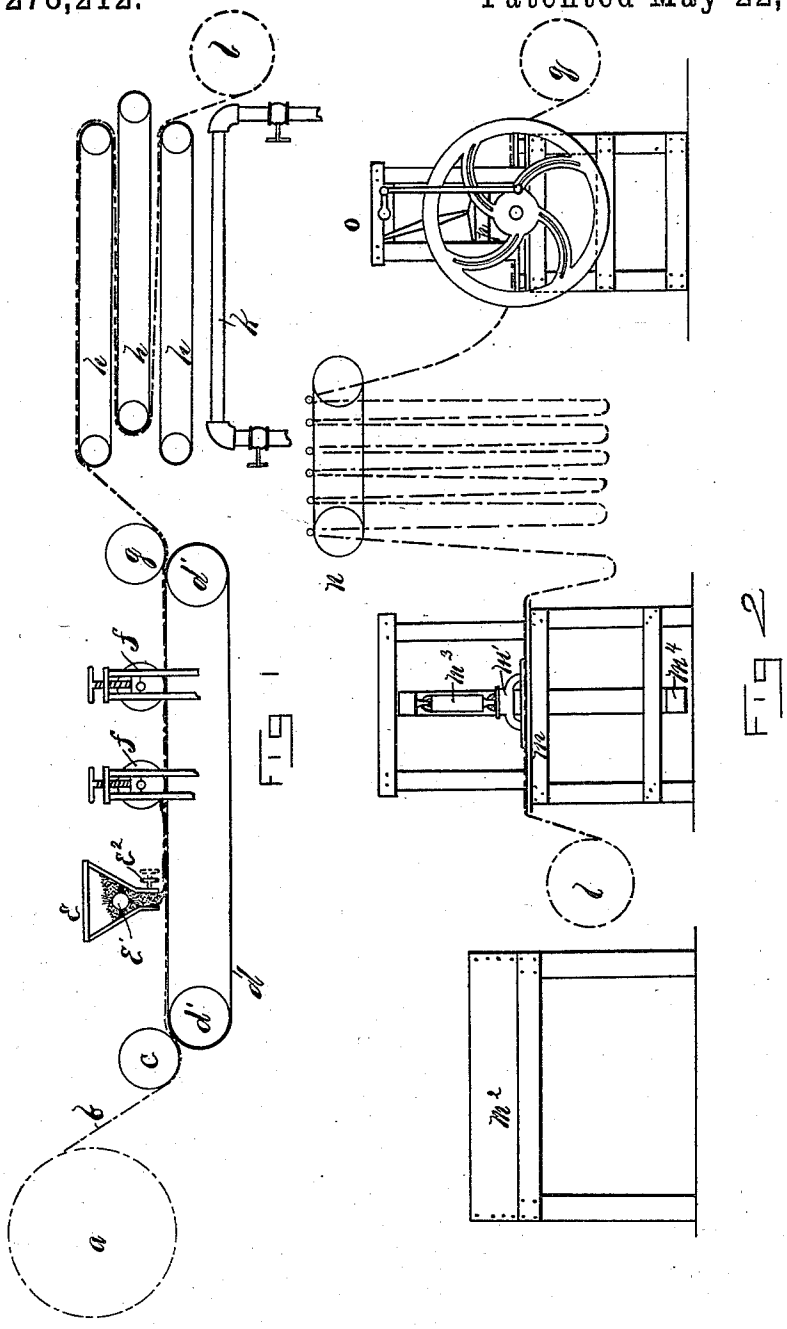
(No Model.)

# G. K. BIRGE.

## MANUFACTURE OF WALL PAPER.

No. 278,212. Patented May 22, 1883.



Witnesses:
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# UNITED STATES PATENT OFFICE.

GEORGE K. BIRGE, OF BUFFALO, NEW YORK.

## MANUFACTURE OF WALL-PAPER.

SPECIFICATION forming part of Letters Patent No. 278,212, dated May 22, 1883.

Application filed March 9, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE K. BIRGE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in the Manufacture of Wall-Paper; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates more particularly to that class of wall-paper which is decorated with colored figures in relief, and especially where the paper so decorated is composed of a backing of strong paper or fabric, or paper and fabric combined, and upon which backing is applied a yielding surface of such well-defined thickness as to enable it to be decorated with colored figures in relief, while the backing is left entirely smooth.

Heretofore paper of the above description has been prepared substantially as follows, viz: A plastic composition has been spread to an even thickness upon a suitable backing material, and upon such plastic material a pattern in relief has been next produced by an embossing-roller, and afterward the color or colors have been applied to the embossed surface by means of printing-rollers. It has been demonstrated thus far in the art that it is impossible to accomplish other than very indifferent and unsatisfactory results in the production of a paper decorated with colored figures in relief by the process just described, for the principal reason that it is practically impossible to prevent the coated fabric from yielding in different directions while under tension between rollers, thereby partially or entirely destroying the register of the printing-roller with the elevations and depressions of the embossed surface, and not only inaccurately applying the colors, but causing the raised figures of the embossed surface to be obliterated.

