

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Roll Film Photographic Cameras

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 4, New York, United States of America (Assignees of Douglass Coate Harvey, and Hubert Nerwin), 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 locking devices for the covers of photographic cameras and more specifically to such devices whereby a member of the film winding mechanism of a camera is moved out of engagement with the film take-up spool by releasing the cover locking means and is engaged with the spool upon locking the cover.

An object of the present invention is to provide an improved camera wherein locking means for the camera back is combined with a spool engaging member in such a way that the spool engaging member is retracted by releasing the locking means.

According to the present invention, there is provided a roll film photographic camera, comprising a chamber for receiving a removable film winding member, locking means for securing a cover for the chamber in the closed position, a winding mechanism having a driving member movable into driving engagement with an inserted film winding member and means, operable by the locking means, for moving the driving member out of driving engagement with the winding member in response to release of the locking means.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

[Price 4s. 6d.]

Figure 1 is a cross sectional view of a portion of a camera according to a preferred embodiment of the invention showing a cover or camera back locking mechanism in a locked position and a spool driving member in driving engagement with a film take-up spool of a film magazine;

Figure 2 is a cross sectional view of the camera, taken along the line 2-2 of Figure 1, showing the cover locking mechanism in the locked position;

Figure 3 is a cross-sectional view of a part of a camera, corresponding to Figure 1, showing the cover locking mechanism in a released position and the spool driving member out of engagement with the film take-up spool;

Figure 4 is a cross sectional view of the camera, taken along the line 4-4 of Figure 3, showing the cover locking mechanism in a released position and the cover partially open;

Figure 5 is a view similar to Figures 1 and 3, showing the cover locking mechanism in locked position and illustrating the position of the spool driving member when the take-up spool happens to be so oriented to prevent the immediate driving engagement of the driving member with the spool;

Figure 6 is an end view of the film take-up spool shown in cross section in Figures 1, 3 and 5;

Figure 7 is a cross sectional view of a portion of a camera according to an alternative embodiment in which the take-up spool in a film magazine serves as a housing for a battery; and

Figure 8 is an end view of the film spool shown in Figure 7.

Referring now to Figures 1 to 6, a camera according to the present invention comprises a front housing 12 and a movable cover or camera 14, which is held in closed position

by the co-operation of a fixed locking member 16 on the cover and a movable locking member 18 slidably mounted on the end wall of the housing 12 by means of a rivet or post 20 extending through an 'L' shaped slot 22 in the lower end of the movable locking member and by a release element 24, the shank of which is secured to the member and extends through a straight slot 26 in the housing end wall. A tension spring 28, attached at one end to the member 18 and at the other end to the end wall of the housing 12, urges the member 18 into locking engagement with the member 16. In this embodiment of the invention, the film take-up spool 30, adapted for use in the camera, is incorporated in a film magazine 32. It should be understood, of course, that the invention is not limited to cameras employing film magazines, but is equally applicable to cameras of the more conventional type adapted to be loaded with roll film.

The illustrated film winding mechanism comprises a shaft 34, slidably and rotatably supported in axial alignment with the spool 30, by a bushing 36 and provided with an external winding knob 38 fixed thereto by means of a screw 40. A spool driving member 42 is attached to the inner end of shaft 34 and comprises a disc 44 provided with one or more spool engaging keys 46. A compression spring 48 between the bushing 36 and the disc 44 urges the spool driving member toward the film spool while allowing it to be rotated by the knob 38. Another coil spring 50 is tightly wound about the shaft 34 with one end 52 of the spring located in a slot 54 in the bushing 36. This spring serves as a one-way clutch to allow the shaft 34 to rotate only in the film winding direction but allows the shaft to move axially by virtue of the freedom of the end 52 of the spring 50 in the slot 54.

As shown in Figure 1, when the camera back or cover is in its closed condition, a driving relation is established between the winding mechanism and the film take-up spool by the engagement of the keys 46 with the ribs 56, (Figure 6), of the spool. In this condition, the camera is locked as previously described, with an offset extension arm 58 of the movable locking member 18 extending through the top wall of the housing 12 into adjacent but non-contacting relation with the lower surface of the knob 38.

To open the camera, the lock release element 24 is slid upwardly against the resistance of the spring 28, thereby sliding the member 18 out of engagement with the member 16. As the member 18 moves upwardly, the extension arm 58 thereof engages the lower surface of the knob 38 and raises the knob to the position shown in Figures 3 and 4 to withdraw the spool

driving member 42 from engagement with the spool 30. After the movable locking member has been moved out of engagement with the member 16, the lower horizontal portion of the 'L' shaped slot 22 moves into alignment with the rivet 20, thereby allowing the member 18 to be rotated about the element 24 to the position shown in Figure 4, due to the offset position of spring 28. This movement of the member 18 also serves to initiate the opening of the cover 14 due to engagement of a face 60 of the locking member 16 with a surface 62 of the member 18. Having assumed this position, the member 18 cannot return to the locking position shown in Figures 1 and 2 until the lower end thereof is moved into alignment with the vertical portion of the slot 22 against the influence of spring 28. Thus, the spool driving member remains in its retracted position to facilitate loading and unloading of the camera.

