UNITED STATES PATENT OFFICE.

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ART OF PREPARING RELIEF PRINTING-SURFACES.

SPECIFICATION forming part of Letters Patent No. 682,581, dated September 10, 1901.

Original application filed July 22, 1899, Serial No. 724,877. Divided and this application filed October 25, 1900. Serial No. 34,377. (No specimens.)

To all whom it may concern:

Be it known that I, RUDOLF WIDMANN, a citizen of Bavaria, Germany, residing at Munich, in the Empire of Germany, have invented certain new and useful Improvements in the Art of Preparing Relief Printing-Surfaces, (this being a division of my application filed July 22, 1899, Serial No. 724,877;) 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.

This invention relates to the art of preparing plates which may be used for typographically printing and which present the design in relief.

The object of the invention is to produce a plate of this character which shall combine a half-tone effect with the necessary contrast of high light and intense shade, thereby securing an artistic effect of a high order and which shall also enable the artist in executing his design to use such materials as will permit him to work without restraint and in the same manner as when using the ordinary artists' materials. In my application for Letters Patent, Serial No. 724,877, filed July 22, 1899, of which this is a divisional application, I have described a method for this purpose whereby the design is executed directly upon the plate from which the printing-surface is to be prepared by first applying to said plate an acid-resisting grain and then drawing the design thereon with acid-resisting chalk or crayon, the amount of shadow or light being governed by the amount of pressure exerted upon the crayon and by the same upon the grained plate. The plate is then etched, and thereupon the acid-resist, comprising the crayon and the acid-resisting grain, is removed by any usual or suitable means, whereupon the printing-plate is complete. The present invention differs from that in my aforesaid application in that the design is not executed on the grained plate, but upon a suitably-prepared transfer-sheet, and in that I employ a liquid or semiliquid fatty paint which is to be applied by means of a brush instead of a fatty crayon or chalk.

I will now give a detailed description of what I consider the preferred method of carrying out my invention.

A suitable sheet of paper or film material, which may be transparent or not, according to the requirements of each individual case, is coated on the surface to be painted on with a suitable painting-ground of a somewhat sticky material, such as a mixture of albumen and isinglass, and the same is then tanned by immersing it in a tannin solution or equivalent treatment. On the background so produced the original design or painting is executed in a liquid or semiliquid black fatty color or paint, which should be soluble in oil and adapted to dry quickly. This color is applied to the ground by means of a brush, similarly to water-colors, sepia, or india-ink painting. The painting-ground prepared as above has the property and the object of preventing the oil which may be used as a dissolving medium from penetrating and spreading over the paper and of allowing the fatty color or paint to adhere to but not to penetrate into the fibers of the paper. This grounding, moreover, has the property of slowly dissolving in water. All of these properties are necessary to produce the best effects under my invention, as will appear hereinafter. With the use of the materials above set forth I may apply a paint one or more times to portions already painted on, according to demand and as may be desired, or the paint may be completely removed at such portions where it is desired to change or correct the execution of the design, and such places may be left open or again painted over, according to the requirements of the case. The painting or design so executed is then allowed to dry.

The printing-plate upon which the design is to be transferred is prepared as follows: A plate to be etched, preferably a zinc plate, is provided with an acid-resisting grain on its smooth flat surface by dusting over the same a comminuted resist, such as resin-powder, in the manner well known. The particles of this powder are caused to adhere to the plate by heating the same to such an extent that the resinous particles will melt sufficiently to adhere to the surface. The design in

fatty color prepared as above described is now transferred upon this grained plate by laying the sheet of paper with the design facing the grained surface of the plate upon the same and then causing the same to adhere to the plate by a strong and even pressure in a manner which is well-known in the art of etching plates which are not grained. The painted sheet of paper is thereby caused to firmly adhere to the grain of the plate. The painted sheet is thereupon moistened, whereby the adhesive background or grounding will slowly dissolve and permit the paper to be pulled off from the plate, leaving the entire fatty design upon the grain and between the grains upon the plate in masses which correspond exactly to the light, shade, and half-tone of the design. In other words, the design has been completely transferred to the plate, with this difference that the light tones have been broken up or finely subdivided by the acid-resisting grain. Each individual particle of the resinous powder is surrounded by fatty substances, the amount of the same being governed by the thickness of the fatty layer at each portion of the design executed. The dark surfaces on the design are transferred as dense patches of fatty substances. The lighter or half tones appear broken up into stipples, whose size correspond to the degree of half-tone. Those portions where the painting-ground was left entirely free or unpainted leave the interstices between the grain in their original condition. High lights may be very readily attained on any portion of the picture by suitable instruments well known in the art. Corrections may be readily and accurately carried out by employing a fatty crayon, such as lithographic crayon. After the plate has been prepared in this manner it is directly etched by immersing it or flooding it with dilute acid in the well-known manner, whereupon the acid-resist, comprising the resinous grain, as well as the fatty design, may be removed in any usual or desired way by using the ordinary solvents or the like. All those portions which have been covered by the acid-resisting grain and the fatty color will appear in relief, since they were not attacked by the acid. The portions of the plate which were not covered by such resist, on the other hand, will be etched and present recesses which will form the white or unprinted portion after the printing.

Instead of executing the transfer design in fatty color upon the transfer-paper by hand the same may manifestly be produced by printing. Thus, for example, I may utilize a proof from any printing-plate which appears in black and white, in lines or in dots, by first going over the same with a brush and changing the same to a half-tone picture.

It is to be noted that this invention is applicable to the preparation of relief-plates for decorative purposes, as well as for the manufacture of relief printing-plates.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process of producing relief printing-surfaces which consists in transferring a design in resisting ink or paint to a plate provided with a grain of resisting material and then etching the plate.

2. The process of producing relief printing-surfaces which consists in transferring a painted or half-tone design made with an etching-resist to a plate provided with a resisting-grain, and then etching the plate.

3. The process of producing relief printing-surfaces which consists in transferring a painted or half-tone design made with an etching-resist to a plate provided with a resisting-grain, then etching the plate, and removing the resisting-grain and design.

4. The process of producing relief printing-surfaces which consists in executing a fatty design upon a sheet or film provided with a soluble adhesive grounding and providing a plate to be etched with a resisting-grain, then transferring said design to the grained plate, and then etching.

5. In the art of preparing relief printing-plates, the method of preparing a transfer-sheet which consists in coating a sheet or film with a mixture of albumen and isinglass and then painting a design thereon in fatty paint.

6. In the art of producing relief printing-surfaces the process which consists in coating a sheet of paper or the like with a mixture of albumen and isinglass, then painting thereon a design in fatty paint, then transferring such design upon a plate provided with a resin-grain and finally etching the plate.

7. In the art of producing relief printing-surfaces the process which consists in coating a sheet of paper or the like with a mixture of albumen and isinglass, then painting thereon a design in fatty paint, then transferring such design upon a plate provided with a resin-grain and finally etching the plate and removing the resin-grain and fatty paint.

In testimony whereof I affix my signature in presence of two witnesses.

RUDOLF WIDMANN.

Witnesses:
GEORGE J. BURNS,
LUDWIG WIDMANN.