

F. E. IVES.
 PHOTOGRAPHIC FILM.
 APPLICATION FILED SEPT. 21, 1915.

1,240,344.

Patented Sept. 18, 1917.

Fig. 1.



Fig. 2.

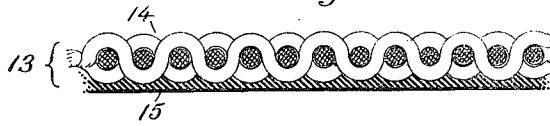


Fig. 3.

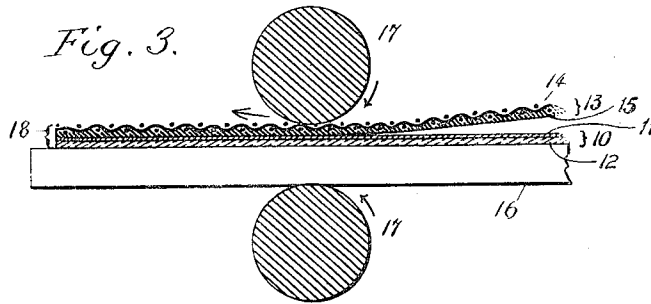


Fig. 4.

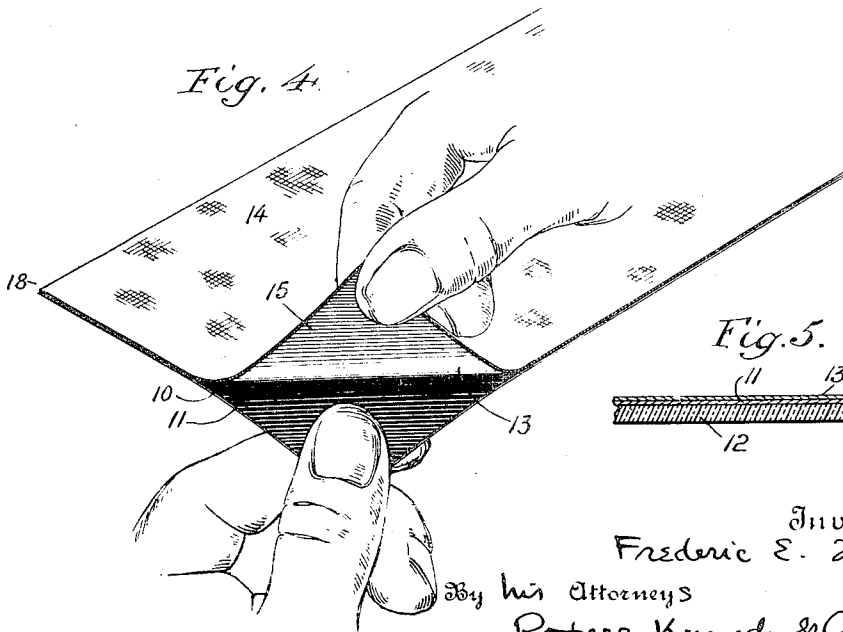
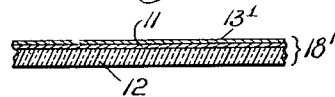


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC FILM.

1,240,344.

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To all whom it may concern:

Be it known that I, FREDERIC E. IVES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Photographic Films, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a new photographic film as a commodity or article of commerce, and more particularly to a colloid or other film having light-sensitive qualities and protectively sealed against deterioration.

It is well-known that bichromated gelatin film or other sensitized colloid possesses relatively very poor keeping qualities. This is so much the case that films of this kind are usually kept in stock unsensitized, thus requiring to be sensitized at the time of use, a very troublesome and expensive procedure. If attempted to be kept in sensitized condition, either warmth or moisture will tend to rapidly destroy its light-sensitiveness, the time of deterioration depending upon the amount of heat or moisture to which the film is subjected.