As the cover is closed, the face 60 of the locking member 16 engages the surface 62 of the member 18 and displaces the lower end of the movable locking member to move the vertical portion of the slot 22 into alignment with the rivet 20, in which position, the member 18 is moved downwardly into locking engagement with the member 16 by the spring 28. As the member 18 returns to the locking position, the extension arm 58 is moved out of engagement with the knob 38 to allow the spool driving member to be engaged with the film spool under the influence of the spring 48 as shown in Figure 1. If a rib 56 of the spool should happen to be exactly aligned with one of the spool engaging keys 46, the spool driving member will assume the position shown in Figure 5, but will return to the position shown in Figure 1 as soon as the knob is rotated by a sufficient amount to move the key out of its supported relation on top of the rib.

Figure 7 shows a similar embodiment of the invention which functions in the same manner described above, the corresponding elements being designated by primed numerals. The structural differences in this embodiment are dictated by the use of a film spool 64 similar to the spool 30 but adapted to house a battery 66 to supply a source of power for a flash unit as shown schematically by a flash-lamp 68 and a synchroniser switch 70 which is normally built into the shutter. In order to incorporate the battery 66 in the circuit, the shaft 34' is provided with a contact pin 72 which is urged into contact with a battery terminal 74 by a light spring 76, to establish a circuit through the members of the film winding mechanism. To complete the circuit, the lower end of the battery is engaged by a resilient contact member 78 mounted on the camera housing.

- In the circuit as shown, the shaft 34' and the bushing 36' as well as the contact pin 72 are assumed to be metal and thus conductive, while the camera housing 12' is formed of plastic or some other insulating material so that the contact 78 may be mounted directly thereon without creating a short circuit. To ensure correct orientation of the battery in the spool, the upper end of the spool is provided with an annular lip 80 (Figures 7 and 8) surrounding the battery terminal 74. If the battery is reversed in the spool, the terminal 74 projects beyond the lower end thereof and is engaged by the resilient contact member to prevent insertion of the spool into the camera. As is evident from the drawings, such a spool construction dictates the employment of a driving member 42' having spool engaging pins 82 rather than keys of the type illustrated at 46.
- Although the foregoing description relates to cameras having external winding knobs, the invention also encompasses cameras in which the film is wound by other means, for example, by means of a lever wind mechanism, a clockwise mechanism, or an electric film advance mechanism. Similarly, the invention may be employed to disengage the rewind mechanism from the film supply spool in cameras in which the film is rewound after being exposed.
- WHAT WE CLAIM IS:—**
1. A roll film photographic camera, comprising a chamber for receiving a removable film winding member, locking means for securing a cover for the chamber in the closed position, a winding mechanism having a driving member movable into driving engagement with an inserted film winding member and means operable by the locking means for moving the driving member out of driving engagement with the winding member in response to release of the locking means.
 2. A camera according to claim 1, wherein the locking of the cover causes the engagement of the driving member with a film winding member inserted in the chamber.
 3. A camera according to claim 2, wherein the locking means comprises a movable element which is mounted on the camera housing and is urged by means of a spring into locking engagement with a fixed element on the cover.
 4. A camera according to claim 3, including latching means for holding the movable element in its inoperative position so as to allow a film winding member to be removed from or inserted into the chamber.
 5. A camera according to claim 4, wherein the movable element is slidably mounted on the housing by means of an externally accessible release member secured to one end of the element and extending through a straight slot in the housing, and a post secured to the housing and extending into an L-shaped slot in the other end of the element, the post being located in the vertical leg of the slot when the element is in the operative position and being aligned with the horizontal leg of the slot and constituting therewith the latching means when the element is manually moved to the inoperative position whereupon the spring turns the element about the externally accessible release member to move the horizontal leg of the slot into engagement with the stud.
 6. A camera according to claim 5, wherein the fixed and movable elements are formed with co-operating surfaces which, upon closing the cover, turn the movable element against the action of the spring to align the stud with the vertical leg of the slot, whereupon the spring slides the movable element into locking engagement with the fixed element.
 7. A camera according to any of the preceding claims 3 to 6, wherein the driving member is slidably and rotatably mounted in the camera and is axially displaced, against the action of a spring, by the movement of the movable element to an inoperative position, the spring moving the driving member into driving engagement with the winding member upon movement of the movable element into engagement with the fixed element.
 8. A camera according to claim 4 or any claim appendant thereto, wherein the movable element is slidably mounted on the housing for movement in one direction against the action of the spring to disengage from the fixed element and, when in the disengaged position, is moved by the spring in a second direction at right angles to said other direction to a position in which a part of the movable element abuts a fixed member to retain the movable element in the disengaged position.
 9. A camera according to claim 8 wherein the fixed and movable elements are formed with co-operating surfaces which, upon closing the cover, slide the movable element to disengage it from the fixed member, whereupon the spring slides the movable element into locking engagement with the fixed element.
 10. A camera as claimed in any preceding claim including a flash device and wherein a source of power for the flash device is contained within an inserted film winding member, the driving member providing a retractable contact post engageable, in the closed position of the cover, with a terminal of the power source.
 11. A camera as claimed in claim 10 including a resilient contact mounted within



