

UNITED STATES PATENT OFFICE.

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TONING-BATH FOR PHOTOGRAPHIC SILVER-PRINTS.

1,064,379.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, PAUL REHLÄNDER, doctor of philosophy, chemist, citizen of the German Empire, residing at Charlottenburg, near Berlin, German Empire, have invented a new and useful Improvement in Toning-Baths for Photographic Silver-Prints, of which the following is a specification.

It has already been proposed to employ selenium dissolved in an alkali sulfid solution for toning photographic prints. Such solutions however, especially when dilute, rapidly deteriorate as they easily become oxidized by the atmosphere. Moreover the white portions of a print turn brownish so that the print has to be after-treated in a bisulfite bath. These baths are strongly alkaline and therefore affect the hands and the paper. Further it is only possible to obtain one tone of brown.

According to this invention I employ for toning silver prints a salt of an acid containing selenium, for example a selenium sulfate compound. The solutions of such salts are neutral, very stable in the presence of an alkali sulfite and in the atmosphere.

Very dilute solutions may be employed as a solution containing even 1/20% of selenium commences to tone. The white portions of a print are not discolored so no after-treatment with bisulfite is necessary.

One great advantage in the use of such baths is that they are employed in exactly the same manner as the gold and platinum solutions habitually used and good tones of different shades can be obtained.

For example:

1. 100 grams of sodium thiosulfate, 1.5

grams sodium selenium sulfate and 13 grams sodium sulfite sicc. are dissolved in one liter of water. The developed and fixed silver print is well washed and immersed in such bath for three to ten minutes according to the quality of the print and the tone it is desired to obtain. The tone changes from a pure black, according to the developer employed, into a brownish or into a violet-blue tone and finally into a red one.

2. 1 gram of potassium sulfite and 1 gram of sodium selenium sulfate are dissolved in a little water and added to a solution of 5 grams of potassium bisulfite in 30 cubic centimeters water the mixture being heated to boiling. The solution contains mainly the potassium salt of the selenium trithioacid and a small quantity of potassium selenium sulfate. 10 cubic centimeters of such solution are added to 200 cubic centimeters of a 20% solution of sodium thiosulfate. Such bath gives the same tone and has similar richness as the first named bath.

I claim as my invention:

1. A toning bath for photographic silver prints, containing a salt of an acid which contains selenium, substantially as described.
2. A toning bath for photographic silver prints, containing a salt of seleno sulfuric acid, substantially as described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

PAUL REHLÄNDER.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.