

Oct. 31, 1939.

F. E. RUNGE

2,178,242

WEB FEEDING APPARATUS

Filed June 30, 1937

Fig. 1.

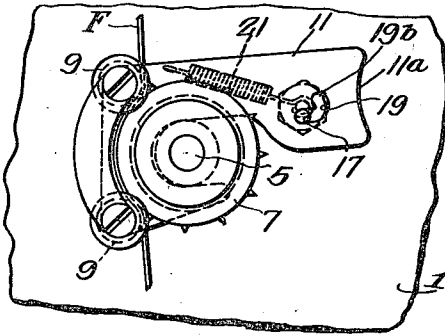


Fig. 2.

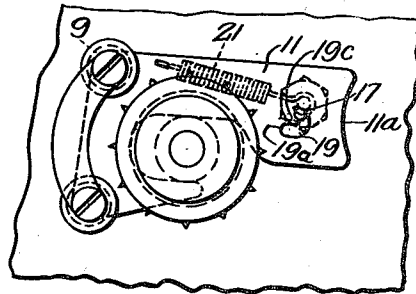


Fig. 3.

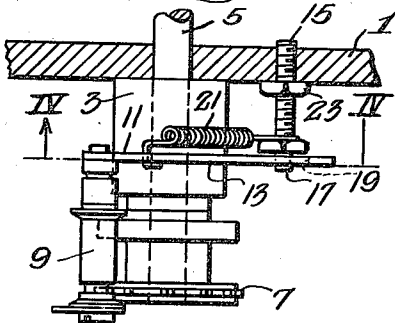


Fig. 4.

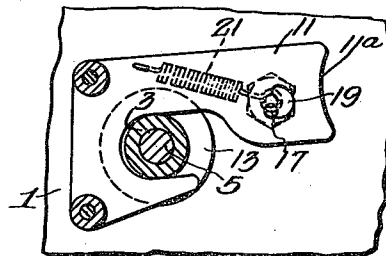


Fig. 5.

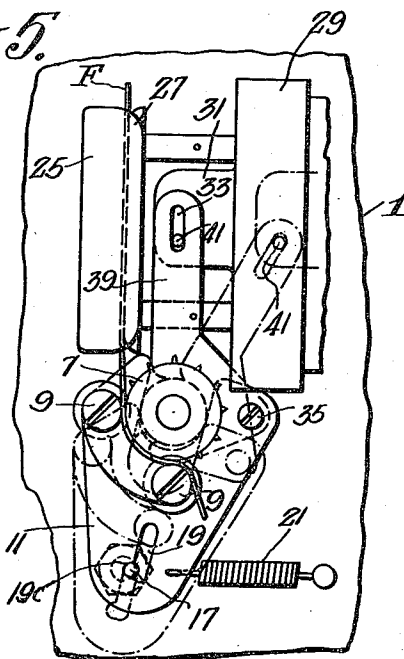
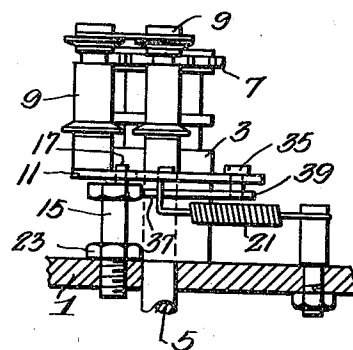


Fig. 6.



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UNITED STATES PATENT OFFICE

2,178,242

WEB FEEDING APPARATUS

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Application June 30, 1937, Serial No. 151,231

8 Claims. (Cl. 271—2.3)

This invention relates to web feeding apparatus, and more particularly to a pad roller construction for use in motion picture apparatus in conjunction with film feeding sprockets, the principal object of the present invention being to provide an improved mounting for the pad rollers whereby the operation will be greatly simplified.

Another object of my invention is to provide an improved pad roller mounting wherein the pad rollers may be readily adjusted for proper accommodation to the film feeding sprocket to provide proper clearance for the film therebetween.

Still another object of my invention is to provide an improved pad roller mounting by means of which the pad rollers will always be maintained in proper relationship to the sprocket.

A further object of my invention is to provide an improved pad roller mounting as aforesaid which may be very easily operated either to open position for threading of the film on the sprocket, or to closed position for holding the film in threaded engagement with the sprocket.

It is also an object of my invention to provide an improved pad roller mounting which is simple in construction, which may be easily manipulated, which will positively lock in either open or closed position, and which is comprised of so few parts as to be economical of manufacture.