The object of my invention is to overcome this and other difficulties; and to that end it consists, substantially, in applying to a backing of paper or fabric, or paper and fabric combined, a flat yielding or plastic surface, then drying or partially hardening same, then printing upon such flat surface with a pattern in one or more colors, then drying such color or colors so printed, and then stamping or embossing the flat surface so printed with a die which depresses parts of such surface and raises other parts in relief in such a manner that the flat pattern previously printed in a color or colors is in depression or relief, as desired, while the backing is left smooth.

In the drawings, Figure 1 shows a portion of the mechanism employed in carrying out my improved process, and Fig. 2 shows the remainder of such mechanism.

This mechanism I have preferably shown as, perhaps, best adapted for the work, or at least sufficient to fully illustrate the method which I intend to claim, it being understood that my invention is entirely confined to my peculiar method or process of preparing colored and embossed wall-paper, and not to any particular mechanism therein employed.

The different devices shown in the drawings are all of an old and well-known character, and in fact the several steps of my improved process, taken separately, are equally well known, the novelty and value of such process resting in the particular arrangement of such steps, whereby a wall-paper is produced of such a perfect finish and appearance as has been heretofore practically impossible to produce.

I will now proceed to particularly describe and illustrate by means of the accompanying drawings the order and arrangement of the several steps of my improved process.

*a* is a roller upon which the backing *b*, composed of paper or fabric, or paper and fabric combined, is placed. This backing passes from its roller under the drum *c*, and upon an endless blanket, *d*, which passes around rollers *d' d'*.

*e* is a hopper, which holds the plastic material to be fed upon the backing. A revolving stirrer, *e'*, assists in feeding this plastic material through an opening in the hopper, the size of which opening is regulated by a valve, $e^2$. The plastic material is spread upon its backing to an even and predetermined thickness by the spring-pressed rollers *f*, one or more. The backing thus prepared passes

off the blanket *d*, under drum *g*, and from thence to a series of smaller endless blankets (two or more) arranged in close proximity to each other, and over a heating apparatus—herein shown as steam-pipe *k*. The coated backing, having passed in and out between the blankets *h*, as shown, where it is dried to a certain degree, is then wound upon the roller *l*, and is in condition for the next step of the process—that of printing. It may be here observed that the ground color of the plastic coating has been previously fixed by preference in the preparation of the plastic material before its application to the backing, or, if preferred, the ground color can be applied to the flat surface of the coating after it has been dried, and previous to printing. The coated backing thus prepared is next passed over a stand or table, *m*, where it is printed with a continuous pattern by the block *m'*, such block being adjusted by hand, the color or colors being taken from the bed $m^2$. The block *m'* is preferably applied to the coating by hand to insure perfect accuracy, and is pressed upon such flat coating to deliver its color by means of arm $m^3$ and foot-treadle $m^4$.

It will be observed that the distinctive difference between my improved process and that which I have hereinbefore outlined is that I find it indispensable, in producing a perfect article of wall-paper, to first apply the color or colors of my pattern upon the flat coated surface, and then when such color or colors are sufficiently dry to raise or depress the pattern during the subsequent stamping or embossing operation, which operation can be much more accurately done when the die or stamp is applied to the pattern partly by hand. In this manner a perfect register of the die or stamp can be made with the previously-printed pattern, which it is impossible at all times to effect when the embossing is first done and the color or colors are afterward applied to the embossed surface by means of a printing-roller, as has been already practiced, or rather attempted, in the manufacture of this style of wall-paper.

I do not wish to be confined in this step of my process to the use of a flat stamp, as an embossing-roller might be used to produce the same result, it being apparent to those skilled in the art that to emboss a pattern after same is printed is more readily accomplished mechanically than to print a pattern after same is embossed.

The printing of the pattern, which I have herein shown as being done with a flat block, could be accomplished equally as well by a printing-roller.

Any other suitable form of drying apparatus than the ones herein shown could be employed for the same purpose.

In lieu of the coating of plastic material heretofore used in the art, I prefer to employ a layer composed of paste or glue, and paper, wood, or rag pulp—such as is used in making paper—and after it is applied to the backing reducing it to proper thickness and to an even surface by passing it between or beneath rollers, after which its treatment would be the same as hereinbefore described.

Another important advantage possessed by my improved process is that the color or colors are applied equally and evenly to all parts of the embossed surface, with particular reference to the almost vertical sides of a pattern possessing very sharply-defined figures in relief. This has not and cannot be satisfactorily accomplished by any of the known processes now in vogue in preparing this particular class of wall-paper, thus giving to my improved process superior advantages not possessed by the others now employed.

In the description of my improved process I have shown it as applied to the manufacture of wall-paper; but it is evident that it is equally applicable to the manufacture of panels and moldings for furniture and wall-decoration, or, in fact, to any articles which are colored and decorated in relief.

I claim—

The process of manufacturing colored and embossed fabrics suitable for wall and other decoration, which consists, substantially, as follows, viz: applying to a backing of paper or fabric, or paper and fabric combined, a flat yielding or plastic surface, then drying or partially hardening same, then printing upon such flat surface with a pattern in one or more colors, then drying such color or colors so printed, and then stamping or embossing the flat printed surface with a suitable die, which depresses parts of such surface and raises other parts in such a manner that the flat pattern, in one or more colors, is in depression or relief, as desired, while the backing is left smooth, substantially as shown and described.

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

GEORGE K. BIRGE.

Witnesses:
W. T. MILLER,
OTTO HODDICK.