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RETOUCHING SOLUTION

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This invention relates to the staining of photographic images having emulsion supports of transparent cellulosic material, and more particularly to a method of and composition for retouching photographic color images surfaced with a transparent film of cellulosic material.

The principal object of the present invention is to provide an improved method of and composition for staining photographic images having a surface comprising transparent cellulosic material.

An important object of the invention is to provide an improved method of and composition for retouching photographic color images having an outer surface comprising a transparent film of cellulosic material.

Other objects and advantages of the invention will become apparent during the course of the following description.

As is well known, photographic images are frequently prepared in the form of images in stripping-film in which the gelatin emulsion containing the photographic image is carried by a transparent, flexible support consisting of a film of cellulosic material, such as cellulose nitrate or cellulose acetate. For example, in the production of natural colored photographs, positive prints are made from color separation negatives on stripping-film. Thereafter, the several positive prints are toned blue-green, magenta, and yellow and the thus toned images in stripping-film are superimposed on a suitable backing, emulsion side down, to provide a natural color photograph.

After photographic images of the character referred to have been prepared, it is sometimes found necessary to stain or retouch the photographic images. This frequently presents difficult or troublesome problems for inexperienced persons. For example, in the case of natural color prints which customarily have an outer surface of cellulosic material, the staining or retouching of such prints has heretofore involved the removal of the cellulosic material surface to expose a gelatin surface which may be stained with conventional dyes. Such removal of the cellulosic material is troublesome, exposes the photographic image in the gelatin emulsion to attack from impurities in the air, and leaves the print unprotected from abrasion, etc. Moreover, it is practically impossible to obtain uniform staining of the gelatin surface when a dye solution is applied thereto with a brush, thereby necessitating the use of an airbrush.

As a result of extended experiments directed to overcoming the above mentioned disadvantages, we have developed a method of and composition for staining the transparent cellulosic emulsion support of photographic prints by which the shortcomings of prior procedures are avoided. By the use of our method and composition, strong and uniform dyeing of the cellulosic material surface is easily and quickly obtained without the removal of the cellulosic surface. As will be apparent, this greatly simplifies the process of retouching for a large number of amateurs and professionals, and particularly those who do not use an airbrush. Our present invention provides for the application of a retouching solution, either with an ordinary brush or airbrush, to any desired portion of the cellulosic film, the retouching solution being of such character that it quickly and uniformly penetrates the cellulosic film without spreading.

Our staining or retouching composition comprises a solution of any suitable dye in a solvent which has the property of uniformly penetrating a cellulosic film without creeping or spreading. This solvent comprises an aqueous solution of acetic acid and an organic sulfonation product wetting agent. These organic sulfonation product wetting agents are well known in the industry, two of the more important members of these class of wetting agents being known in the trade as "Gardinol" and "Nacconol." These wetting agents, which consist of organic sulfonates and sulfates, are water soluble, as are their calcium and magnesium salts; they are not "salted" out by brines; and they possess very low surface tension and, consequently, are powerful penetrants.

We have found that in the practice of our present invention we may use any of the organic sulfonation product wetting agents. As is well known in the art, the specific types of organic sulfonation products constituting this class of wetting agents include sulfuric esters of alcohols derived from higher fatty acids, alkyl aryl sulfonates, and esters of sulfonated dicarboxylic acids. These wetting agents are customarily used in the form of alkali-forming metal salts. Specific examples of this class of wetting agents include sodium lauryl sulfate or sulfonate, alkylated naphthalene sulfonates, alkylated benzene sulfonates, etc.

Although, as stated above, we may use in the practice of our invention any organic sulfonation product wetting agent of the type referred to above, we prefer to employ the product known to the trade as "Gardinol," which is customarily considered to be sodium lauryl sulfonate.

In preparing the dye solvent to be used in making our staining or retouching composition, we dissolve a minor proportion of acetic acid in a major proportion of water and dissolve in the solution a very small proportion of an organic sulfonation product wetting agent, such as "Gardinol." The permissible range of proportions of ingredients is very wide. For example, the solvent may consist of an aqueous solution of from 1% to about 50% of acetic acid by weight and from approximately 0.1% to about 10% by weight of the organic sulfonation product wetting agent. However, we prefer to employ the acetic acid and the wetting agent in amounts toward the lower limits of the ranges set forth above since we have found that it is not economical to use substantially larger amounts of ingredients. For example, a solvent having the following ingredients in the proportions indicated has been found to be generally satisfactory for all purposes:

Water	cc.	2400
Acetic acid glacial	cc.	700
"Gardinol"	gms.	20

In preparing our staining or retouching solution, we add a sufficient amount of a concentrated solution of a dye of the desired color to the dye solvent described above to obtain a staining or retouching solution of the required strength to provide staining in the desired shade. For convenience, we initially prepare a stock of concentrated dye solutions by dissolving about 1% of dye either in a solvent of the character referred to above or in a 25% solution of acetic acid. Of course, these concentrated solutions are much stronger than required for retouching and, consequently, in preparing the final retouching solution, the concentrated dye solution is added to a given quantity of our dye solvent drop by drop until a dye solution of the required strength is obtained. For example, if 5 cc. of the dye solvent are employed to prepare a retouching solution, only a few drops of the concentrated dye solution need be added thereto. Thus, assuming that a particular portion of a print is to be stained a brilliant green, two drops of concentrated yellow dye solution and one drop of concentrated blue-green dye solution might be added to 5 cc. of our dye solvent. The resulting retouching solution may then be applied to the print either with a brush or airbrush.

