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E. GIOVANNONI ET AL

1,492,291

WINDER

Filed Oct. 29, 1921

Fig. 1,

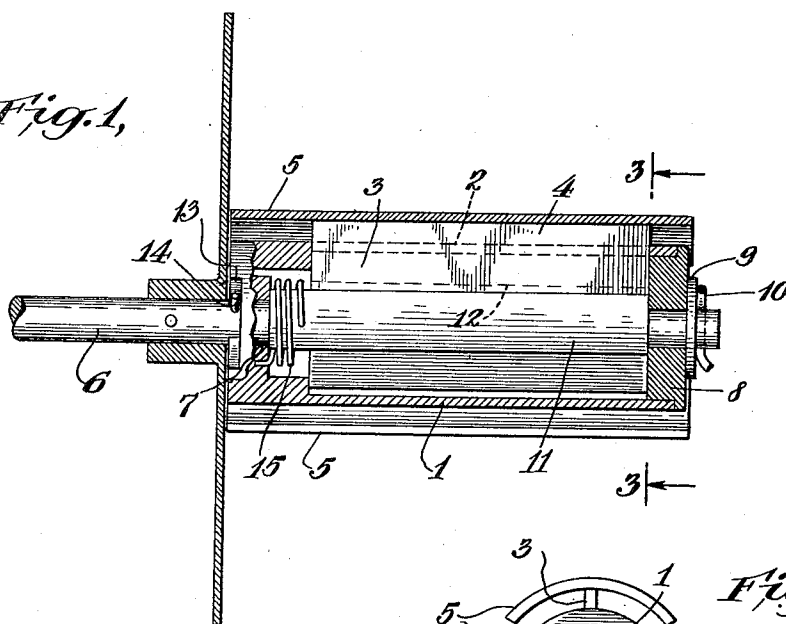


Fig. 2,

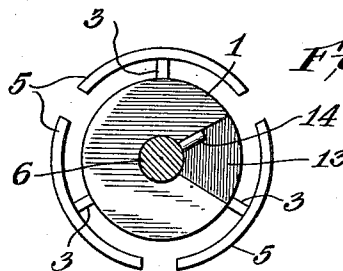


Fig. 3,

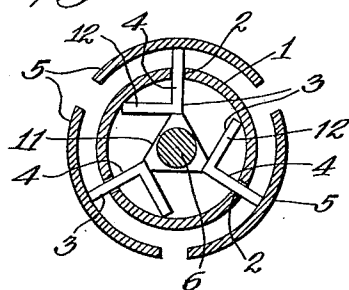
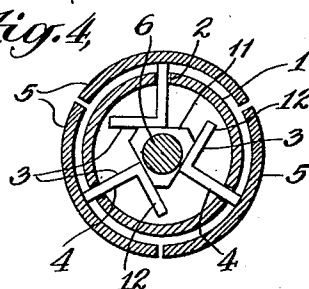


Fig. 4,



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UNITED STATES PATENT OFFICE.

EGISTO GIOVANNONI, OF EDGEWATER, AND HARRY JONES, OF WEST FORT LEE,
NEW JERSEY.

WINDER.

Application filed October 29, 1921. Serial No. 511,485.

To all whom it may concern:

Be it known that we, EGISTO GIOVANNONI and HARRY JONES, citizens of the United States, and residents of Edgewater, in the county of Bergen and State of New Jersey, and West Fort Lee, in the county of Bergen and State of New Jersey, respectively, have made certain new and useful Improvements in Winders, of which the following is a specification.

Our invention relates to an improvement in collapsible winding devices particularly adapted for use in winding films, paper, cloth and the like.

An object of our invention is to simplify the manufacture and assembly of winding devices of this character and also to improve the operation thereof. To this end, therefore, we have provided a winder which consists of only a comparatively few parts all of which are easy to manufacture and assemble, the device being so constructed as to normally maintain itself in expanded position and to hold itself locked in such position.

The winder is collapsed by merely reversing the direction of rotation thereof which makes the removal of a roll of material such as films, paper, cloth and the like from the device a simple matter.

