Dec. 24, 1940. J. M. GOLDBERG 2,225,987

SEPARABLE MOVING PICTURE FILM REEL

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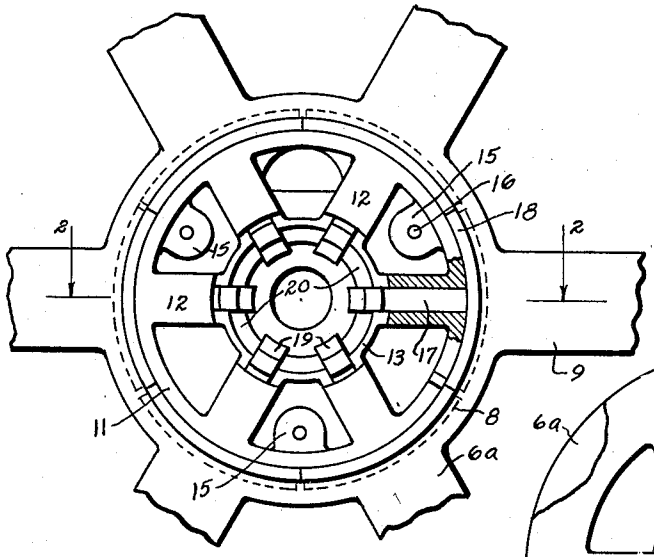


FIG. 1

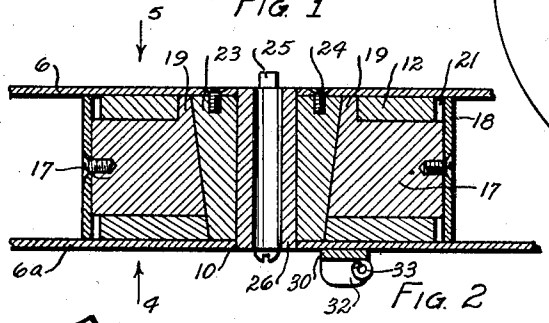


FIG. 2

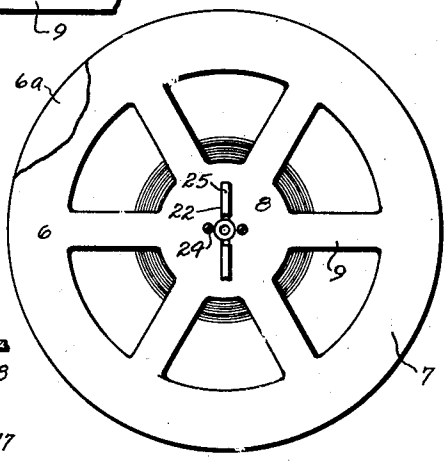


FIG. 5

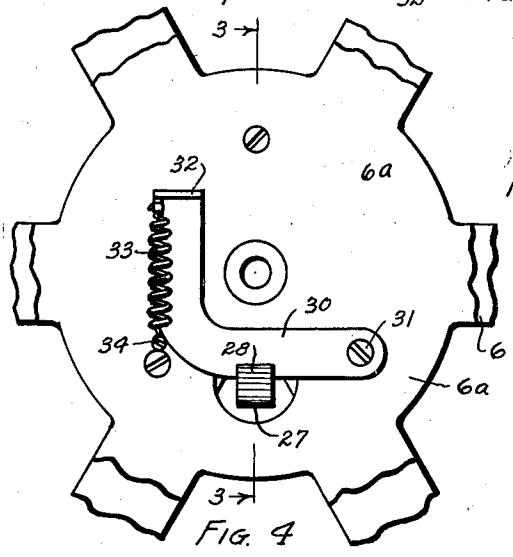


FIG. 4

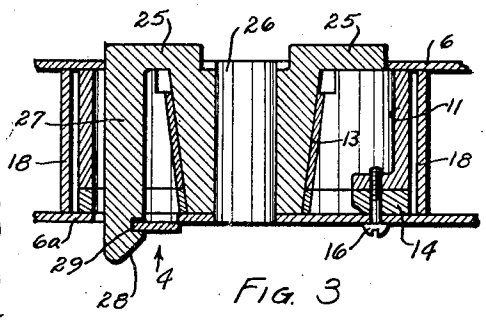


FIG. 3

Inventor:
Jacob M. Goldberg
By Martin E. Anderson
Attorney

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SEPARABLE MOVING PICTURE FILM REEL

Jacob M. Goldberg, Denver, Colo.

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2 Claims. (Cl. 242—72)

This invention relates to improvements in reels of the type employed in connection with moving picture films and has reference more particularly to a separable reel for use in winding junk film.

After moving picture films have been worn so as to become unsuitable for further use, or when there is no further demand for the picture, the films are first of all mutilated, after which they are subjected to a chemical process that removes the silver contained in the emulsion after which the Celluloid or film proper is destroyed in some suitable manner.

After a film has been selected for destruction, it is customary to rewind the same on a specially constructed reel from which it can be later removed, as by this method it becomes possible to retrieve the moving picture reel that is employed during the process of exhibition.

