Aug. 13, 1929. J. FRANKENBERG 1,724,705

APPARATUS FOR CLEANING FILMS

Filed Dec. 14, 1927

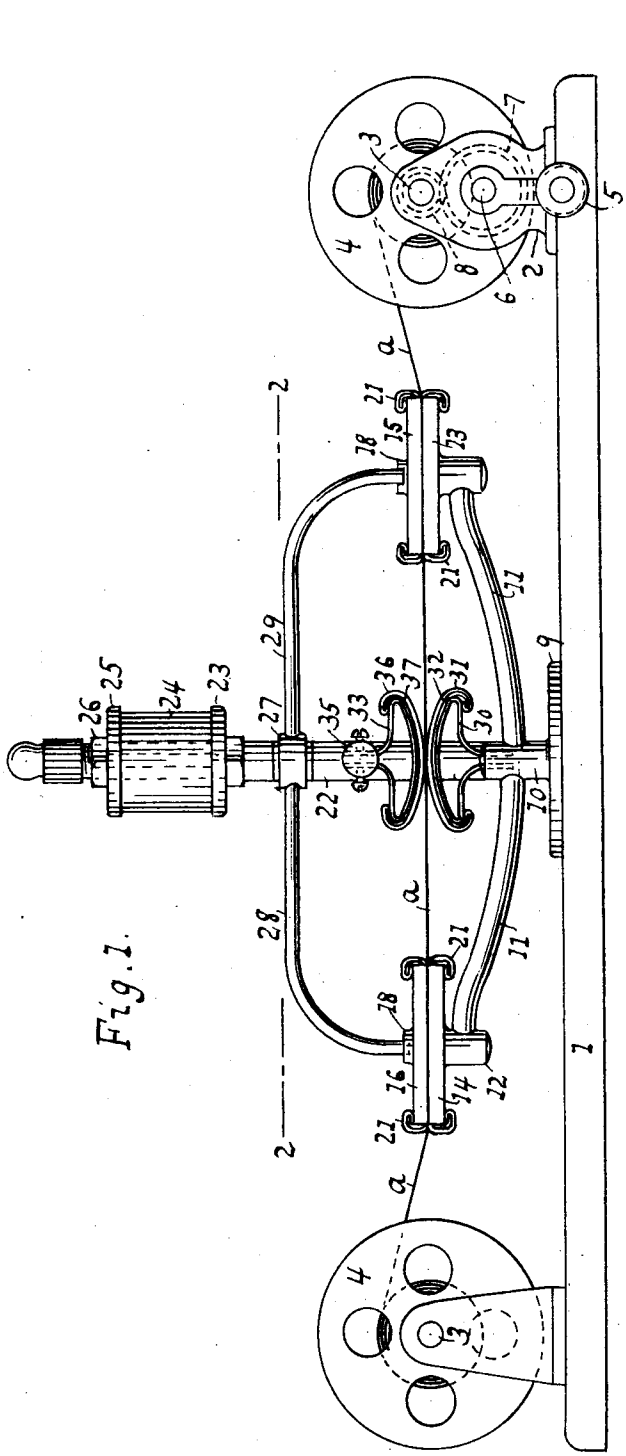


Fig. 1.

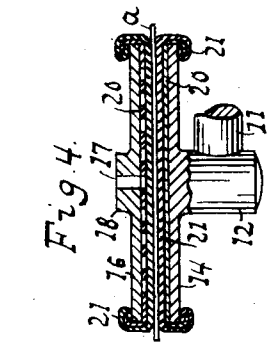


Fig. 4.

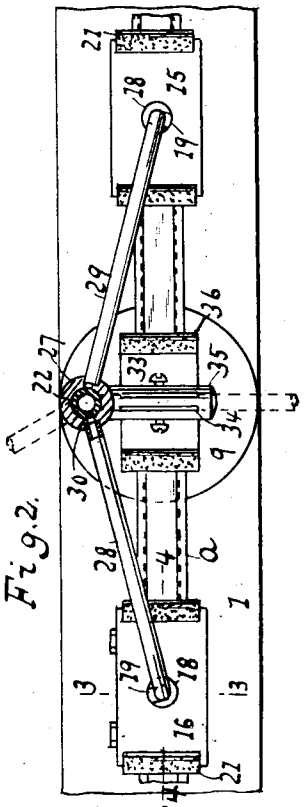


Fig. 2.

