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PHOTOGRAPHIC DEVELOPING TANK

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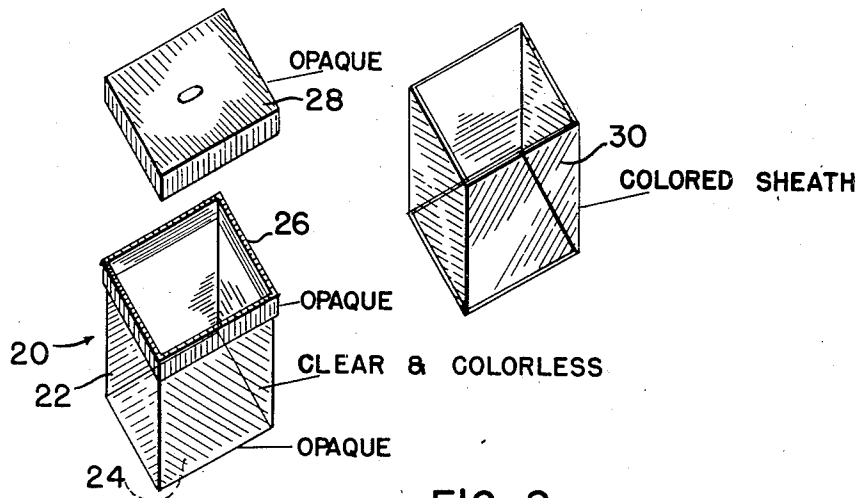


FIG. 2

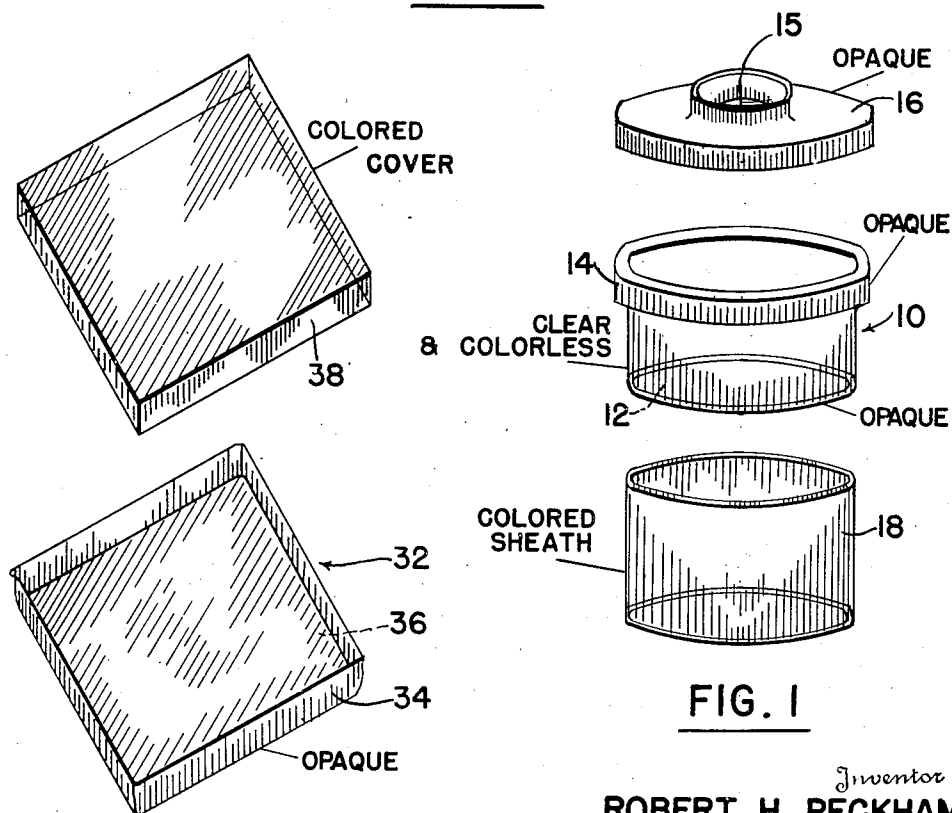


FIG. 1

FIG. 3

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PHOTOGRAPHIC DEVELOPING TANK

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2 Claims. (Cl. 95—96)

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This invention relates to a device for use in photography, and more especially to a receptacle adapted to facilitate processing sensitized elements such as films, plates and records.

