

UNITED STATES PATENT OFFICE.

LOUIS ANTOINE GARCHEY, OF DEMI-LUNE, FRANCE.

PHOTOGRAPHIC PROCESS AND PRODUCT.

SPECIFICATION forming part of Letters Patent No. 679,501, dated July 30, 1901.

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To all whom it may concern:

Be it known that I, LOUIS ANTOINE GARCHEY, a citizen of the French Republic, residing at the Demi-Lune, near Lyons, France, have invented certain new and useful Improvements in Photographic Processes and Products, of which the following is a specification.

All processes of photography in powdered enamel hitherto described are based upon potassium-bichromate solutions as devised by Poitevin. The usual process has been to make a solution of bichromate in distilled water and add honey, dextrin, or other agglutinant. This solution, which constitutes the sensitive material, was then poured on the desired surface, such as a plate of glass. The plate or the like was then exposed to the action of light under a photographic negative and after sufficient exposure developed and sprinkled with a vitrifiable finely-pulverized color of a shade corresponding to the desired decoration. It is impossible to wash out the bichromate from the image thus obtained with acid without injuring the image, and it has therefore been necessary to coat the plate with a film of collodion, and on this the acid could be poured without injury. The image was then taken off with the collodion and transported to another support, on which the enamel was to be baked. The fragility of the collodion film has rendered it impossible to treat large surfaces according to this process, and the liability of the film to be damaged by washing has rendered the process uncertain as to results. My process gets rid of both these difficulties.

One object of my invention is to strengthen this film by incorporating a reinforcing substance with the sensitive material. Collodion seems best adapted to such a purpose; but great difficulty was found in my experiments in mixing it with the sensitive material. All these solutions contain much water, and if collodion was introduced it was found to be decomposed, forming a precipitate of guncotton. In order to avoid this difficulty, I have devised the following process: First, I dissolve the bichromate in the least possible quantity of water—about two grams of bichromate in five grams of distilled water; second, with this I incorporate

syrupe matter—such as honey, glucose, or dextrin—about two grams; third, I add alcohol (five hundred grams of ninety-nine per cent.) and a small quantity (one decigram) of antiphotogenic coloring-matter, such as fuchsin. The antiphotogenic coloring-matter introduced is intended to prevent the effects of interference of luminous rays, which sometimes present themselves on proofs on transparent or translucent backings, such as glass, opal, or the like, and, fourth, and lastly, I introduce collodion, which dissolves in the mixture without decomposing, or instead of the collodion I introduce ether and then guncotton, which dissolve therein and form collodion in the mixture.

The sensitive material prepared as above described is employed to sensitize plates, and these after the image is developed can be repeatedly subjected to acidulated washings without injury, and thus very large plates may be employed, such as could not be used with methods hitherto known. The plates thus prepared are exposed to the light under the desired negative for a sufficient length of time to obtain the image, the colored vitrifiable powder is laid thereon, as usual, and the acid washings proceeded with, the collodion incorporated in the sensitive material giving a firm support to the enamel-powder while the bichromate is being removed. A complete elimination of the bichromate is necessary, because the least trace thereof would discolor the enamel and even interfere with its successful baking. The fixity of my sensitive coating enables it to stand a great number of washings without injury and also obviates the necessity for removal of the film.

My process is particularly adapted to the making of many-colored pictures, since it avoids the moving of the superposed films of bichromatized collodion, which was necessary under the old process. It is sufficient with my invention to isolate the superposed films after each photographic impression and application of powdered enamel by means of a coating of gelatin or gum. For the many-colored picture I utilize the well-known Ducos du Hauron process, which consists in exposing to the same subject negatives sensitive solely to the three fundamental colors—red, yellow, and blue—by means of interposed

screens of these colors and placing the plate to be decorated under the said negatives successively, developing the image in each case with a powder of corresponding color. Before the application of each new color I cover the film which has received the previous color with an isolated layer of a weak (about two-per-cent.) solution of organic material, such as gum or gelatin. I then apply another coating of sensitive material to the negative and repeat the process as often as I desire, the isolating layer preventing the new coating of sensitive material from dissolving the previous ones. After having printed and developed by yellow powder, for instance, and washed with acidulated water the bichromate film strengthened with collodion which has been exposed to the plate forming the yellow negative, I spread over it a layer of isolating material and dry it. Then a fresh coating of sensitive material can be applied, and the film can be exposed to the negative for blue and developed and powdered with blue. After washing with acidulated water the like operations are repeated for the red. Many other tints might be applied, if necessary.

For producing enameled effects I prefer to use plates of glass, porcelain, metal, or other material that can be baked, and for developing the pictures I employ colored powders of vitrifiable enamels. For producing prints on paper, pasteboard, celluloid, or the like, which are not intended to be baked, I operate in the same way, provided that the negatives are in the first place made impermeable, and I develop the pictures with colored vegetable or mineral powders.

As I have stated, my process allows of very large films being employed; but in order to avoid the use of very large negative-plates I print by projection and direct enlargement, and thus I can decorate large surfaces with photographs in colors.

The application of pictures in black or in color to large glass plates is objectionable, because if the pictures are looked at with the light behind them the half-tints become thin and have their full value only when the surfaces are covered with a layer of translucent enamel.

My invention enables such pictures to be improved by first applying over the whole surface white or dull enamel-powder, thus having a translucent ground for the desired color. On this ground I put a layer of the isolating material, sensitize afresh, and develop as many times as desired, as above described. On baking the ground becomes indelible and the desired effect is obtained.

It will be apparent that my process and the product thereof, though of especial use in photography with enameled colors as now practiced, are capable of use in connection with various other photographic processes. I

am not to be understood, therefore, as limiting myself to either the specific embodiment of my invention described or to the particular applications thereof which I have specified.

My invention makes it possible to obtain very large plates on which are fixed very clear photographic images, the images being in one or in several colors and being on a base which is roughened or not, as desired. The clearness of the images is due to the incorporation in the sensitive material of an antiphotogenic substance which prevents the interference of luminous rays. The great size of the plates which may be obtained and the ability to reproduce the image in several colors are due chiefly to the fact that there is no transporting of the film from one base to another, which is due in turn to the incorporation in the sensitive material of a substance, such as collodion, which increases the resistance of the film and which permits a considerable washing of the same.

What I claim, therefore, and desire to secure by Letters Patent, are the following-defined novel features, all substantially as set forth:

1. The process of photographic reproduction which consists in covering a plate with sensitive material containing potassium bichromate in which collodion and an antiphotogenic substance have been incorporated, exposing said plate, covering the same with suitable enamel-powder, removing the bichromate by repeated acid washings, covering the whole with an isolating layer, and finally baking the same.

2. The process of photographic reproduction in colors which consists in applying a coating of translucent enamel to a plate, applying a film of sensitive material containing potassium bichromate in which collodion and an antiphotogenic substance have been incorporated, exposing and covering said film with an enamel-powder of one color, removing the potassium bichromate by repeated acid washings, applying an isolating-coating to said film, repeating said steps with enamel-powders of other colors, and finally baking the whole.

3. A plate having thereon a foundation coating of translucent enamel, successive films printed from collodionized sensitive material containing potassium bichromate and an antiphotogenic substance, and isolating-coatings between the successive films, the images printed on said successive films being in colored enamels, and the whole being baked.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS ANTOINE GARCHEY.

Witnesses:
SETUN CRETEN,
M. NACHONCY.