May 11, 1937. S. E. SHEPPARD ET AL 2,080,066

FILM PRESERVING PACKAGE

Filed Oct. 31, 1933

Fig. 1.

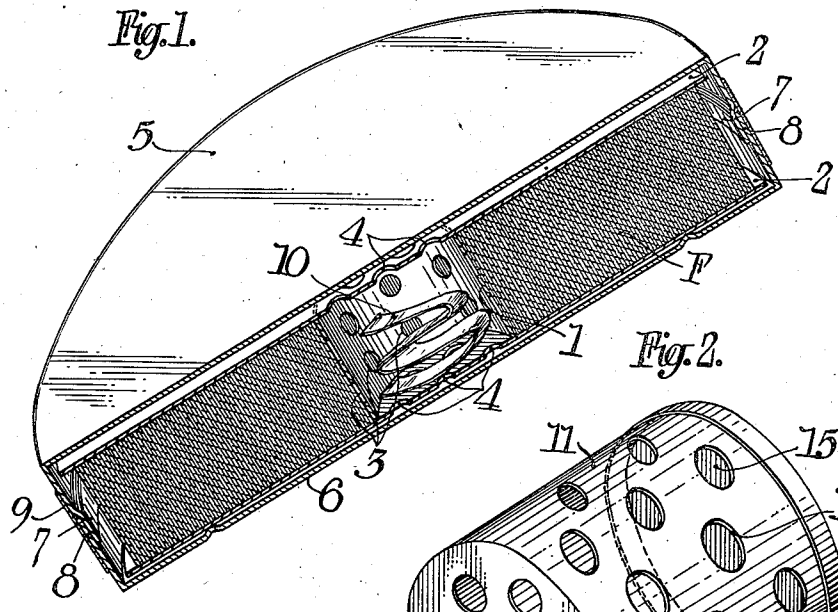


Fig. 2.

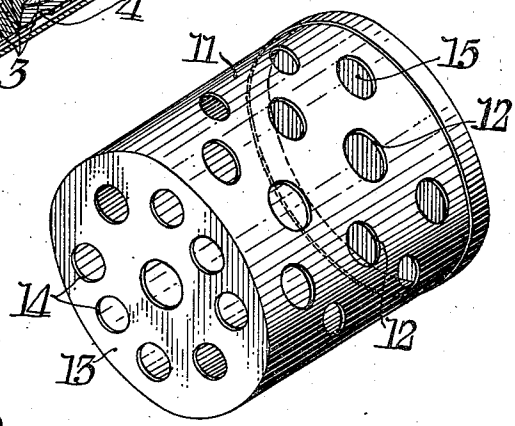


Fig. 3.

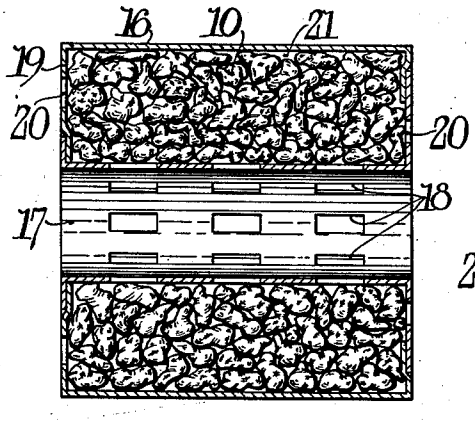


Fig. 4.

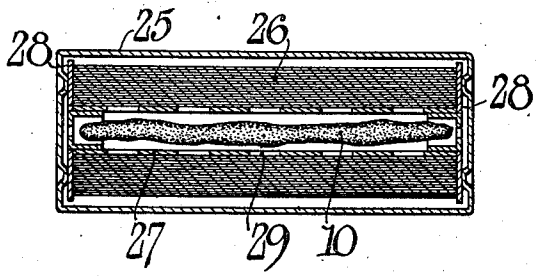
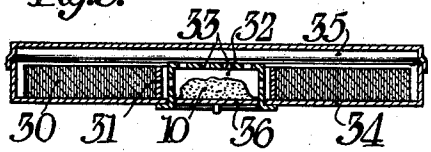


Fig. 5.



