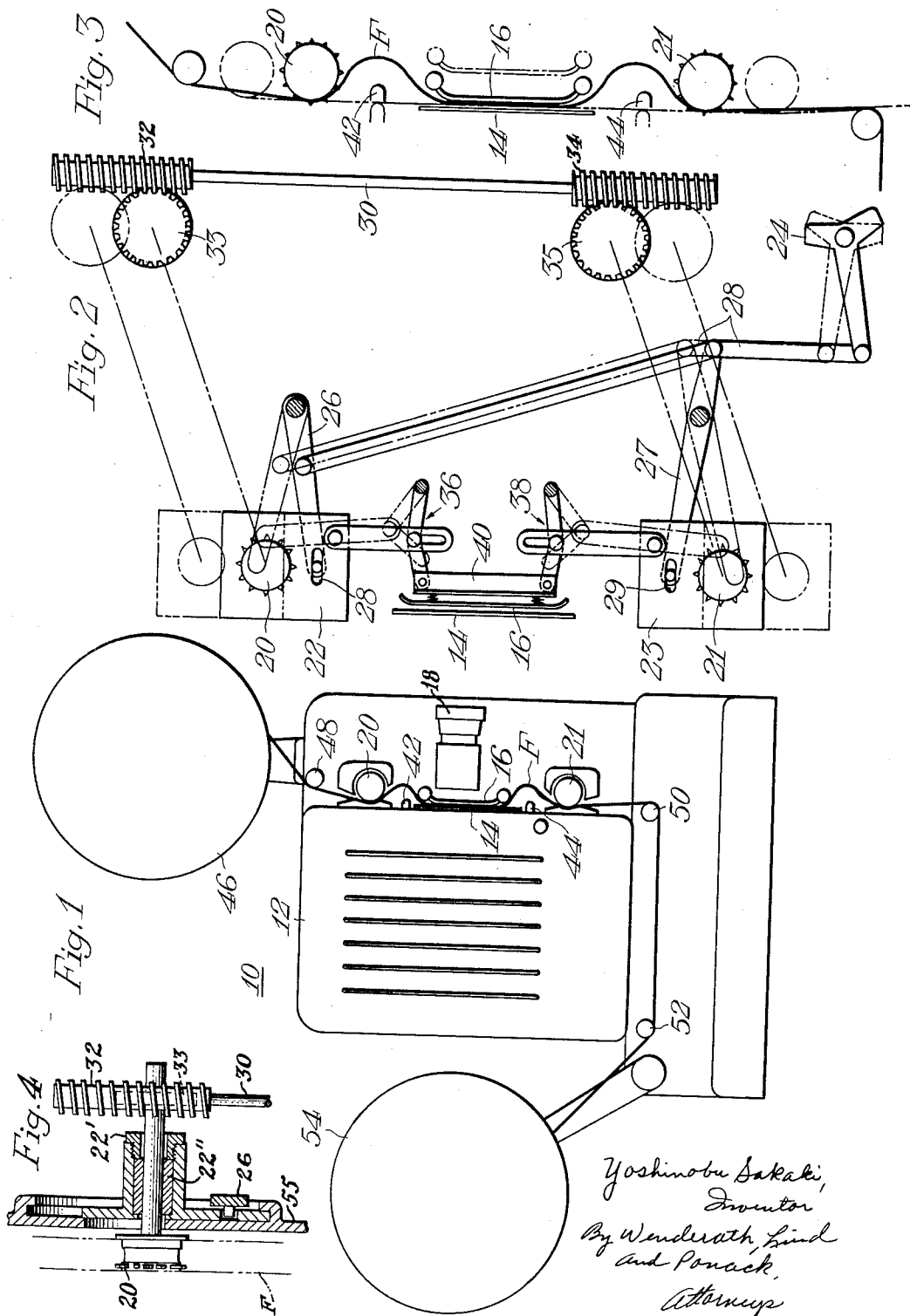


May 14, 1963

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DEVICE FOR THREADING LEADING PORTION OF
A CINEFILM IN CINEPROJECTOR

3,089,629

Filed Jan. 2, 1962



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**DEVICE FOR THREADING LEADING PORTION OF
A CINEFILM IN CINEPROJECTOR**

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Filed Jan. 2, 1962, Ser. No. 163,523

5 Claims. (Cl. 226—91)

This invention relates to a device for threading a leading portion of a cinefilm in a cineprojector.

In order to thread a leading portion of a cinefilm in a cineprojector, it has been heretofore the practice manually to place the leading portion of the cinefilm along a predetermined winding path involving a pair of loops and within a relatively small space in the cineprojector. This normally requires much time and much labor. It is highly desirable to provide means for facilitating such threading operation without the necessity of taking much time and much labor.

