

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) REEL FOR A WEB OF FLEXIBLE MATERIAL

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America, of 343 State Street, Rochester, New York 14650, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a reel for a web of flexible material such as motion picture film.

In accordance with the present invention there is provided a reel for a web of flexible material comprising a spindle-engaging core on which the reel may be mounted for rotation about its axis, and an annulus coaxially supported by the core and on which the web may be wound, the annulus having a slot which extends parallel to the reel axis and into which the leading end of the web may be inserted to extend between spaced first and second walls which depend inwardly from the annulus towards the core at respective sides of the slot, the first and second walls together defining a socket which extends parallel to the reel axis and is open at one end for the longitudinal insertion therein of a complementary elongated web retaining member, in combination with such a web retaining member, the web retaining member being removable longitudinally from the socket to permit the leading end of the web to be inserted through the slot and socket and being adapted, when then inserted in the socket, to engage and deform the leading end in the socket and frictionally to retain this leading end therein.

In the accompanying drawings:—
Fig. 1 is a perspective view of a reel having a web or film retaining means in accordance with the present invention;

Fig. 2 is a fragmentary front elevation of the reel structure shown in Fig. 1 with
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the retaining pin in its storage position;

Fig. 3A is a perspective view to an enlarged scale, of the retaining pin shown in Fig. 1;

Figs. 3B and 3C are perspective views to an enlarged scale illustrating different embodiments of the retaining pin;

Fig. 4 is a perspective view of the reel with a portion broken away, to illustrate the manner in which the film retaining means is used;

Fig. 5 is a perspective view of the reel in a cartridge;

Fig. 6 is a fragmentary sectional view of the parts shown in Fig. 5; and

Fig. 7 is a cross section to an enlarged scale, of the retaining pin and retaining sleeve shown in Fig. 4 illustrating the manner in which a film is retained thereby.

Referring to the drawing, there is shown a film supply reel 10 adapted to be contained within a cartridge 32. The supply reel 10 comprises a generally hollow hub 11 having an outer surface 12 on which film is wound and having an inner surface 13. A plurality of arms 14 extend radially inwardly from the inner surface 13 to a core portion 15 having a suitable central opening adapted to receive a spindle (not shown). A pair of spaced side flanges 16 and 17 extend radially outwardly from the ends of the hub 11 to guide successive convolutions of film onto the hub. Side flange 16 is provided with a break 18 therein in alignment with a film threading slot 19 in the hub 11 such that the end portion of a film or web can be threaded into the slot 19.

The reel structure may comprise an integrally moulded part of plastics material. Since the particular reel configuration thus far described and the method of moulding the same are well known in the art, further description is deemed unnecessary.

In the disclosed embodiment, a socket, which takes the form of a sleeve 20 having

an axial slot 21, is attached to the reel 10 such as by integrally moulding the sleeve with the reel hub on its inner surface 13. The retaining sleeve 20 is located on the inner surface 13 such that the two semi-circular halves of sleeve 20, separated by slot 21, are circumferentially aligned on opposite sides of film threading slot 19.

Circumferentially spaced from retaining sleeve 20, but also on inner surface 13 of cores 11, is a storage socket or sleeve 22, the purpose of which will become more apparent hereinafter.

Referring to Fig. 3A of the drawing there is shown one embodiment of a retaining pin, identified by the reference numeral 23, which is adapted to be slidably received by sleeve 20 and to co-operate therewith to secure the end of a film to the hub 11. More specifically, the pin 23 comprises an elongated rigid body portion 24 having a tapered end and a head portion 25. Head portion 25 may simply comprise an enlarged extension of body portion 24 or may comprise a separate part attached thereto. The body portion of pin 23 has a diameter generally complementary to that of the sleeve 22 to be frictionally retained therein during storage.

In operation, the end of a film is inserted into film threading slot 19 and between the semi-circular halves of retaining sleeve 20 as shown in Fig. 4. Elongated body portion 24 of pin 23 is then inserted into retaining sleeve 20 so that the film is resiliently deformed and frictionally held between the pin and the wall of one semi-circular half of sleeve 20 thereby securing the film to the reel as shown in Fig. 7. If, for example, the pin body portion 24 has a diameter of .110 inches, the inner diameter of the sleeve is .125 inches and the width of the slot is .020 inches, the retaining means will adequately retain a film having a thickness of .005 inches without permanently deforming or bending the film. When the retaining pin is not in use, as when the reel is used with a projector without automatic rewind, the pin 23 may be stored in socket 22 to prevent loss of the pin.

