L. A. WILSON.

ENDLESS FILM REEL.

APPLICATION FILED SEPT. 25, 1919.

1,382,040. Patented June 21, 1921.

Fig. 1.

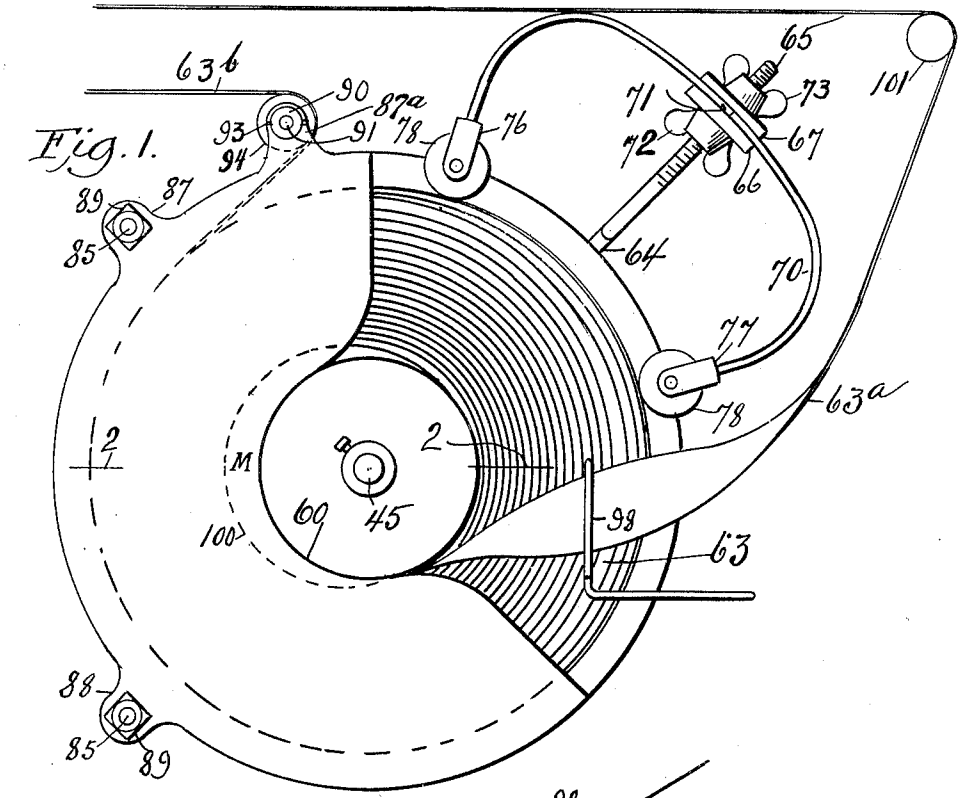
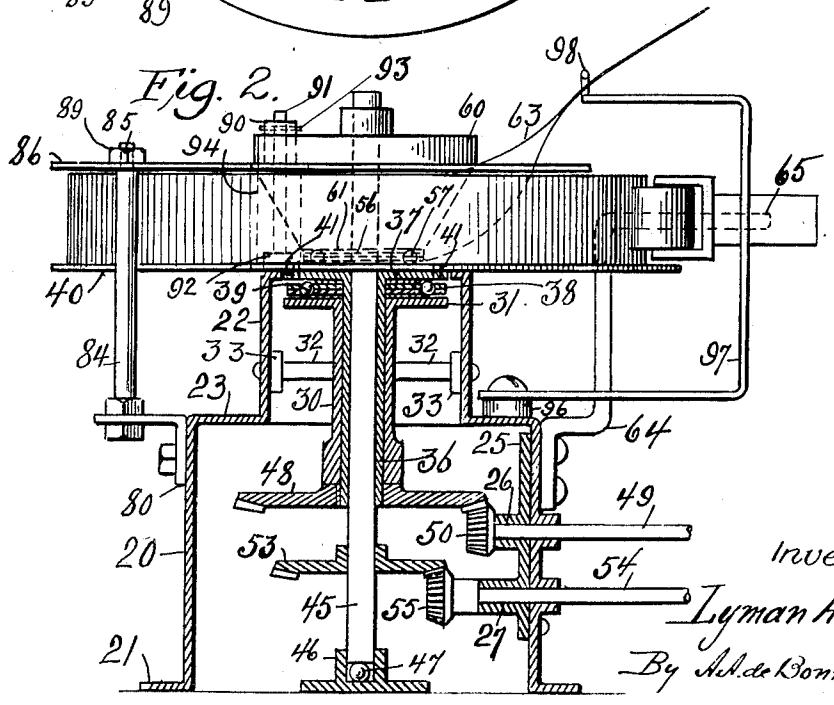


Fig. 2.



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ENDLESS-FILM REEL.

1,382,040. Specification of Letters Patent. Patented June 21, 1921.

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To all whom it may concern:

Be it known that I, LYMAN A. WILSON, citizen of the United States, and resident of the borough of Manhattan, city of New New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Endless-Film Reels, of which the following is a specification.

