

UNITED STATES PATENT OFFICE.

GEORGES EMMANUEL ZELGER, OF VINCENNES, FRANCE, ASSIGNOR TO PATHE CINEMA, ANCIENS ETABLISSEMENTS PATHE FRERES, OF PARIS, FRANCE.

PROCESS FOR OBTAINING DIRECT POSITIVES BY REVERSAL.

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The known method for obtaining direct positives or counter-types by reversal, consists in a thorough development of a photographic plate, and in then treating it in a bath which dissolves the silver of the image, and lastly in reducing by a developer the bromide of silver which remains unchanged. The obtainment of the first and thorough development requires a very strong developer, and it is thus necessary to operate as a rule in a very alkaline medium. But the baths for dissolving the silver, based upon potassium permanganate and sulphuric or chromic acids, etc. are always strongly acid. Inversely, the second development, effected in a developer, is alkaline.

The applicant has found that this alternation of media, which are alternately strongly acid and basic, to which the gelatine is subjected, tends to alter it considerably, chiefly in warm weather; and it is especially the operation in the last developing bath which is to be feared in this respect.

The present invention consists in substituting for the second development a chemical reduction, partial or complete, of the silver bromide, by means of baths which have not the nature of developers but which are formed of substances reducing the silver salt in an acid medium. In this manner an alternation between acid and basic substances is obviated, and after the treatment in the first developer, the gelatine of the print is treated only in an acid medium. This avoids the serious drawback above mentioned.

The alkaline hydrosulphites, with the addition of a weak acid, the acidulated

hypophosphites, stannous chloride, etc. are adapted for this last operation.

By way of example, use can be made of the following bath: water, 1 litre, sodium bisulphite liquid, 50 cubic centimeters, sodium hydrosulphite, 10 grammes.

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

1. A photographic process for obtaining direct positives consisting in effecting a first development, then dissolving in an acid bath the silver of the image thus obtained, and then effecting the final reduction of the remaining silver salt in a non basic bath containing substances capable of reducing said silver salt in an acid bath even without any exposure to light.

2. A photographic process for obtaining direct positives consisting in effecting a first development, then dissolving in an acid bath the silver of the image thus obtained and then effecting the final reduction of the remaining silver salt in an acid bath containing substances capable of reducing said silver salt in an acid bath even without any exposure to light.

3. A photographic process for obtaining direct positives consisting in effecting a first development, then dissolving in an acid bath the silver of the image thus obtained and then effecting the final reduction of the remaining silver salt in a nonbasic bath containing in proportion: water 1 litre, sodium bisulphite liquid 50 cubic centimeters, sodium hydrosulphite 10 grammes.

In testimony whereof I have signed my name to this specification.

GEORGES EMMANUEL ZELGER.