Accordingly, an object of the invention is to provide an improved device for threading a leading portion of a cinefilm in a cineprojector in an extremely easy and rapid manner.

A more specific object of the invention is to provide an improved device for threading a leading portion of a cinefilm in a cineprojector merely by first placing the same along a straight path extending past a projection gate and then forming the necessary loop portions of the cinefilm simultaneously with the engagement of a pair of sprocket wheels with the adjacent portions of the cinefilm without the necessity of having access to the same.

Another object of the invention is to provide an improved device of the type described in the preceding paragraph and further including means for automatically moving a pressure plate toward a projection gate to resiliently press the adjacent portion of a cinefilm against the same at the instant the loops are formed on the cinefilm.

With these objects in view, the present invention resides in a device for threading a leading portion of a cinefilm in a cineprojector, comprising, in combination, a pair of sprocket wheels for driving the cinefilm disposed movably on both sides of a projection gate respectively, and manual operating means for moving said pair of sprocket wheels toward and away from each other, the leading portion of the cinefilm being adapted to engage said pair of sprocket wheels without any slack when the sprocket wheels are maintained at the longest distance therebetween and to include a pair of loops formed on those portions thereof disposed between the sprocket wheels and the projection gate when the pair of sprocket wheels are moved toward each other and maintained at the shortest distance therebetween.

Preferably, a pressure plate for a cinefilm may be arranged to be moved toward and away from the projection gate simultaneously with the movement of the sprocket wheels toward and away from each other respectively.

The invention will become more readily apparent from the following exemplary description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a diagrammatic side elevational view of a cineprojector embodying the teachings of the invention with a cinefilm loaded in its operative position;

FIG. 2 is a diagrammatic view of a film threading device constructed in accordance with the teachings of the invention;

FIG. 3 shows diagrammatically the manner in which a leading portion of a cinefilm is placed in position; and

FIG. 4 shows an elevational view, partly in section of

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means for operatively connecting a sprocket wheel and a worm gear illustrated in FIG. 2.

Referring now to the drawings and more particularly to FIGS. 1 and 2, there is diagrammatically illustrated a cineprojector generally designated by the reference numeral 10 and including a film threading device constructed in accordance with the teachings of the invention. More specifically, a lamp housing 12 includes an aperture plate 14 at the center of the front face of the right hand face as viewed in FIG. 1. The aperture plate 14 is provided with a projection gate (not shown) and faces a movable pressure plate 16 serving to press the adjacent portion of a cinefilm lightly against the aperture plate. The cineprojector is shown as including a projecting objective 18 disposed on that side of the pressure plate 16 remote from the aperture plate 14.

According to one feature of the invention a pair of vertically spaced sprocket wheels 20 and 21 are disposed in front of the front face of the lamp house 1 for vertical movement toward and away from the ends of said aperture plate. To this end, the pair of sprocket wheels 20 and 21 are rotatably mounted on a pair of movable members 22 and 23 arranged to be movable toward and away from each other by a manually operated element 24 through a pair of levers 26, 27 and a linkage 28.

As shown in FIG. 2, the upper lever 26 includes one end serving as a fulcrum and has the other end slidably engaging in a slot 28 formed on the upper movable member 22 whereas the lower lever 27 includes one end pivotally mounted to the linkage 28 at the suitable point and has the other end also slidably engaging in a slot 29 formed on the lower movable member 23. That point on the linkage 28 operatively connected to the lower lever 27 is operatively connected to the intermediate point on the upper lever 26 by an arm and is also connected to the operating element 24 through a pair of relatively rockable arms. It will be appreciated that the operating element 24 can be moved from its one position illustrated by solid lines in FIG. 2 to another position illustrated by dotted-and-dashed lines to move the levers 26, 27 and the linkage 28 from their positions illustrated by solid lines in the same figure to their positions illustrated by dotted-and-dashed lines respectively, whereupon the upper and lower members 22 and 23 will be moved from their positions represented by solid lines to their positions represented by dotted-and-dashed lines respectively. This permits the pair of sprocket wheels 20 and 21 to be moved from their positions illustrated by the solid lines in FIG. 2 toward each other to their positions illustrated by dotted-and-dashed lines respectively.

It is to be understood that the illustrated arrangement comprising the pair of levers 26, 27 and the linkage 28 may be replaced by any other suitable coupling mechanism.

