J. I. CRABTREE.

METHOD OF TREATING PHOTOGRAPHIC FILM.

APPLICATION FILED MAY 11, 1914.

1,168,286.

Patented Jan. 18, 1916.

2 SHEETS—SHEET 1.

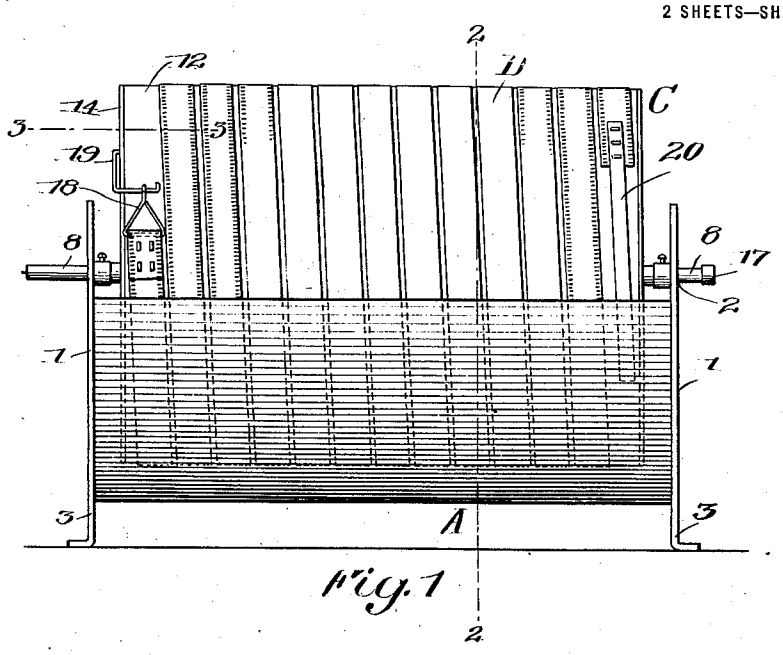


Fig. 1

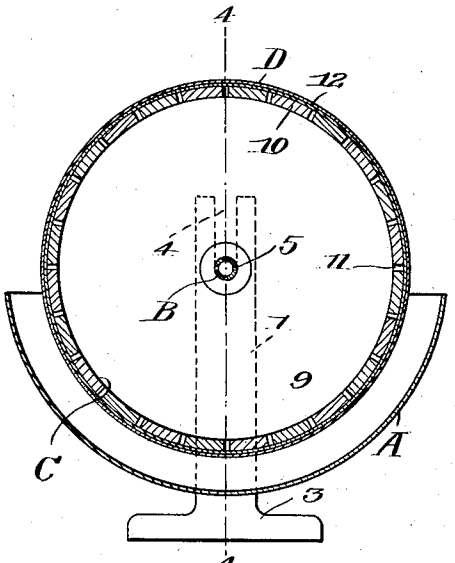


Fig. 2

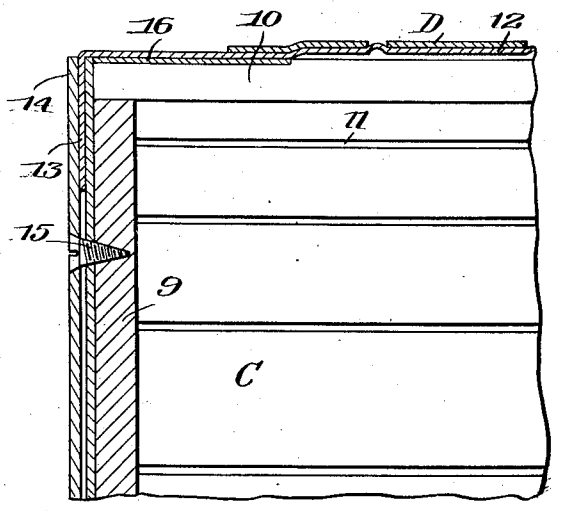


Fig. 3

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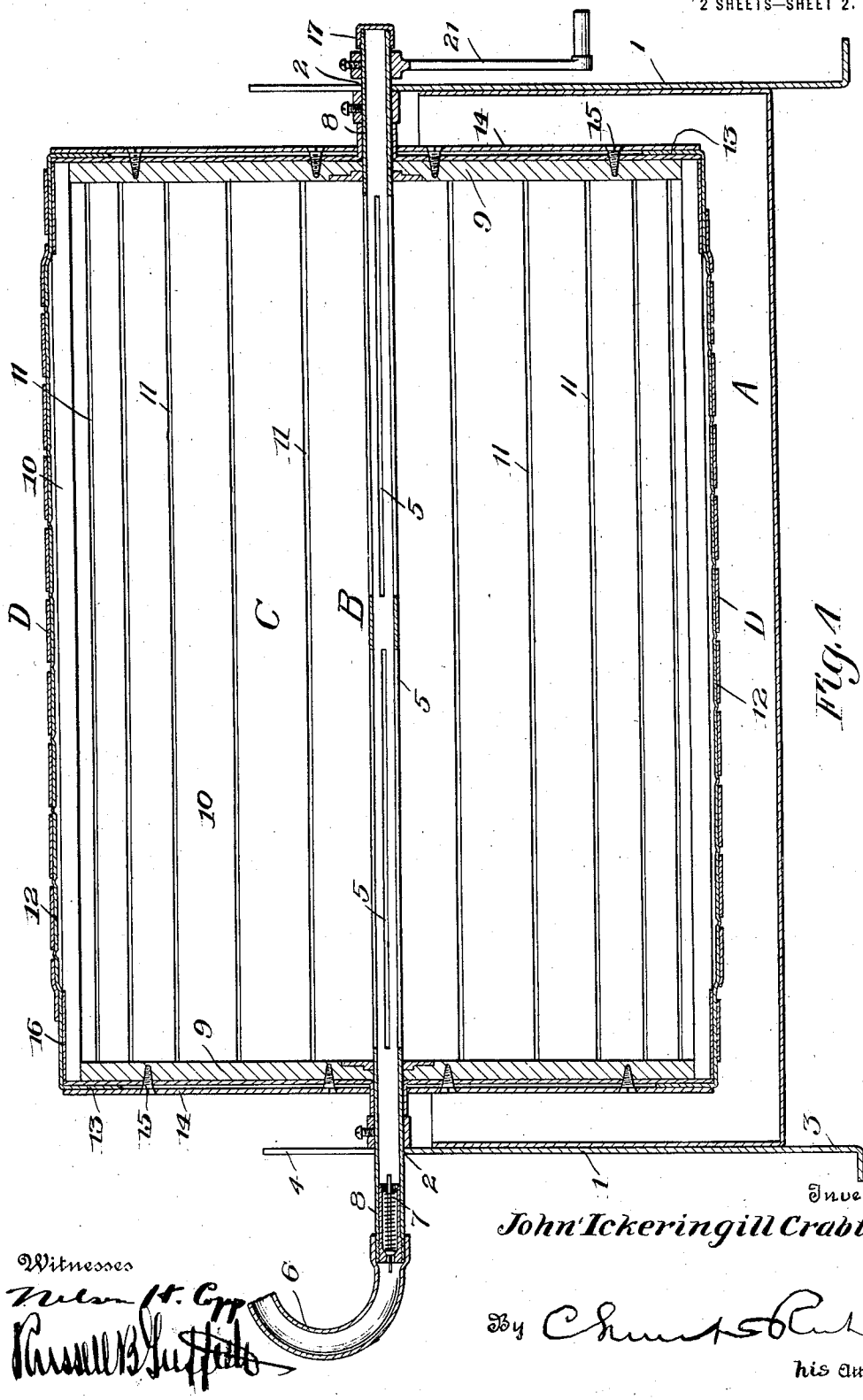


Fig. 4.

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UNITED STATES PATENT OFFICE.

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METHOD OF TREATING PHOTOGRAPHIC FILM.

1,168,286. Specification of Letters Patent. Patented Jan. 18, 1916.

Application filed May 11, 1914. Serial No. 837,961.

To all whom it may concern:

Be it known that I, JOHN ICKERINGILL CRABTREE, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Methods of Treating Photographic Film; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to photography and more particularly to flexible photographic film, and it has for its object to provide an improved and efficient method of protecting one side of a film when it is desired to make a liquid or other application to the other side exclusively.

A further object of the invention is to provide for the treatment in the manner indicated of long strips of film, such as motion picture strips, the improvements being particularly applicable when it is desired to dye the two faces separately so that they may present a combination of color values to transmitted light.