

PATENT SPECIFICATION

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DRAWINGS ATTACHED



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(54) MOTION PICTURE FILM CARTRIDGE

(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 motion picture film cartridges in which a roll of film is sealed before, during and after exposure in the camera.

Super 8 movie camera cartridges, for example, include a substantially rectangular housing in which a supply roll of film and a take-up spool are rotatably mounted in a side-by-side coaxial relation. As initially loaded, a film leader is pulled from the supply roll, threaded past an exposure aperture in an end wall of the cartridge and then attached to the take-up spool. After being so loaded with unexposed film, the housing is closed and sealed.

Usually such cartridges also include devices to overcome the tendency of coiled film to clockspring when the cartridge is subjected to sharp movements. The term "clockspring", as used herein, means radial displacement of successive outer convolutions of the film roll, caused by the tendency of the roll to unwind.

Anti-clockspring devices in the take-up chamber of most commercial cartridges operate on the take-up spool in such a manner that reverse rotation of the spool is prevented, so that film on the spool cannot be unwound. Such devices often comprise a pawl and ratchet arrangement wherein a shuttle with a plurality of teeth engages teeth on the take-up spool to prevent rotation of the spool in one direction. In our copending Application No. 14876/70 (Serial No. 1,280,256), the shuttle is mounted for transverse movement with respect to the axis of rotation of the spool to permit it to be moved

out of the way when the spool is rotated in its forward direction to wind up film.

In accordance with the present invention there is provided a motion picture film cartridge having an exposure aperture, a partition separating the interior of the cartridge into supply and take-up chambers, and a take-up spool rotatably mounted in the take-up chamber for winding up film which has been advanced past the exposure aperture, wherein an anti-backup means for the spool comprises ratchet means rotatable with the spool and a flexible pawl finger located to engage the ratchet means for preventing rotation of the take-up spool in an unwinding direction.

In the accompanying drawing:—

Fig. 1 is a perspective view of the supply side of a motion picture film cartridge constructed in accordance with one form of the present invention, with a portion of the cartridge housing broken away, and with a punch aligned with respect to the cartridge on a predetermined path to disable the anti-backup mechanism in the cartridge;

Fig. 2 is a cross section, to an enlarged scale, of a portion of the cartridge shown in Fig. 1 with a portion of the take-up spool broken away;

Fig. 3 is a plan, to an enlarged scale, of the anti-backup means shown in Fig. 1; and

Fig. 4 is a side view, to an enlarged scale, of a portion of the cartridge with the housing and partition in cross-section to show the take-up spool and a hub in the supply chamber with the punch inserted into the cartridge to disable the anti-backup mechanism.

As shown in Figs. 1 and 2, a cartridge 10 includes a substantially rectangular housing 11 and an internal partition 12 which divides the interior of the housing into a supply chamber 13 and a take-up chamber 14. Located in the supply chamber 13 is a hub 15 which is mounted on the partition 12 and serves to locate a supply roll of film, not shown. Mounted for rotation on a post

16 on the opposite side of the partition 12 is a take-up spool 17 for receiving and winding up exposed film F. As initially loaded in the factory, a film leader is pulled from the supply roll, threaded past the exposure aperture 18 in an end wall of the cartridge and then attached to the take-up spool 17 in the take-up chamber 14.

In order to prevent film wound on the take-up spool 17 from clockspringing, the cartridge 10 includes an anti-backup mechanism which, as illustrated, comprises a flexible pawl finger 19 moulded integrally with the partition 12 and located to engage teeth 20 on the take-up spool 17. As seen more clearly in Fig. 3, the teeth 20 define gradually inclined surfaces 22 and sharply inclined surfaces 23, such that rotation of the take-up spool in a counterclockwise direction, as viewed from the supply side of the cartridge, will cause the pawl finger 19 to ride up the gradually inclined surfaces 22 of the teeth 20, so that this ratchet mechanism offers substantially no resistance during film winding operations. However, rotation of the spool in a clockwise direction will cause the sharply inclined surface 23 of one of the teeth 20 on the spool to engage the end of the flexible end of the pawl 19, so that rotation of the spool is prevented in that direction and film cannot be unwound from the spool.