As well known to those skilled in the art, the pair of sprocket wheels must be positively driven by a common drive to run a cinefilm past the projection gate. To this end, a pair of worm and worm gear mechanisms may be preferably provided between the pair of sprocket wheels and the common drive respectively. Thus, a driving shaft 30 operatively connected to a common drive (not shown) interconnects a pair of worms 32 and 34 which, in turn mesh with a pair of worm gears 33 and 35 respectively. The worm gears 33 and 35 are operatively connected to the sprocket wheels 20 and 23 respectively as schematically shown by a dotted-and-dashed line. As shown in FIG. 4, the worm gear 33 is rigidly mounted on one end of a shaft 33' rotatably carried in the movable member 22 in a sleeve 22' and a bearing 22'' disposed within a bore formed in the movable member. The shaft 33' has the sprocket wheel 20 rigidly secured to the other end

thereof. In FIG. 4, the movable member is shown as being a flanged tubular member provided at the end near the sprocket wheel 20 with a flange portion movably disposed within an elongated recess suitably formed on a housing frame 55. The worm gear 35 is operatively connected to the sprocket wheel 21 in the same manner as just described. If desired, a pair of universal joints may be used to operatively connect the pair of sprocket wheels to the common drive.

According to another feature of the invention a pair of toggle mechanisms 36 and 38 can be provided for interlocking the sprocket wheels with the associated movable members respectively. As shown in FIG. 2, the pair of toggle mechanisms 36 and 38 operatively connect the movable members 22 and 23 to the pressure plate 16 through a block 40 which, in turn, is resiliently coupled to the pressure plate. With the arrangement described, it will be understood that the movement of the pressure plate 16 is effected simultaneously with the movement of the sprocket wheels. In other words, if the sprocket wheels are moved toward or away from each other through the actuation of the operating element respectively, the pressure plate will be simultaneously displaced toward or away from the aperture plate and hence the projection gate respectively. If desired, the pressure plate may be separately displaced by any suitable, manually operated member.

FIGS. 1 and 3 further show a pair of pushing members 42 and 44 disposed between the aperture plate 14 and the adjacent sprocket wheels 20 and 22 respectively. These pushing members 42 and 44 interlocking with the pressure plate so as to be displaced in the direction opposite to the direction in which the pressure plate will be displaced. However, the members 42 and 44 may be omitted, if desired.

In the cineprojector thus far described a roll of cinefilm to be projected is loaded in the following manner. First the operating element 24 is moved to its position illustrated by dotted-and-dashed lines in FIG. 2. This causes the sprocket wheels 20 and 21 to be moved away from each other through the movement of the linkage 28 and the levers 26, 27 until they occupy their respective positions illustrated by dotted-and-dashed lines FIGS. 2 and 3. In these positions the sprocket wheels are maintained with the longest distance therebetween. At the same time, the pressure plate 16 is moved away from the aperture plate 14 by the action of the toggle mechanisms 36 and 38 to thereby establish a space between both plates sufficient so that it is easy to thread a leading portion of the cinefilm into the same.

Then the leading portion of the cinefilm F contained on a supply reel 46 (see FIG. 1) suitably mounted on the cineprojector 10 can be manually threaded into the projector such that the leading portion of the cinefilm F is passed over a guide roller 48 and the upper sprocket wheel 20 and thence to the space between the plates 14 and 16 and over the lower sprocket wheel 21 and guide rollers 50, 52 to a take up reel 54 mounted on the cineprojector. Thus, in front of the lamp housing 12, the leading portion of the cinefilm F is placed along a straight path illustrated by dotted-and-dashed line in FIG. 3.

Under these circumstances, the manually operated element 24 can be returned to its position illustrated by solid lines in FIG. 2. This causes the sprocket wheels 20 and 22 to be moved toward each other by the actuation of the linkage 28 and the levers 26, 27, whereby the distance between the sprocket wheels is reduced to the minimum magnitude. Therefore, that portion of the cinefilm disposed between each end of the aperture plate and the adjacent sprocket wheel will be slackened. Simultaneously with the movement of the sprocket wheels toward each other, the pressure plate 16 is moved toward the aperture plate 14 to resiliently press the adjacent portion of the cinefilm against the latter plate. In this manner, a pair of loops required for effecting the intermittent movement

of the cinefilm in the range of the projection gate are formed in the portions of the cinefilm disposed between the upper and lower sprocket wheels and the pressure plate respectively. In this case, the pushing members 42 and 43 will project beyond the plane of the aperture plate to aid in forming the loops.

With the embodiment illustrated, the movement of the sprocket wheels 20 and 21 toward each other effects a rolling movement of the worm gears 33 and 35 on the associated worms 32 and 34 respectively. This causes the sprocket wheels to be somewhat rotated in a direction in which the formed loops will be increased in dimension.

Now, the cineprojector is ready for projecting the loaded cinefilm.

