Nov. 3, 1936. P. HAAS 2,059,342

PAD ROLLER ASSEMBLY

Filed July 24, 1935

FIG_1

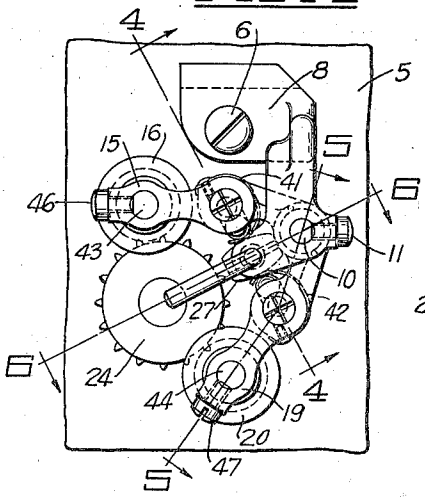


FIG_2

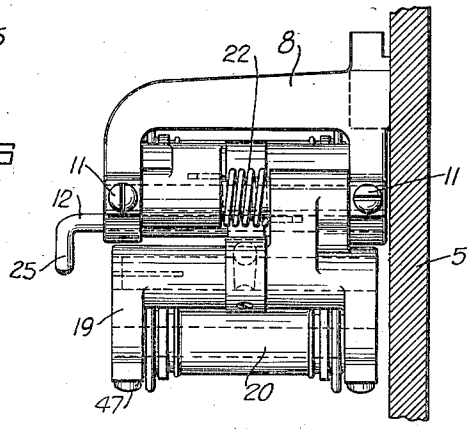


FIG_3

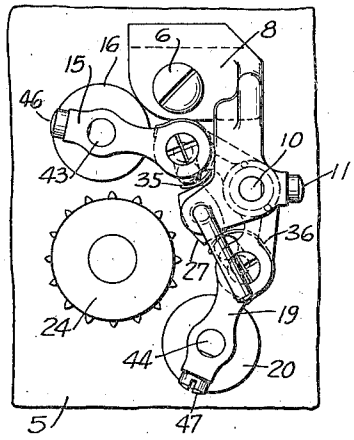


FIG_4

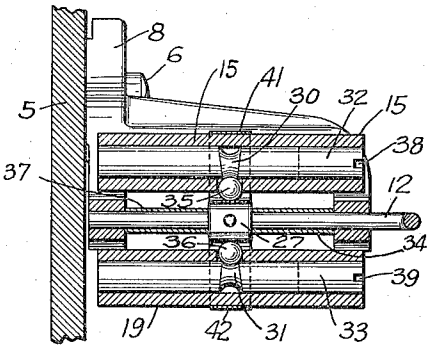


FIG_5

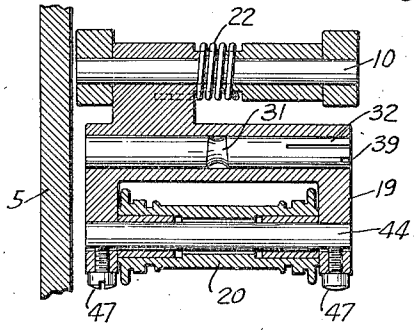
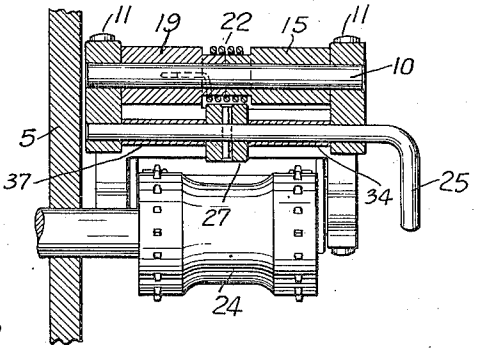


FIG_6



INVENTOR
Paul Haas
BY Virl R. Gosliaw
ATTORNEY

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PAD ROLLER ASSEMBLY

Paul Haas, Maspeth, N. Y., assignor to United Research Corporation, Long Island City, N. Y., a corporation of Delaware

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10 Claims. (Cl. 271—2.3)

This invention relates to motion picture apparatus and particularly to pad rollers for maintaining a film on a drive sprocket.