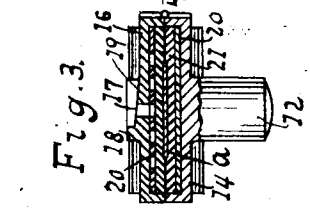


Fig. 3.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CLEANING FILMS.

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The present invention relates to means for and a method of cleaning and polishing films.

In the past it has been impossible to clean films both on the celluloid side and on the emulsion side for the reason that all the known cleaning lotions had a deleterious effect on the emulsion side. Consequently the mechanical devices used in cleaning films were complicated structures for they had to embody means to protect one side of the film while cleaning the other. To applicant's knowledge there has never been a lotion on the market for cleaning a film on both sides nor has there been a machine for applying a cleaning lotion to both sides of a film.

Applicant having developed a lotion that can be applied to both sides of a film, it is the object of this invention to provide a method for applying that lotion to both sides of a film and a mechanism for carrying out said method.

All prior methods have been arduous technical processes requiring the services of a skilled operator and the use of very expensive mechanisms.

In late years the number of amateur motion picture producers and operators has increased so amazingly that a serious problem has arisen regarding the reclamation of the films used by them in their homes. It is at present being solved at a great cost to these home operators by submitting the films to reclamation laboratories using the above mentioned expensive machinery and process.

It is therefore a further object of this invention to promote the home motion picture industry by providing a simple mechanism the cost of which will not be prohibitive to the home operator and the operation of which can be mastered by a child.

It is still a further object of this invention to provide a mechanism that can be installed in all theatres and which will permit professional operators to clean their films after every daily run. At present due to the aforesaid time and expense necessary for such a cleaning, the practice of cleaning films after every run is prohibitive. Consequently after a few days the film becomes oily and the projection is blurred and indistinct causing dissatisfaction among the patrons. But this problem is admirably solved by applicant's device without even necessitating the expenditure of extra time by the operator. At the end of every daily run the operator must rewind his film, and since applicant's device embodies a rewinder, he can now clean and rewind at the same time.

Applicant's device as before intimated consists merely of a rewinder with a detergent applying means placed between the two reels. It is simple, cheap and easy to operate.

The detergent applying device is a simple hinged casing the inside of which is lined with soft material and which is supplied on its cover with a vent to receive the end of a tube connected to a detergent reservoir whereby the detergent is continuously supplied in regulated quantities.

In the construction of this mechanism it is a further object of the applicant to make the cleaning pads easily removable and replaceable.

It is a further object to construct the supply pipe as a swingable member of resilient material so that it performs the double duty of supply pipe and clamp when in operative position.

It is a still further object to provide means for automatically shutting off the flow of liquid in the pipe when it is removed from the top of the cleaning case.

It is a still further object of this invention to so arrange the parts that the assembly presents the attractive appearance of an ornamental article of furniture.

In the annexed detailed description from which further advantages will be evident, reference will be had to the accompanying drawings in which:—

Fig. 1 is a front elevation of the device.

Fig. 2 is a sectional view of the device taken on the line 1—1 of Fig. 1.

Fig. 3 is a cross-section of the cleaning clamp on the line 3—3 of Fig. 2.

Fig. 4 is a cross-section on the line 4—4 of Fig. 2.

Referring to the drawings in detail 1 represents a base of any desired material. Mounted on either end of the base are uprights 2 carrying spindles 3 to receive reels 4. One of the uprights carries a handle 5

mounted on a stud shaft 6 on which is mounted a gear 7 in mesh with another gear 8 which is mounted on the reel shaft 3. This entire arrangement constitutes the ordinary rewind mechanism in common use for transferring film from one reel to another to have the proper end of the film on the outside. Mounted on the base intermediate the reel supports is a standard 9. Secured to the standard by any known method is a post 10 having arms 11 in longitudinal alignment with the reel supports. At the end of each arm 11 is secured perpendicular posts 12 each carrying at its top a channel plate. The channel plate closest the winding reel is designated as 13 and the other channel plate as 14. Hinged to one side of each channel plate is another channel plate adapted to be swung into superimposed position with the first mentioned plates. The channel plate superimposed on plate 13 is designated 15, and that superimposed on plate 14 is designated as 16. Each of the channel plates 15 and 16 have in their middle a perforation 17 shown in Figs. 3 and 4 surrounded on the outer side of said channel plates by a bead 18. Each bead has a cut away portion 19 the purpose of which will be later explained. Mounted on the inner face of each channel plate is a spring clip 20 which extends the length of the face of and is turned up over the ends of each said channel plate. Carried by each spring clip and extending over the outer face thereof is a strip of soft material 21 such as felt, velvet or chamois. The ends of this strip of soft material are tucked in between the turned over portions of the clip and the body of the clip so that when the clip is sprung on to the channel plate the strip of soft material is wedged between the spring ends of the clip and the ends of the channel plate. It is to be noted that the clip is entirely covered by the soft material as is the entire end portion of the channel plate. The clips are all the same except that attached to plate 16 which is perforated over its entire surface as shown in Figs. 3 and 4. As can be seen, the pairs of channel plates described above form a pair of clamps in longitudinal alignment with each other and in longitudinal alignment with the film reels.