From the foregoing it will be appreciated that the present invention has provided a device for threading a leading portion of a cinefilm in a cine-projector in extremely easy and rapid manner.

While the invention has been described in conjunction with the preferred embodiments thereof it is to be understood that various changes and modifications may be made without departing from the spirit and scope of the invention.

What I claim is:

1. In a device for threading a leading portion of a cinefilm into a cineprojector, the combination of a projection gate, a pair of sprocket wheels for driving the cinefilm disposed movably at opposite ends of the projection gate respectively, means coupled to said sprocket wheels for driving said sprocket wheels, and manually operated means coupled to said sprocket wheels for moving said pair of sprocket wheels toward and away from each other, the leading portion of the cinefilm being adapted to engage said pair of sprocket wheels without any slack when the sprocket wheels are maintained at the longest distance therebetween and to include a pair of loops formed on those portions thereof disposed between the sprocket wheels and the projection gate respectively when the pair of sprocket wheels are moved toward each other to be maintained at the shortest distance therebetween.

2. In a device for threading a leading portion of a cinefilm into a cineprojector, the combination of a projection gate, a pressure plate in front of said projection gate and movable toward and away from said projection gate, a pair of sprocket wheels for driving the cinefilm disposed movably at opposite ends of the projection gate respectively, means coupled to said sprocket wheels for driving said sprocket wheels, and manually operated means coupled to said sprocket wheels for moving said pair of sprocket wheels toward and away from each other, and means actuated by said manually operated means and coupled to said pressure plate for moving the pressure plate for the cinefilm toward and away from the projection gate simultaneously with the movement of the sprocket wheels, the leading portion of the cinefilm being adapted to engage said pair of sprocket wheels without slack when the sprocket wheels are maintained at the longest distance therebetween and to include a pair of loops formed on those portions thereof disposed between the sprocket wheels and the projection gate when the pair of sprocket wheels are moved toward each other to be maintained at the shortest distance therebetween and when the pressure plate is moved toward the projection gate to resiliently press the adjacent portion of the cinefilm against the projection gate.

3. In a device for threading a leading portion of a cinefilm into a cineprojector, the combination of a projection gate, a pressure plate in front of said projection gate and movable toward and away from said projection gate, a pair of sprocket wheels for driving the cinefilm disposed movably at opposite ends of the projection gate respectively, means coupled to said sprocket wheels for driving said sprocket wheels, and manually operated means coupled to said sprocket wheels for moving said pair of sprocket wheels toward and away from each other,

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and a pair of toggle mechanism operatively connected to said manually operated means and for coupling the pair of sprocket wheels to the pressure plate for the cinefilm in such way as to move the latter toward and away from the projection gate when the pair of sprocket wheels are moved toward and away from each other respectively, the leading portion of the cinefilm being adapted to engage said pair of sprocket wheels without slack when the sprocket wheels are maintained at the longest distance therebetween and to include a pair of loops formed on those portions thereof disposed between the sprocket wheels and the projection gate when the pair of sprocket wheels are moved toward each other to be maintained at the shortest distance therebetween and when the pressure plate is moved toward the projection gate to resiliently press the adjacent portion of the cinefilm against the projection gate.

4. In a device for threading a leading portion of a cinefilm into a cineprojector, the combination of a projection gate, a pressure plate in front of said projection gate and movable toward and away from said projection gate, a pair of sprocket wheels for driving the cinefilm disposed movably at opposite ends of the projection gate respectively, manually operated means coupled to said sprocket wheels for moving said pair of sprocket wheels toward and away from each other, a pair of toggle mechanisms operatively connected to said manually operated means

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and for coupling the pair of sprocket wheels to a pressure plate for the cinefilm in such way as to move the latter toward and away from the projection gate when the pair of sprocket wheels are moved toward and away from each other respectively, and a worm and worm gear mechanism operatively connected to each of the sprocket wheels, a driving shaft connecting the worm in one of said mechanisms to the worm in the other mechanism, the leading portion of the cinefilm being adapted to engage said pair of sprocket wheels without slack when the sprocket wheels are maintained at the longest distance therebetween and to include a pair of loops formed on those portions thereof disposed between the sprocket wheels and the projection gate when the pair of sprocket wheels are moved toward each other to be maintained at the shortest distance therebetween and when the pressure plate is moved toward the projection gate to resiliently press the adjacent portion of the cinefilm against the projection gate.

5. A device as claimed in claim 2, further comprising a pair of pushing members disposed movably between the pair of sprocket wheels and the projecting gate respectively and serving to aid in forming said pair of loops in the corresponding portions of the cinefilm.

No references cited.