It is the main object of the present invention to afford, as a new photographic commodity of commerce, a sensitized colloid film having perfect keeping qualities, and this object is accomplished by the present invention by excluding air from the surface of the film, particularly warm or moist air, thus protecting the film against deteriorating influences.

I believe that heretofore when colloid films have been attempted to be kept in sensitized condition the best known practice has been to inclose the film within metallic containers or tubes supplied with a suitable amount of calcium chlorid or similar hygroscopic substance serving to absorb any moisture present in the container. This scheme does not protect the film from warm air contained within the tube and has proved unsatisfactory because involving troublesome procedure and being unreliable in practice. The present invention entirely overcomes the objections to such prior practice.

To the attainment of the above referred

to objects and advantages, the present invention may be said to consist of a new photographic commodity of commerce comprising a bichromated gelatin or other sensitive photographic film carried upon a water-impervious support, such for example as celluloid, and protectively sealed over its surface by a temporary water-impervious layer, which is placed in atmospheric contact with the sensitive film; this layer being of a character capable of being readily and cleanly removed from the film when it is desired to be used.

I will first describe suitable embodiments of the present invention, and will thereafter set forth the novel features in the appended claims.

In the accompanying drawings, in which dimensions are exaggerated for the purpose of clearness, Figure 1 in cross-section represents an ordinary sensitized photographic film upon a suitable carrier.

Fig. 2 in cross-section shows one form of protective layer which may be employed in accordance with the present invention.

Fig. 3 shows the protecting layer partly applied and in the act of being applied to the sensitized film.

Fig. 4 shows in perspective a suitable mode of removing the protective layer of Figs. 2 and 3 when the film is to be made use of.

Fig. 5 shows a modification in which the sensitized film is sealed by a different sort of protective layer in accordance with this invention.

The invention may be applied to any form of suitably supported sensitized photographic film 10. This, for example, may consist of a gelatin layer 11 sensitized by potassium bichromate and carried upon a support or carrier 12, which is preferably transparent and may consist of glass, flexible celluloid or the like.

Fig. 1 represents, therefore, the ordinary commodity of commerce after sensitization and before consumption. This article might have to be maintained in stock or in storage for long periods of time between sensitization and use, and the present invention, in order to preclude deterioration, provides for the sensitized surface of the colloid what may be termed a temporary layer 13 of pro-

5 tective water-impervious material, this layer serving to hermetically seal the film over its surface by reason of being in atmospheric contact at the margins, and preferably over the entire surface of the film.

10 As already stated, it is another characteristic of this invention that the temporary projecting layer is of a character capable of being readily and cleanly removed from the sensitized film, so that, when the time comes to use the film, it may be efficiently restored to its original or proper condition. It should be here stated that, when using the film of this invention, the temporary protective layer may sometimes be removed prior to the exposure of the film to light, or, when the film is carried upon a transparent base and the printing or exposing is done through the base, the protective layer may be retained until after exposure and removed in time for development in warm water or otherwise.

15 Various forms of protective layers answering the above stated requirements may be employed within the scope of this invention. The important points are that the layer should be water-impervious, and should temporarily protectively seal the film by reason of being in atmospheric contact therewith, while also capable of being readily and cleanly removed when desired. I will refer to different embodiments of this principle.

20 The embodiment represented more particularly in Figs. 2 and 3 involves the use of a tough, flexible, protecting layer 13 composed of woven fabric 14 impregnated or coated with a sticky or gummy substance 15 at one side. A typical and available layer of this character is the ordinary well-known adhesive plaster or surgeon's plaster, which is on the market. This adhesive plaster 14, 15, should be applied to the sensitized colloid surface, for example, by thoroughly squeegeeing or equivalently spreading it in firm contact over the film. This may be accomplished as indicated in Fig. 3, in which the sensitized film is shown laid face up upon a rigid support 16 and the protective layer 13 is laid adhesive side downward on top of the film, these assembled parts being run through a pair of pressure rollers 17, 17. In this way the film is very perfectly sealed without the possibility of leaving air-bells between the film and the protective layer.

