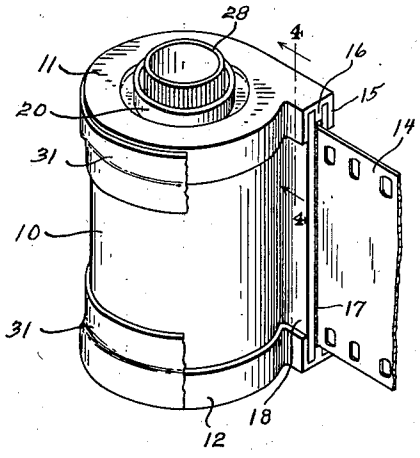
April 11, 1939. D. H. KINLOCH 2,153,573

NONABRADING RELOADABLE CARTRIDGE

Filed Sept. 23, 1936

Fig. 1.



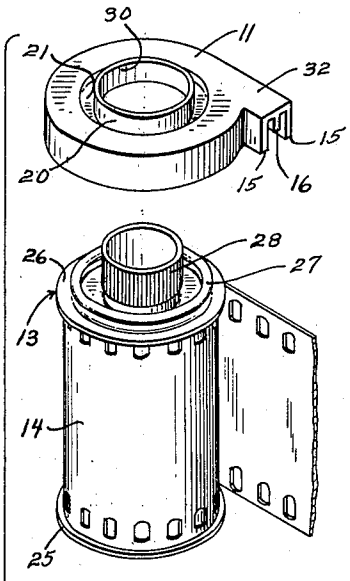
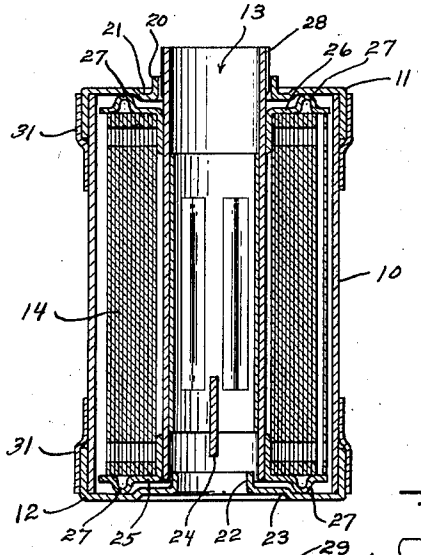
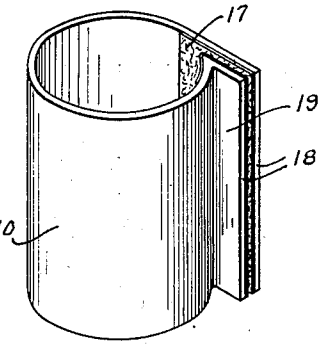


Fig. 2.

Fig. 3.





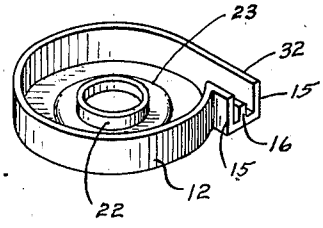


Fig. 4.

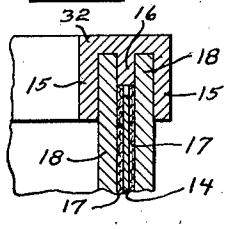
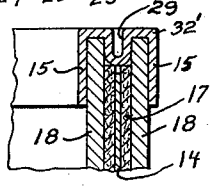


Fig. 5.



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Patented Apr. 11, 1939 2,153,573

UNITED STATES PATENT OFFICE

2,153,573

NONABRADING RELOADABLE CARTRIDGE

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Application September 23, 1936, Serial No. 102,231

5 Claims. (Cl. 242—71)

This invention relates to a non-abrading reloadable cartridge for photographic film. A principal object is to provide a reloadable cartridge that cannot scratch or streak the film during unwinding, retraction and reloading even under careless or unskilled use. Another object of this invention is to provide a simple and inexpensive cartridge that can be readily reloaded and adjusted in a dark room by the amateur. Further objects will more plainly appear from the detailed specification and description hereinafter set forth.

The present invention is primarily directed to cartridges for use in miniature or so-called Candid cameras that employ perforated cine-film having a sensitized surface that is often hypersensitized in a dark room by the user just before loading in the camera. This film presents an extremely delicate surface readily marred by prior cartridges even when under unusual care. Furthermore prior cartridges provide no means for preventing unavoidable or accidental pressure on the delicate surfaces of the film by the lips of the film-slot during extraction or retraction of the film. In prior devices this causes much serious damage to the film and is a source of frequent grief to the user and manufacturer. These and other disadvantages in the prior art have been efficiently overcome by the present invention which provides means for preventing the harmful effects of pressure on the delicate film surfaces by positively separating the film guide lips in light-excluding spaced relationship.