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2,080,066

FILM PRESERVING PACKAGE

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Application October 31, 1933, Serial No. 696,012

6 Claims. (Cl. 206—62)

This invention relates to photography and more particularly to packaging photographically light-sensitive film to prevent deterioration.

It has been common practice to use wooden cores for winding convolutions of film or convolution of film and film backing paper for photographic use. The coils of film so wound are ordinarily sold in cans or other substantially moistureproof containers which preserve the film from the usual climatic changes to which it is subjected.

The use of such wooden cores has some advantages and some disadvantages. One of the advantages is that a wooden core may absorb and give off a certain amount of moisture which is desirable but at the same time the wooden core is liable to give off vapors which react on the photographic film and cause it to become fogged. This is due to the liberation of volatile peroxides, chiefly hydrogen peroxide.

In Patent No. 1,921,950, Samuel E. Sheppard, August 8, 1933, non-fogging photographic packing materials are considered and in this patent various methods of treating wooden cores to prevent them from giving off fogging materials are disclosed.

In order to overcome the above-mentioned and other difficulties due to the use of wooden cores, metallic cores are coming into use, these having many advantages over the wooden cores. It has been found, however, that with the use of a metallic support for the film, there is a greater tendency for water vapor to condense due to the temperature changes and form liquid drops of water which are responsible for the so-called "moisture spots" and "moisture mottle" which ruins film.

Our present invention is particularly directed to a means for overcoming or at least minimizing the tendency to condensation. To obtain the desired results we fill the metal core or place in the film package a substance of high moisture regain which will both take up water vapor with fair velocity and also give it up. Thus, such a substance will serve as a stabilizing material and will prevent the formation of liquid water drops due to condensation.

It is obvious that it is not highly important as to the location of the stabilizing material in the film package, except that it is, of course, desirable to have such material in a position in which it can readily perform the desired function.

Coming now to the drawing wherein like reference characters denote like parts throughout:

Figure 1 is a perspective view partially in section showing a film package constructed in accordance with and embodying a preferred form of our invention.

Figure 2 is a perspective view of a film core which may be used in accordance with a different embodiment of our invention.

Figure 3 is a section through still another type of film core suited for use with our invention.

Figure 4 is a section through a film package suitable for use with the ordinary hand camera film cartridges, but equipped for use with our invention, and

Figure 5 is a section through a film package constructed in accordance with still another embodiment of our invention.

In Figure 1 we have illustrated a usual type of film package in which the film F is supported on a spool which consists of a cylindrical hub member 1 and flange members 2 for protecting the edges of the film. Such spools are well known.

However, the hub member 1 differs from the usual hub members in having a series of perforations 3 in the periphery of the hub and a series of perforations 4 in the flanges lying over the ends of the hub. These perforations permit the air inside the container to circulate freely through and around the hub.

The film spool is enclosed in a can consisting of a top member 5 and a bottom member 6 which fit together through the flanges 7 and 8 which inter-engage to form a tight joint. This joint is rendered substantially air-tight by means of a paster or tape 9 which may be of the usual surgeon's adhesive tape so that the entire package is substantially moistureproof.

The moisture content of the room in which the film is packed and of the film itself determines to a large extent the moisture conditions in the air inside of the package. However, it has been found that due to temperature changes the film is liable to give off moisture which, in the absence of some means for absorbing the moisture, will form water droplets, causing "moisture mottle." In order to prevent the formation of such moisture spots, we place inside of the perforated core 1 a material 10 which will absorb the moisture vapor given off by the film. This material will also give up moisture to the film which under some conditions will absorb moisture previously given off.

It is important that the materials used should be incapable of deliquescing and liquefying however much moisture they may take up, because of course, if they should liquefy they would spoil the film in the same way as the water drops. It is also important that the materials must be chemically inert towards the film—that is, that they must not give off vapors which deleteriously affect the film.

We have found as suitable materials to place in the film package that vapor absorbing mineral gels may be used, such as silica gel, iron oxide

gels, or alumina oxide gels. Different mineral gels may be mixed and used if desired. We have also found that cellulosic materials may be used, such as wood pulp, paper pulp, mercerized, washed, and dried cotton cellulose. These may be used alone or mixed.

In the case of cellulose materials, where there is a possibility of auto-oxidation and production of fogging peroxides, this may be overcome by pretreatment with permanganate solutions as considered in the patent above-mentioned—No. 1,921,950.

