(No Model.)

J. JACOBSON.

MATRIX AND PROCESS OF PRODUCING SAME.

No. 584,551. Patented June 15, 1897.

Fig. 1.

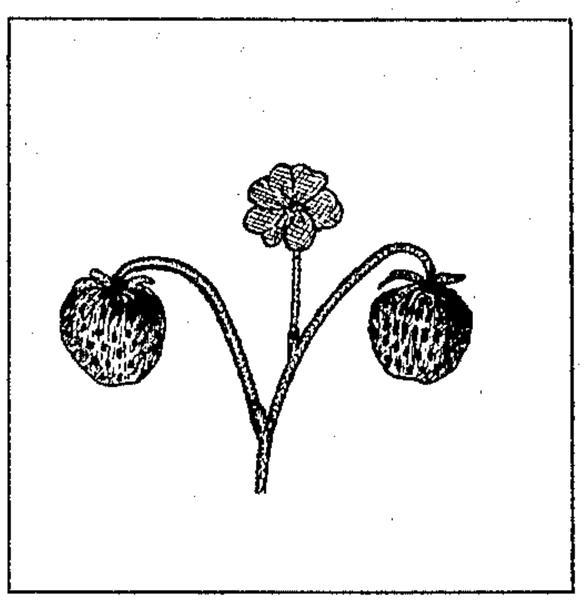


Fig. 2.

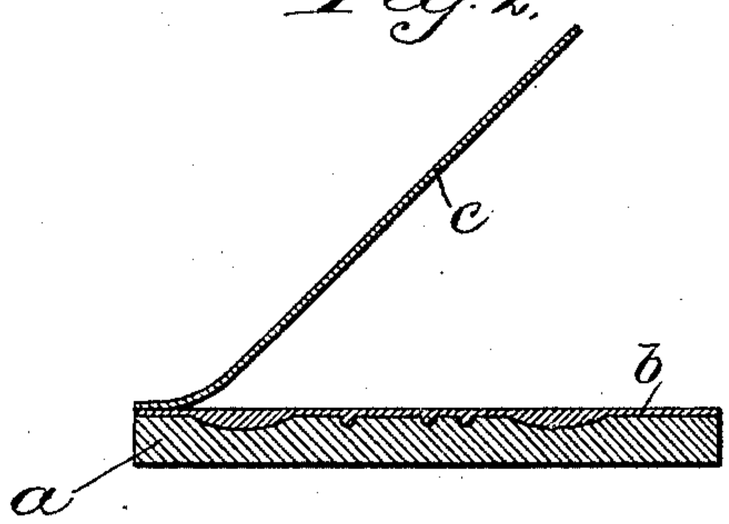


Fig. 3.

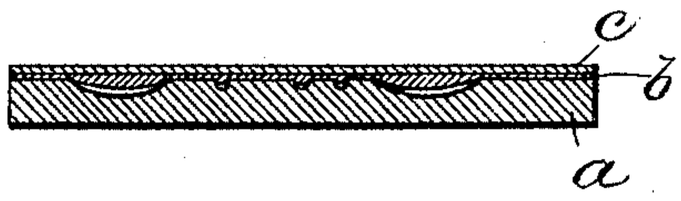


Fig. 4.

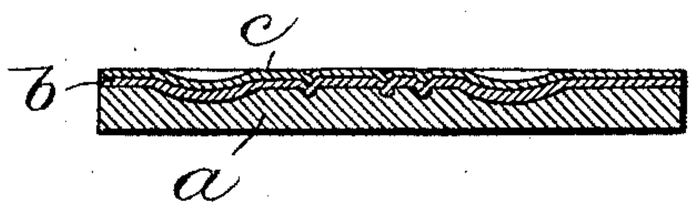
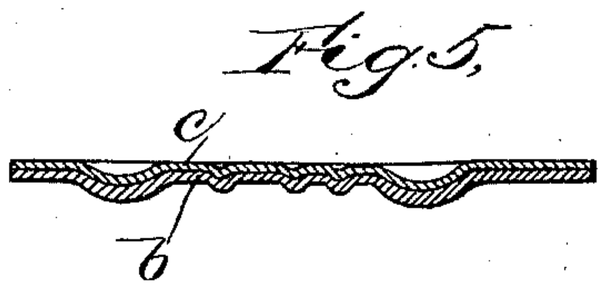


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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MATRIX AND PROCESS OF PRODUCING SAME.

