A. C. McCLOSKEY.

PHOTOGRAPHIC PAPER.

APPLICATION FILED MAY 25, 1916.

1,265,464. Patented May 7, 1918.

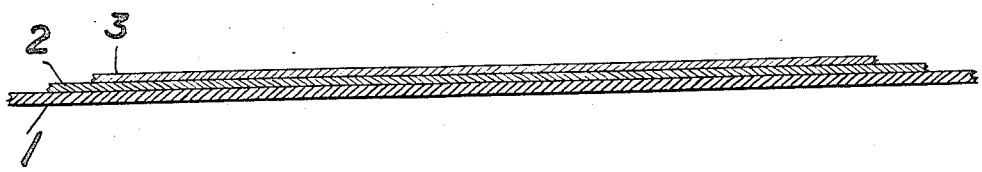


FIG. 1.

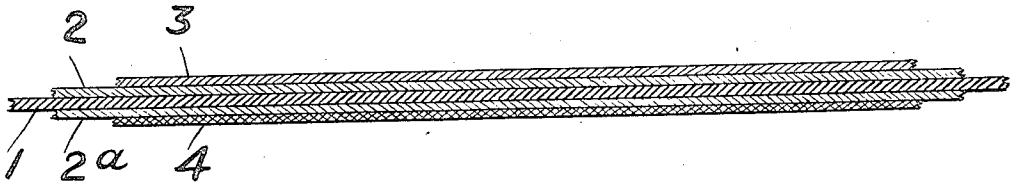


FIG. 2.

WITNESS:

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ALFRED C. McCLOSKEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO HIMSELF, ONE-FOURTH TO A. ELTON DAVIS, AND ONE-FOURTH TO FREDERICK J. GEIGER, ALL OF PHILADELPHIA, PENNSYLVANIA.

PHOTOGRAPHIC PAPER.

1,265,464. Specification of Letters Patent. Patented May 7, 1918.

Application filed May 25, 1916. Serial No. 99,712.

To all whom it may concern:

Be it known that I, ALFRED C. McCLOSKEY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Photographic Papers, of which the following is a specification.

The present invention relates to improvements in that class of papers which are sensitized by a coating containing ferric salts and a gum or its equivalent, and which are developed by potassium ferro-cyanid and cleared as with sulfuric acid and which produce from tracings or the like prints having dark lines or marks where the tracings have dark lines or marks and light grounds where the tracings have light grounds. The invention is applicable not only to such papers when coated upon one side but also to such papers when coated upon both sides in accordance with the invention forming the subject-matter of my Patent No. 1,213,925, dated January 30th, 1917.

The principal object of my present invention is to improve the appearance of the ground by making it more white and entirely free from stains, and in addition, as applied to my prior invention, to improve the appearance of the back in a similar manner, while at the same time the lines of the print are strong, clear and distinct.

The invention will be claimed at the end hereof but will be first described in connection with the accompanying drawings forming part hereof and in which—

Figure 1, is a diagrammatic sectional view illustrating paper embodying features of the invention and coated on one side only, and

Fig. 2, is a similar view illustrating paper embodying a modification of the invention.

Referring to Figs. 1 and 2, the paper 1, has an under coat 2, which will not dissolve in water or alkaline solutions and which is removable by dilute acids. An example of such a coating is a solution of ferric chlorid applied to the paper which when alkaline probably produces ferric hydrate. Paper which is not alkaline may be given an alkaline bath. At any rate the application of a solution of ferric chlorid to the paper produces a coating which does not dissolve or become removable in water or potassium-ferro-cyanid—the developer—but which does become removable by dilute sulfuric acid—the clearing solution. The outer coating 3, may appropriately contain organic matter, as gum, dextrin, gelatin or the like, ferric ammonium citrate (brown) and ferric chlorid. Upon exposure under a tracing or the like the ground, or probably more accurately the exposed part of the outer coating 3, is converted from the ferric to the ferrous state, and the lines remain in the ferric state, since they are covered by the lines of the tracing. The developer—potassium ferro-cyanid—renders the lines insoluble in water and sulfuric acid either by precipitation or otherwise. The ground, like the under coat 2, is soluble in the acid clearing solution and rendered removable, so that after the print is washed off with water the ground is white and free from stains, but the back would not be white if the paper were immersed in the various solutions. To obtain a white back as well as a white ground and at the same time permit of the immersion of the print in the various finishing solutions, which may of course include staining solutions in addition to the potassium ferro-cyanid solution, as a developer, and dilute sulfuric, or other suitable acid, as a clearing solution, recourse may be had to the invention of my said prior patent as improved by the present invention. A description will be given of one manner in which this can be done:

Referring to Fig. 2, the face of the paper is provided with the same sensitizing coating consisting of the over and under layers 3 and 2, which is used in connection with the paper illustrated in Fig. 1, and which has been above described. Referring to Fig. 2, a coating 2^a, of ferric chlorid is applied to the other face of the paper so that in this case both sides of the paper are provided with an under coat of ferric chlorid. On top of the coating 2^a, and on the back of the paper there is applied a coating 4, consisting of or containing organic matter as gum, dextrin, gelatin or the like, ferrous ammonium citrate (green), and ferrous chlorid.

A tracing or the like is placed in contact

with the coating 3, and the paper is printed by exposure to light. All those parts which are covered by the lines of the tracing remain in the ferric condition but the other parts of the coating 3, which are exposed to the light are reduced to the ferrous condition. At this stage the coating on the back is the same as that part of the coating on the face which has been exposed and acted upon by light. When the print is immersed in the developing bath containing potassium ferrocyanid, the lines of the print, being ferric, become insoluble in dilute acid either by precipitation or otherwise, whereas the rest of the coating on both the back and front or face remains or is rendered soluble by immersion in dilute sulfuric acid, the clearing solution. After the print has been developed and washed in water, it is immersed in the clearing solution and when again washed in water all of the coatings come off except the lines of the print, leaving a white stainless ground for the print and a white stainless back. Where staining solutions are employed to produce, for example, black instead of blue lines on a white ground, the action is the same for any stains produced by the staining solutions or in fact by any of the solutions employed or by impurities therein, come off with the exposed portion of the coating on the front and the coating on the back. The under coating formed by the application to the paper of ferric chlorid since it is insoluble in water and alkaline solutions remains in place until the final treatment of the print with the acid clearing solution and so this coating plays an important part in protecting the paper from stains and in removing the same. Furthermore this under coat in no way interferes with the operations by which the lines are printed, developed and, if desirable, stained.

The word paper is used herein in its ordinary sense and includes linen, tracing cloth or any equivalent material, and the word tracings includes plates, films, transparencies and the like.

From the foregoing description it is obvious that changes may be made in details by substituting equivalents in the application of the invention to different known papers and printing processes, so that the invention is not limited in those respects nor otherwise than as the claims may require.

What I claim is:

1. Photographic paper provided on each side with a ferro under coat and on one side with an outer coat containing ferric salts and on the other side with an outer coat containing ferrous salts.

2. Photographic paper provided on one side with a ferro under coat and an outer sensitizing coat containing ferric salts.

3. Photographic paper provided on one side with a ferro under coat and an outer protective coat containing ferrous salts.

ALFRED C. McCLOSKEY.