UNITED STATES PATENT OFFICE.

WILLIAM W. SHERMAN, OF MILWAUKEE, WISCONSIN.

PROCESS OF PRODUCING PHOTOGRAPHS IN PERMANENT PIGMENTS.

SPECIFICATION forming part of Letters Patent No. 332,364, dated December 15, 1885.

Application filed July 1, 1884. Serial No. 136,573. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM W. SHERMAN, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in a Process of Producing Photographs in Permanent Pigments, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to a process for making photographic impressions for the use of artists, either professional or amateur, which impressions are designed to be finished in crayons, pastels, india-ink, water-colors, or oil-colors, as preferred; and it consists in the following steps, in the order named: First, coating paper, canvas, or cloth with a sizing of suitable solubility; secondly, the application to the same, in the form of a fine spray, of a pigment suspended in a vehicle capable of being made sensitive to the action of light; thirdly, the exposure to light in the usual manner of producing photographic prints from a negative; and, fourthly, the development of the image by washing away the parts not acted upon by the light, as well as partially washing away the parts only partially acted upon by the light to secure a gradation of light and shade.

I prepare two stock solutions, which I call "No. 1" and "No. 2," respectively, the first being used in the sizing of the paper and the second in connection with the first, together with pigments and a sensitizing-salt, in preparing the paper for printing.

I prepare my stock solution No. 1 by soaking "Nelson's photographic gelatine, No. 1," in cold water for fifteen minutes, pouring off the water not taken up by the gelatine, melting the residue by the aid of heat, and filtering.

To size the paper, take one part of the stock solution No. 1 and dilute with three parts of water. The paper may be floated on the sizing-solution or drawn through it, or the sizing may be applied by means of a brush, the object being to evenly coat the surface to receive the impression. After sizing the paper is allowed to dry.

My stock solution No. 2 is made by soaking Coignet's gelatine half an hour in cold water, pouring off, as before, the water not taken up by the gelatine, and then melting the residue by the aid of heat, adding to the melted mass six times its bulk of water, and filtering.

To prepare the paper for receiving the impression, I take one-half (½) fluid ounce of each stock solution Nos. 1 and 2 and add one and one-half (1½) drams of a saturated solution of bicromate of potash and a sufficient quantity of pigment, previously mixed with water, to produce results of the desired depth, together with enough water to make the entire mixture two fluid ounces. This mixture is thrown onto the paper by means of an atomizer—such as is used by physicians—operated by means of a continuous current of air from a suitable air-pump, or it may be applied by means of the air-brush, all of which operations to be performed in non-actinic light, as well known. The paper is ready for exposure as soon as dry, which exposure is effected in the usual manner by allowing the light transmitted through a negative to fall on the paper. The time of exposure varies with the character of the negative and the intensity of the light, but is about one-tenth of that required by the ordinary silver process under the same conditions. After exposure the paper is immersed in water of temperature from 80° to 120° Fahrenheit, which in a few minutes generally suffice to dissolve the gelatine in the unexposed parts. The paper is then placed on a frame covered with sheeting and washed with a spray of water consisting of a number of small jets having sufficient force to dislodge the particles of pigment and gelatine from the parts not acted upon by the light.

While the solutions that I have described are such as I prefer to use under ordinary circumstances, these may be varied somewhat, at the will of the operator, under other circumstances. A sizing-solution of less solubility tends to produce results having sharper contrasts, the same being true with regard to the solutions with which the pigments are mixed, and in preparing the paper for printing I may substitute a saturated solution of bichromate of ammonia for that of potash, to secure a greater degree of sensitiveness, when required, and in case a stronger sizing-solution is used than that hereinbefore described it will be necessa-

ry to increase the time of exposure correspondingly; but the constituents and proportions already named have been found generally satisfactory.

If desired, the solution of bichromate of potash or ammonia may be omitted from the described mixture of pigment, water, and solutions Nos. 1 and 2, and after this mixture has been sprayed upon the paper and allowed to dry the paper may be sensitized by floating it, face down, upon a solution of said bichromate.

Among the chief advantages of my process are the following: My method is simple and inexpensive in developing. I avoid all transfer of the film from one support to another, which is necessary in the ordinary method of pigment-printing, and which requires great skill and care, and in the resulting print I obtain a most desirable texture, the shadows being free from heaviness, and the half-tints being open and resembling the texture of crayon or the stipple of brush-work. The prints are as permanent as any pigment-prints, and, being made with a much smaller proportion of gelatine, are less liable to deterioration, and the paper not being coated with a film of gelatine there is less liability of the print flaking or scaling off, as by using my fine spray I avoid the said glossy film, which, being smooth and without tooth, is particularly objectionable, and the dotted or stipple appearance of my work is highly desirable and, I believe, novel in photography.

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

1. In the process of producing photographs, the application, in the form of a fine spray, of pigments suspended in a gelatine solution or other suitable vehicle capable of being sensitized, to the surface designed to receive the photographic impressions, and producing thereon a dotted or stipple effect, substantially as set forth.

2. In the process of producing photographs, the several steps described, consisting of, first, coating the surface of the paper or other suitable material with a sizing of suitable solubility; secondly, the application, in the form of a fine spray, to said surface of the pigments suspended in a vehicle made sensitive to the action of light; thirdly, the exposure to the light; and, fourthly, the development of the image by washing away the parts not acted upon by the light, leaving a dotted or stipple effect upon the print, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM W. SHERMAN.

Witnesses:
STANLEY S. STOUT,
H. G. UNDERWOOD.