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a front elevation of one type of mechanical apparatus adapted for use in treating photographic film in accordance with my invention; Fig. 2 is a transverse section thereof, taken substantially on the line 2—2 of Fig. 1; Fig. 3 is an enlarged fragmentary sectional view taken substantially on the line 3—3 of Fig. 1, and Fig. 4 is an enlarged longitudinal central section taken substantially on the line 4—4 of Fig. 2.

Similar reference numerals in the several figures indicate the same parts.

The specific apparatus shown in the drawings forms no part of the subject matter to be claimed in this application, the right being reserved to claim these mechanical features in a separate divisional application to be hereinafter filed. An explanation of such apparatus will, however, aid in obtaining an understanding of the general method constituting the present invention.

In this view, and referring more particularly to the drawings, A indicates, generally, a preferably semi-cylindrical tank or container in the end standards 1 of which is journaled at 2 a hollow shaft B, carrying a drum C. Continuations of the standards 1 constitute supporting legs 3 for the tank, while the upper ends are preferably slotted, as at 4, clear to the top, permitting the quick removal of the shaft B from the journal bearings 2 when required. The drum C is hollow and the shaft B preferably runs entirely therethrough, being provided on the interior with suitable openings 5 for the flow of compressed air admitted from a pipe 6 through a check valve 7 at one of the projecting ends 8 of the shaft. The pipe 6 may represent any suitably controlled source of fluid pressure supply.

