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PROCESS FOR INCREASING THE TRANSPARENCY DIFFERENCE OF SOUND RECORDS IN MULTILAYER MATERIALS

Wilhelm Schneider, Dessau, and Norbert Senger, Dessau-Haideburg, Germany; vested in the Alien Property Custodian

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5 Claims. (Cl. 95—5)

Our present invention relates to a process for increasing the transparency difference of sound records in multi-layer materials for color photography.

In the production of multi-color images or multi-layer materials with sound tracks it is known to treat the sound record partly independently of the image record so as to obtain a sound track consisting of compounds impermeable to infra-red rays in order that an unobjectionable sound reproduction is reached in scanning with the usual photo-cells. In many cases color films having sound records are worked up such that the sound track is wholly or partly formed from silver. This silver sound track itself may be used for the reproduction or it may be intensified in known manner or transformed into other compounds impermeable to infra-red rays as, for instance, metal complex salts.

In the manufacture of multi-color images or multi-layer material it is also known to use filter layers or anti-halation layers which contain colloidal silver. With such material one obtains a sound track the blackened parts of which consist of silver or silver and dyestuffs and the non-blackened parts of which contain silver uniformly distributed in the filter layer or anti-halation layer. These silver layers already absorb infra-red rays perceptibly. Since the volume of sound is determined by the transparency difference, but the transparency as a logarithmical function of the density decreases more quickly in the regions of low density than it does in those of higher density, the additional absorption uniform per se of the filter layers or anti-halation layers results in a reduction of the transparency difference and hence of the maximum volume of sound in the regions of low density. As to the usual methods of intensifying or converting the silver sound track the silver filter layers or anti-halation layers naturally have the same chemical behavior as the silver sound record, i. e., the filter or anti-halation layer is, for instance, modified in the same way as the silver record when an intensifier is used. The transparency of the unexposed parts again decreases more strongly than that of the exposed parts does so that an additional loss of sound intensity is effected.

Our present invention is based on the observation that these disadvantages are avoided by treating the sound track with a solution of a substance capable of bleaching silver of such a concentration and for such a duration that the colloidal silver of the filter or anti-halation layers is dissolved, but the granular silver particles of the sound record are not or only slightly attacked. In fact, with different concentrations the silver-bleaching agents show widely differing solution velocities for the colloidal silver of the filter or ant-halation layers and for the granular silver of the sound record. For each material it is possible to determined the concentrations and period of action for the bleaching of the colloidal layers without causing material attack of the granular silver of the sound record.

For multi-layer materials for the production of color images with sound records such layers are especially suitable as contain non-diffusing dyestuff formers as, for instance, described in the journal: "Photographische Korrespondenz," 1938, page 21, and 1939, page 106. The filter layers may, for instance, be produced by the process disclosed in U. S. Patent 2,220,187.

The production of the sound track and the color image may be carried out in various ways as, for instance, by the processes described in U. S. Patents 2,220,178, 2,178,882, 2,235,033, 2,232,056 and 2,323,246.

The following example illustrates the invention but is not intended to limit it thereto.

Example

The silver sound track film of a photographic multi-layer material in the several emulsion layers of which the color component images have been produced by reacting non-diffusing dyestuff formers with an aromatic amino developer and which contains a yellow filter layer and an anti-halation layer with colloidal silver is treated with a solution consisting of 4 g. of potassium ferricyanide and 1000 cc. of water for 15 minutes.

The transparency difference which was 0.11 before treatment is 0.24 after the treatment. The increase of sound intensity is 6.8 db.

We claim:

1. A process for increasing the transparency difference of sound records on color photographic multi-layer materials having at least one filter layer containing colloidal silver which process comprises treating the sound track with a solution of a substance capable of bleaching silver of such a concentration and for such a period that said colloidal silver of the filter layers is dissolved but the granular silver of said sound record is not or only slightly attacked.

2. A process for increasing the transparency difference of sound records on color photographic multi-layer materials having at least one filter layer and an anti-halation layer, said layers containing colloidal silver which process comprises

treating the sound track with a solution of a substance capable of bleaching silver of such a concentration and for such a period that said colloidal silver of the layers is dissolved but the granular silver of said sound record is not or only slightly attacked.

3. The process as defined in claim 1 wherein the substance capable of bleaching silver is an alkali metal ferricyanide.

4. The process as defined in claim 1 wherein the substance capable of bleaching silver is potassium ferricyanide and wherein the same is used in a .4 per cent solution.

5. The process as defined in claim 1 wherein the substance capable of bleaching silver is potassium ferricyanide, wherein the same is applied in a concentration of about a .4 per cent solution for a period of about 15 minutes.

WILHELM SCHNEIDER.
NORBERT SENGER.