EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
20.06.2001 Bulletin 2001/25

(21) Application number: 95202262.2

(22) Date of filing: 22.08.1995

(54) Releasable attachment for connecting a film strip to a film cassette spool
Lösbare Verbindung zum Befestigen eines Filmstreifens an einer Spule einer Filmpatrone
Attachement amovible pour la fixation d’une pellicule à une bobine d’une cartouche de film

(84) Designated Contracting States:
CH DE FR GB IT LI

(30) Priority: 24.08.1994 GB 9417099

(43) Date of publication of application:

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FR-A- 891 267
DE-A- 1 522 260

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Description

Field of the Invention

[0001] The present invention relates to a releasable attachment for connecting a film strip to a film cassette spool, and is particularly concerned with such an attachment which allows for repeated use of the film cassette spool.

Background of the Invention

[0002] It is well known to rotatably support a film strip on a spool within a film cassette. In some such arrangements, the end of the film strip adjacent the spool is not secured thereto and there is a risk that the film strip will inadvertently become detached from the spool and hence be wholly withdrawn from the cassette during its exposure. One such arrangement is described in US-A-4 145 133.

[0003] There are other arrangements which overcome this problem by attaching the trailing end of the film strip to the spool. These arrangements prevent the film strip being fully extracted from the cassette during exposure, but necessitate the use of a cutter to detach the film strip from the spool prior to processing.

[0004] US-A-5 054 710 discloses a spool for a camera on to which a film strip is to be wound during exposure. The spool includes a shaft having a slit formed therein. A protrusion is located in the slit to engage a perforation in the leading edge of the film strip, the film strip being wound on to the spool as it is exposed in the camera. When the film strip is fully exposed, it is unwound from this spool back into its cassette. The leading edge of the film strip slips out of the slit as the wall of the perforation engaging the protrusion slides down an angled wall thereof to release the film strip from the spool.

[0005] US-A-4 334 750 discloses an arrangement for a spool in a film cassette which allows the trailing end of the film strip to be released. The arrangement comprises a hollow spool having a slot formed in its wall. A retaining member is located within the hollow spool and carries a protrusion for engaging a perforation in the trailing end of the film strip to retain it in the slot. When it is desired to release the film strip from the spool, the retaining member is pushed inwardly with respect to the spool so that the protrusion is forced out of the slot thereby releasing the perforation and the trailing end. Once pushed in, the retaining member cannot be withdrawn from the spool.

[0006] FR-A-891267 and DE-A-1522260 both also disclose an arrangement which allows the end of the film strip to be releasably connected to a spool. FR-A-891267 discloses a strip which is inserted and removed from the slot obliquely. DE-A-1522260 discloses a strip having a cut-out portion which allows it to be disengaged from the slot in the body portion of the spool.

[0007] EP 698808 discloses a method of releasably attaching a film strip to a film cassette spool in which the strip is moved transversely to the direction of insertion to disengage and withdraw.

Problem to be solved by the Invention

[0008] In arrangements for permanently attaching the film strip to the spool, it is necessary to cut the film strip to detach it from the spool so that it can be processed. This means that a small piece of film strip remains attached to the spool which then has to be removed by hand prior to the spool being re-used.

[0009] Although the arrangement described in US-A-4 334 750 allows the film strip to be detached from the spool without having to sever it therforem, the spool is complex and cannot be re-used.

Summary of the Invention

[0010] It is therefore an object of the present invention to provide a releasable attachment for connecting a film strip to a film cassette spool which overcomes the problems mentioned above.

[0011] In accordance with one aspect of the present invention, there is provided a method of releasably attaching a film strip to a film cassette spool as defined in claim 1.

[0012] In accordance with another aspect of the present invention, there is provided a film strip as defined in claim 2 for use in the method described above.

Advantageous Effect of the Invention

[0013] The method of the present invention can easily be applied to existing film cassette spools by providing a cut-out portion in the trailing end of the film strip which is to be attached to the spool which is narrower than the width of the slot and allows the film strip to be easily removed therefrom. Existing film cassette spools can be utilised.

Brief Description of the Drawings

[0014] For a better understanding of the present invention, reference will now be made, by way of example only, to the accompanying drawings in which:-

Figure 1 a schematic side elevation of an existing spool for a film cassette;
Figure 2 is a schematic perspective view of a trailing end of a film strip coming into engagement with a slot in spool as shown in Figure 1 as is conventional;
Figure 3 illustrates a trailing end of a film strip in accordance with the present invention;
Figure 4 illustrates schematically the steps for attaching the film strip to a spool and subsequent detachment therefrom; and
Figure 5 illustrates detachment of the film strip from
Detailed Description of the Invention

[0015] In existing arrangements for attaching a trailing end of a film strip to a film cassette spool, the width of the trailing end is no greater than the width of the slot formed in the spool and is preferably substantially the same width. This means that there is engagement between the edges of the trailing end and the walls of the slot. As a consequence, there is little or no lateral movement of the trailing end with respect to the slot. Furthermore, due to the shape of the slot, there is no allowance for any vertical movement of the film strip within the slot except where the film strip engages the slot.

[0016] The releasable attachment of the present invention necessitates that there is vertical movement of the trailing end of the film strip within the slot. It is necessary to provide a cut-out portion in the trailing end of the film strip so that a portion thereof is narrower than the slot into which it is to be inserted and that the necessary vertical movement can be achieved. This means that the trailing end of the film strip is not retained at its edges along its entire length and is free to move vertically within the slot when required.

