Dec. 15, 1942. J. F. KIENINGER 2,305,011

CINEMATOGRAPHIC APPARATUS

Filed Dec. 13, 1938

Fig. 1

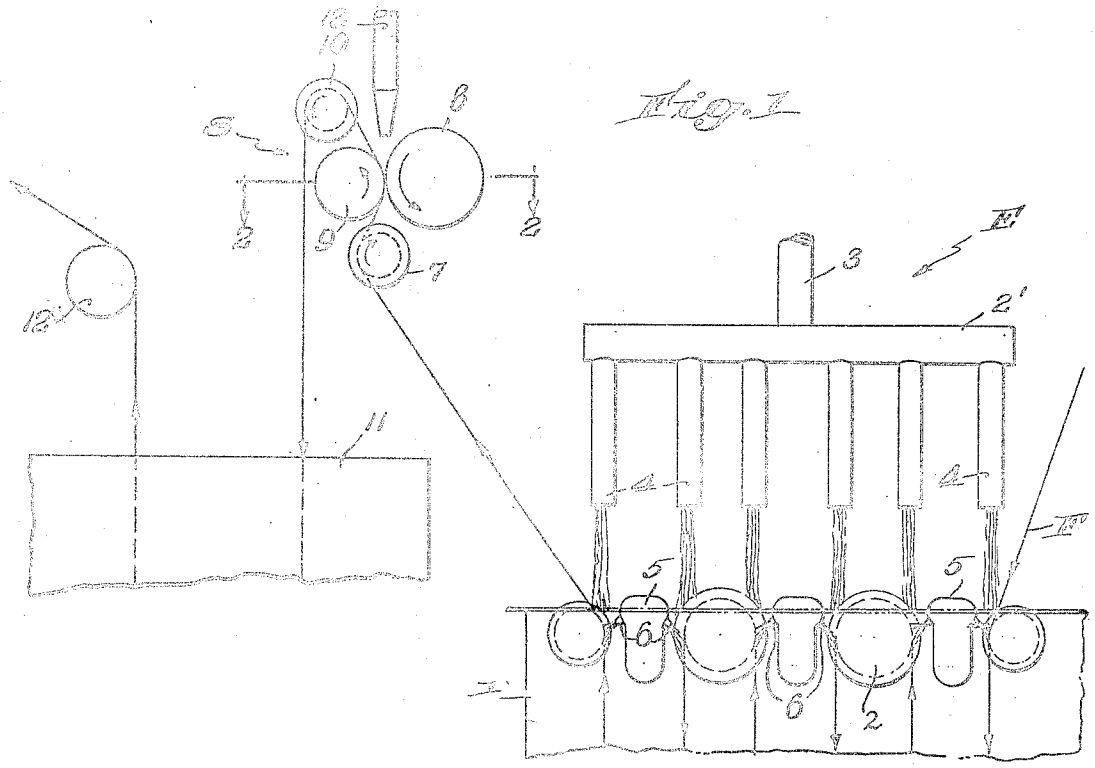
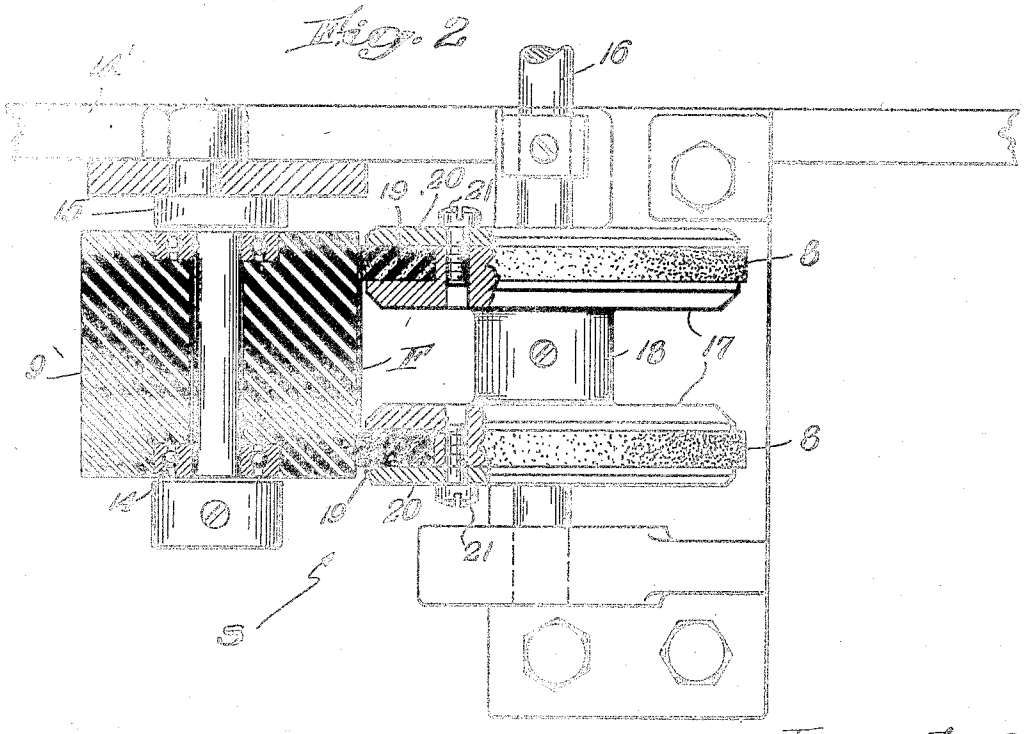


Fig. 2



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CINEMATOGRAPHIC APPARATUS

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5 Claims. (Cl. 95—89)

In subjecting cinematographic film to liquid treatments there is a tendency for liquid pellicles to bridge the sprocket holes, thereby giving rise to subsequent difficulties. For example, if the pellicles break while the film is drying they tend to spatter the picture areas of the film, and in any event they tend to clog the sprocket wheels over which the film is subsequently run. These tendencies are particularly pronounced in forming relief pictures by etching off part of the gelatine, including all the gelatine from the edges of the film to the central row of picture areas, because the pellicles often comprise relatively thick patches of gelatine which float off the film during the etching process. While most of the patches may be rinsed off after etching and before drying, some cling in the sprocket holes in the form of pellicles partly or completely bridging the holes.