In motion picture apparatus, a film having picture images and/or sound images thereon is driven through a picture projector and/or sound reproducer by means of sprockets having teeth on each end thereof for engaging the film in the perforations longitudinally disposed adjacent the edges of the film. As this film must be advanced at a substantially constant and uniform speed, particularly past the translation points in the sound units, it becomes essential that the film pass over the sprockets uniformly. One of the factors which produces uniform film travel is the maintenance of the film on the sprockets at a substantially constant pressure. It is, of course, usual in the art to use pad rollers for this purpose, the present invention being directed to an improved form of these pad rollers which provides flexibility of adjustment and simplicity of operation.

The pad roller assembly of this invention has two rollers, each of which is independently adjustable with respect to the film contact surface of its associated sprocket in a unique manner. The adjustment is easily accomplished and is of the vernier type. Another feature of the assembly is the simplicity of operation of the rollers to the film threading and running positions. The assembly is especially rugged and includes an interconnecting link which equalizes the pressure of each roller on the film passing over the sprocket.

The details of the invention will be more clearly understood by reference to the following description read in conjunction with the accompanying drawing, in which

Figs. 1 and 3 are side elevational views of a pad roller assembly in closed and open positions, respectively.

Fig. 2 is a front elevational view of the pad roller assembly of Fig. 1; and

Figs. 4, 5 and 6 are cross-sectional views along the lines 4—4, 5—5, and 6—6 respectively, of Fig. 1.

Referring now to the figures in which the same numerals indicate identical elements, a wall or base plate 5 has the sprocket assembly attached thereto by means of a screw 6 passing through a U-shaped bracket 8 which has a fixed shaft 10 held by screws 11 at one position between the arms, and a movable shaft 12 extending between the arms of the bracket at another position.

A U-shaped bracket arm 19 has one end journalled on substantially the entire length of shaft 10 and has mounted at the other end a pad roller 20. A similar bracket arm 15 has one end journalled on a section of the part of arm 19 journalled on the shaft 10 and has mounted on its other end a pad roller 16. A coil spring 22 surrounds a narrow central section of the arm 19, the terminals of which are bent around the connecting portions of the arms 15 and 19 after a definite tension has been placed therein for effecting a certain pressure on the film. Since each arm is thus interconnected the pressure on the film is equalized at all times, even when splices pass between the rollers and sprocket.

Each of the arms 15 and 19 are positioned in film threading and running positions by turning the shaft 12 which has a right angle bend therein forming a hand lever 25. Fixedly mounted upon the shaft 12 is an elliptical cam 27 having flattened ends which upon rotation as shown in Figs. 1 and 3 separate the arms 15 and 19 thus removing the rollers 16 and 20 from the surface of the sprocket 24. The flattened ends of the cam maintain the arms 15 and 19 in separated position for threading film on the sprocket.

Each roller is also independently adjustable with respect to the surface of sprocket 24 by means of a ball and groove arrangement shown in more detail in Figs. 4 and 5. Grooves 30 and 31 have been cut in shafts 32 and 33 respectively, each of these grooves varying in depth circumferentially of their shafts. Each groove has inserted therein respective ball bearings 35 and 36. The shafts 32 and 33 have notches 38 and 39 to accommodate a screwdriver or like instrument to rotate the shafts 32 and 33, and thus contact the balls 35 and 36 at different points around the grooves. The center of the balls will be positioned at different distances from the axes of the shafts according to the angular position of the shafts and thus position the rollers 16 and 20 a corresponding proportionate distance from the surface of the sprocket 24. As the depth of the grooves changes very gradually, extremely small variations in adjustment may be obtained. The ends of the shafts 32 and 33 are split and are sprung apart so that there is sufficient friction provided to maintain them in any adjusted position.

To maintain the ball bearings 35, 36 in the grooves 30 and 31, springs 41 and 42 are bent around the enlarged portion of the arms 15 and 19, and the ball bearings 35 and 36, respectively, the outer surface of the springs bearing against the sides of the elliptical cam 27. Spacer sleeves 34 and 37 maintain the cam 27 at a central posi-

tion. Thus each individual arm may be adjusted with respect to the sprocket **24** by turning the shafts **32** and **33** while both arms may be separated for film threading by a single movement of the lever **25**.

