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PREPARATION OF ENGRAVED RUBBER PRINTING PLATES

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1 Claim. (Cl. 95—5.6)

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This invention relates to the preparation of engraved rubber printing plates, and more particularly to a process for preparing such plates involving photographcially reproducing a photographic image in ink on the surface of engraving rubber.

The purpose of the invention is the provision of an improved process for preparing an engraved plate or mat of engraver's gum (engraving rubber) wherein a photographic image is reproduced in ink on the plate to guide the rubber engraver in engraving the plate. Heretofore, it has been the usual practice in making a rubber printing plate to reproduce a drawing of the matter to be engraved on the plate by transferring the drawing to the surface of the rubber using mechanical drafting methods. This invention involves photographic transfer of the matter to be engraved to the surface of the rubber. In general, the process of the invention involves first heating the rubber. Then a first coat of a light-sensitive albumin photographic coating composition or the like is applied to the surface of the rubber. This dries quickly because the rubber is heated. Then a second coat of the same composition is applied and allowed to dry. The coated surface is then exposed to light through a photographic negative of the image to be reproduced. Then a coating of developing ink is applied to the coated surface of the rubber. The surface is then washed to wash away the unexposed areas of the light-sensitive coating and the ink on these areas, leaving ink on the surface of the rubber on the exposed areas of the light-sensitive coating and thereby reproducing the image in ink on the surface of the rubber. Finally, the rubber is engraved, utilizing the ink image as a guide. Other features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the steps and sequences of steps, and features of manipulation, which will be exemplified in the methods hereinafter described, and the scope of the application of which will be indicated in the following claims.

In accordance with the invention, a mat of engraver's gum (engraving rubber), which comprises a relatively thin base layer of soft rubber bonded to a thicker face layer of hard rubber, is heated, and a coating of a light-sensitive albumin photographic emulsion or the like is thinly and evenly applied to the surface of the face of the heated mat. A suitable emulsion for the purpose consists of flake albumin, ammonium

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dichromate (sensitizer) and water in the proportions of ¼ oz. albumin, 90 grains ammonium dichromate, and 32 oz. water. The mat is heated to a temperature such that the coating will not remain soft and sticky and fuse with a second coating of the emulsion, but not so high as to cause it to lose its adhesive properties. For the particular coating composition mentioned, the mat is heated to a temperature from 100° F. to 110° F. This may be done on a steam table or in any other suitable way that will not damage the face of the mat.

The rubber being heated, the first coat dries within a few seconds after it is applied. The coating acts as a sealing coat on the porous surface of the rubber and thus prepares it for a second coat of the emulsion. This second coat is applied while the mat is still warm, and is allowed to dry, several minutes being allowed for drying the second coat.

To reproduce a photographic image on the plate prepared as described above, a photographic negative of the image, preferably of extreme contrast, is placed in close contact with the coated face of the mat. If the negative is of large size, or if several small negatives are to be simultaneously exposed, close contact is obtained by using a vacuum printing frame wherein the mat and negative or negatives thereon are squeezed between a flat bed blanket and a glass surface by vacuum. If only one small negative is to be exposed, close contact may be obtained simply by placing a heavy sheet of plate glass on the negative. The coated face of the mat is then exposed through the negative to extreme light for approximately two minutes, where the above-mentioned albumin photographic emulsion is used. It will be understood that exposure time may vary for different emulsions.

After exposure, a thin coating of developing ink is applied to the exposed face of the mat with a rubber roller. The developing ink can be any standard commercial etching ink, or a good grade of letterpress ink to which a small quantity of Canada balsam may be added. Before the ink completely dries, the face of the mat is washed in a bath of running water immediately following the application of the ink. This washes off the ink from those areas of the mat which were unexposed, since in these areas the emulsion readily washes off the mat, carrying the ink with it. Ink remains on the exposed areas of the mat since the exposed areas of the emulsion do not wash off the mat. Thus,

the photographic image is reproduced in ink on the face of the mat. The development of the ink image on the face of the mat may be hastened by drawing a loose tuft of cotton, preferably medical rather than raw cotton, lightly across the surface of the mat while in the bath. Raw cotton may scratch the surface.

After water has been drained from the surface, the mat is dried as by placing it on a steam table, excessive heating being avoided. When the mat is thoroughly dry, a thin coat of shellac is applied on its face to protect the ink image thereon from being rubbed off. The mat is then ready for engraving.

Excessive application of developing ink should be avoided, as this hinders washing away of the unexposed emulsion.

The use of two coats of the photographic emulsion is of considerable importance. If only one coat is used, the image does not develop properly since the emulsion tends to adhere to the rubber throughout its entire area, whether exposed or unexposed. By using two coats, the first coat acts as a sealing coat on the surface of the rubber, and thus inhibits adherence of the unexposed areas of the second coat to the mat. The heating of the mat before the first coat is applied is also important because, due to this heating, the first coat dries quickly, and the drying of the second coat is also more rapid due to the residual heat in the rubber.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above methods without departing from the scope of the invention, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

I claim:

The process of preparing an engraved mat of engraver's gum consisting of a relatively thin base layer of soft rubber bonded to a thicker face layer of hard rubber, comprising the steps of heating the mat to a temperature from 100° F. to 110° F., then applying a first coat of light-sensitive photographic emulsion comprising albumin and ammonium dichromate to the surface of the face layer of the heated mat, then applying a second coat of the same emulsion after the first coat has dried and while the mat is still warm, exposing the coated surface of the mat to light through a photographic negative, applying a coating of developing ink to the coated surface after exposure, washing off with water the said surface before the ink has completely dried to wash off the ink and the emulsion from unexposed areas of the surface leaving an ink image on the exposed areas, applying a protective coating over the image, and finally engraving the face layer of the mat utilizing the image as a guide.

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