Aug. 9, 1938. G. SZÁSZ 2,126,516

PHOTOGRAPHIC PROCESS

Filed Sept. 13, 1935

Fig. 1.

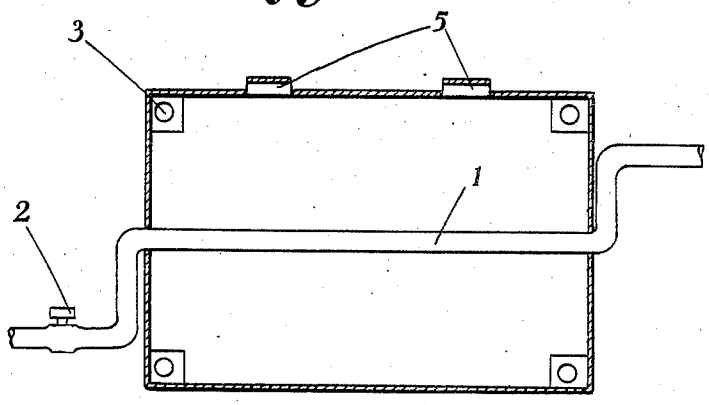
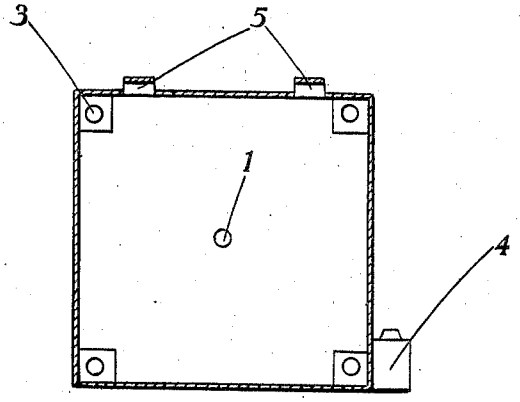


Fig. 2.



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PHOTOGRAPHIC PROCESS

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5 Claims. (Cl. 95—7)

This invention relates to improvements in or relating to photographic processes and emulsions for use therein and has for one of its objects to provide an emulsion or emulsion layer which upon exposure and subsequent development enables a direct positive to be obtained in a very simple and expeditious manner.

It is already known that by adopting what are known as reversing processes which usually involve exposing an emulsion up to a point of solarization or maximum blackening, and subsequent exposure for the actual taking of a photograph, a direct positive copy may be obtained but known processes have not been successful in practice inter alia on account of the very long exposure necessary and the unsatisfactory nature of the final copies. Further objects of the present invention are to provide a process which is free from these objections to previously known processes and to enable good quality direct copies to be made very quickly and in a manner as simple as that ordinarily followed in making a negative copy of an original, the reversing action i. e. the reduction of the darkening at the exposed places taking place during quite brief exposure and the "reverse" picture being produced during a single development.

According to one feature of the present invention I provide a photographic emulsion having the property of reversing upon exposure characterized in that the desired silver halide is produced in a sufficiently small amount of gelatine to prevent the immediate formation of a stable emulsion or suspension but tends to become precipitated and settle on the bottom of the vessel. If desired, the silver halide may undergo a maturing process by being allowed to stand for some time in the cold and the supernatant solution may be removed by filtration or decanting and the silver halide may then be emulsified in a gelatine solution of the desired concentration for instance about 8% to 10% in which condition the solution can be poured.

In some cases, and dependent upon the gradation required, the supernatant solution may not be removed or be only partially removed and the silver halide emulsified in the concentrated gelatine layer may be subjected to a watering treatment.

The emulsion produced in the above manner is subjected to a process resulting in solarization for instance by being exposed in suitable apparatus and/or chemically by the addition of suitable agents such for example as silver nitrate, sulphur compounds, dyestuffs or the like. An emulsion prepared in the above manner has a strong tendency towards reversal i. e. upon subsequent exposure the exposed portions tend to become bleached and this tendency can be enhanced by adding to the light sensitive material or to the emulsion thereof suitable dyestuffs. Thus for example I find that specially beneficial results can be obtained by using safranine, azine, oxazine, thiazine, quinoxaline and similar dyestuffs which possess desensitizing characteristics, although in some cases I also find that the bleaching effect can be increased by employing dyestuffs which have a sensitizing effect on usual emulsions such for instance as thio-carbocyanines. Moreover any means favourable towards the Herschel effect such for example as copper salts can also be used with advantage for increasing the bleaching effect.

The solarization of the silver halide may be effected at any desired stage or stages of the manufacture of the emulsion, for instance directly after precipitation in which case there is the advantage that the bulk of the material is small and the uniform treatment of each particle by light is facilitated.

In the accompanying drawing is shown by way of example one embodiment of apparatus which may be employed for carrying out the preliminary exposure in cases wherein this method of attaching solarization is employed.

Figure 1 is a diagrammatic side view of an apparatus for carrying out the solarization step of this invention; and

Figure 2 is a diagrammatic end view thereof.

In the drawing, 1 designates a tube through which the emulsion is caused to flow, the speed of flow being regulated by a valve 2. This tube passes through a box-like container in which are located a plurality of suitable light sources 3. These light sources are preferably electrical ones and means 4 are preferably provided for controlling the voltage or degree of illumination and/or the wave length of the light. Any desired ventilating valves such as those indicated at 5 may of course be provided in the container.

It will be appreciated that by employing the above apparatus it is ensured that the material under treatment is uniformly exposed on all sides and that by controlling the rate of flow as well as the degree of illumination the treatment is kept under very fine control. If desired in order to permit of additional control or to improve the characteristics of the treatment, light filters may be employed in conjunction with the light sources.

Whilst I have hereinbefore given some examples of methods of and apparatus for carrying out the present invention it is to be understood that the specific details may be varied or modified without departing from the scope thereof. Thus for instance the light sensitive material employed may be any suitable compound or compounds of silver and halogen, such for example as a mixture of silver halides and the process may be used for making direct positive copies of any originals such for example as views or documents or facsimile copies of positive or negative documents or pictures.

I claim:—

1. The process of manufacturing photographic emulsion layers directly yielding positive pictures, which comprises forming silver halide in a solution containing an amount of gelatine so small as to prevent the formation of a stable emulsion, settling the silver halide from the solution, bringing the silver halide to a condition of solarization, and thereafter emulsifying the silver halide in a gelatine solution of a concentration such that a stable emulsion capable of being poured is obtained.

2. The process as claimed in claim 1 in which at least a part of the supernatant liquid is separated from the precipitated silver halide prior to the emulsifying step.

3. The process as claimed in claim 1 in which the silver halide is matured by standing in the cold prior to the emulsifying step.

4. The process as claimed in claim 1 in which said solarization step is performed at least in part by exposing the silver halide to the action of light while flowing in a small stream.

5. The process of manufacturing photographic emulsion layers directly yielding positive pictures, which comprises forming silver halide in a solution containing an amount of gelatine so small as to prevent the formation of a stable emulsion, settling the silver halide from the solution, separating at least a part of the supernatant liquid from the precipitated silver halide, bringing the silver halide to a condition of solarization by exposing the same to the action of light while flowing in a small stream, and thereafter emulsifying the silver halide in a gelatine solution of a concentration such that a stable emulsion capable of being poured is obtained.

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