The anti-backup mechanism of this invention is adapted for disengagement by the method described and claimed in our co-pending Application No. 14876/70 (Serial No. 1,280,256) to permit exposed film to be unloaded through the exposure aperture 18 as the spool rotates in reverse. In order to adapt the cartridge for this purpose, the cover 11 on the supply side of the cartridge is provided with a thinned out portion 25, seen in Fig. 2, to allow easier puncturing by a disengaging punch 26 having a tapered end portion 27. In addition, the hub 15 in the cartridge supply chamber is provided with an opening 28 located in the predetermined path of the punch 26. The opening 28 is of sufficient size to provide clearance for the punch to gain access to the pawl 19.

In order to disengage the anti-backup mechanism of this invention the punch 26 punctures the weakened portion 25 of cover 11, as seen in Fig. 4, and passes through the cutaway portion 28 of the hub 15, so that the tapered end portion 27 engages the pawl 19 and cams it out of engagement with the teeth 20 on the spool 17. When the pawl is disengaged from the spool teeth 20 in this manner the exposed film on the spool may be unloaded from the cartridge through the exposure aperture.

WHAT WE CLAIM IS:—

1. A motion picture film cartridge having an exposure aperture, a partition separating the interior of the cartridge into supply and take-up chambers, and a take-up spool rotatably mounted in the take-up chamber for winding up film which has been advanced past the exposure aperture, wherein an anti-backup means for the spool comprises ratchet means rotatable with the spool and a flexible pawl finger located to engage the ratchet means for preventing rotation of the take-up spool in an unwinding direction.
2. A motion picture film cartridge according to claim 1, wherein the ratchet means comprises one or more ratchet teeth formed integrally with the spool.
3. A motion picture film cartridge according to claim 1 or 2, wherein the flexible pawl finger is formed integrally with the partition.
4. A motion picture film cartridge according to claim 3, wherein a hub for supporting a coil of film is mounted in the supply chamber coaxially of the take-up spool and includes an opening located in alignment with the flexible finger pawl which is disabled upon insertion of a punch through the opening.
5. A motion picture film cartridge according to claim 1, constructed substantially as hereinbefore described with reference to, and as shown in, the accompanying drawing.

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The anti-backup mechanism of this invention is adapted for disengagement by the method described and claimed in our co-pending Application No. 14876/70 (Serial No. 1,280,256) to permit exposed film to be unloaded through the exposure aperture 18 as the spool rotates in reverse. In order to adapt the cartridge for this purpose, the cover 11 on the supply side of the cartridge is provided with a thinned out portion 25, seen in Fig. 2, to allow easier puncturing by a disengaging punch 26 having a tapered end portion 27. In addition, the hub 15 in the cartridge supply chamber is provided with an opening 28 located in the predetermined path of the punch 26. The opening 28 is of sufficient size to provide clearance for the punch to gain access to the pawl 19.

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1. A motion picture film cartridge having an exposure aperture, a partition separating the interior of the cartridge into supply and take-up chambers, and a take-up spool rotatably mounted in the take-up chamber for winding up film which has been advanced past the exposure aperture, wherein an anti-backup means for the spool comprises ratchet means rotatable with the spool and a flexible pawl finger located to engage the ratchet means for preventing rotation of the take-up spool in an unwinding direction.

2. A motion picture film cartridge according to claim 1, wherein the ratchet means comprises one or more ratchet teeth formed integrally with the spool.

3. A motion picture film cartridge according to claim 1 or 2, wherein the flexible pawl finger is formed integrally with the partition.

4. A motion picture film cartridge according to claim 3, wherein a hub for supporting a coil of film is mounted in the supply chamber coaxially of the take-up spool and includes an opening located in alignment with the flexible finger pawl which is disabled upon insertion of a punch through the opening.

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