In the specification and in the claims where we use the term "stabilizing" material, we mean any of the materials in the classes above referred to, or broadly a material capable of both absorbing and giving off moisture to stabilize the moisture content of the film package preventing the formation of water droplets. Such materials really transfer the moisture to and from the film as temperature conditions change and prevent moisture from condensing into drops of water. As mentioned above, the stabilizing materials may be treated, if desired, to prevent chemical fogging of the film.

It is impossible to give definite limits of humidity at which the film may take-up or give off moisture because there are so many contributing factors. Film, when packed, may contain quite widely varying moisture content. The film may be packaged under varying conditions of humidity. Consequently with different film packages the moisture transfer may occur at different temperatures.

Referring again to the drawing, it is possible to place a loose or unsupported coil of film in a container in which a small box contains the stabilizing material, or the box may be made into a hub by making it cylindrical as shown in Figure 2 wherein the hub consists of a cylindrical periphery 11 perforated at 12 having a bottom 13 perforated at 14. The stabilizing materials may be introduced through a cover member 15 and the film may be wound directly on the hub 11.

In accordance with Figure 3, a hub 16 is shown as having a central opening 17 with perforations 18 and as including side walls 19 perforated at 20. Stabilizing material 10 may be placed inside of the annular space 21 and the moisture can pass through the slots 18 and 20.

It is customary to pack film for cameras of the amateur type in moistureproof metal containers such as lead or composition tubes. In Figure 4 we have illustrated such a tube at 25, this tube supporting convolutions of film or film and backing paper 26 wound upon a hub 27 on the ends of which there are flanges 28. The hub may be perforated at 29 so that the stabilizing material 10 may absorb and may give off moisture to the film 26.

Figure 5 shows another type of container which may be used to carry out our invention. In this case the film 30 is wound on an imperforate cylindrical member 31 which may fit loosely over a box 32 which is perforated at 33 and which contains a stabilizing material 10. For convenience, this box opens on the outside of the container which consists of two parts 34 and 35 which may be sealed together in any suitable manner. A screw cap or door 36 permits the stabilizing material to be introduced into the package.

While it is not necessary for the film package to be absolutely moistureproof, best results can be obtained with a stabilizing material, in accordance with our invention, by having the package substantially moisture-proof because the condition of the film can be beter controlled.

We are aware that film has been packed in containers in which an absorbent material may be partially saturated with a liquid capable of maintaining the air in the case in a moist condition. Such containers are frequently used for developed film which is not so susceptible to moisture spots and which becomes very dry and brittle through passing through the light beam of a projector. However, such a humidifying device is totally unsuitable for unexposed light-sensitive photographic film.

We are also aware that the use of calcium chloride or other moisture absorbing substances has been suggested particularly for use with certain types of light-sensitive photographic paper which must be kept extremely dry before use. Obviously such a material is unsuited for and would not accomplish applicants' purpose.

In one case the sole object is to supply moisture to a film to prevent it from becoming dried out and brittle, and in the other case the object is solely to keep the photographic paper as dry as possible.

Our present invention is not for either of these purposes. We do not wish to moisten dry film or keep sensitive material dry. Our invention is stabilizing the moisture content of a film package and preventing moisture spots on film by transferring moisture back and forth, if temperature conditions require it, between a moisture-containing film and moisture-stabilizing material.

What we claim as our invention and desire to be secured by Letters Patent of the United States is:—

1. A photographic film package including photographically light sensitive material enclosed with a moisture stabilizing mineral gel having the properties of giving-up and absorbing moisture.

2. A photographic film package including photographically light sensitive material enclosed with a moisture stabilizing mineral gel selected from the following group, silica gel, iron oxide gel, alumina gel.

3. A photographic film package including photographically light sensitive material enclosed with a moisture-stabilizing material consisting essentially of silica gel.

4. A photographic film package including photographically light sensitive material enclosed with a moisture-stabilizing material consisting essentially of iron oxide gel.

5. A photographic film package including photographically light sensitive material enclosed with a moisture-stabilizing material consisting essentially of aluminum gel.

6. A photographic film package including photographically light sensitive material enclosed with a moisture-stabilizing material consisting essentially of a mixture of mineral gels having the properties of giving up and absorbing moisture.

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