this purpose depending upon the taste or judgment of the operator. The composition is then colored to imitate the tint of the natural straw which the complete article is intended to imitate, which may be done by stirring into the composition a small quantity of a saturated solution of picric acid in water. A tea-spoonful of said solution will impart a straw tint to a pint of the composition; but the quantity of the coloring material and the kind of material that is used may be varied according to the taste and judgment of the operator.

The hat-bodies are brushed over on their exteriors with the composition in such manner as to give them a thin even coating of it. They are then permitted to dry, until they cease to be sticky to the touch, after which they are pressed lightly in smooth-faced dies, such as above referred to, so as to lay the napped surface smooth. The pressed bodies are coated once again on their exteriors and once on their interiors with a thin coat of the composition, applied with a brush in the same manner as the first coat, and are permitted to dry after the application of each coat until they cease to be sticky to the touch. Lastly, a thick coat of the composition is applied with a brush to the interiors of the bodies, and they are then permitted to dry as before.

After the last coating has become dry upon the bodies, a varnish of collodion is applied to them with a brush. The collodion varnish which we have used is the same solution of gun-cotton as that used for photographic purposes, with the addition of from four to ten drops of castor-oil to each fluid-ounce of the solution, according to the pliability which the hat is to possess, the largest quantity of castor-oil corresponding with the greatest pliability. Two coats of this varnish are applied to the hat-bodies, each coat being allowed to dry separately. After the last coating is dry the surface of each body is punctured with a needle, at least three or four punctures being made in each square inch of surface, the object of which is to permit air to escape from between the coatings at the exterior and interior of the body; and in this condition the bodies are ready for the action of the embossing-dies, by means of which the required embossed surface is imparted to them, and the articles are consolidated.

We prefer to make the embossing-dies by depositing a shell of copper, by means of a galvanic battery, directly upon the surface of a hat of natural straw, of the form and size of the hats to be made, and to back up the shell with type-metal, according to the process devised by Henry Löwenberg, for making straw-faced dies. We use two dies, one for the interior of the body and the other for the exterior. They are fitted in a strong press, capable of exerting a forcible pressure—say, of five hundred pounds to the square inch of surface—the kind of press we prefer to use being a hydraulic press. The dies are warmed to a temperature of about 100°, and the pressure must be sufficient to make the surface of the body correspond with that of the dies. The pressed hats are removed from the dies, and, as this operation is apt to distort their shape somewhat, each hat is afterward subjected to a light pressure between a pair of smooth dies of the form of the finished hat. The hats are then trimmed to suit the taste of the manufacturer.

Although we prefer to manufacture hats embodying our new combinations in the above mode, we do not confine ourselves to that precise mode, as it may be greatly varied. Thus, for example, we have manufactured hats according to our invention out of plain or unnapped stockinet cloth. We have also manufactured them of stockinet cloth napped on only one side, and after coating the bodies with the pliable coating, and varnishing them on the napped side only, and imparting the required surface by pressure in dies, we have put two thicknesses of the material together, so as to form a hat of double thickness throughout, the two thicknesses being united by sewing at the rim, and the embossed surfaces being reversed so as to show on the exterior of the outer thickness and on the interior of

the inner thickness. Again, we have made hats in like manner, with the crown of one thickness and the brim of two thicknesses. We have also greatly varied the composition of the pliable coating, but that before given is the best we have thus far used.

Although we prefer to manufacture hats and other coverings for the head so as to embody both parts of our invention, we have manufactured head-coverings embodying each part of our invention without the other. Thus, we have used the first part of our invention without the second by applying a coating of benzine, Dammar varnish, French zinc, starch, glue, and coloring materials, without india-rubber, to the stockinet-bodies, the various operations in other respects being conducted as before described. Again, we have embodied the second part of our invention without the first by forming the hat-body out of the ordinary woven cotton-flannel, and treating it in other respects as before described.

Stockinet cloth, however, as a material for hats, is a very superior article to woven cloth, because the great extensibility of the former material permits the entire hat-body to be made of one piece of material, even when there are great variations from a plane surface. Thus, for example, a lady's hat, such as is represented at Fig. 1 in the accompanying drawing, in which the crown *a* and brim *b* are substantially at right angles with each other, or a man's hat, can be made entirely of one piece of stockinet cloth, thus obviating the expense of joining several pieces together, and the appearance of the seams. On the other hand, the india-rubber composition possesses the duplex advantages of pliability without risk of cracking, and repellant to water; hence it is superior to all compositions that we are aware of as a coating for coverings for the head, having an embossed surface.

Having thus described the several modes in which we have contemplated the application of the principle or character of our invention, what we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of a body of stockinet, of the form of the head-covering required, with a pliable coating, the said combination being consolidated by pressure between dies, substantially as before set forth.
2. The combination of a cloth body, of the form of the head-covering required, with an embossed coating composed of india-rubber, substantially as before set forth.

In testimony whereof we have hereunto set our hands this 6th day of March, A. D. 1868.

H. C. HULBERT.
ALONZO FOLLETT.

Witnesses:

JOHN RATHBONE, Jr.,
W. L. BENNEM.