

UNITED STATES PATENT OFFICE.

PIERRE A. DESPAQUIS, OF PARIS, FRANCE.

IMPROVEMENT IN PROCESSES OF PREPARING PHOTO-PLATES FOR PRINTING IN FATTY INKS.

Specification forming part of Letters Patent No. **170,716**, dated December 7, 1875; application filed July 6, 1875.

To all whom it may concern:

Be it known that I, PIERRE AUGUSTE DESPAQUIS, of Paris, France, have invented certain Improvements in Printing Photographic Pictures in Fatty Inks; and I do hereby declare that the following is a description of my invention, sufficient to enable those skilled in the art to practice it.

This invention of improvements in the preparation of gelatine and albumen photographic plates for printing from with lithographic inks is based upon the following observation: That a layer of bichromated gelatine, intended to furnish a plate for impressions with lithographic inks, however thin it is, may be divided into three parts or thicknesses.

In operating after the Poitevin process, and the process called Albertype, the sensitive layer is thus composed: First, a layer of albumen and bichromate run over the surface of the glass. Secondly, a layer of gelatine, also bichromated, covering the albumen, and, together, forming the total layer to be converted into the plate for the impressions. This total layer may then be divided into three thicknesses, the first attached to the glass and composed of albumen; the second, forming the exterior layer of gelatine; and the third forming the intermediate part between the layer of albumen and the exterior part of the layer of gelatine.

Up to the present time, all those who have employed these processes, or the analogous processes of Edwards or others, proceeded as follows: The layer of albumen, being placed on the glass, is rendered partly insoluble, either by the cooking or drying at a temperature of 60° to 80° centigrade. It is then rendered totally insoluble and adherent to the glass by solarization through the glass. This result arrived at, the layer is then covered over with another layer of bichromated gelatine.

This second layer being dried, the glass plate, thus prepared, is placed in the pressure-frame under the negative to be printed, the gelatine side in contact with the negative and exposed to the light. After exposure the plate is immersed in cold water to free it from the bichromate not acted upon, or otherwise

to fix it. In this manner two, only, of the three layers of the total have been rendered insoluble by the light—the one forming the support and adherent to the glass and insoluble beforehand, the other forming the exterior of the gelatine and solarized under the negative. But this solarization under the negative of the exterior of the layer of gelatine has penetrated unequally, according to the transparencies of the negative, and has not traversed entirely the intermediate thickness, which, consequently, remains hygrometric, and will absorb the water like the exterior parts of the layer which have been preserved from solarization by the opacities of the negative, and should take the water which repels the fatty inks, so that, after a very limited number of proofs the intermediate layer is found saturated with water, it loses its adherence to the layer of albumen forming its support, and is dragged off by the inking-roller, and the plate is destroyed.

The printer, to avoid the rapid destruction of the plate, dares not sufficiently water it before the passage of the inking-roller, and the ink not being sufficiently repelled in the whites and half-tints, the proof loses its contrasts.

To obviate these inconveniences, after the two exposures above named are made, a third exposure must be made through the glass to let the light penetrate, and, consequently, render it insoluble, and make it lose its hygrometric condition in its intermediate thickness, until it meets with the solarization which has had its action under the negative up to the strong half-lights, so as to stop the water passing behind the blacks and half-tints, (the gelatine will take sufficient water between the tones of the image,) so that the two solarizations form the two links of a chain, and do not come away from the glass without great difficulty, allowing a much greater number of proofs to be taken off. This solidity of the layer allows the plate to be wetted much more, the proof does not lose its contrasts, and the whites remain pure.

The application of this principle may be made in other ways: First, in suppressing the preliminary exposure of the layer of albumen or, if necessary, suppressing it altogether, and commencing to solarize the exterior layer

under the negative, and then solarizing by the ordinary light from the back of the glass until the action of the light meets the blacks and deep half-tints of the first solarization. It will be seen quite easily when the two solarizations meet each other, and, consequently, the moment to stop the exposure to light, viz., when the proof commences to fade away and become of one tint. Secondly, if the layer of albumen has been first of all rendered insoluble, either by cooking or solarization through the glass, by recovering this first thickness by a second in bichromated gelatine, but very thin, and calculated so that the solarization through the negative allows the light to penetrate, to give the blacks and the deep half-tints up to the layer of albumen, so as to render them adherent.

In place of employing the ordinary means of damping with a sponge, a method which necessitates the use of a dry dabber to remove the excess of water, and, above all, that left in the depressions forming the black of the image, and which should take the ink, I employ, by preference, a roller in porous stone or Passy brick, which is rendered specially porous and spongy, and which I have invented for this object. I intend to apply separately for a patent. With this damping-roller the damping is only done in the reliefs of the plate—that is to say, in the parts not solarized, and which ought to take the water and repel the fatty ink, and, consequently, form the lights of the picture—in this way the water not running over the entire plate, but depositing itself solely on the parts in relief, and which are the only parts requiring it, it becomes unnecessary to use the dry dabber, and there is no fear of taking away the water from the parts which should be saturated, which causes the ink to adhere to these parts and equalizes the half-tints with the blacks and stains the white.

The operation is as follows: A layer of bichromated gelatine, having been exposed under a negative, is wetted on the face—that is to say, upon the image—by any means, either by immersion in cold water for some minutes, if the layer of gelatine is supported by an impermeable plate, either of glass, metal, or

wood, or with a sponge, if the support of the layer is permeable—such as gauze or paper, &c.—so as to eliminate from the surface only of the layer the bichromate which is in the shades of the image. Then the bichromate being eliminated in that part of the layer, the plate is inked, so as the better to see if the bichromate has been sufficiently eliminated. It should be just to the depth of the penetration of the blacks. This being done, all the plate is left to be acted on by mixing the water of the surface with a little glycerine, which, maintaining a certain humidity on that surface, prevents the gelatine from becoming insoluble in that part, while all the part in the bottom becomes completely insoluble, and gives, consequently, a plate fit to yield a great number of proofs.

My invention rests, then, on the observation that to obtain a photographic plate upon gelatine, for printing with lithographic inks, fit to give a great number of proofs, and to prevent the half-tones equalizing themselves with the blacks, and the whites from staining, the general solarization through the supporting-layer (or even when there is no supporting-layer, as in the process-Edwards, or gelatinized metallic plate) ought to be carried on until it meets with the blacks, and deep half-tones of the exterior solarization under the negative, so as to avoid leaving between the two solarizations, in the total layers, an intermediate thickness, which, remaining hygrometric by the want of solarization, quickly imbibes water, after the drawing off of a very few proofs, and leads to the tearing up of the plate.

I claim—

The method, herein described, of preparing gelatinous surfaces for photograph-printing in fatty inks by solarizing the gelatine from both sides until the solarization from the back meets the deeper solarizations of the image, so as to retain the image while being printed from, substantially as set forth.

Signed by me this 12th day of June, 1875.

PIERRE AUGUSTE DESPAQUIS.

Witnesses:

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ROBT. M. HOOPER.