This invention relates to an endless film reel, and is characterized by means with which a spirally wound endless film can be unwound at its core in amounts equal to that simultaneously wound up on the outside thereof.

The invention consists essentially of a rotating turntable to support a spirally wound endless film and a rotating guide cone to guide the discharge of the film from its core. Means are provided to rotate the guide cone at a greater speed than the turntable, thereby compensating the difference of diameters of the film at its outside and at its core to equalize the amounts of discharge and intake of the film.

In the accompanying drawings Figure 1 shows a top plan view of a reel with its endless film exemplifying the invention; Fig. 2 shows an elevation and partial section of Fig. 1 on the line 2, 2.

A hollow base housing is shown with the lower portion 20 having the foot 21 and the upper contracted head portion 22.

A step 23 is formed between said portions. A bracket 25 with the journal bearings 26 and 27 is fastened to the lower portion 20. A stationary guide sleeve 30 with the upper flange 31 is coaxially located in the head portion 22 and has formed therewith the arms 32 having the feet 33. The latter are secured to the inner face of the wall of the said head portion 22.

A second guide sleeve 36 with the flange 37 is coaxially located within the guide sleeve 30. A ball bearing cage 38 with the ball bearings 39 encircles the sleeve 36 and said ball bearings bear upon the flange 31. The flange 37 bears upon the ball bearings 39. A turntable 40 bears upon the flange 37 and is secured thereto by means of pins or rivets 41. A vertical cone driving shaft 45 is guided in the sleeve 36 and its lower end is supported in a foot bracket 46. A ball 47 in the bracket 46 supports the lower end of the shaft 45. A bevel gear 48 is fastened to the lower end of the sleeve 36. A driving shaft 49 is supported in the journal bearing 26 of the bracket 25. A bevel pinion 50 is fastened to the shaft 49 and meshes with the bevel wheel 48. A bevel wheel 53 is fastened to the shaft 45 and is smaller in diameter than the bevel gear 48. A second driving shaft 54 is journaled in the journal bearing 27 and has fastened thereto the bevel pinion 55 that meshes with the bevel gear 53. A ball bearing cage 56 with the ball bearings 57 encircles the shaft 45. The ball bearings 57 bear upon the turntable 40. A guide cone 60 having the lower face 61 is fastened to the shaft 45 and its lower face bears upon the roller bearings 57.

An endless film 63 of a motion picture machine (not shown) or the like, is placed upon the turntable 40 and encircles the guide cone 60.

A bracket 64 with the threaded upper end 65 is secured to the lower portion 20 of the base housing. A pair of clamping plates 66, 67 are adjustably supported upon the end 65. A spring 70 having an opening 71 is supported upon the end 65 and the plates 66 and 67 bear against the opposite faces of the spring 70. A pair of thumb nuts 72, 73 bear against the clamping plates 66 and 67 and maintain the spring 70 in operative position. A pair of journal brackets 76, 77 are secured to the ends of the spring 70. A tension guide roller 78 is journaled in each of the brackets 76 and 77 and bear against the outer face of the endless film 63 to maintain the later in proper position upon the turntable 40.

A pair of brackets like 80 are secured to the lower portion 20 and each supports a post 84. Each post 84 is shouldered at its upper end for the threaded portion 85.

A stationary film guide cover plate 86 partially covers the film 63 and has formed therewith the lugs 87, 87ª and 88. The plate is supported upon the shoulders of the posts 84. Nuts 89 in threaded engagement with the threaded portions 85 secure the cover plate 86 in place.

With the lug 87ª there is formed a sleeve 90. A spindle 91 with the head 92 at its lower end is fastened in the sleeve 90 by means of the pin 93. A guide roller 94 is journaled on the spindle 91,

A lug 96 extends up from the step 23, and has secured thereto the film guide rod 97. A U shaped film guide loop 98 is formed at the upper end of the rod 97. The plane of the film guide loop 98 is at right angles to the plane of the turntable 40. The core of the endless film 63 is located around the guide cone 60 and the said film is unwound at its core 100, during the operation of the reel. The outgoing portion 63^a of the film passes through the guide loop 98, then leads over a guide roller 101. From the latter the portion 63^a leads to a picture machine, or other apparatus in which it is to be used. The returning portion 63^b of the film 63 passes over the roller 94 and then winds around the periphery of the roll of the film 63.

To operate the device, the driving shafts 49 and 54 are turned at the same speed by means not shown. They in turn through the bevel pinion 50, bevel gear 48 and bevel pinion 55 and bevel gear 53, respectively turn the sleeve 36 and the shaft 45. The bevel gear 53 being smaller than the bevel gear 48, the shaft 45 is turned with a greater speed than the sleeve 36. Consequently, the guide cone 60 rotates with a greater speed than the turntable 40.

By this means the outer portion of the film 63 which has a larger diameter than windings of the film at its core travels more slowly than the windings at the core 100. Thereby the tension of the film 63 at its outer and inner windings is equalized, and the film is evenly wound and unwound during its operations.

By means of the threaded end 65 of the rod 64, the spring 70 can be adjusted to different positions on said rod, and thereby the pressure of the guide rollers 78 on the outside winding of the film 63 can be adjusted.

