[Second Edition.]

PATENT SPECIFICATION

Application Date: July 18, 1929. No. 22,098/29. **335,310**

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PROVISIONAL SPECIFICATION.

An Improved Method of Enabling Pictures or the like to be Exhibited in Substantially Natural Colours.

We, ANTHONY BERNARDI, Dr. Phil., an Austrian Citizen, and RAYCOL LIMITED, a British Company, both of 22, Surrey Street, London, W.C. 2, do hereby declare the nature of this invention to be as follows:—

This invention relates to an improved method of enabling pictures or the like to be exhibited in substantially natural colours and is an improvement on or modification of the invention described in our co-pending Patent Application No. (Serial No. 329,438) 8828/29.

According to the present invention we take three or more pictures of the same object simultaneously and from a single point of view through different colour filters and we project the photographs thus obtained simultaneously and into superimposition on the screen, one or more without the interposition of a filter and the others through like filters to those used in the taking process for the individual pictures in question. By this means the colours corresponding to that picture or those pictures which are projected without a filter or filters appears to be evoked by contrast so that the resulting picture as seen by the observer appears to be in substantially natural colours.

The invention is particularly applicable to a three colour process in which three photographs of the same object are simultaneously taken from a single view point through red, yellow-green and blue filters, the yellow-green filter being omitted in the projecting process. Yellow-green colours in this case appear to be evoked by contrast as set forth above.

The component pictures are preferably all arranged within a single monochromatic space of an ordinary film, conveniently diagonally, in order to give good separation of the component light beams and ordinary panchromatic films may be employed.

Dated the 19th day of June, 1929.

GEE & Co.,
Patent Agents,
Staple House, 51 and 52, Chancery Lane,
London, W.C. 2, and
71, George Street, Croydon,
Agents for the Applicants.

COMPLETE SPECIFICATION.

An Improved Method of Enabling Pictures or the like to be Exhibited in Substantially Natural Colours.

We, ANTHONY BERNARDI, Dr. Phil., an Austrian Citizen, and RAYCOL LIMITED, a British Company, both of 22, Surrey Street, London, W.C. 2, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the exhibition of pictures in colours, for example, by means of cinematographs, magic lanterns and the like.

In colour cinematography as heretofore proposed the film has been taken with two or more colour components such, for example, as red and bluish green and the

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film, after development, is projected through colour filters of the same, or substantially the same, colour values as those employed in the taking process, the two colour components either being super-imposed on the screen or projected successively on to the screen so that they more or less register, whereby the pictures are exhibited in colour due to the phenomenon known as "persistence of vision". The use of these filters, however, in the projection process leads to a great loss of light and hence not only does the illuminant employed in the projection have to be of considerably greater intensity than in ordinary monochromatic cinematography but there has heretofore always

been a certain lack of brilliancy in the projected coloured picture which is thus not at all pleasing to the eye. Furthermore, when the colour component pictures are projected successively on to the screen the eye is fatigued.

It has also been proposed but, as far as we are aware, never carried into practice, to take a film, with exposures, alternately through a red or other colour filter and without a filter so that alternate pictures are thus a "red" or other component and a plain black and white picture. It was proposed to project these pictures successively and respectively through a red or other colour filter and without a filter on to the screen relying on the phenomenon of persistence of vision. Such a process has, however, many disadvantages and will not successfully produce pictures in substantially natural colours.

We have discovered that if the film be taken through—let us say—orange and blue-green filters so that there is an "orange" component and a "blue-green" component and the film so taken is projected, the "orange" component through an orange filter and the "blue-green" component without a filter so that there is on the screen an orange image of the "orange" component and a black and white image of the "blue-green" component, then under these circumstances the orange light projected upon the screen appears to evoke by contrast and fatigue the complementary blue and green colours and a very pleasing picture is produced in substantially natural colours. Such a process of producing pictures in substantially natural colours is described and claimed in our co-pending Patent Application (Serial No. 329,438) No. 8828/29.

According to the present invention, we take three or more pictures of the same object simultaneously, and from a single point of view, through different colour filters and we simultaneously project the positives obtained from these exposures, one or more without the interposition of a filter and the other or others through colour filters. By this means the colour corresponding to the picture or pictures which are projected without a filter or filters appears or appear to be evoked by contrast and possibly by retinal fatigue so that the resulting picture as seen by an observer appears to be in substantially natural colours.

In carrying out a three colour process according to this invention, we take three colour component pictures simultaneously and from a single point of view through three substantially primary filters, say red, yellow (or yellow-green) and blue. In the projecting stage the "red" component picture may be projected through a red filter, the "blue" component picture through a blue filter, and the "yellow and green" picture without a filter. Under these circumstances the red and blue light on the screen will cause the yellow-green shades to be evoked by contrast.

If desired, two of the colour component pictures may be projected without a filter.

Again, the "red" component may be projected through a red filter and the "yellow-green" component (or the "blue" component) may be projected through a green filter corresponding to the combination of the yellow and blue filters used in the taking stage. Any two filters used for taking may thus be combined in shade to give a single filter for the projection, one of the colour components corresponding to the filter combined being projected through the new filter.

The component pictures are preferably all arranged within a single monochromatic space of an ordinary film, conveniently diagonally by any known combination of reflectors or prisms, in order to give good separation of the component light beams and ordinary panchromatic films may be employed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A method of exhibiting pictures in substantially natural colours by cinematograph or like means consisting in employing three or more simultaneously taken pictures of the same object or group of objects, each taken through a colour filter, and simultaneously projecting said three or more pictures on to the screen, one or more without the interposition of a filter and the other or others through colour filters.

2. A method of exhibiting pictures in substantially natural colours by cinematograph or like means according to Claim 1, characterised in that in the projecting stage two of the pictures are projected through like colour filters to those used in the taking stage and the other picture or pictures is or are projected without the interposition of a filter, substantially as described.

3. The improved methods of exhibiting pictures in substantially natural colours by cinematograph or like means substantially as hereinbefore described.

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Dated the 18th day of March, 1930.

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