In order that our invention may be fully understood and its advantages appreciated we might mention that in the manufacture of moving picture films for example it is common practice to wind the films upon a cylindrical member of some sort which is provided with a disk for guiding the films upon the winder and for forcing the roll or coil of films therefrom after the winding operation has been completed. This type of winder is sometimes collapsible and after the film has been wound thereon is collapsed. The winder has to be expanded manually before beginning each winding operation as distinguished from an automatic expansion of the winder and it frequently happens that an operator neglects to perform this operation with the result that the new roll may be completed before the fact that the winder is collapsed is noticed which, of course, necessitates unwinding the roll of films and rewinding the same to the proper size. This involves unnecessary delay and expense. Of course when a non-collapsible winder is employed it is very difficult to re-

move the roll of films therefrom at all and it is sometimes necessary to rewind the entire roll.

Our winder, as above noted, is not only a collapsible winder but it maintains itself in expanded position so that the film or other material employed therewith is necessarily rolled to the desired dimension. The winder being collapsible, there is no danger of placing too much tension on the film in winding so far as removal of the film is concerned because to remove the film it is merely necessary to reverse the winder.

Another important feature of our improved device is that the parts are held in expanded position automatically,—that is to say locked in expanded position, eliminating danger of collapsing of the winder during the winding operation. In order to unlock and collapse the winder it is merely necessary to reverse the direction of rotation thereof.

It will be understood of course that the winder being automatically expanded, as soon as the roll of material is removed therefrom the parts will at once move to expanded position where they are locked.

Briefly, our invention comprises a slotted cylindrical member, the slots of which receive a series of radially movable arms or expanding members. These arms are attached permanently to a series of segmental members constituting the outer or winding surface of the winder. The arms are actuated automatically to expanded position by means of a cam extending through the slotted cylindrical member referred to, the slots in this cylindrical member functioning as guides for the radially movable arms while the interior of the cylindrical member is engaged by a portion of the said arms so as to impart rigidity to the winder when the parts are in expanded position.

In the accompanying drawings we have illustrated an embodiment of our invention,—

Fig. 1 being a sectional elevational view thereof;

Fig. 2 an end elevation of Fig. 1, looking from left to right;

Fig. 3 a section on the line 3—3 of Fig. 1; and

Fig. 4 a view similar to Fig. 3, with the parts in collapsed position.

Referring now to the drawings in de-

tail,—it will be seen that our device comprises a slotted cylindrical shell designated 1, this shell being provided with longitudinally extending slots 2 for the reception of a plurality of radially movable arms 3. These arms as will be seen from Figs. 1 and 3 are substantially L-shaped in cross-section and extend practically from end to end of the cylindrical shell 1, with the side 4 of each arm projecting outwardly through the slots 2. Secured to the side 4 of each arm is a segmental member 5, these members together constituting the winding surface of the device. The members 5 are secured to the arms 3 in any suitable manner as by riveting for example, it being understood that the arms and the segmental members are rigid with each other. A drive shaft 6 passes through the center of the shell 1 and has a bearing in one end thereof as indicated at 7. The opposite end of the shell 1 is provided with a plug 8 closely fitting the end of the shell, this plug constituting a bearing for the other end of the drive shaft 6, the plug being held in place on the shaft and against the end of the shell by means of a washer 9 and pin 10. The drive shaft 6 has formed on it or rigidly secured thereto a cam 11. This cam as will be seen from Fig. 3 is substantially triangular in cross-section and when in place is in constant engagement with the sides or bottom 12 of the radially movable arms 3. The left-hand end of the shell 1 as viewed in Fig. 1 is provided with a depression or cut-out 13 the walls or sides of which depression cooperate with the stop pin 14 carried by the shaft 6.

It will be seen, therefore, that rotation of the shaft 6 relatively to the shell 1 is limited by the cut-out or depression 13 and the pin 14, the purpose of which will be pointed out hereinafter.

Surrounding the shaft 6, adjacent the left-hand end of the shell 1 is a coil spring 15, this spring having one end secured to the shaft and its other end secured to the shell 1.

