UNITED STATES PATENT OFFICE.

AMOS WESTWOOD, OF OAKLAND, AND PETER L. MALLON, OF SAN FRANCISCO, CALIFORNIA; SAID WESTWOOD ASSIGNOR TO SAID MALLON.

METHOD OF DECORATING GLASS AND PORCELAIN.

SPECIFICATION forming part of Letters Patent No. 447,991, dated March 10, 1891.

Application filed September 17, 1889. Serial No. 324,454. (No specimens.)

To all whom it may concern:

Be it known that we, AMOS WESTWOOD, a citizen of the United States, residing at Oakland, Alameda county, State of California, and PETER L. MALLON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Decorating Glass, Porcelain, and other Surfaces, of which the following is a complete specification.

Our invention relates to the art of decorating surfaces such as glass, porcelain, china, &c., by producing an image or impression upon them and making it permanent by firing; and our invention consists in the novel process hereinafter fully described, and specifically pointed out in the claims.

The object of our invention is to decorate such surfaces by producing and permanently fixing upon them any suitable impression, image, or picture.

Our process as a whole may be divided into six principal steps, viz: first, the preparation of the sensitive emulsion; second, the coating of the plate or other surface to be decorated with the emulsion; third, the exposure of the sensitized plate or surface under a positive; fourth, the development of the exposed plate or surface by means of what is known as the "dusting-in process;" fifth, the application of a thin layer or coating of any suitable flux to the developed plate or surface, and, sixth, the firing of said plate.

We make stock solutions as follows: No. 1, a saturated solution of bichromate of potash, which is rendered alkaline by strong ammonia, changing it to a bright yellow; No. 2, a solution of sugar in about the proportions of four of sugar to nine of water; No. 3, gelatine soaked in water to the extent of its absorbing power; No. 4, alcohol.

To make the emulsion we take of No. 1 three parts, of No. 2 three parts, of No. 3 one part, of No. 4 two parts, and mix together by agitation and filter. We then take any suitable plate which we desire to decorate—as, for example, a piece of glass—and coat it with the emulsion thus formed in any ordinary manner and dry the plate with a dry heat. We then expose the sensitized plate under a positive, the time of exposure being approximately about three minutes in sunlight. The positive may be obtained in any ordinary manner. After the exposure the plate is developed by the use of a ceramic powder of any color desired. This powder is taken dry, sifted onto the plate, and is then brushed over it evenly with a fine soft brush. The picture or image gradually develops, as in any dusting-in development. If the image is slow in coming up, breathe gently over the surface of the plate to assist it. After the image or picture is thus developed we apply over the entire surface a thin coating or layer of any suitable flux. This is done lightly and quickly with a fine blender. We then put the plate into the furnace and fire it, so that the image or impression becomes permanent.

The plates thus decorated are adapted for all purposes to which art stained glass is usually applied—for decorating houses, buildings, &c.

The ceramic powder which we use in the development is what is known as "fluxed color"—that is, a vitrifiable pigment. We have found that if the plate be fired without having a coating or layer of flux over its surface the impression will not burn in, notwithstanding that the color used be a fluxed one. We have also found that if the color used be not a fluxed one and a coating of flux be placed upon it and then the plate fired it will not burn in.

It appears to be a peculiarity of our process that the image or impression obtained by the use of the emulsion we have described and developed by the dusting-in process requires both the already fluxed colors used in the development and the employment of a surface coating or layer of flux before firing, in order that it may be burned in.

We are aware of the general process of dusting-in in which an emulsion is made of some organic matter and a bichromate and the development effected by means of a vitrifiable pigment, and have experimented with several emulsions of this character. We find that in our emulsion the use of alcohol is novel and important, its object being to make the emulsion more adhesive and have less tendency to

run off the glass when being coated. If we dispensed with the alcohol, we would have to use more of the gelatine, or the equivalent of gelatine, to obtain the necessary adhesiveness of the emulsion.

The gelatine itself has useful and distinctive properties in this emulsion, making a clearer coat, requiring less of it than of other articles, and especially being essential in connection with the use of the alcohol, in that it has no tendency to curdle, as would be the case if gum-arabic were used in an emulsion of which alcohol formed an ingredient.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The process of decorating glass, porcelain, and other surfaces, consisting of coating the surface to be decorated with a sensitive emulsion made of a saturated solution of bichromate of potash rendered alkaline, sugar, gelatine, and alcohol, exposing it under a positive, developing the image or impression by dusting in a ceramic powder, coating it with a flux, and firing it, substantially as herein described.

2. The process of decorating glass, porcelain, and other surfaces, consisting in coating the surface to be decorated with an emulsion made of a saturated solution of bichromate of potash rendered alkaline in the proportion of three parts, a solution of sugar in the proportion of three parts, moist gelatine in the proportion of one part, and alcohol in the proportion of two parts, exposing the surface under a positive, developing the image or impression by the dusting in of a ceramic powder, applying a coating of flux to the surface, and firing it, substantially as herein described.

3. The sensitive emulsion herein described, consisting of a saturated solution of bichromate of potash rendered alkaline, a solution of sugar, moist gelatine, and alcohol, combined in the proportions substantially as herein described.

In witness whereof we have hereunto set our hands.

AMOS WESTWOOD.
PETER L. MALLON.

Witnesses:
S. H. NOURSE,
J. H. BLOOD.