25 In this way the protective layer, which is water-impervious, is effectively placed in atmospheric contact over the surface of the film, that is to say, in such contact as to exclude the admission of air. The resulting product or commodity 18 composed of the temporarily united elements 10 and 13 is an instance or embodiment of the present invention, and attains the objects and advantages hereinabove recited. Air and moisture are excluded from the sensitized film,

which is hermetically closed between the adhesive plaster above and its impervious carrier beneath.

This novel commodity may be satisfactorily preserved merely by inclosure in plain paper envelopes of a character adapted to exclude light.

70 When it is desired to use the protected photographic film 18, it is merely necessary to strip off the protecting layer 13, which, being flexible, permits this to be easily done, as indicated in Fig. 4. It is found that the adhesive plaster does not leave any adhesive material upon the film, but, on the contrary, it is readily and cleanly removed therefrom by the illustrated stripping action. This may be done at ordinary temperatures, as the plaster strips off effectively without heating.

75 With the above described embodiment of this improvement it has been found that after long periods of preservation the sensitized film was in the same efficient condition as though freshly produced, although projecting exposed portions of the film not covered by the protecting layer had become completely hardened and insoluble, thereby indicating complete loss of light-sensitivity; and this defect was also found to occur locally if an air-bell was allowed to remain imprisoned between the film and plaster.

80 Another embodiment of the described invention is that indicated in Fig. 5. As before, we have the sensitized colloid film 11 carried on the transparent celluloid support 12. Over the face of the film is applied, either by a brush or by flowing and draining, a layer or coating 13' of varnish of a water-impervious character. This coating is in atmospheric contact with the film and should be of a character capable of being readily and cleanly removed therefrom. For example, the varnish coating 13' may consist of benzol damar. When it is desired to use the film this coating may easily be completely removed by a suitable solvent. For example, benzol may be efficiently used to wash off the varnish or coating at ordinary temperatures without heating. The complete removal of the varnish is easily recognized, since the presence of varnish gives a glossy finish, while the unvarnished colloid shows a mat finish.

85 The present invention may be employed for protecting the sensitized film not only from air and moisture, but also from light. Thus, the protecting layer 13 or 13' may be opaque or of such character as to exclude actinic light, and the rear face of the carrier 12, if transparent, may be temporarily coated with an opaque or non-actinic substance.

90 It will thus be seen that I have described embodiments attaining the advantages and objects hereinbefore stated, and other advantages will be apparent to those skilled in the art.

in the art. Since mere matters of arrangement, detail and other features may be varied without departing from the main principles involved, no limitation to such features is herein intended, excepting so far as specified in the appended claims.

What is claimed is:

1. As a new photographic commodity of commerce a sensitized photographic colloid film carried upon a water-impervious support and protectively sealed by a temporary water-impervious layer, which is in atmospheric contact with the sensitized film and of a character capable of being readily and cleanly removed therefrom without injury to the colloid film.

2. As a new photographic commodity of commerce a sensitized colloid film carried upon a water-impervious support and protectively sealed by a temporary water-impervious layer, which is in atmospheric contact with the sensitized film and of a character capable of being readily and cleanly removed therefrom at ordinary temperatures

by a solvent non-destructive of the sensitive film.

3. As a new photographic commodity of commerce a sensitized colloid film carried upon a water-impervious support and protectively sealed by a temporary water-impervious layer of soluble varnish, which is in atmospheric contact over the entire face of the sensitized film and of a character capable of being readily and cleanly removed therefrom by a solvent non-destructive of the sensitive film.

4. As a new photographic commodity of commerce, a sensitized colloid film carried upon a water-impervious support and protectively sealed by a temporary water-impervious layer, consisting of a soluble coating of benzol damar varnish in atmospheric contact with the sensitized film and adapted to be readily and cleanly washed off therefrom by benzol.

In testimony whereof, I have affixed my signature.

FREDERIC E. IVES.