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MANUFACTURE OF LENTICULAR FILMS

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5 Claims. (Cl. 18—57)

My present invention relates to the production of lenticular films and more particularly to the preparation of the casting support used in the manufacture of such films.

One of its objects is a method which allows of producing lenticular elements of different focal length. Further objects will be seen from the detailed specification following hereafter.

In the manufacture of lenticular films there is first provided a casting support. This casting support is impressed by means of a profiled roller, for instance, a roller which bears a coil of thin wire. Thus the casting support receives a system of parallel engravings and may then be used as a matrix for casting lenticular films.

Now, when using the roller provided with a coil of thin wire for producing the matrix, the lenticular embossings of the film made from this matrix will have the form of segments of a cylinder.

However, according to the optical conditions desired in taking the pictures, and according to the thickness of the film the lenticular elements, that is to say the cylinder segments above referred to, must be given a different radius of curvature. Thus for each different radius of curvature a correspondingly profiled roller would be necessary for engraving the casting surface.

Now, I have found a method according to which it is possible to obtain engravings of different radii of curvature though utilizing one single engraving roller. For this purpose the surface of the casting support, consisting of a colloid, such as gelatine, cellulose ester, for instance, cellulose acetate or nitrate, mixed cellulose esters, for instance, cellulose acetate-nitrate, cellulose ether, natural resins, artificial resins or the like, is treated with a swelling agent, until it swells up. Suitable swelling agents are a mixture of methanol and water, chloroform, a mixture of acetone and water preferably in the ratio of 1 proportion of acetone on 4 proportions of water up to 1 proportion of acetone on 7 proportions of water. In this swollen state the casting surface is engraved, in the manner described in the copending application Ser. No. 401,623 filed October 23, 1929 by Eggert et al. by means of a roller having a wire spirally wound on, or a positive duplicate of this roller, or by a roller made in any suitable manner, for instance, by engraving, the roller being preferably warmed before the rolling operation. On evaporation of the swelling agent, the volume of the colloid layer forming the casting support is reduced whereby, at the same time, the relief engraved

on the swollen casting surface flattens. If there are produced by the engraving process, for instance, impressions of a semi-circular cross-section, these will flatten to such an extent that their cross-section represents only a small segment of a circle, that is to say the lenticular elements possess a greater radius of curvature than those which would be produced by the roller used for engraving the surface of the casting support without employing the swelling treatment.

The more the casting surface swells up before being engraved, the more the relief, after drying, flattens. By a suitable composition of the swelling solution and by a well adapted duration of the said treatment, the formation of the reliefs may be influenced at will. The most suitable swelling agent for each special compound constituting the support and the best concentration for applying the said solvent can be easily found by a few simple comparative experiments.

If the casting surface consists of a layer of a cellulose derivative, for instance, cellulose nitrate or cellulose acetate, it is advantageous to subject it, after the engraving operation, to an after-treatment according to the method set forth in British specification No. 279,047. By this after-treatment the surface of the casting plane is either entirely or partially regenerated to cellulose. The casting surface thus treated allows of obtaining sharp lenticular engravings.

However, I may likewise effect the saponification to cellulose of the surface of the support before the engraving operation, whereupon the support is dried. In order to change the curvature of the segments in this case water is used as a swelling agent and the swelling capacity of this agent is changed by a greater or less addition of an organic liquid miscible with water such as methanol, ethanol or acetone which has no swelling action on the regenerated cellulose. The swollen surface is subjected to the engraving process and then dried as already described.

My invention is not limited to the peculiar substances described herein. Numerous other embodiments are possible and I contemplate as included within my invention all such modifications as fall within the scope of the appended claims. The more the surface of the support has been swollen during the treatment with the swelling agent the flatter will be the curvature of the engravings and consequently of the lenticular embossings of a lenticular film made from this casting support, and the longer will, therefore, be the focal distance of the lenticular embossings.

What I claim is:

1. In the manufacture of lenticular films by the casting process the steps which comprise treating the surface of a casting support with a swelling agent, producing engravings on said swollen surface of the casting support by means of a profiled roller, and drying the surface of the casting support, so that the embossings have a radius of curvature different from that of the profiled roller.
2. In the manufacture of lenticular films by the casting process the steps which comprise treating the surface of the casting support with a swelling agent, producing engravings on said swollen surface of the casting support by means of a roller provided with a wire coil, and drying the surface of the casting support, so that the embossings have a radius of curvature different from that of the roller provided with a wire coil.
3. In the manufacture of lenticular films by the casting process from cellulose derivatives the steps which comprise treating the surface of the casting support with a swelling agent, producing engravings on said swollen surface of the casting support by means of a roller provided with a wire coil, drying the surface of the casting sup-

port, and regenerating at least partially the cellulose on the surface of the casting support, so that the embossings have a radius of curvature different from that of the roller provided with a wire coil.

4. In the manufacture of lenticular films by the casting process from cellulose derivatives the steps which comprise regenerating at least partially the cellulose on the surface of the casting support, treating the surface of the casting support thus prepared with a swelling agent, producing engravings on said swollen surface of the casting support by means of a roller provided with a wire coil, and drying the surface of the casting support, so that the embossings have a radius of curvature different from that of the roller provided with a wire coil.

5. In the manufacture of lenticular films the steps which comprise treating with a swelling agent the surface of a colloid layer, embossing said swollen surface by means of a profiled roller and drying the colloid layer, so that the embossings have a radius of curvature different from that of the profiled roller.

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