Objects of the present invention are to avoid the aforesaid difficulties by removing the pellicles in such a way that they do not damage the picture areas.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawing in which:

Fig. 1 is a diagrammatic view of the apparatus, including means for etching the film; and

Fig. 2 is a section on line 2—2 of Fig. 1.

The particular embodiment of the invention chosen for the purpose of illustration comprises etching means indicated generally by E and scrubbing means indicated generally by S. The etching means comprises a tank 1 having series of rollers 2 at the top and bottom for guiding the film F through the tank along a zigzag path in the direction indicated by the arrows, together with nozzles at the top of the tank for flowing warm water downwardly along the vertical stretches of film in the tank. The particular nozzle arrangement shown in Fig. 1 comprises a manifold 2' to which water is supplied through the pipe 3 and a series of nozzles 4 depending from the manifold 2' in alignment with the vertical stretches of the film F, each of the nozzles 4 being provided with an opening in its lower end to permit the water to flow by gravity to the film. In addition to the aforesaid nozzles other nozzles 5 are located between the rollers of each adjacent pair of rollers in the tank 1, the nozzles 5 being provided with outlets 6 directed laterally and downwardly against the film on the rollers 2.

After the film leaves the etching means E it passes upwardly to the scrubbing means S which comprises a guide roller 7, two scrubbing rollers 8 opposed to a film guide in the form of a backing roller 9, another guide roller 10, a rinsing tank 11 and another guide roller 12, a nozzle 13 being located immediately above the space between the rollers 8 and 9 to direct a stream of rinse water downwardly along the film as the margins of the film are scrubbed by the rollers 8. The backing roller 9 is preferably formed of Bakelite or other molded material mounted on ball bearings 14 which are adjustably mounted on the frame 14' through the medium of the eccentric 15. The rollers 8, which are preferably mounted on the same shaft 16, comprise two discs 17 integrally connected by a cylindrical portion 18, each of the discs 17 being recessed at its outer periphery to receive a sponge-rubber ring 19 which serves as a brush. The sponge-rubber rings are held in their recesses by clamping rings 20 held in place by screws 21.

As shown in Fig. 2 the sponge-rubber rings 19 are spaced apart a distance substantially equal to the distance between the two rows of sprocket holes in the film F and the rubber rings are wide enough to extend to the outer edge of the film. The shaft 16 is driven by suitable means, not shown, to rotate the rollers 8 in a counterclockwise direction as indicated by the arrow in Fig. 1, the frictional engagement of the film with the backing roller 9 also rotating this roller in a counterclockwise direction. Best results have been secured by advancing the film at the rate of approximately 36 feet per minute and rotating the rollers 8 with a peripheral linear velocity of approximately 1275 feet per minute. The scrubbing action of the sponge-rubber rings 19 loosens and removes the gelatin from the margins and sprocket holes of the film and the rinsing jet 13 carries the loosened gelatin away.

It is to be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. In apparatus for making motion pictures by etching off a part of the gelatin with etching liquid to leave images in relief, involving a tendency for gelatinous pellicles to bridge the sprocket holes, the combination of cleaning means for breaking said gelatinous pellicles out of the sprocket holes, said means acting upon the sprocket-hole zone of the film without corresponding action on the picture zone, and means for rinsing away the gelatinous material cleaned out of the sprocket holes.

2. In apparatus for making motion pictures by

etching off a part of the gelatin with etching liquid to leave images in relief, involving a tendency for gelatinous pellicles to bridge the sprocket holes, the combination of means for scrubbing the sprocket-holes zone of the film without scrubbing the picture zone and means for rinsing away the gelatinous material scrubbed out of the sprocket holes.

3. In apparatus for making motion pictures by etching off a part of the gelatin with etching liquid to leave images in relief, involving a tendency for gelatinous pellicles to bridge the sprocket holes, the combination of means for scrubbing the sprocket-holes zone of the film without scrubbing the picture zone and means for rinsing away the gelatinous material scrubbed out of the sprocket holes, said scrubbing means comprising a narrow rotary scrubber rotating about an axis extending edgewise of the film and engaging only the margin of the film.

4. In apparatus for making motion pictures by etching off a part of the gelatin with etching liquid to leave images in relief, involving a tendency for gelatinous pellicles to bridge the sprocket holes, the combination of means for scrubbing the sprocket-hole zone of the film without scrubbing the picture zone and means for rinsing away the gelatinous material scrubbed out of the sprocket holes, said scrubbing means comprising a narrow rotary scrubber rotating about an axis extending edgewise of the film and engaging only the margin of the film, and a roller on the side of the film opposite the scrubber for holding the film against the scrubber.

5. In apparatus for making motion picture film by etching off a part of the gelatin with etching liquid to leave images in relief, involving a tendency for etched-off gelatinous pellicles to bridge the film perforations, the combination of means for transporting the film, a scrubber mounted for rotary movement with its effective surface engaging, and extending substantially only over the marginal zone including said perforations and adapted to loosen and remove the gelatin from the perforations of the film as positioned in said transport means, means for rotating said scrubber to provide relative scrubbing movement between said film engaging surface and the film moving in said transport means, and means for directing a rinsing jet towards said perforations for carrying away the loosened gelatin.

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