It is the object of this invention to produce a separable rewind reel for use with junk film which shall be so constructed that when the parts are in assembled position the reel will be rigid and true, so as to rotate without wobble and which can be separated for the purpose of removing the rewind film therefrom.

This improved reel, briefly described, comprises two circular side members of the same diameter, an annular hub secured to one side member and positioned centrally thereof, the annular hub being provided with a plurality of angularly spaced radial openings in which radially movable arms are positioned. Attached to or formed integral with the outer end of each arm is an arcuate segment of such length and such curvature that when it is in position with its under surface against the outer surface of the hub the segments will form a continuous circular surface. The inner ends of the arms project into the opening in the hub and taper inwardly towards the bottom of the opening. The other side member has attached to it a tubular hub portion whose outer surface is conical and which is of such size and so tapered that it will fit the correspondingly tapered opening in the hub and force the arms outwardly, thereby moving the arcuate segments outwardly so as to increase the circumference of the hub. Means is provided for latching the two parts in assembled position and for limiting relative rotation of the parts to a very few degrees.

Having thus briefly described the invention, the same will now be described in detail and for this purpose reference will be had to the accompany drawing in which the invention has been illustrated in its preferred form, and in which:

Figure 1 is a top plan view of the hub with one side of the reel removed, a portion of the hub being shown in section to better disclose the construction;

Figure 2 is a section taken on line 2—2, Figure 1 and shows the two sides of the reel in assembled position;

Figure 3 is a section taken on line 3—3, Figure 4 and shows the parts reversed so that the side that is at the top in Figure 4 is shown at the bottom in Figure 3;

Figure 4 is a top plan view of the central portion of the reel looking in the direction of arrows 4 in Figures 2 and 3; and

Figure 5 is a top plan view of the reel looking in the direction of arrow 5 in Figure 2 and shows the reel to a somewhat smaller scale.

The reel which forms the subject of this invention consists of two circular side members 6 and 6a which are substantially identical in shape and construction and each is formed with a circular rim 7 that is connected with a central portion 8 by means of spokes 9. The side 6a is provided with a central opening 10 and has attached to one side thereof an annular hub whose rim has been indicated by reference numeral 11 in Figure 1. Extending inwardly from the rim are wide spokes 12 whose inner ends are connected by means of a thin rim-like member 13. The space between the spokes and the rims form openings extending entirely through the hub. The hub is made in two parts, as shown in Figure 3, and the part designated by reference numeral 14 is a removable cover portion whose purpose will hereinafter appear. The rim 11 of the hub proper and also corresponding portions of the cover part 14 are provided with inwardly extending lugs 15 that are perforated for the reception of screws 16 that pass through the reel sides 6a and through the two portions of the hub and secure the several parts in assembled relation as shown in Figure 3.

Referring now more particularly to Figures 1 and 2, it will be seen that the spokes 12 are provided with radial openings through which arms 17 extend. The openings are rectangular in cross section and the arms 17 are of a corresponding shape and size and are longitudinally movable in the openings. Attached to the outer ends of arms 17 are arcuate segments 18 whose curvature on their inner surface is the same as that of the outer surface of the hub so that when the parts are in the position shown in Figure 1, the arcuate segments will rest snugly against the outer surface of the hub.

It will be seen from Figure 2 that the inner ends of arms 17 are provided with upwardly extending lugs 19 that limit their outward movement. The inner ends of arms 17 are inwardly flared when viewed as in Figure 2 and when in their outermost position form a continuous surface with the conical inner surface 20 of the hub. The distance from the inner surface of the segments 18 to the opposing surfaces of lugs 19 are slightly greater than the corresponding length of the spoke 12 so as to permit the parts to move radially a short distance as indicated by the space designated by reference numeral 21 in Figure 2. When the segments are in the position shown in Figure 1, the diameter of the hub or its circumference is a minimum, but by moving the arms 17 and their attached segments outwardly to the position shown in Figure 2, the diameter and the circumference is increased to a maximum.

The other side of the reel, which has been designated by reference numeral 6, is provided with a central elongated slot or opening 22 and has secured to its inner surface when viewed as in Figure 2, a tubular expander 23 whose outer surface is conical and whose taper is the same as that of the inclined surface 20 of the hub. The expander 23 is so proportioned that when it is in place as shown in Figure 2, it will entirely fill the conical opening in the hub and force the arms 17 outwardly so as to provide a maximum diameter of the hub. The expander 23 is held in place by means of screws 24 and it is also provided with diametrically positioned lugs 25 that extend through the opening 22 a short distance to the outside of the reel and these projections serve a two-fold purpose. In the first place they serve as a finger grip that enables the operator to conveniently rotate the side in assembling the reel and in taking it apart, and they also serve as means to resist torsional strains whereby the strain that would otherwise have to be resisted by screws 24 will be resisted by these lugs.

In the embodiment illustrated, the expander 23 is provided with an enlarged central opening through which a bushing 26 extends. This bushing is made of bronze or some material that is harder than the expander, especially if the latter is made from aluminum. But if the expander is made from hard metal, the bushing 26 is not necessary, as the entire expander element can then be made from the same material.