The pressure of the guide rollers 78 on the outside winding of the film 63 maintains the said film in eccentric relation to the guide cone 60, with a crescent shaped clearance space M between the core of the film and the said guide cone. The inclination of the wall of the guide cone and the clearance space M enables the film to make a turn or twist of 90 degrees in the body thereof, to be enabled to rise to a higher level as it is unwound at its core. The film then easily passes through the U-shaped guide loop 98. To direct the film to a higher level in the same plane in which it is positioned at its core, would permit it to be easily broken.

Having described my invention what I desire to secure by Letters Patent and claim is:—

1. In an endless film reel the combination of a rotary turntable for supporting and winding up an endless film and a rotating guide cone to unwind the film at its core, the said cone rotating at a greater speed than said turntable to compensate for the difference of diameters of said film at its core and at its outer windings.

2. In an endless film reel the combination of a rotating turntable for supporting and winding up an endless film, a rotating guide cone at the core of the film to unwind the film, the said cone rotating at a greater rate of speed than the turntable and a stationary film guide loop to guide the film as it unwinds at its core.

3. In an endless film reel the combination of a rotating turntable for supporting and winding up an endless film, a rotating guide cone coaxial with the turntable at the core of the film, the cone rotating at a greater rate of speed than the turntable, a stationary film guide loop to guide the film as it unwinds at its core and a guide roller bearing against the outer face of the outer winding of the film.

4. In an endless film reel the combination of a turntable, a guide sleeve supporting and secured to the turntable, a rotating shaft coaxial with said guide sleeve, a guide cone secured to the shaft, a ball bearing cage encircling said shaft, ball bearings in the cage rolling on the upper face of the turntable, the lower face of the guide cone supported on the ball bearings, means to rotate the guide sleeve and thereby the turntable and means to rotate the shaft and thereby the guide cone at a greater rate of speed than the turntable.

5. In an endless film reel the combination of a turntable, a guide sleeve supporting and fastened to the turntable, a flange at the upper end of the guide sleeve, a stationary guide sleeve encircling the first guide sleeve and having a flange at its upper end, ball bearings between said flanges, a shaft within said first guide sleeve, a guide cone fastened to the upper end of the shaft, ball bearings between the lower face of the guide cone and the upper face of the turntable, means to turn the guide sleeve that carries the turntable and means to rotate the shaft at a greater rate of speed than the turntable.

6. In an endless film reel the combination of a base housing with a lower portion and an upper portion, a shaft in the longitudinal axial center of the housing, a guide cone fastened to the upper end of the shaft, a stationary guide sleeve with a flange at its upper end in the housing, a rotating guide sleeve having a flange at its upper end between the shaft and stationary sleeve, ball bearings between the two flanges, a gear fastened to the shaft, a gear fastened to the rotating guide sleeve, a gear meshing with the gear on the shaft, a gear meshing with the gear on the rotating guide sleeve, the gears rotating the shaft at a greater rate of speed than the guide sleeve, a stationary film

guide cover plate over the turntable to guide a film thereon, a stationary film guide loop over the film and tension guide rollers to bear against the outer face of the outer winding of the film.

7. In an endless film reel the combination of a base housing with a lower portion and an upper portion, a shaft extending into the housing in the axial center thereof, a guide cone fastened to the upper end of the shaft, a stationary guide sleeve with a flange at its upper end secured in the upper portion of the housing, a rotative guide sleeve having a flange at its upper end between the shaft and stationary sleeve, ball bearings between the two flanges, a turntable carried on and fastened to the flange of the rotative sleeve, ball bearings between the turntable and the lower face of the guide cone, a stationary film guide cover over the turntable to guide a film thereon, a pair of tension rollers located to bear on the outside winding of the film, a stationary film guide loop for the film, a gear fastened to the shaft, a larger gear fastened to the rotative guide sleeve and means to rotate both gears, the smaller gear rotating at a greater rate of speed than the larger.

8. In an endless film reel the combination of a turntable for an endless film, a guide cone at the core of the film coaxial with the turntable, means to rotate the turntable, means to turn the guide cone, the said film spirally wound around the guide cone on the turntable during the rotation of the reel, means to maintain a clearance space on one side between the guide cone and the core of the film, a guide loop adjacent to the guide cone for said film as it unwinds at its core, the guide loop having a pair of arms parallel to the turntable to guide the film to make a turn or twist of 90 degrees as it unwinds at its core.

9. In an endless film reel the combination of a turntable for an endless film, a guide cone at the core of the film coaxial with the turntable, means to rotate the turntable, means to turn the guide cone, the said film spirally wound around the guide cone on the turntable during the operation of the reel, the said film unwound at its core, flexible means bearing against the outer windings of the film producing on the opposite side a crescent shaped clearance space between the core of the film and the guide cone and a guide loop adjacent to the guide cone for said film, the guide loop parallel to the turntable to guide the film to make a turn or twist of 90 degrees as it leaves its core.

Signed at New York city, in the county of New York and State of New York, this eighth day of September, A. D. 1919.

LYMAN A. WILSON.