UNITED STATES PATENT OFFICE.

REDFIELD B. WEST, OF GUILFORD, CONNECTICUT.

PROCESS OF PHOTOGRAPHIC PRINTING.

SPECIFICATION forming part of Letters Patent No. 345,938, dated July 20, 1886.

Application filed January 9, 1886. Serial No. 188,124. (No specimens.)

To all whom it may concern:

Be it known that I, REDFIELD B. WEST, of Guilford, in the county of New Haven and State of Connecticut, have invented a new Improvement in Processes of Photographic Printing; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to an improvement in the process of photographic printing described in another application, Serial No. 167,289. In that application the paper is sensitized by subjection to a bath consisting of a solution in water of potassium bichromate and mercuric chloride. After the paper has been properly dried it is printed upon by exposure to light under a negative, in the usual manner. The photographic prints thus produced are of a yellow color, which not being always desirable, the object of my present invention is to change this yellow tint to a more desirable violet-black; and the invention consists in the treatment of the prints, as hereinafter described, and particularly recited in the claims. After washing the prints in clear water I subject them to a developing-bath produced by a solution of the following compound in water. The developing compound consists of pyrogallol, two parts; gallic acid, eight parts; ferrous sulphate (dried) or other ferrous salt soluble in water, ten parts; sodium hyposulphite, (dried,) eighty parts. This compound is prepared in mass, and sold for use when required. The solution is made by dissolving the compound in water in the proportion of two per cent. on the compound to the water. By employing the pyrogallol in the solution I am enabled to change the color which it produces to a brown or any intermediate shade by subjecting the prints to a toning-bath containing lead nitrite. Without the pyrogallol a violet-black is produced by an aqueous solution of the three other ingredients; but the color is not subject to change in the toning-bath. The ferrous salt referred to is preferably ferrous sulphate; but I sometimes use ferrous tartrate or other ferrous salt, or produce these salts in the bath by adding to the compound an alkaline tartrate, &c.

The advantage in substituting other iron salts for the sulphate is that by so doing I can vary the color developed within certain limits, according to the ferrous salt used and the proportion of pyrogallol, from the violet-black produced by the sulphate alone to a warmer tone, using the toning-bath only when it is necessary to obtain well-marked browns.

In my previous processes I added alum to the gallic acid, ferrous sulphate, and sodium hyposulphite for the purpose of obtaining prints having clear whites; but I find this addition unnecessary with the method of bleaching which I now use, and objectionable, as it prevents the development of a good color. The print should be left in the developing-bath from five to ten minutes, then removed from the bath, then washed in clear water, and then may be bleached by the action of a dilute solution of chlorine or bromine. The bleaching action of the halogens should be modified by the presence of an acid, as it is then more even.

The chlorine bath is best prepared by dissolving one part of calcium hypochlorite in three hundred parts of water and adding about two parts of an acid, preferably phosphoric.

After the prints have been bleached they may be mounted in the usual manner; or, if a brown color is desirable, they are toned by subjecting them to a bath consisting of a one or two per cent. solution of lead nitrite or a mixture of potassium or sodium nitrite and lead nitrate; but should a cold gray be preferred to the brown, then add to the toning-bath from two to five per cent. of mercuric chloride. The prints are then washed in clear water.

The proportions which I have mentioned for the ingredients in the several compounds and baths are such as in practice have produced the best results; but they may be varied somewhat without departing from my invention.

I would state that in order to attain the best results the paper should possess a considerable degree of porosity and be thickly coated with starch on both sides, and the paper should be free from alkaline particles.

I claim—

1. The herein-described composition for bath for the development of photographic prints which are obtained by the action of

light upon paper sensitized with potassium bichromate and mercuric chloride, said compound consisting of pyrogallol, gallic acid, a ferrous salt soluble in water, and sodium hyposulphite, in the proportions and substantially as described.

2. The process herein described for developing photographic prints which are obtained by the action of light upon paper sensitized with potassium bichromate and mercuric chloride, consisting in subjecting the print to a bath composed of a two per cent. solution of pyrogallol, gallic acid, a ferrous salt soluble in water, and sodium hyposulphite, in the proportions and substantially as described.

3. The herein-described improvement in bleaching photographic prints, consisting in subjecting the prints to a solution of calcium hypochlorite and phosphoric acid, in the proportions and substantially as described.

4. The herein-described improvement in toning photograpic prints which are produced by the action of light upon paper sensitized with potassium bichromate and mercuric chloride where a cold-gray color is desired, consisting in subjecting the prints to a toning-bath composed of a solution of lead nitrite and mercuric chloride, in the proportions substantially as described.

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Witnesses:
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