

# UNITED STATES PATENT OFFICE.

VICTOR M. GRISWOLD, OF PEEKSKILL, NEW YORK.

PROCESS AND COMPOSITIONS FOR PRINTING PHOTOGRAPHIC PICTURES.

Specification forming part of Letters Patent No. 53,815, dated April 10, 1866.

*To all whom it may concern:*

Be it known that I, VICTOR MOREAU GRISWOLD, of Peekskill, in the county of Westchester and State of New York, have invented an Improved Photographic Surface and the Compositions and Process for Preparing the Same, of which the following is a specification.

My invention consists of an improved photographic surface prepared and finished in the manner and by means of the compositions hereinafter described, and in the compositions and process for producing the same, hereinafter set forth.

The object of thus preparing and finishing a photographic surface is to reduce the expense, simplify the process, and provide a means for taking photographic pictures on any prepared material by previously coating it with a perfectly white opaque film, while, at the same time that the expense is less, I am enabled to make a better picture.

In order to carry my invention into effect, I first make a collodion by the following formula, viz:

Formula for solution No. 1, (opal collodion:) Alcohol, (ninety-five per cent.,) ten ounces; sulphuric ether, fifteen ounces; acetic ether, two ounces; gum-kauri, one ounce; gum-shellac, bleached, one-half ounce; solution cotton, ninety grains; castor-oil, twenty-five drops; glycerine, twenty-five drops.

The proportions and quantities of the above-named substances may be changed or modified according to the effect desired to be produced, and for the purpose of rendering the resulting film more or less tough and pliable, or thin and powdery, as well as to affect its sensitiveness to light and secure either a moist or dry surface.

The collodion film must be well dried before plunging into the silver-bath. The acetic ether in the above solution renders the collodion film powdery by opening the tissue or fiber. The castor-oil renders it tough and prevents bronzing in printing, and the glycerine makes it moist or renders it capable of retaining moisture.

The solution may be used and moderately good results obtained without either the acetic ether, castor-oil, or glycerine, and other resinous gums may be substituted for the gum-kauri and gum-shellac named therein; but I prefer using the formula as given, as better

results are thereby obtained than by any other with which I am acquainted.

I next prepare a sensitizing solution as follows, viz:

Formula for solution No. 2, (sensitizing:) Water, three ounces; alcohol, (ninety-five per cent.,) two and one-half ounces; muriatic acid, one-half ounce; chloride of calcium, one and one-half ounce; chloride of ammonia, one ounce; bi-chloride of mercury, one ounce.

The mixed acid and water should be poured upon the chlorides and agitated in a warm place until dissolved, and then the alcohol added.

While the above formula is an improvement in the art and makes a better picture, still the most important advantages of my invention may be secured, in connection with my improvements, by the use of other proper sensitizing solutions known to the trade. Of this solution (No. 2) add to the collodion solution (No. 1) from two to ten drops to each ounce of collodion, according to the strength of the ammonia-nitrate bath or the tone desired to be produced.

If the plain silver-bath is used with ammonia-fuming, the smaller quantity named will be sufficient. In either case the silver-bath must be strongly impregnated with alcohol—say eight ounces in a bath of forty ounces. On coming from the silver-bath the plate should be again thoroughly dried before being exposed under the negative. After exposure the plate is immersed in a solution composed, as follows: water, four ounces; solution No. 2, thirty to forty drops, and gently rubbed with a piece of soft sponge or a soft camel's-hair brush to remove all the unreduced silver from the surface before toning and fixing. The picture should now be washed thoroughly and toned and fixed by any of the many toning and fixing processes, and finished with the opal picture-enamel hereinafter described.

For printing in the camera I vary the above process by using the opal collodion, (solution No. 1,) sensitized by any of the formulas for sensitizing bromo-iodized collodion, and I then use the ordinary nitrate-of-silver bath.

When the plain silver-bath is used with ammonia-fuming I produce the vapor of ammonia as follows: lime, unslaked, one part; ammonia-alum, one part; the lime and alum pulverized separately, and then triturated together and placed in the fuming-box. By the

use of this mixture I obtain strong ammonia-fumes at a cost very much below that of any other process now known to the trade.

The plate is exposed wet in the copying-camera and developed in the usual manner. If desired, it may be toned with chloride of gold, after which it may be fixed with cyanide of potassium or hyposulphite of soda. This last process converts the picture into a negative, and it is reconverted into a positive by the application of the following: water, three ounces; solution No. 2, one-half ounce. This solution is kept upon the plate until all the details are clear and sharp, when it is thoroughly washed and dried, and finished with the following solution—viz., solution No. 3, (opal picture-enamel:) Bleached gum-shellac, two and one-half pounds; borax, six and one-half ounces; water, one gallon; linseed-oil, two ounces; sulphuric acid, one dram; albumen, one ounce. The borax should be dissolved in the water over a fire, and when dissolved the sulphuric acid well stirred in. Next the oil should be added and the solution brought rapidly to the boiling-point, after which the shellac should be added, the mixture being stirred continually until the shellac is dissolved, when it should be allowed to become cool. Then add the albumen, previously thoroughly beaten up, with about a pint of the enamel. When settled, unless it is designed to be used upon wet films, add about one-third of its bulk of alcohol to make it flow readily over the plate. Let the enamel dry spontaneously in a moderately warm place.

In the above solution (No. 3) the linseed-oil is used to render the enamel tough and pliable, the sulphuric acid to harden it, and the albumen to clarify it and give it additional luster. The enamel may be made and used very well without the three ingredients above named, but I prefer using them, as a better result is obtained thereby.

The above-described manner of producing the opal collodion, sensitizing solution, and opal picture-enamel, while apparently distinct in themselves, are each very important in the obtaining of the desired object, which is the production of a more perfect photographic picture upon an opal surface in a comparatively cheap and easy manner.

By the above process and compositions I am enabled to form a perfectly white opaque

collodion film, sensitized by a process which gives increased rapidity to the action of the light, and also preserves the purity of the white film as well as the film itself, and finished with an enamel which is peculiarly adapted to this purpose, and which is the only enamel I have been able to discover which will not render the white film transparent and ruin the picture. I am also enabled to print photographic pictures upon japanned iron or other japanned surfaces of any color, or upon glass, superseding the present difficult and expensive opal-glass process, or upon card-board or other paper or paper-like surface previously prepared for the purpose, or any other smooth surface, thus doing away with much of the present tedious and expensive manipulations in printing photographs or opal pictures.

Having thus described my invention and the manner in which it may be usefully employed, I claim—

1. As a new article of manufacture, the photographic surface described, with or without the opal picture-enamel.

2. The composition of the opal collodion by the formula No. 1, and in the manner hereinabove set forth, or in any manner substantially the same.

3. The fuming of the plate over a mixture of ammonia-alum and unslaked lime, as hereinabove set forth.

4. The composition of the sensitizing solution by the formula No. 2, and in the manner hereinabove set forth, or in any manner substantially the same.

5. The composition of the opal picture-enamel by the formula No. 3, and in the manner hereinabove set forth, or in any manner substantially the same.

6. The combination, in the process of manufacture, of the opal collodion, sensitizing solution, and opal picture-enamel hereinbefore described, as and for the purpose hereinabove set forth.

7. The process hereinabove described for preparing and finishing an opal surface for photographic purposes.

V. M. GRISWOLD.

Witnesses:

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D. F. CLAPP.