Referring more particularly to Figs. 5 and 6, the cartridge 32 comprises a two-part casing adapted to contain the reel 10 and generally defining side walls 26 and 27 having central openings 28 and 29, respectively, through which the spindle (not shown) of a projector may extend. The cartridge 32 may be provided with indexing surfaces whereby the cartridge can only be mounted on a projector in a predetermined position of orientation. The opening 28 of side wall 26 has a larger diameter than the opening 29 in side walls 27. In addition, opening 28 has a radius which exceeds the distance between the rotational axis of reel 10 and the outermost edge of head

portion 25 of retaining pin 23, such that pin 23 will freely orbit within opening 28 when reel 10 is rotated by the projector spindle in cartridge 32. Opening 29, on the other hand, has a smaller radius than the distance between the reel axis and the outermost edge of head portion 25. Thus, interference will result between head 25 of pin 23 and the cartridge surfaces if it is attempted to position the reel in the cartridge when the reel is improperly oriented relative to the cartridge.

Referring to Fig. 3B of the drawing, another embodiment of the retaining pin, identified by the reference numeral 23b, comprises a pin body portion 31 having a head portion 32 in the form of a washer-shaped disk which serves as a cover for the annular space between the reel hub and core. The diameter of disk 32 will freely rotate within opening 28 if the reel 10 is properly orientated in cartridge 32. If the reel 10 is not properly orientated, interference will occur between the disk 32 and the smaller diameter opening 29 to prevent complete insertion of the reel 10 in the cartridge.

The washer 32 may be provided with suitable abutments or dimples 33 which are spaced and positioned to fit between two of the arms 14 in engagement therewith to provide an alignment means which facilitates positioning of the washer 32 concentrically with hub 11.

Still another embodiment of the retaining pin is depicted in Fig. 3C. This embodiment, identified by the reference numeral 23c, comprises a pin body portion 34 having a head portion 35 comprising an arcuate segment of a washer similar to that depicted in Fig. 3B. The washer segment 35 has a radius also related to the radii of openings 28 and 29 such that interference will result if the reel 10 is improperly orientated in the cartridge 32. Spaced dimples 36 may also be provided to position the washer segment 35 concentrically with the reel hub. The Fig. 3C embodiment thus functions similarly to the Fig. 3B embodiment.

WHAT WE CLAIM IS:—

1. A reel for a web of flexible material comprising a spindle-engaging core on which the reel may be mounted for rotation about its axis, and an annulus coaxially supported by the core and on which the web may be wound, the annulus having a slot which extends parallel to the reel axis and into which the leading end of the web may be inserted to extend between spaced first and second walls which depend inwardly from the annulus towards the core at respective sides of the slot, the first and second walls together defining a socket which extends parallel to the reel axis and is open at one end for the longitudinal insertion therein of

an axial slot 21, is attached to the reel 10 such as by integrally moulding the sleeve with the reel hub on its inner surface 13. The retaining sleeve 20 is located on the inner surface 13 such that the two semi-circular halves of sleeve 20, separated by slot 21, are circumferentially aligned on opposite sides of film threading slot 19.

Circumferentially spaced from retaining sleeve 20, but also on inner surface 13 of cores 11, is a storage socket or sleeve 22, the purpose of which will become more apparent hereinafter.

Referring to Fig. 3A of the drawing there is shown one embodiment of a retaining pin, identified by the reference numeral 23, which is adapted to be slidably received by sleeve 20 and to co-operate therewith to secure the end of a film to the hub 11. More specifically, the pin 23 comprises an elongated rigid body portion 24 having a tapered end and a head portion 25. Head portion 25 may simply comprise an enlarged extension of body portion 24 or may comprise a separate part attached thereto. The body portion of pin 23 has a diameter generally complementary to that of the sleeve 22 to be frictionally retained therein during storage.