The clamp made up of plates 14 and 16 constitutes a cleaning clamp, and that made up of plates 13 and 15 constitutes a polishing clamp. The soft material covering plates 13 and 15 is of a finer grade than that covering 14 and 16. The soft material covering plates 14 and 16 is saturated with cleaning fluid by a device that will be herewith explained.

Mounted on the standard 9 and behind the post 10 is a post 22 of greater height than post 10 and carrying at its upper end an ordinary oil cup which consists of the base 23, glass body portion 24 and top portion 25 screwed onto the upper end of the post 22. Mounted on the top of the oil cup is the usual screw plunger for regulating the flow of oil from the oil cup. This oil cup constitutes a reservoir for carrying a supply of a quick drying film cleaning fluid of the type which is applicable to both sides of a film. Intermediate its ends the post 22 carries a collar 27 on which is mounted spring arms 28 and 29, arm 28 being hollow and arm 29 being solid. The upper part of the post 22 is hollow from the top to a point corresponding to the point of attachment of arm 28 as shown in Fig. 2. At this point there is a vent 30 corresponding in size to the bore of tube 28. The arms 28 and 29 are swingable around the post 22, and are so arranged that their free ends can swing into the beads 18 by passing through the aforesaid cut away portions 19. The cut away portions 19 have an inclined surface so that when the arms are pushed up these surfaces they are put in tension thereby exerting a clamping force on the hinged channel plates. When in the position shown in full lines in Figs. 1 and 2 the arm 28 establishes a direct fluid conveying connection between the reservoir and the clamp made up of plates 14 and 16. When, however, the arms are swung to the position shown in dotted lines in Fig. 2 the vent 30 is closed and the flow of liquid in arm 28 is automatically shut off. When the film passes through the cleaning clamp it receives a coating of cleaning fluid. Since the distance between the cleaning clamp and the polishing clamp is not very large, this coating may not be completely evaporated, so that means are preferably interposed to positively remove any excess moisture from the film before it enters the polishing clamp. Such means may comprise a bowed spring 30 having its ends received by slots in the top of post 10 and covered by a layer of velvet 31 removably attached to the bowed spring by a spring clip 32 in connection with another bowed spring 33 the ends of which are secured in slots 34 in the arm 35 attached to post 22 and which is also covered by a layer of velvet 36 removably secured by a spring clip 37. These bowed springs are in yielding contact since they are mounted in superimposed position. The film passes between them whereby any excess moisture is wiped off without injury to the film. Referring now to the drawings, the operation of the machine is as follows:

When a film is to be cleaned the reel carrying it is mounted on the left hand reel support. At this stage the arms 28 and 29 are in the position shown in dotted lines in Fig. 2 and the clamps are swung open on their hinges. The arm 28 is then swung over the open faces of the channel plates 14 and 16

allowing the liquid from the reservoir to drop onto the soft material covering the inner faces of the channel plates. When this material is thoroughly moistened the film which in the drawing is designated as *a* is brought down over the channel plate 14, between the wipers 30 and 33, and over the channel plate 13 and attached to the reel on the winding post. Then the channel plates 15 and 16 are swung into closed position and the bars 28 and 29 are swung into clamping position by virtue of which the fluid connection between the reservoir and the plate 16 is established. The liquid from the reservoir runs through the perforation in the plate 16 onto the spring clip 20. It passes through the perforations in this spring clip and saturates the material 21. This is accomplished when the film is held by the clamp by virtue of the fact that the channel plates are made wider than the widest film in use. The device now being in operative position the handle 5 is turned at the rate of about 60 to 100 revolutions per minute carrying the film *a* through the two clamps. On passing through the cleaning clamp the film acquires a layer of cleaning fluid on both sides which is removed on passage through the wiping mechanism whereby the film is practically dry when it enters the polishing clamp.

