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UNITED STATES PATENT OFFICE.

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PREPARATION OF PHOTOGRAPHIC DEVELOPERS.

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In the present state of the art there is no method known in photography for obtaining automatic rectification of errors in exposure.

The processes utilized up to the present for effecting such rectifications consist simply in modifications in the composition or concentration of the developers being used, during development, the result being that these rectifications depend merely upon the experience and skill of the operator. In many cases, as for instance during the development of a film in which normally exposed, over exposed and under exposed portions are all present without it being known in which portions of the film the defective sections are to be found, rectifications are impossible.

When using ordinary plates in the case of which there are greatly over exposed or under exposed portions or which have been exposed to a bright facing light, there is no process which enables a good negative to be obtained, that is to say a negative which is not clouded, fogged by the sun or showing a halo.

Furthermore, the problem of development in broad daylight with uncoloured developers, has not been solved up to the present time.

The characteristic feature of the present invention is that by its means the greater part of the defects existing in the usual developers are obviated by the addition of certain new ingredients.

These ingredients are nitrous acid salts or their reaction products with sulphurous salts, such for instance as hydroxylamine (NH_2-OH.) or the derivatives of hydroxylamine obtained by replacing the hydrogen atoms of hydroxylamine by sulphonic radicals as for instance

Hydroxylamine sulphonic acid $N(H)(OH)(SO_3H)$.

Hydroxylamine disulphonic acid $N(OH)(SO_3H)(SO_3H)$.

Hydroxylamine isodisulphonic acid $N(H)(OSO_3H)(SO_3H)$.

Hydroxylamine trisulphonic acid $N(SO_3H)(OSO_3H)(SO_3H)$.

Nitrilosulphonic acid $N(SO_3H)_3$.

Derivatives of hydroxylamine can also be used in which one atom of hydrogen is replaced by an organic radical of the type $C.H_3-C_6H_5$—etc., such as

(1) $R-N(H)(OH)$.

(2) $R-N(SO_3H)(OH)$.

(3) $R-N(SO_3H)(OSO_3H)$.

(4) $R-N(SO_3H)(SO_3H)$.

Finally derivatives of hydroxylamine may be employed in which the hydrogen atom is replaced by an organic radical of the type C_6H_5-CO, such as hydroxamic acid for instance:—

$C_6H_5-CO-N(OH)(H)$.

Each of these substances or their salts when introduced into the composition of the developer gives it new properties by means of which, during development, without modifying the composition or concentration, defects of exposure may be suppressed as also the phenomena of fogging and halo when exposures are taken facing a bright light. In general the violent contrasts between light and shade are equalized. At the same time the said substances reduce to so great an extent the sensitivity of the silver haloids that it is possible to develop in a bright red light or even in a yellow light.

By way of example, the following composition of a developer made according to the invention is now given.

	Grammes.
Water	1,000
Hydroquinone	5
Sodium sulfite	20
Sodium hydroxylamine isodisulphonate	5
Sodium carbonate	40
Potassium bromid	1

What I claim and desire to secure by Letters Patent of the United States of America is:—

1. A photographic developer formed by mixing with substances constituting an ordinary developer, nitrous acid salts and sulphurous acid salts, substantially as described.

2. A photographic developer formed by mixing with substances constituting an ordinary developer, the reaction products of nitrous acid salts with sulphurous acid salts substantially as and for the purposes described.

3. A developer for photographic purposes, formed by mixing with substances constituting an ordinary developer, hydroxylamine derivatives obtained by replacing the hydrogen atoms of hydroxylamine by sulphonic radicals, substantially as described.

4. A developer for photographic purposes, formed by mixing with substances constituting an ordinary developer, hydroxylamine derivatives in which one atom of hydrogen is replaced by an organic radical of the type $CH_3-C_6H_5$.

In witness whereof I affix my signature.

PIERRE SCHESTAKOFF.