According to my invention, the pad rollers are carried by a mounting plate which is itself mounted in, and guided by, a groove formed in the bearing bushing which supports the sprocket shaft. This groove not only serves to locate the pad rollers in proper radial and lateral relation to the sprocket, but also to positively guide the movement of the pad rollers toward and away from the sprocket as well as to center the pad rollers across the film and the sprocket. A bayonet lock in cooperation with a suitable spring and an eccentric locking stud positively locks the plate in either closed or open position, while at the same time permitting easy operation of the plate to either position by a very slight pressure. Film clearance between the pad rollers and the sprocket is readily adjustable by adjusting the aforementioned eccentric stud.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will best be understood from the following description of several embodiments thereof, when read in connection with the accompanying drawing, in which

Figure 1 is an end elevation of one form of pad roller arrangement and mounting therefor according to my invention with the pad rollers in closed position relative to the film feeding sprocket,

Figure 2 is a similar view, but showing the pad rollers in open position to permit threading of a film,

Figure 3 is a top plan view thereof with the pad rollers in closed position,

Figure 4 is a view partly in elevation and partly in section taken on the line IV—IV of Fig. 3,

Figure 5 is an end elevation of a slightly different form of my invention, the solid lines showing the pad roller assembly in closed position and the dot-and-dash lines showing the assembly in open position, and

Figure 6 is a bottom plan view of the latter form of my invention.

Referring more specifically to the drawing, wherein similar reference characters designate corresponding parts throughout, there is shown, in Figs. 1 to 4, a supporting wall 1 forming part of a moving picture apparatus and supporting a bushing 3 in which is journaled a shaft 5 having a film feeding sprocket 7 suitably secured thereto. Cooperating with the sprocket 7 to maintain the film 7 in feeding engagement with the sprocket 7 are a pair of spaced pad rollers 9 rotatably carried by a mounting plate 11, the rollers 9 having their axes parallel to the axis of rotation of the sprocket 7.

Formed in the bushing 3 is an annular guide groove 13 which receives the mounting plate 11 for sliding movement therein in a plane normal to the axes of rotation of the sprocket 7 and the pad rollers 9. A post 15 is threaded into the support 1 for adjustment thereon and has a projecting stud 17 eccentrically formed thereon, the stud 17 being received in a bayonet locking slot 19 formed in the plate 11. A coil spring 21 connected at one end to the plate 11 and at the other to the post 15 constantly urges the plate 11 into the closed position shown in Fig. 1 wherein the limit of approach of the pad rollers 9 toward the sprocket 7 is determined by engagement of the end 19a of the slot 19 with the projection or stud 17. By loosening the locking nut 23 on the post 15 and turning the post 15 one way or the other, the eccentric stud 17 will be correspondingly moved, and thus the film clearance between the pad rollers 9 and the sprocket may be readily adjusted, after which the nut 23 may again be tightened against the wall 1.

To prepare the device for threading of the film

F, it is merely necessary to engage the finger against the end 11a of the mounting plate 11 and apply a slight pressure thereto toward the left (as viewed in Fig. 1) sufficient to overcome the tension of the spring 21, whereupon the mounting plate 11 and its pad rollers 9 are moved bodily as a unit to the position shown in Fig. 2. In this position, the plate 11 rotates clockwise slightly about the shaft 5 as an axis until the end 19b of the slot 19 engages the stud 17 whereupon the spring 21, pulling back on the unit, causes the shoulder portion 19c at the slot 19 to abut against the stud 17 and releasably lock the unit in the open position. After threading the film F on the sprocket 7 in well known manner, the plate is pushed upwardly slightly to free the shoulder 19c from the stud 19, whereupon the spring 21 immediately pulls the unit back to the closed position of Fig. 1. During either the opening or the closing operation of the pad roller unit, a mere flick of the finger, so to speak, will be sufficient to effect the desired result, and at the same time not only are the limits of movement of the plate 11 well defined by the slot 19 and the stud 17, but the unit is adequately locked in either the closed or the open position.

In certain cases, it may be desirable to have the opening and closing of the pad rollers relative to the sprocket automatically effected while other parts of the apparatus are being conditioned for threading. The modification of my invention shown in Figs. 5 and 6 is designed to meet such conditions. In these figures, there is shown a film gate comprising a fixed aperture plate 25, and a relatively movable aperture plate 27 between which the film is advanced, as by means of the sprocket 7 which may be intermittently operated in any suitable manner. The movable plate 27 may be secured to the housing 29 of an optical system (not shown) for movement therewith and the housing 29 may be provided with a projecting plate 31 having a pin 33 fixed thereto.

Pivoted to the mounting plate 11 at 35 and received in a second annular guide groove 37 in the bushing 3 is an operating lever 39 having a slot 41 therein which receives the pin 33. When the film gate is opened by pushing the optical housing to the right (as viewed in Fig. 5), the pin 33, acting in the slot 41, forces the operating lever 39 clockwise around the shaft 5 in the guide groove 37 thereby causing the lever 39 to impart, first, a slight clockwise rotation about the shaft 5 to release the shoulder 19c from the stud 17, and then to impart a thrust to the mounting plate 11 in a downward direction to cause the plate 11 and its rollers 9 to move bodily as a unit from the solid line position to the dot-and-dash line position of Fig. 5. On the other hand, when the film gate is closed by pushing the optical housing 39 to the left, the pin 33 effects counterclockwise rotation of the operating lever 39 about the shaft 5 and causes the lever 39 to raise the pad roller unit back to the closed, or solid line, position, the spring 21 pulling the plate counterclockwise about the shaft 5 for the shoulder 19c to again engage the stud 17 and thereby releasably lock the pad roller unit in closed position.