In operation, the end of a film is inserted into film threading slot 19 and between the semi-circular halves of retaining sleeve 20 as shown in Fig. 4. Elongated body portion 24 of pin 23 is then inserted into retaining sleeve 20 so that the film is resiliently deformed and frictionally held between the pin and the wall of one semi-circular half of sleeve 20 thereby securing the film to the reel as shown in Fig. 7. If, for example, the pin body portion 24 has a diameter of .110 inches, the inner diameter of the sleeve is .125 inches and the width of the slot is .020 inches, the retaining means will adequately retain a film having a thickness of .005 inches without permanently deforming or bending the film. When the retaining pin is not in use, as when the reel is used with a projector without automatic rewind, the pin 23 may be stored in socket 22 to prevent loss of the pin.

Referring more particularly to Figs. 5 and 6, the cartridge 32 comprises a two-part casing adapted to contain the reel 10 and generally defining side walls 26 and 27 having central openings 28 and 29, respectively, through which the spindle (not shown) of a projector may extend. The cartridge 32 may be provided with indexing surfaces whereby the cartridge can only be mounted on a projector in a predetermined position of orientation. The opening 28 of side wall 26 has a larger diameter than the opening 29 in side walls 27. In addition, opening 28 has a radius which exceeds the distance between the rotational axis of reel 10 and the outermost edge of head

portion 25 of retaining pin 23, such that pin 23 will freely orbit within opening 28 when reel 10 is rotated by the projector spindle in cartridge 32. Opening 29, on the other hand, has a smaller radius than the distance between the reel axis and the outermost edge of head portion 25. Thus, interference will result between head 25 of pin 23 and the cartridge surfaces if it is attempted to position the reel in the cartridge when the reel is improperly oriented relative to the cartridge.

Referring to Fig. 3B of the drawing, another embodiment of the retaining pin, identified by the reference numeral 23b, comprises a pin body portion 31 having a head portion 32 in the form of a washer-shaped disk which serves as a cover for the annular space between the reel hub and core. The diameter of disk 32 will freely rotate within opening 28 if the reel 10 is properly orientated in cartridge 32. If the reel 10 is not properly orientated, interference will occur between the disk 32 and the smaller diameter opening 29 to prevent complete insertion of the reel 10 in the cartridge.

The washer 32 may be provided with suitable abutments or dimples 33 which are spaced and positioned to fit between two of the arms 14 in engagement therewith to provide an alignment means which facilitates positioning of the washer 32 concentrically with hub 11.

Still another embodiment of the retaining pin is depicted in Fig. 3C. This embodiment, identified by the reference numeral 23c, comprises a pin body portion 34 having a head portion 35 comprising an arcuate segment of a washer similar to that depicted in Fig. 3B. The washer segment 35 has a radius also related to the radii of openings 28 and 29 such that interference will result if the reel 10 is improperly orientated in the cartridge 32. Spaced dimples 36 may also be provided to position the washer segment 35 concentrically with the reel hub. The Fig. 3C embodiment thus functions similarly to the Fig. 3B embodiment.

WHAT WE CLAIM IS:—

1. A reel for a web of flexible material comprising a spindle-engaging core on which the reel may be mounted for rotation about its axis, and an annulus coaxially supported by the core and on which the web may be wound, the annulus having a slot which extends parallel to the reel axis and into which the leading end of the web may be inserted to extend between spaced first and second walls which depend inwardly from the annulus towards the core at respective sides of the slot, the first and second walls together defining a socket which extends parallel to the reel axis and is open at one end for the longitudinal insertion therein of



a complementary elongated web retaining member, in combination with such a web retaining member, the web retaining member being removable longitudinally from the socket to permit the leading end of the web to be inserted through the slot and socket and being adapted, when then inserted in the socket, to engage and deform the leading end in the socket and frictionally to retain this leading end therein.

2. A reel as claimed in Claim 1, wherein the socket formed by the first and second walls is of generally circular cross-section.

3. A reel as claimed in Claim 1 or Claim

2, including a second socket for receiving and storing the retaining member when not in use.

4. A reel as claimed in Claim 3, wherein the first and second sockets have been moulded integrally with the hollow member.

5. A reel according to Claim 1, constructed substantially as hereinbefore described with reference to, and as shown in the accompanying drawing.

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