Heretofore, it has been necessary to process sensitized elements such as films, after exposure, that is, to develop and fix the films in a dark room with the aid of artificial light, usually red light, the color, however, being varied in accordance with the characteristic of the film being processed. Dark room operation is at best difficult, and it is impossible in the light that is afforded to tell with any certainty the progress of development or to study the photo-recorded subject as it develops. Moreover, the elapse of time between taking the undeveloped film or record into the dark room, developing it and returning it in a finished state for study, may be considerable, since the dark room is usually located at a place remote from the place at which the photograph is taken. This time element may be the difference between life and death, particularly in cases which require the study of heart actions, and in which electro-cardiographic records must be processed by development. Similarly, time may be very important in other photographic work relating to medical examination. In this type of work, it is highly desirable to be able to study the results of the record or photograph at the bedside of the patient so that the attending physician may have the information before him immediately, and while he is observing the condition of the patient. With this in view, it is an object of this invention to provide a device for processing a sensitized element such as a film or record, immediately upon removal from the camera, or other device for exposing the sensitized element, after exposure, which will eliminate the necessity of a dark room processing, which will permit continuous observation of the sensitized element throughout its development and which will be simple and effective for any type of sensitized element, whether it be of the type employed for making electro-cardiographic records, or the ordinary photosensitive film used in photographic work for technical or esthetic purposes.

As illustrated herein, the invention resides in a device for use in processing sensitized elements, comprising a receptacle which consists of a material which normally permits the passage of all the components parts of visual radiant energy and a material which inhibits the passage of a selected portion of said visual radiant energy, the receptacle being selected which incorporates

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a material which inhibits the passage of that portion of radiant energy to which the sensitized element being treated is most sensitive. More specifically, the device comprises a transparent receptacle into which the sensitized element may be placed for processing, and a shield or sheath adapted to envelope the receptacle, the shield being adapted to transmit sufficient visual radiant energy to permit observation of the sensitized element during the processing, but having incorporated therein, a material which will inhibit that portion of the visual radiant energy to which the sensitized element is particularly sensitive from getting to the sensitized element, so that further activation of the sensitized element will not take place during processing, even though the receptacle is exposed to white light.

The invention will now be described with reference to the accompanying drawing, in which:

Fig. 1 is an exploded view of a cylindrical receptacle for receiving a sensitized element for development, together with a shield incorporating a material for cutting out a given portion of the visual radiant energy;

Fig. 2 shows a perspective view of a rectangular receptacle and sheath; and

Fig. 3 shows a perspective view of a developing tray and a shield in the form of a cover for the tray.

This invention comprises a developing tank or tray which is to be used for developing sensitized elements such as photographic film, paper, plates or records, but particularly recording paper that has been used in preparing electro-cardiographs, so that the attendant physician may examine the record during its development at the bedside of the patient, and hence, be able to determine almost immediately the nature of the heart action which has been recorded thereon. While the invention is particularly useful in making the information recorded by photography immediately available, it is to be understood that it is not confined in any aspect to medical work, but it is equally applicable to any kind of photographic work, and when used, enables the person developing the film or record to study almost immediately the recorded information, whether this be of a technical or esthetic nature, without the necessity of a dark room and dark room equipment.

The invention is based upon the fact that sensitized emulsions have been developed which are selectively sensitive to certain components of white light and not to others. This sensitivity of the emulsion can be so carefully controlled that it is possible to develop a film having a sensi-

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tized emulsion of a given character in ordinary white light, provided a shield is provided which will prevent that part of the white light to which the emulsion is sensitive from reaching the film.

The idea of blocking out all of the light except that which is least active in changing the character of the emulsion in order to prevent further exposure, and the latter in only such a small amount that the film is but dimly visible, has been known for a long time, and has been practiced in some degree in the ordinary dark room where the film has been developed while exposed to a standard ruby light. However, it has not heretofore been thought possible to develop a photosensitive element except in the dark room, and in the dark room even when a ruby light is employed, it is practically impossible to determine with assurance the recorded information during the process of the development of the element.

The important aspect of the present invention resides in equipment for processing a sensitized element such as a photosensitive film or record in white light without further activation of the sensitized emulsion, and at the same time, enabling an interested person to examine the recorded information as it develops. This can be accomplished by selecting a sensitized element that is sensitive to a given portion of white light but not to another portion thereof, and providing a shielding device which will not transmit any of the light to which the element is sensitive during the development thereof. For example, a shield may be made up which will transmit only about 50% of incident visual illumination by incorporating therein a uniform distribution of orange particles. For a film of a given sensitivity, this will act as sufficient protection for the sensitive emulsion during development and yet will enable the person developing the film to observe what is taking place. If an ortho-chromatic film is being developed, a shield incorporating red particles and transmitting about 20% of visual illumination will provide protection against further activation and yet permit visual observation of the film. No attempt will be made herein to list the many kinds of sensitive emulsions, to what portion of white light they are sensitive and what should be used to shield them. It is sufficient to say that for any sensitive emulsion there is a suitable material for blocking out substantially all of the radiant energy to which it is sensitive, or at least enough so that satisfactory results can be obtained.