It is evident that some means must be provided for holding the two parts of the reel in assembled relation during use and for this purpose one of the lugs 25 is provided with a reentrant plug 27 as shown in Figure 3. This plug is somewhat longer than the distance through the reel and projects through an opening in side 6*a*. The plug 27 has an inclined surface 28, at its outer end, and is provided on its inner surface with a notch 29 that serves to receive a latching member 30 which is pivoted at 31.

Referring now to Figure 4 it will be seen that the latching member 30 is formed from a right-angled piece of metal, one end of which is provided with an opening for the reception of screws 31 and the other end of which is bent upwardly as indicated at 32 for the reception of a tension spring 33, whose other end is anchored to the reel at 34. The anchor screw 34 also serves as a stop which limits the downward movement of the latching member 30 to that shown in Figure 4. When the parts are in the position shown in Figures 3 and 4, the two sides of the reel are held in assembled relation and the reel can then be operated in the same manner as any ordinary moving picture film reel. The side 6*a* should preferably be on the outside of the rewinding machine so as to prevent an accidental engagement between the projecting parts and the frame of the machine. When the reel is to be taken apart, the latching member 30 is moved upwardly from the position shown in Figure 4 until it becomes disengaged from the notch 29, whereupon the reel can be readily separated. To facilitate the separation, the lug 27 is made somewhat narrower than the opening through which it passes so as to permit a slight amount of relative rotation between the parts and this serves to release any frictional engagement that tends to hold the parts in assembled relation.

We will now assume that a reel has been constructed in the manner shown and described and that it is to be used for the rewinding of a length of junk moving picture film. The assembled reel is put into position on the spindle of the rewinding machine, the spindle passing through the opening in bushing 26. When the hub is expanded, the ends of the segments 18 will be separated from each other to a slight extent as they will then be in the position indicated by dotted lines in Figure 1. The end of the film is inserted into one of the openings between the segments 18 and the reel turned once or twice around, so as to fasten the film, after which the motor is started whereupon the rewinding operation commences and continues until the film is completely rewound. After the film has been rewound onto this reel, it is surrounded by a paper band in the usual manner so as to prevent unwinding, after which the reel is laid on a flat surface and the latching member 30 moved to unlatching position, whereupon the parts can be readily separated. One side of the film is now completely exposed and after the expander 23 has been removed, the arms 17, with their segments 18, are free to move inwardly. The inward movement of the parts reduces the diameter and the circumference of the hub thereby loosening the film which can now be easily removed from the reel. The roll of film, which is now without any reel or supporting means, can either be stored in this condition, or can be transported to the place where the silver is chemically removed therefrom. After the emulsion with its silver content has been removed, the remaining portion of the film is destroyed in the usual manner.

In the drawing and in this description, a specific embodiment of the expanding hub has been illustrated and described, but it is evident that other means than these shown can be substituted and similar results obtained. For example, instead of using a conical expander, some other means, as for instance, a helically threaded connection can be employed between the removable side and the arms 17. The construction shown and described, however, is believed to be preferable on account of its great simplicity and the ease with which it can be manufactured and operated.

From the above description it will be apparent that the reel herein described and illustrated on the drawing is of simple substantial construction and is exceedingly well adapted for the purpose for which it is intended. The expansible hub is of a strong and substantial construction and the parts are so designed that they will re-

sist any ordinary strains to which they are subjected during operation. If one of the segments 18 should be bent or damaged, a new segment can readily be applied and therefore the injury of one part will not necessitate the replacement of the whole reel.

If a side is bent so as to make it useless, it can be replaced at a comparatively small cost, thereby obviating the necessity of buying an entirely new reel.

Having described the invention what is claimed as new is:

1. A separable reel for the winding of junk moving picture films and the like, comprising, in combination, a circular reel side having a central opening, an annular hub attached thereto in concentric relation therewith, the hub having a plurality of angularly spaced radial openings, arms slidably mounted in the openings, each arm having an arcuate segment secured to its outer end, the arms extending into the central opening in the hub when the segments engage the outer surface of the hub, a tubular conical expander for insertion into the hub for engaging the ends of the arms and moving them outwardly, a second side member, and means for securing the last named side member to the hub assembly comprising cooperating latch elements carried by the two sides for releasably holding them in assembled position, one of the latching elements being movably attached to one of the sides, the other latching element comprising a projection carried by the tubular conical expander and extending through an eccentrically positioned opening provided for its reception in the side to which the first mentioned latching element is movably attached.

2. A separable reel comprising, in combination, a reel side having a tubular hub attached thereto, a second reel side having a tubular conical expander member attached thereto and projecting from one side thereof for insertion into the tubular hub, the first mentioned side having an eccentric opening, the tubular conical expander having a projection positioned to extend through the opening, said projection having a notch, a latching element movably attached to the side having the eccentric opening, and resilient means for urging the movable latching element into engagement with the notch in the projection whereby the two sides of the reel become latched in operative position.

JACOB M. GOLDBERG.