SPECIFICATION forming part of Letters Patent No. 584,551, dated June 15, 1897.

Application filed November 2, 1896. Serial No. 610,858. (No specimens.)

To all whom it may concern.

Be it known that I, JOHN JACOBSON, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Matrices and Processes of Producing the Same, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a matrix or form for producing a die or mold adapted to be used in molding or stamping suitable material, such as papier-mâché, in imitation of articles having a design thereon in relief, the invention being especially intended for producing imitations of embroidery or tapestry, the embroidered part of which is reproduced in relief upon a flat surface and afterward colored to imitate the color of the threads, the background also being colored, if desired, in imitation of a colored cloth having the design embroidered thereon.

In carrying out the invention a mold is taken in plaster or other suitable material directly from the article which is to be reproduced, it being obvious that in case of an embroidered article the threads both of the fabric which is embroidered and of the embroidery itself will be reproduced in the mold, while the embroidered portions which in the original article stand out in relief from the surface of the fabric will be reproduced in intaglio in the mold, so that the surface of a cast or reproduction taken from the mold will be an exact reproduction of the surface formation of the original article.

If the mold is to be of plaster, the article may be rendered non-adhesive to prevent the plaster from sticking to it, as by painting with kerosene.

Over the surface of the mold which has thus been produced molten gelatin is then flowed and allowed to cool and solidify, the surface of the gelatin thus becoming an exact reproduction of the surface of the article to be copied. The gelatin is then allowed to dry, and in drying will become thinned down, so that the high-relief portions representing the embroidery will not stand out so prominently as in the original article. The gelatin plate thus dried down is again applied to the surface of the mold and brought to such a position that the relief portions thereof register with the intaglio portions of the mold, it being obvious that since the gelatin film has become thinner throughout, in the drying process, the said relief portions will not fill the intaglio portions of the mold when the flat portion of said film is in engagement with the flat portion of the mold. Pressure is then applied to the back of the film or to that portion which is in relief, so as to cause the entire surface of the said film to come in contact with the corresponding surface of the mold, the back of the film behind that portion of the face where the relief portions exist thus being hollowed in with relation to the remainder of the back behind the flat portions of the face. It is obvious, therefore, that the face of the dried-down film will be correspondingly pushed forward or bulged out, so that portions thereof, even when the film is dry, will have a certain prominence or relief, which if the film is maintained in this shape and again soaked in water to restore it to the swelled condition in which it left the mold will be added to the relief actually produced upon the surface of the film by the molding process. To maintain the back of the film in the shape thus produced, a support or backing is provided corresponding in surface shape to that of the back of the film, and the film thus mounted is soaked in water, so that it again swells to the shape produced by the mold, the relief portions, however, having, in addition to their own prominence, the prominence of the backing or support which has been shaped to conform to the back of the dried film when pressed into the mold. The plate in its swelled condition then constitutes the matrix embodying the invention, and may be utilized by taking from it a mold of plaster or other suitable material, in conjunction with which reproductions of the original article may be formed. The relief portions of such reproductions will obviously be somewhat more prominent than those of the original, while the surface detail thereof is perfectly reproduced, this feature being of special importance in connection with em-

broidered articles where the actual relief of the embroidered portion is much less than the apparent relief, so that the additional actual relief obtained by this process produces a better imitation than would be produced by an actual facsimile reproduction of the original surface.

It is desirable, but not essential, in carrying out the process, to use a backing or support for the gelatin of some material which is capable of being shaped and of retaining its shape, a malleable metal, such as sheet-lead, being preferably used, and it is also found more convenient to apply this plate to the gelatin as soon as said gelatin is flowed over the mold, the plate thus adhering to the gelatin when the latter cools and solidifies, so that both together are removed from the mold, and after the gelatin film has dried they are together replaced upon the mold and subjected to pressure, the malleable plate yielding as the gelatin is forced into the mold and assuming and retaining the necessary shape to support the gelatin film during the final soaking process.