As carried out herein, the invention takes the form of a developing tank or tray which consists of a material which transmits white light, and a material which inhibits the transmission of a given portion of white light, or is provided with a shield consisting of a material of like characteristic. The tank or its shield is selected so that it inhibits the passage of light which is detrimental to the sensitive emulsion of the film to be treated, that is, which will cause further activation thereof after the film has had its original exposure and yet permits the transmission of sufficient white light to enable the person developing the film to see what is taking place. In Fig. 1, there is shown a more or less exploded view of a cylindrical receptacle 10 which is composed of a clear glass or plastic, or other transparent material having an opaque bottom 12 and an opaque rim 14. A cover 16, composed of an opaque material, is provided which will fit tightly over the rim 14, the cover having the usual aper-

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ture 15 centrally thereof through which may pass the handle of the film holder and agitator which is customarily disposed in receptacles of this character. The exposed film, together with the developing solution, is placed in the receptacle. This may be carried out in a dark room or any other convenient place from which light may be excluded. When this has been done, a shield 18 in the form of a cylindrical hollow sleeve is slipped over the body portion of the receptacle 10, that is, the transparent portion thereof. The sleeve 18 extends from the bottom of the receptacle up to and engages the under edge of the rim 14, and is so selected that the collar will prevent transmission of that portion of the white light which would cause further activation of the film. When this is done, the receptacle may be taken out of the dark room into the light and the process of development may be continued in daylight without damage to the film, thereby enabling an interested person to observe the development of the film while it is taking place. Another form of receptacle is shown in Fig. 2, denoted by reference character 20. This receptacle is rectangular in cross section and consists of a body portion 22 which is composed of clear glass or plastic, an opaque bottom 24 and an opaque rim 26. An opaque cover 28 is provided which is adapted to fit over the rim 26, and a colored sheath 30 is adapted to fit over the body portion of the receptacle up against the rim 26. In Fig. 3, there is shown still another form of developing receptacles, which in this case, takes the form of developing tray 32, the tray being formed of an opaque material and consisting of walls 34 and a bottom 36. A cover 38, composed of a colored material which will prevent the transmission of light rays which would further activate the film being developed, and yet will permit the transmission of sufficient white light to enable the operator to observe what is going on, is provided.

It is to be observed that while each of the developing receptacles shown in Figs. 1, 2 and 3, are provided with sheaths which are formed of material including coloring matter which prevents the transmission of a given portion of white light, such sheaths are entirely unnecessary, since the transparent body of the receptacle itself may be formed of a material which incorporates particles of colored matter which will give the same effect. The only advantage of a separate sheath is that a single receptacle may be provided with a plurality of sheaths to take care of different types of film, thus eliminating the necessity of an excessive number of receptacles.

While the invention has been described with reference to developing tanks, it is equally applicable to any other receptacle to be used for processing sensitized elements.

The invention described herein may be manufactured and used by and for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. A photographic film developing tank for strip type film wherein the film may be observed throughout its entire development comprising a base portion, a single cylindrical wall rising from the edges of the base portion, and a removable closure on the top of the chamber so formed, said removable closure being supported by the upper edge of the cylindrical wall, the wall portion between the top and the base of the chamber be-

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ing made of a material which will transmit substantially all light in the visible portion of the spectrum, and a separate light inhibiting filter of a generally cylindrical shape and having an inside diameter slightly greater than the outside diameter of the tank which filter when applied over the wall of the chamber inhibits the passage therethrough of radiant energy in the portion of the spectrum to which the film being processed is most sensitive.

2. A photographic film developing tank wherein the process of development may be observed in ordinary room illumination as it takes place comprising, a container made of transparent material and formed to contain a developing solution 15

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therein, a substantially light-impervious cover for said container, and means for preventing the passage through the transparent portion of the container of light which will impair the film development including a filter means surrounding the container, said filter means inhibiting the passage within the container of radiant energy in the range of the spectrum to which the film being processed is most sensitive, the container walls and filtering means being disposed around all the sides of the container to permit observation of the container contents from various angles and by reflection of light upon various portions of the container contents.

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