The accompanying drawing shows diagrammatically in

Figure 1: a perspective view of the assembled cartridge;

Figure 2: an exploded view in perspective of the cartridge showing the caps, spool, separators and casing;

Figure 3: a longitudinal cross section taken on the vertical axis of the cartridge;

Figure 4: a longitudinal section of a detail taken on the line 4—4 in Figure 1 showing the separators;

Figure 5: a modified detail of the guide separators in Figure 4.

The cartridge comprises a cylindrical tubular casing 10 open at both ends and having a straight longitudinal outwardly projecting slotted film guide provided with lips 18 extending the length of the casing. The guide 19 is lined on the inside of both lips 18 with light-excluding material 17 such as velvet or felt ribbon. The remainder of the cartridge 10 is unlined. Over the top of the casing 10 is slidably fitted a rigid cylindrical cup shaped cap 11 having a guide 32 adapted to fit over the lips 18 of the casing 10. The guide 32 is provided with an inwardly projecting separator 16 adapted to fit in between the lips 18 and to hold them apart in spaced relationship between the cap guides 32. The cap 11 is provided with an annular outwardly projecting collar 20 which forms a guide bearing seal for the exterior of the spool shank and an inwardly projecting annular groove 21 which cooperates with a ridge upon the flange of the film spool to form a light-lock. Cap 12 which fits on the bottom of the casing has a similar guide portion 32 or 32' (Fig. 5) which engages the lips of the casing. This cap is further provided with an inwardly projecting collar 22 which engages the inner periphery of the shank and forms a bearing seal therefore. The cap 12 is further provided with an annular groove 23 which cooperates with a ridge on the lower flange of the film spool to form a light lock.

The spool comprises the usual hollow shank member and the usual film slit as shown in Figure 3. The lower portion of the shank is provided with the usual spool key 24, countersunk with respect to the lower spool flange 25 and adapted to engage the rewind key in the camera, not shown. The upper portion of the shank is provided with a knurled thumb screw 28 that projects upwardly from the upper flange 26. The spool 13 is provided with film retaining end flanges 25 and 26 having outwardly projecting ridges 27. The spool 13 is adapted to slidably fit into the casing 10 and the caps 11 and 12 so that the ridges 27 may rotate in slidable light-excluding contact with the end caps, 11 and 12, forming an efficient light seal therewith.

To assemble the cartridge the reeled spool 13 is placed in the casing 10 and the film 14 is drawn through the plush-lined guide lips 18. The top cap 11 is slipped over the top end of the casing 10, permitting the thumb screw 28 to project through the opening 30, the collar 20 fitting around the thumb screw 28 and the ridges 27 fitting against the inwardly projecting grooves 21 to form a light seal therewith. The bottom cap 12 is slipped over the lower end of the casing 10 so that the inwardly projecting collar 22 engages the inner periphery of the lower end of the shank of the spool 13 so that the ridge 27 fits against the inwardly projecting grooves 21 and 23 to form a light seal therewith. The caps 11 and 12 are then fixed on the casing with readily removable and resealable adhesive tape 31.

When the cartridge is thus assembled the guide lips 18 are securely held in position by the guide lips 15 and the lip separators 16 as shown in Figure 4 (or 29 as shown in Figure 5) both at the top and bottom of the cartridge. The separators 16 as shown in Figure 4 (or 29 as shown in Figure 5) furthermore hold the lips 18 securely apart, thus preventing them from exerting any harmful pressure on the delicate surfaces of the film 14, the light-excluding material 17 having

a sufficiently high pile to provide an efficient light seal throughout the length of the guide.

When the cartridge is in the camera the camera rewind key is engaged with the spool key 24 and the thumb screw 28 is used to advance or retract and adjust the film and draw it taut against the sprocket in the camera. After exposure the cartridge may be taken to the dark room and the detachable seal 31 removed, the cap 11 slipped off and the reeled spool 14 slipped out of the casing 10 by gripping the thumb screw 28. The film 14 may then be developed.