Although I have shown and described but two embodiments of my invention, I am fully aware that many other modifications thereof are possible. Furthermore, it will undoubtedly be apparent to those skilled in the art that many changes may be made even in the embodiments

herein described without departing from the spirit of my invention. For example, in place of the sprocket 7, any other rotary film feeding element, such as a friction drum, may be employed for feeding forward the film F or any other suitable strip or web, in which case the pad rollers 9 would be arranged to engage the web and press it against the rotary element in the closed position. Many other changes will, no doubt, readily suggest themselves to those skilled in the art. I therefore desire that my invention shall not be limited except insofar as is made necessary by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. In apparatus for advancing a perforated film strip, the combination of a rotatable film feeding sprocket, a movable mounting plate, a plurality of pad rollers carried by said plate for cooperation with said sprocket to hold the film strip in feeding relation therewith, means having a guide groove therein receiving said plate for guiding the movement thereof between predetermined positions in one of which said pad rollers are relatively removed from said sprocket and in another of which said pad rollers are relatively close to said sprocket for effecting said cooperation, means constantly urging said plate and its pad rollers toward said latter position, and means associated with said plate for determining positions.

2. The invention set forth in claim 1 characterized in that said position determining means is adjustable whereby said positions may be varied at will.

3. The invention set forth in claim 1 characterized in that said plate and said position determining means are so constructed and arranged relative to each other that said means is adapted to releasably lock said plate in said first named position against the influence of said first named means.

4. In apparatus for advancing a perforated film strip, the combination of a rotatable film feeding sprocket, a movable mounting plate, a plurality of pad rollers carried by said plate for cooperation with said sprocket to hold the film strip in feeding relation therewith, and means having a guide groove therein receiving said plate for guiding the movement thereof between predetermined positions in one of which said pad rollers are relatively removed from said sprocket and in another of which said pad rollers are relatively close to said sprocket for effecting said cooperation.

5. In apparatus for advancing a perforated film strip, the combination of a rotatable film feeding sprocket, a movable mounting plate, a plurality of pad rollers rotatably carried by said plate for cooperation with said sprocket to hold the film strip in feeding relation therewith, means having a guide groove therein receiving said plate for guiding the movement thereof between predetermined positions in one of which said pad rollers are relatively removed from said sprocket and in another of which said pad rollers are relatively close to said sprocket for effecting said cooperation, and means constantly urging said plate and its pad rollers toward said latter position.

6. In apparatus for advancing a perforated film strip, the combination of a supporting member, a bushing carried thereby, a film feeding sprocket rotatably carried in said bushing, said bushing having an annular guide groove therein,

5 a plate slidably received in said guide groove and
having a preformed locking slot therein, a plu-
rality of pad rollers rotatably mounted on said
plate in spaced relation to each other and
10 adapted, when in closed position with respect
to said sprocket, to hold the film strip in feeding
relation therewith, a locking element mounted
on said supporting member and received by said
locking slot, and means constantly urging said
15 plate and its pad rollers toward said closed posi-
tion, said locking element cooperating with one
portion of said slot to hold said plate and its pad
rollers in said closed position, and cooperating
with another portion of said slot to hold said
20 plate and its pad rollers in open position against
the influence of said means and with said rollers
spaced from said sprocket.

7. The invention set forth in claim 6 charac-
terized in that said locking slot is constituted by
a bayonet slot, and characterized further in that
said locking element is arranged to cooperate
with one end of said bayonet slot to hold said
25 plate and its pad rollers in said closed position
and with the other end thereof to hold said plate
and its pad rollers in said open position.

8. In apparatus for advancing a perforated

film strip, the combination of a supporting mem-
ber, a bushing carried thereby, a film feeding
sprocket rotatably carried in said bushing, said
bushing having an annular guide groove therein,
5 a plate slidably received in said guide groove and
having a bayonet slot therein, a pair of pad
rollers rotatably mounted on said plate in spaced
relation to each other and adapted, when in
closed position with respect to said sprocket, to
10 hold the film strip in feeding relation therewith,
said rollers having their respective axes parallel
to the axis of rotation of said sprocket, a post
adjustably mounted on said supporting member,
spring means connected between said post and
said plate constantly urging said plate toward
15 closed position with respect to said sprocket, and
a projection eccentrically located on said post,
said projection extending into said bayonet slot
and serving, at one end of said slot, to determine
the clearance between said pad rollers and said
20 sprocket in closed position, and at the other end
of said slot, to positively hold said mounting
plate and said pad rollers in open position away
from said sprocket, said post being adjustable
to vary said clearance.

FRANK E. RUNGE.

CERTIFICATE OF CORRECTION.

Patent No. 2,178,242.

October 31, 1939.

FRANK E. RUNGE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 28, for "film 7" read film F; page 2, second column, line 31, claim 1, before "positions," insert said; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of January, A. D. 1940.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.