In the circuit as shown, the shaft 34' and the bushing 36' as well as the contact pin 72 are assumed to be metal and thus conductive, while the camera housing 12' is formed of plastic or some other insulating material so that the contact 78 may be mounted directly thereon without creating a short circuit. To ensure correct orientation of the battery in the spool, the upper end of the spool is provided with an annular lip 80 (Figures 7 and 8) surrounding the battery terminal 74. If the battery is reversed in the spool, the terminal 74 projects beyond the lower end thereof and is engaged by the resilient contact member to prevent insertion of the spool into the camera. As is evident from the drawings, such a spool construction dictates the employment of a driving member 42' having spool engaging pins 82 rather than keys of the type illustrated at 46.

Although the foregoing description relates to cameras having external winding knobs, the invention also encompasses cameras in which the film is wound by other means, for example, by means of a lever wind mechanism, a clockwise mechanism, or an electric film advance mechanism. Similarly, the invention may be employed to disengage the rewind mechanism from the film supply spool in cameras in which the film is rewound after being exposed.

WHAT WE CLAIM IS:—

1. A roll film photographic camera, comprising a chamber for receiving a removable film winding member, locking means for securing a cover for the chamber in the closed position, a winding mechanism having a driving member movable into driving engagement with an inserted film winding member and means operable by the locking means for moving the driving member out of driving engagement with the winding member in response to release of the locking means.

2. A camera according to claim 1, wherein the locking of the cover causes the engagement of the driving member with a film winding member inserted in the chamber.

3. A camera according to claim 2, wherein the locking means comprises a movable element which is mounted on the camera housing and is urged by means of a spring into locking engagement with a fixed element on the cover.

4. A camera according to claim 3, including latching means for holding the movable element in its inoperative position so as to allow a film winding member to be removed from or inserted into the chamber.

5. A camera according to claim 4, wherein the movable element is slidably mounted on the housing by means of an externally accessible release member secured

to one end of the element and extending through a straight slot in the housing, and a post secured to the housing and extending into an L-shaped slot in the other end of the element, the post being located in the vertical leg of the slot when the element is in the operative position and being aligned with the horizontal leg of the slot and constituting therewith the latching means when the element is manually moved to the inoperative position whereupon the spring turns the element about the externally accessible release member to move the horizontal leg of the slot into engagement with the stud.

6. A camera according to claim 5, wherein the fixed and movable elements are formed with co-operating surfaces which, upon closing the cover, turn the movable element against the action of the spring to align the stud with the vertical leg of the slot, whereupon the spring slides the movable element into locking engagement with the fixed element.

7. A camera according to any of the preceding claims 3 to 6, wherein the driving member is slidably and rotatably mounted in the camera and is axially displaced, against the action of a spring, by the movement of the movable element to an inoperative position, the spring moving the driving member into driving engagement with the winding member upon movement of the movable element into engagement with the fixed element.

8. A camera according to claim 4 or any claim appendant thereto, wherein the movable element is slidably mounted on the housing for movement in one direction against the action of the spring to disengage from the fixed element and, when in the disengaged position, is moved by the spring in a second direction at right angles to said other direction to a position in which a part of the movable element abuts a fixed member to retain the movable element in the disengaged position.

9. A camera according to claim 8 wherein the fixed and movable elements are formed with co-operating surfaces which, upon closing the cover, slide the movable element to disengage it from the fixed member, whereupon the spring slides the movable element into locking engagement with the fixed element.

10. A camera as claimed in any preceding claim including a flash device and wherein a source of power for the flash device is contained within an inserted film winding member, the driving member providing a retractable contact post engageable, in the closed position of the cover, with a terminal of the power source.

11. A camera as claimed in claim 10 including a resilient contact mounted within

the camera for engagement with the other terminal of the power source on insertion of the film winding member into the camera.

12. A camera as claimed in claim 10 or
5 11 wherein the film winding member comprises a film spool and the power source comprises a battery accommodated in an axial bore of the spool.

13. A camera as claimed in claim 12
10 wherein the axial bore is so formed as to

prevent incorrect insertion of the battery thereinto.

14. A roll film photographic camera substantially as hereinbefore described with reference to and as illustrated in Figures 1 15 to 6 or Figures 1 to 6 as modified by Figures 7 and 8 of the accompanying drawings.

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