As stated above, any suitable dye, such as conventional photographic dyes, may be used in preparing our retouching solution but we prefer to employ the so-called basic dyes. Where our compositions are to be employed for retouching natural color photographs, we prefer to employ dyes which will provide true blue-green, magenta, and yellow retouching solutions. In preferred practice, the dyes used are Capril Blue for blue-green, Rhodamine B for the magenta, and Auramine O for the yellow. However, other dyes, such as Methylene Blue, Basic Fuchsin, etc., may be employed, as will be obvious.

The retouching operation in accordance with our invention is very simple and can be carried out effectively with an ordinary retouching brush. The brush is just dampened in a retouching solution of the desired color and the solution applied to the portion of the print to be retouched. The solution penetrates the cellulosic film very quickly and any excess of solution quickly evaporates. The area is then wiped with a piece of damp cotton or other suitable material. The character of the retouching solution is such that strong and uniform staining is obtained without creeping or spreading of the retouching solution. As a result, the use of an airbrush is not necessary, although an airbrush may be employed if desired.

If necessary or desirable, the dye can be removed from the stained or retouchced print, or any portion thereof, by swabbing the area from which the color is to be removed with cotton or the like dampened with the dye solvent described above. This is a very important advantage of our present invention, since it has been found to be virtually impossible in prior art retouching processes to remove excess retouching color from a gelatin surface.

We have found that our retouching composition is suitable for use with any type of cellulose material film, such as cellulose nitrate, cellulose acetate and other cellulose ester films. It is also suitable for application to cellulose films, such as Cellophane.

By the use of our present invention, any photographic images, whether in color or not, and whether transparencies or ordinary paper-backed prints, can be effectively stained, retouched or colored if there is a cellulosic surface exposed. This cellulosic surface may be either the emulsion support itself, as in an ordinary film negative, stripping-film, Kodachrome, etc., or it may be a cellulosic surface applied to the gelatin emulsion in the form of a lacquer, or a sheet of transparent cellulosic material. In other words, either a positive or negative photographic image whether on a transparent support, such as film or glass, or on an opaque support, such as paper, may have its gelatin surface protected by a transparent cellulosic coating sprayed or otherwise applied on the gelatin, and such cellulosic coating may be stained, retouched, or colored by the practice of our present invention.

We have found that the desired results cannot be obtained in the practice of our invention except by the combined use of acetic acid and an organic sulfonation product wetting agent in the retouching solution. For example, if the acetic acid is omitted, practically no staining of the cellulosic material results. If the wetting agent is not used in the solution, the staining is weak and uneven. However, by the use of our retouching solution containing both acetic acid and the wetting agent, strong and even staining is obtained.

The term "organic sulfonation product wetting agent" as used herein is employed in a generic sense to designate a member of the well known class of wetting agents consisting of organic sulfonates and sulfates which are exemplified by the products known in the trade as "Gardinol" and "Nacconol." The members of this class of wetting agents are water-soluble, are not "salted out" by brines, and possess very low surface tension. The specific types of organic sulfonation products constituting this class of wetting agents include sulfuric esters of alcohols derived from higher fatty acids, alkyl aryl sulfonates, and esters of sulfonated dicarboxylic acids. Illustrative compounds in this class are sodium lauryl sulfate or sulfonate, alkylated naphthalene sulfonates, alkylated benzene sulfonates, etc.

While we have described in detail the preferred embodiment of our invention, it will be understood that the details of procedure may be variously modified without departing from the

spirit of the invention or the scope of the subjoined claims.

We claim:

1. In a method of treating a photograph having an emulsion layer carrying a photographic image and a supporting layer of transparent cellulosic material, the improvement for coloring said photograph by staining said supporting layer without staining said emulsion layer which comprises applying to the surface of said supporting layer a solution of a dye of desired color in a solvent comprising an aqueous solution of acetic acid and a sulfonation product wetting agent.

2. In a method of treating a photograph having an emulsion layer carrying a photographic image and a supporting layer comprising a transparent cellulose ester film, the improvement for coloring said photograph by staining said film without staining said emulsion layer which comprises applying to the surface of said film a solution of a dye of desired color in a solvent comprising an aqueous solution of acetic acid and a wetting agent consisting of a water-soluble salt of a sulfonic ester of an alcohol derived from a higher fatty acid.

3. In a method of retouching a color photograph having an emulsion layer carrying a photographic color image and a supporting layer comprising a transparent cellulose ester film, the improvement for coloring the portion of the photograph to be retouched by staining said film without staining said emulsion layer which comprises applying to the surface of said film at the portion of the photograph to be retouched a solution of a dye of desired color in a solvent comprising an aqueous solution of acetic acid and a wetting agent consisting of sodium lauryl sulfonate.

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