Patented June 29, 1943

2,323,246

UNITED STATES PATENT OFFICE

2,323,246

PRODUCTION OF MULTICOLORED MOTION PICTURES WITH SOUND TRACK

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No Drawing. Application December 14, 1939, Serial No. 309,243. In Germany December 17, 1938

5 Claims. (Cl. 95—88)

This invention relates to the production of multicolored motion pictures with a sound track. In producing black and white and multicolored motion pictures with sound records it is very well known to treat the film separately for picture and sound. With black and white films it is mostly done in order to obtain for the sound track a gradation suitable for sound reproduction, which may differ from the gradation of the picture. In the production of colored sound films it was effected by a different treatment of picture and sound to ensure that the sound track absorbs sufficiently in the range of maximum sensitivity of the photocells. This range lies in the infra-red with presently used photocells. In order to increase the infra-red absorption of the sound track, it is known to treat picture and sound separately in one or several developing baths, to produce a sound track which may consist for instance of silver, of silver and dyestuff, of a metal complex compound formed by the transformation of the dyestuff of the sound track, or of an infra-red absorbing compound, obtained by the transformation of the silver or the silver salt. Furthermore it was proposed to apply to the photographic color material an additional silver halide emulsion, preferably an infra-red sensitized silver halide emulsion containing dyestuff components which produce during development an infra-red absorbing dyestuff and to form the sound track in this emulsion. With the usual processes for the separate treatment for picture and sound special chemical equipments for instance, for side-edged guiding, was necessary.

It has now been found that the separate treatment of the picture zone and sound track may be very much simplified by applying one or several treating baths in the form of solutions with increased viscosity, which are coated either in the picture zone or on the sound track. The coating may be accomplished with the known coating or dipping devices generally used for the coating of emulsions. For that purpose one may employ the usual dipping rolls, coating rolls, slot casting devices, jets etc.

As thickeners for the treating baths there are suitable all sufficiently indifferent materials increasing the viscosity of the solutions as for instance gelatine, mucilage, polyvinyl alcohols, polyethylene oxides, polyglycuronic acids, dextrines, pectines, water soluble cellulose derivatives, sodium silicates or sugar. After a sufficiently long treatment the applied coating is removed either by dissolving it in water or by a wiper or the effect of the coating is destroyed in a known manner by a stop-bath. The separate treatment for picture and sound may be preceded, if necessary, by a common development of the two records.

According to this invention it is possible to produce infra-red impermeable sound tracks in a very simple way, for instance with the aid of complex salts by applying to the sound track a viscous solution of a complexforming metal salt, which is removed after the treatment, for instance by a wiper. In the same way the sound track may be developed separately from the picture with a colorforming developer containing in its molecule a complexforming group, which is capable of being transformed into a metal salt after development. It is further possible to develop the sound record separately from the picture with a developer containing a dyestuff component, especially an infra-red absorbing dyestuff component, whereby it is possible to develop the sound track again after the common colorforming development of both of them.

As it is possible to coat the viscous solutions in any position onto the film, it can be partially treated in a very simple manner without materially changing the usual developing machines.

It has been proposed to supply a colloidal solution as a resist for covering part of the film's surface, in order to protect it against further chemical reactions. Contrary to this, in the present invention the treating baths themselves are applied as colloidal solutions. These emulsions therefore cannot be considered as resists. It is further known to apply a colored gelatine coating to the film, in order to dye the picture-forming hardened emulsion. This process however differs in principle from the present invention in that in this way a separate treatment of picture and sound track may never be accomplished.

Example I

On an exposed copying film, having a plurality of layers containing dyestuff components, picture and sound track are developed together in a colorforming developer. After the colorforming development, if necessary, picture and sound may be finally developed with a black and white developer, for instance hydroquinone. In order to bleach out the picture silver, a solution of methyl cellulose and potassium ferricyanide in water is applied to the picture zone. For this purpose the coating devices for viscous materials usually known in the art may be used, for instance dipping rolls, jets, slots, coating rolls,

etc. The viscous solution is obtained by boiling 10 g. methyl cellulose in 90 cc. water, which is diluted with 160 cc. water. In 100 cc. of this solution 10 g. potassium ferricyanide are dissolved. The coating applied to the film is washed off with water after a reaction-time of 5–7 minutes. Picture and sound track are then fixed together in the usual manner. The sound track keeps its content of metallic silver, while the picture is free from it. In this way an excellent sound reproduction similar to the one on black and white films is obtained.

Example II

An exposed multicolored reversal film is first developed black and white and the sound track then coated with a gelatine solution containing a water soluble screening dye. It is then exposed in diffuse light having a wave length completely absorbed by the screening dye and the remaining silver halide in the picture zone is developed in color and the screening dye at the same time washed out or chemically destroyed by suitable means, which has to be done in such a way, that the picture dyestuff is not permanently damaged. Such means are described for instance in U. S. Patent 2,276,548, filed February 3, 1939.

In the zone of the picture, for instance, a potassium ferricyanide gelatin solution is applied and after a reaction-time of 5–7 minutes its effect is interrupted by a dilute sodium sulfite solution. The film is then fixed. In this way a colored reversal positive is obtained with a negative silver sound track. The applied coating may be retained as protective layer to prevent scratching of the film.

The screening dye need not be removed, if it does not show special absorption in the infrared. It is advisable to use as screening dye the dyes according to U. S. P. No. 2,058,725 and U. S. Patent 2,186,731, issued October 27, 1936 and January 9, 1940, respectively. If needed the emulsion containing the necessary substances for the treatment, which is applied to the picture, may be slightly colored in order to straighten out possible tints of the multicolored picture.

For the application of the present invention the different color photographic materials are suitable, especially photographic materials according to the following U. S. Patents:

U. S. P. 2,179,228, issued November 7, 1939, U. S. P. 2,179,239 issued November 7, 1939, U. S. P. 2,178,612, issued November 7, 1939, U. S. P. 2,186,849, issued January 9, 1940, and U. S. P. 2,179,244, issued November 7, 1939.

We claim:

1. In the process of producing color picture film with an infrared impermeable sound track involving exposing, color developing and bleaching the sound and picture areas of the film, the step of rendering the color developed and bleached sound track impermeable to infrared which comprises applying only to the sound track a viscous composition of a thickening agent and a compound capable of reacting with the products of the bleaching of the silver to produce a complex metal compound, removing the composition entirely from the area to which it is applied, and fixing the picture and sound areas.

2. The process as defined in claim 1 wherein the bleaching of the sound and picture areas of the film is effected by means of potassium ferricyanide.

3. The process as defined in claim 1 wherein the thickening agent is methyl cellulose.

4. The process as defined in claim 1 wherein the thickening agent is gelatin.

5. The process as defined in claim 1 wherein the thickening agent is a polyvinyl alcohol.

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