The cartridge may be readily reloaded in a dark room with fresh or hypersensitized film in the following manner: a suitable length of film 14 is engaged with the spool shank slits and reeled on the spool 13, no paper leader being needed. The reeled spool 13 is slipped into the cylindrical case 10 so that the free end of the film 14 will slide through the guide lips 18 held apart by the separators 16 (or 29). The cap 11 is slipped over the top end of the casing 10 and the cartridge may then be removed to white light, where replaceable sealing tape 31 may be applied to hold cap 11 in place. In working in the dark room the thumb screw 28 affords readily accessible means for removing and inserting the spool 13 in the cartridge.

A wide choice of materials is available for the construction of my novel cartridge. Any inexpensive non-fogging sheet metal of sufficient rigidity to prevent accidental distortion of the casing 10 may be used as no cumbersome retaining clamps are necessary with my improved cartridge which also avoids the use of complicated locking or fastening devices suggested in the prior art for retaining the cartridge in its assembled position. Preferred materials are rigid lacquered brass sheeting, dye cast aluminum, rigid cellulose derivative compositions, and rigid plastics such as phenol condensation products of the type known as Bakelite, or the like. The lining of the guide lips 18 are preferably velvet ribbon, having sufficiently high pile to adequately light-seal the opening. However, any other suitable non-fogging, light-excluding, easily compressible fabric, such as plush or felt may be used.

The hereindescribed combined light sealing action of the ridges 27 with the grooves 21 and 23 make it unnecessary to provide a lining for the casing 10 or felt discs for the caps 11 and 12.

A preferred cartridge structure inexpensive enough to be given away with the purchase of the film may be made according to my invention from lacquered brass sheeting for the caps 11 and 12, the casing 10 and spool 13, and velvet ribbon for the lining of the guide lips 18.

While applicant has herein described his novel reloadable, non-abrading cartridge in detail, he does not contemplate limitation thereto, but does include all forms and modifications within the language and scope of the appended claims.

I claim:

1. A non-abrading reloadable light-proof film cartridge comprising an unlined tubular casing provided with a straight longitudinal outwardly projecting slotted film guide having lips lined with light-excluding material; a removable and resealable cup shaped cap sealed over each end of said casing; said caps having portions fitting over said guide, said portions having inwardly projecting members approximately the width of said slotted guide for holding said lips apart; and a roll of sensitized film carried by a spool provided with end flanges adapted to slidably fit and rotate in light excluding contact in said cartridge.

2. A non-abrading reloadable light-proof film cartridge comprising an unlined tubular casing provided with a straight longitudinal outwardly projecting slotted film guide having lips lined with light-excluding material; a removable and resealable cup shaped cap sealed over each end of said casing; said caps having portions fitting over said guide, said portions having inwardly projecting substantially hemispherical indentations adapted to hold said lips apart; and a roll of sensitized film carried by a spool provided with end flanges adapted to slidably fit and rotate in light excluding contact in said cartridge.

3. A film cartridge comprising a tubular casing provided with a straight longitudinal slotted film guide having outwardly projecting lips lined with light-excluding material, a removable cup shaped cap on each end of the casing having a portion fitting over the lips of the film guide, an inwardly projecting member extending between the lips of the film guide for holding said lips apart and an annular groove; and a film spool provided with end flanges having an annular ridge which is adapted to contact with the respective caps and form a light-lock with the respective annular grooves.

4. A film cartridge comprising a tubular casing provided with a straight longitudinal slotted film guide having outwardly extending lips lined with light-excluding material, a removable cup shaped cap on each end of the casing having a portion fitting over the lips of the film guide and an annular groove, the upper cap being further provided with an outwardly extending annular collar which forms a bearing seal for the exterior periphery of the film spool shank, the lower cap being further provided with an inwardly extending annular collar which forms a bearing seal for the inner periphery of the film spool shank; and a film spool having a hollow shank which is adapted to extend through the upper cap and an upper and lower flange having annular ridges which are adapted to contact with the respective caps and form a light-lock with the respective annular grooves.

5. A film cartridge comprising a tubular casing provided with a straight longitudinal slotted film guide having outwardly projecting lips lined with light-excluding material, a removable cup shaped cap on each end of the casing having a portion fitting over the lips of the film guide, an inwardly projecting member extending between the lips of the film guide for holding said lips apart, and an annular groove, the upper cap being further provided with an outwardly extending annular collar which forms a bearing seal for the exterior periphery of the film spool shank, the lower cap being further provided with an inwardly extending annular collar which forms a bearing seal for the inner periphery of the film spool shank; and a film spool having a hollow shank which is adapted to extend through the upper cap and an upper and lower flange having annular ridges which are adapted to contact with the respective caps and form a light-lock with the respective annular grooves.

DONALD H. KINLOCH.