Figure 1 is a plan view of an embroidered fabric from which a reproduction is to be made according to the present process. Fig. 2 is a section of a mold taken from the surface of the article shown in Fig. 1, having a film of gelatin flowed thereon, and also showing the backing-plate which is to be applied thereto. Fig. 3 is a similar section showing the gelatin film after it has been dried and again applied to the mold. Fig. 4 is a similar view showing the gelatin film and its backing-plate after they have been subjected to pressure. Fig. 5 is a similar view showing the completed matrix which forms the subject of the invention.

Upon the surface of the cast *a*, which has been taken from the article to be reproduced, a film of liquid gelatin *b* is flowed, as indicated in Fig. 2, the liquid gelatin filling in the intaglio portions of the mold, so that the surface thereof when set becomes a perfect reproduction of the surface of the article shown in Fig. 1. The said film, after it is cooled and solidified or set, is then stripped from the mold and the gelatin allowed to dry and harden.

In the hardening and drying process the film *b* will shrink until it assumes approximately the shape shown in Fig. 3, so that when it is applied to the face of the mold, as therein indicated, the relief portions will not wholly fill the intaglio portions of the mold, there being, as indicated in Fig. 3, a space between the surface of the film and the surface of the mold in these portions. The film thus applied to the mold is then subjected to pressure, the said pressure being equalized on all portions thereof, as by interposing a block of sponge-rubber between it and the press, and pressure is then exerted until the surface of the gelatin film is brought into contact with all parts of the mold, as shown in Fig. 4, the rear surface thereof thus being shaped to follow the general contour of the design, while the front surface has upon it a perfect reproduction of the details of the design. The film is then removed from the mold and soaked in water in conjunction with a suitable backing-plate *c*, the surface of which is shaped to conform to that of the back of the film. The said backing-plate *c* is herein shown as a plate of malleable metal, such as lead, which is applied to the rear surface of the film *b*, it being desirable to apply the said backing during the first molding operation of the gelatin, as indicated in Fig. 2, the said plate being rolled or smoothed down upon the molten gelatin which adheres thereto when it cools and sets. When the backing is thus applied, it is obvious that the same becomes of such shape as to conform to the rear surface of the film when the latter is pressed upon the mold, as indicated in Figs. 3 and 4. When the film and its backing are soaked in water, the gelatin again swells, the result being, as indicated in Fig. 5, that a plate is produced having upon its surface all the details of the design. In the case of an embroidered article, for example, every thread is perfectly reproduced, and the embroidered portions or actual design portions are brought out with not only the relief of the original article, but with the additional prominence afforded by the raised portions of the backing-plate behind the relief portions of the film. The matrix thus formed may then be used before the gelatin is again dried down for making a cast to be used in making reproductions of the article shown in Fig. 1. After the article is molded in said die it may be suitably colored, and the additional relief obtained, as above described, of that portion which reproduces the embroidery will add largely to the effect, while each individual thread of the original will be reproduced on the surface, thus making a striking imitation of an expensive embroidered article, these imitations being capable of production at slight expense and in large quantities.

While an embroidered article has been herein shown as the article to be reproduced by applicant's process, it is obvious that the process may be equally well used and the matrix produced in conjunction with any article having a relief design which it is desired to reproduce and intensify.

I claim—

1. The process of producing a matrix which consists in forming a cast; flowing molten gelatin upon the surface of said cast; stripping and drying said gelatin; again applying it to the surface of the cast; subjecting it to pressure until its surface is in contact with the surface of the cast in all portions thereof; and then soaking it in conjunction with a suitable support or backing-plate conforming to the rear surface of the film, substantially as described.

2. As an article of manufacture, a matrix

consisting of a film of gelatin mounted on a base portion or plate and having a relief design reproduced upon its surface, the back of said gelatin film being curved to conform to the main high relief portion of the design, and the surface of the backing-plate being also shaped to conform to and support the rear surface of the film, substantially as described.

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

JOHN JACOBSON.

Witnesses:
H. J. LIVERMORE,
N. P. FORD.