The rollers **16** and **20** are rotatable upon fixed shafts **43** and **44**, the shafts being held in the extensions of the U-portion of the brackets by screws **46** and **47**, respectively.

From the above description it will be noted that the present pad roller assembly provides a simple and rugged construction which may be easily assembled and adjusted. Spring **22** reacts upon each roller thus equalizing the pressure exerted upon the film passing over the sprocket **24**. The adjustment of each roller of the assembly may be made independently in a simple and efficient manner and in particularly small degrees of adjustment. Furthermore, both rollers may be placed in a threading position by a single movement of the lever, the extreme movement thereof maintaining the assembly in locked position.

What is claimed is:

1. A pad roller assembly comprising a pair of arms movable about a common axis, a roller mounted at each terminal of said arm, means positioned between said arms and intermediate said rollers and said axis for separating the terminals of said arms simultaneously, and means bearing on said last mentioned means and adapted to individually vary the separation of said arms, said last mentioned means being adjustable from the side of said assembly.

2. A pad roller assembly comprising a pair of arms pivoted on a common axis, pad rollers mounted on the ends of said arms, a sprocket intermediate said pad rollers, a cam positioned between said arms and intermediate said rollers and said pivot axis for removing said rollers from the surface of said sprocket simultaneously upon rotation of said cam, a shaft in each of said arms and mounted intermediate said rollers and said pivot axis, said shafts having grooves therein varying in depth circumferentially of said shafts, and means positioned in said grooves and intermediate said shafts and said cam for individually varying the position of respective rollers with respect to the surfaces of said sprocket.

3. A pad roller assembly comprising a pair of arms pivoted about a common axis, pad rollers mounted on the ends of said arms, a sprocket intermediate said pad rollers over which film is adapted to be advanced, means interconnecting said arms for providing said rollers with equal bearing pressure upon said film, and means adjustable from the side of said assembly for individually positioning each of said pad rollers with respect to said sprocket.

4. An assembly in accordance with claim 3 in which said first mentioned means comprises a coil spring the axis of which is coincident with said common axis and each end of which contacts a respective arm.

5. A pad roller assembly comprising a mounting bracket, a pair of arms having one end of each arm pivoted on a common axis on said bracket, means interconnecting said arms for urging the other ends of said arms toward one another, pad rollers rotatably mounted on the other ends of said arms, means adjustable from the side of said assembly for individually positioning each of said arms and means between said arms and intermediate said rollers and said pivot axis for simultaneously separating said arms, said means maintaining said arms in separated position.

6. A pad roller assembly in accordance with claim 5 in which said last mentioned means comprises an elliptical cam having flattened ends.

7. A pad roller assembly construction comprising a mounting bracket, a pair of arms pivoted on a common axis on said bracket, pad rollers mounted on said arms and adapted to bear on the surface of a sprocket, means for individually adjusting the bearing pressure of each of said pad rollers on said sprocket, said means being adjustable from the side of said assembly, and means positioned between said axis, rollers and sprocket for simultaneously removing said rollers from said sprocket.

8. A pad roller assembly construction in accordance with claim 7 in which said last mentioned means comprises an elliptical cam having flat ends, said ends maintaining said rollers in open position when adjusted to said position.

9. A pad roller assembly construction comprising a bracket, a pair of arms pivoted about a common shaft mounted on said bracket, pad rollers rotatably mounted on the ends of said arms, a rotatable shaft mounted in each of said arms intermediate each of said rollers and said shaft, said rotatable shaft having a circumferential groove therein of varying depth, a ball bearing positioned in each of said grooves, means individual to each ball bearing for maintaining said ball bearings in said grooves, and means interposed between each of said last mentioned means for determining the separation of said arms.

10. An adjustable pad roller construction comprising a fixed shaft, a pair of arms adapted to move about said shaft, a shaft having a groove therein rotatably mounted in each of said arms, means intermediate said arms for predetermining their position with respect to one another, and means in said grooves and cooperating with said rotatable shafts and said last mentioned means for individually positioning said arms with respect to one another.

PAUL HAAS.