From the foregoing description of the structure and operation of applicant's device it can be seen that it is capable of cheap production, that it does not require skill for its operation, and that it will clean films in an amazingly short period of time requiring no more time than is necessary for the ordinary rewinding operation.

It is to be understood that the above described device is merely the preferred embodiment of applicant's invention in practice and is susceptible to such various changes and modifications within the scope of applicant's claims as he may deem advisable to practice.

Having thus fully described the objects and practical embodiment of the invention, what is desired to be protected by Letters Patent is:—

1. A device for cleaning films comprising a base, film reel supports mounted on said base, a cleaning device placed intermediate said supports comprising a film clamp lined on its interior with soft material and having open ends to allow passage of said film through said lined interior, and means to moisten said lining with a cleaning lotion, said means comprising a reservoir mounted above the clamp, a swingable pipe mounted on said reservoir and adapted to connect said reservoir to said clamp and means operated by the swinging of said pipe to effect the flow of liquid from said reservoir to said clamp when said connection is made and to stop the flow of liquid from said reservoir when said connection is broken.

2. A device for cleaning and polishing films comprising a base, a pair of film clamps mounted in longitudinal alignment on said base each clamp comprising superimposed channel plates hinged together on one side and lined with soft material, a reservoir support mounted adjacent the clamps, and means on said reservoir support for clamping the said channel plates together, said clamping means serving to conduct liquid from the reservoir to one of said clamps whereby the film receives a coating of liquid on passage therethrough.

3. A device for cleaning and polishing films comprising a base, a pair of film clamps mounted in longitudinal alignment on said base, each clamp comprising a stationary channel plate and a movable channel plate superimposed on said stationary plate and hinged thereto, each plate carrying a pad of soft material mounted on a spring clip and attached to said plate, a reservoir support mounted adjacent said clamps, a pair of spring arms swingably mounted on said support and pressing on said movable channel plates when in closed position to clamp said movable plates to the stationary plates, and means to conduct liquid from the reservoir to one of said clamps.

4. A device for cleaning and polishing films comprising a base, a pair of film clamps mounted in longitudinal alignment on said base, each clamp comprising a stationary channel plate and a movable channel plate superimposed on said stationary plate and hinged thereto, each movable channel plate having a perforation, each channel plate carrying a pad of soft material mounted on a spring clip clamped at each end of each said channel plate, a reservoir support mounted adjacent said clamps carrying a reservoir having means to regulate the flow of liquid, a pair of spring arms swingably mounted on said support and engaging the perforations in said movable channel plates when said plates are in closed position to clamp said plates to the said stationary plates and means to conduct liquid from said reservoir to one of said clamps.

5. A device for cleaning and polishing films comprising a base, a pair of film clamps mounted in longitudinal alignment on said base, each clamp comprising a stationary channel plate and a movable channel plate superimposed on said stationary plate and hinged thereto, each movable channel plate having a perforation, each channel plate carrying a pad of soft material mounted on a spring clip clamped at each end of each said channel plate, a reservoir support mounted adjacent said clamps carrying a reservoir having means to regulate the flow of liquid, and a pair of spring arms swingably mount-

ed on said support and engaging the perforations in said movable channel plates when said plates are in closed position to clamp said plates to the said stationary plates, one of said arms being hollow and connected with the reservoir whereby when it engages the perforations in the channel plate liquid is conveyed to said channel plate from said reservoir.

6. A device for cleaning and polishing films comprising a base, a pair of film clamps mounted in longitudinal alignment on said base, each clamp comprising a stationary channel plate and a movable channel plate superimposed on said stationary plate and hinged thereto, each movable channel plate having a perforation, each channel plate carrying a pad of soft material mounted on a spring clip clamped at each end of each said channel plate, a reservoir support mounted adjacent said clamps carrying a reservoir having means to regulate the flow of liquid, a pair of spring arms swingably mounted on said support and engaging the perforations in said movable channel plates when said plates are in closed position to clamp said plates to the said stationary plates, one of said arms being hollow and connected with the reservoir whereby when it engages the perforation in the channel plate liquid is conveyed to said channel plate from said reservoir and means whereby when the said arms are swung away from the channel plates the flow of liquid in said hollow arm is automatically stopped.

7. In a film cleaning device a cleaning pad comprising a flat perforated spring plate having turned over ends and a pad of soft material mounted on said plate with its ends clamped under the turned over portions of said plate.

In testimony whereof I have hereunto set my hand.

JULIUS FRANKENBERG.