The action of our improved winder is as follows:

When the winder is idle the action of the spring 15 will cause the shaft 6 and hence the cam 11 and the shell 1, together with the parts carried thereby to move relatively to each other until the cam has moved from the position shown in Fig. 4 for example to the position shown in Fig. 3. This relative movement between the several parts of the winder carries the arms 3 outwardly or radially with respect to the winder imparting a radial movement to the segmental members 5 so that when the parts have reached the position shown in Fig. 3 the winder is in full expanded condition. This is the position of the parts at all times ex-

cept when removing the film or other material being wound.

It will be seen that with the parts in this position further movement of the cam is prevented by the stop pin 14 and collapsing of the winder is prevented by the cam 11, being in dead center the inward thrust of the arms 3 being across the apices of the triangular cam 11 and through the center of the drive shaft 6. At this time also the portions 12 of each arm are in contact with the inner surface of the shell 1 which will impart rigidity to the winder as a whole.

The parts are actuated to this position by the action of the spring 15 as already noted and in order that the winder may be collapsed it is merely necessary to rotate the winder against the action of the spring 15 to carry the cam from beneath the arms 3 and permit the parts to fall to the position shown in Fig. 4. As soon as the winder has been released however, the parts will again return to expanded position.

If desired a disk 16 may be secured to the drive shaft 6, this disk being considerably larger in diameter than the winder when the winder is expanded so that the disk may serve as a guide for guiding films or other material upon the winder.

Now it will be apparent from the foregoing that our improved winder is normally or initially automatically maintained in full expanded condition so that all danger of the winding of a film or other material upon the winder when the same is collapsed is eliminated.

It will be seen also that by employing our improved type of radially movable arm ample guiding surface is provided to insure proper operation of the segmental members 5 and to maintain them in proper relation with respect to each other.

It will be seen also that by providing the triangular shaped cam 11 it is a simple matter to lock the segmental members 5 in expanded position, this cam affording a supporting surface for the arms 3 also when the winder is collapsed. Likewise it will be apparent that by permitting the arms 3 to engage or contact with the inner surface of the cylindrical member 1 when the parts are in expanded position the rigidity of the winder as a whole is enhanced.

What is claimed as new is:

1. An expansible and collapsible winder upon which material is adapted to be directly wound while the winder is expanded, in combination with means for holding the winder in expanded position during the winding operation, and means to expand the winder upon the collapse of the same and as the wound material is removed therefrom.

2. An expansible winder upon which material is directly wound comprising a plu-

ality of segments, a radially movable arm attached to each segment and a cam for actuating said arms, and a spring for actuating said cam to move the arms and segments to expanded position after removal of the wound material from the winder and to maintain the winder in expanded position during the winding operation.

3. An expansible winder comprising a plurality of segments, radially movable arms operatively connected to said segments, a cam substantially triangular in cross-section and a spring for causing said cam to function upon the removal of wound material from said winder for actuating said arms into position to expand the winder.

4. An expansible winder comprising a plurality of segments, radially movable arms carried by said segments, a cam substantially triangular in cross-section for actuating said arms and a spring for actuating said cam into position to cause the winder to be expanded.

5. An expansible winder comprising a shell provided with longitudinal slots, arms received by said slots, segments carried by said arms, a shaft, a cam carried by said shaft within said shell and in constant engagement with said arms to cause the arms

to be moved radially and the winder to be expanded, and a stop on said shaft for preventing movement of said cam past dead center position.

6. An expansible winder comprising a cylindrical member provided with longitudinal slots, radially movable arms extending through the said slots, segments secured to said arms, a drive shaft for the winder extending through said cylindrical member, a cam carried by said shaft and engaging said arms for actuating the arms into engagement with the inner face of said cylindrical member and the segments to expanded position and a stop on said shaft for preventing movement of said cam past dead center.

7. An expansible winder comprising a slotted cylindrical member, radially movable arms extending through the walls in said member, and carrying at their outer ends segments, a cam within said slotted member in constant engagement with said arms and a spring for rotating said cam to actuate said arms radially to carry the said segments to expanded position.

This specification signed this 21st day of October, 1921.

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