The framework of the drum C is, in the present instance, comprised by imperforate circular heads 9 on the peripheries of which are secured the ends of slats 10. It is the intention that fluid be permitted to escape or to communicate its pressure through or past these slats for which purpose they may be perforated at intervals, but I prefer, as shown in the present instance, to form narrow slots or passages 11 between them by spacing them slightly from each other, as shown. This slotted periphery is completely covered by a continuous sheet of soft, elastic and non-absorbent material 12 such as dental rubber. The covering lies loosely upon the periphery and is secured only at the ends where the margins 13 of the cylindrical sheet are clamped by means of plates 14 and screws 15 to the heads 9.

It will thus be seen that when air or other fluid under pressure is admitted to the interior of the drum through the pipe 6 and hollow shaft B, the covering 12 will be inflated and will swell out beyond contact with the frame of the drum. It is so shown in Fig. 4 while in Fig. 2 it is shown before inflation where it hugs the drum frame. In order to prevent the thin rubber from blowing out or becoming loosened or unduly distended at the ends, I cement it at these points to a canvas or other inextensible band 16 which may or may not be in turn cemented to the slats 10. There is therefore a non-inflatable marginal surface at each edge of the cylinder which performs the function stated for a purpose that will here-

inafter appear. To deflate the drum, a cap 17 at the other projecting end 18 of the shaft B is removed in the present instance, or any suitable means of exhaust control may be utilized.

The present improvements, as before stated, are particularly applicable to the treatment of photographic film in strips and particularly the greater lengths of motion picture film. Taking for example a process of treating motion picture strips for the projection of pictures in color, it is desired to dye one side of the strip exclusively red and the other side exclusively green. In the practice of my present invention in connection with the particular apparatus just described, I wind the strip, indicated at D, spirally upon the drum C, as shown in Fig. 1, with the proximate edges of adjacent convolutions slightly separated, the covering 12 being deflated at the time by reason of an absence of pressure in the interior of the drum. One end of the film may have attached thereto a yoke 18 that is initially engaged over a hook 19 on the drum to anchor it and at the completion of the winding the other end may be fastened down with a strip of adhesive tape 20 to prevent unwinding or slippage in the convolutions, or other means may be employed at both ends for like purposes. Air or other fluid pressure is then admitted to the interior of the drum in the manner described, and to a reasonable extent. The immediate result is that the covering 12 becomes inflated and forces its fluid tight, clinging surface securely against the under surfaces of the film convolutions, bulging forth slightly between the latter to lock off the entrance of fluid in a definite manner at the edges. The dye is then placed in the tank A to such a depth as to partially submerge the drum and the latter rotated by means of a crank 21, or otherwise, carrying every portion of the periphery and hence of the strip D to immersion in the dye, the outer surface only being exposed thereto. The film may be dried while still on the drum with the latter inflated and then removed, reapplied in a reverse position with the dyed surface protected and the clear surface exposed and the operation repeated with the other dye, the drum of course being deflated previous to the rewinding.

Of course there is bound to be ineffective protection to the extreme ends of the strips and it is therefore preferable to attach "leaders" carrying the fastening devices 18 and 20 to the film body to be treated at each end. These may be composed of short pieces of spoiled film or other material of corresponding size temporarily joined up to the film body by adhesive tape, for instance. These leaders will thereby form the first one or two convolutions and constitute the portion of the whole strip that rest upon the inexpansible end bands 16.

I claim as my invention:

1. The method of protecting one side of a photographic film from an application made to the other side which consists in confining the side to be protected against an inflated surface while such application is being made.

2. The method of protecting one side of a photographic film from an application made to the other side, which consists in confining the side to be protected against the surface of an inflatable body, inflating said body and then making the application to the other side.

3. The method of protecting one side of a photographic film strip from an application made to the other side, which consists in winding the strip about an inflatable body with the side to be protected confined against the surface of the body, inflating said body and then making the application to the other side of the film strip.

4. The method of protecting one side of a photographic film strip from an application made to the other side, which consists in winding the strip in spiral convolutions about an inflatable body with the side to be protected confined against the surface of the body and the ends of the strip secured, inflating said body and then making the application to the other side of the strip.

5. The method of applying a liquid treatment to one side only of a photographic film strip, which consists in winding the strip about an inflatable body, inflating said body and then immersing the surface of said body and the strip carried thereon in the liquid bath.

6. The method of protecting one side of a photographic film from an application made to the other side which consists in confining the side to be protected against a pneumatically inflated rubber surface while such application is being made.

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