[0017] Figure 1 illustrates an existing film cassette spool 10. The spool 10 comprises a body portion 12 which carries two flange members 14, 16 spaced apart along the body portion a distance to accommodate the width of the film strip to be wound thereon. A slot 18 is formed in the body portion 12 for retaining the trailing end of the film strip (not shown). The slot 18 has a central protrusion 20 and two shoulder portions 22, 24 formed one on either side of the protrusion 20. The trailing end of the film strip is inserted over protrusion 20 but under shoulder portions 22, 24.

[0018] Figure 2 illustrates schematically the slot 18 and a trailing end 30 of a film strip. The trailing end 30 has an aperture 32 formed therein for engagement with the protrusion 20 when inserted into the slot 18 in the direction indicated by arrow 'A'. The protrusion 20 has a ramped surface 26 which allows the front edge of the trailing end 30 of the film strip to pass thereover until the aperture 32 falls over the protrusion 20 to effect engagement therewith. Movement of the film strip in a direction reverse to that indicated by arrow 'A' is not possible as is conventional.

[0019] Figure 3 illustrates a trailing end 40 of a film strip in accordance with the present invention. The trailing end 40 has an aperture 42 as is conventional, and a cut-out portion 44 which is spaced from the aperture 42. This cut-out portion 44 allows vertical movement of the film strip within the slot 18.

[0020] Figures 4A to 4G illustrate the stages of attaching the trailing end 40 of a film strip modified in accordance with the present invention to a film cassette spool and its subsequent detachment therefrom. These stages are illustrated as viewed in the direction of arrow 'Z' in Figure 2.

[0021] In Figure 4A, the front edge of the trailing end 40 is shown as it is inserted into slot 18 in the direction indicated by arrow 'A' in Figure 2. Further insertion into the slot 18, as shown in Figure 4B, brings the aperture 42 of the trailing end 40 into alignment with the protrusion 20 and the film strip is attached to the spool. In this position, withdrawal of the film strip from the slot 18, in the direction reverse to that indicated by arrow 'A' in Figure 2, is not possible due to the engagement of the protrusion 20 with the aperture 42.

[0022] For detachment of the film strip from the spool 10, the trailing end 40 is pushed further into the slot 18 as shown in Figure 4C. This causes the aperture 42 to pass up over ramped surface 26 of the protrusion 20 so that there is no longer any engagement between the trailing end 40 and the slot 18 of the spool 10. However, if one attempts to withdraw the trailing end 40 of the film strip from the slot 18 (in the direction reverse to arrow 'A' in Figure 2) at this stage, the aperture 42 will re-engage with protrusion 20.

[0023] Further insertion of the trailing end 40 into the slot 18 pushes cut-out portion 44 into the slot 18 between shoulder portions 22, 24. Once the cut-out portion 44 is clear of shoulder portions 22, 24, as shown in Figure 4D, the trailing end 40 of the film strip flips up out of the slot 18, in the direction of arrow 'B', due to the inherent springiness of the film strip. The film strip is confined in slot 18 by shoulder portions 22, 24 in the shape shown in Figure 4C. Once the film strip has flipped out, it can be withdrawn from the slot 18, in the direction of arrow 'C' in Figure 5, as shoulder portion 24 supports the trailing end 40, keeping aperture 42 out of engagement with protrusion 20. This is shown in Figures 4E, 4F and 5.

[0024] Figure 4G illustrates the slot 18 with the trailing end 40 of the film strip completely detached therefrom.

Claims

1. A method of releasably attaching a film strip to a film cassette spool (10), the cassette spool (10) comprising a body portion (12) having a slot (18) formed therein, the slot (18) having retaining means (20) for retaining an end (40) of the film strip including a protrusion having a ramped surface (26) inclined in the film strip insertion direction in the slot and two shoulder portions (22, 24) each formed at one side of the protrusion, the film strip having an aperture (42) for location with the returning means and a substantially U shaped cut out portion (44) located on one longitudinal side of the strip, the method comprising the steps of:

   a) inserting the end (40) of the film strip in a first direction into the slot (18) in the body portion (12), the film strip passing up the ramped surface (26);
1. Verfahren zum lösbaren Befestigen eines Filmstreifens, wobei die Spule (10) ein Hauptelement (12) mit einem darin ausgebildeten Schlit (18) aufweist, welcher zum Festhalten eines Endabschnitts (40) des Filmstreifens ein Haltemittel (20) umfasst, das mit einem Vorsprung (20) in Eingriff (42) versehen ist, der von einer Öffnung (42) im Endabschnitt (40) auf eine Längsseite des Filmstreifens, gekennzeichnet durch die Schritte:

a) Einführen des Endabschnitts (40) des Filmstreifens in einer ersten Richtung in den Schlit (18) im Hauptelement (12) derart, dass der Filmstreifen die rampenartige Fläche (26) hin aufgleitet,

b) Ineingriffbringen der am Endabschnitt (40) des Filmstreifens vorgesehenen Öffnung (42) mit dem Vorsprung (20), um den Filmstreifen an der Spule (10) zu befestigen, und
c) Herausziehen des Filmstreifens aus dem Schlit (18) in einer zur ersten Richtung entgegengesetzten Richtung, um den Filmstreifen von der Spule (10) zu lösen durch
d) weiteres Einführen des Endabschnitts (40) des Filmstreifens in der ersten Richtung in den Schlit (18), derart, dass die Öffnung (42) über die rampenartige Fläche (26) hinweggleitet, derart, dass der Filmstreifen außer Eingriff mit dem Vorsprung gelangt und wegen des Vorsprungs eine gebogene Form annimmt, und dass der Ausschnitt (44) die Stege (22, 24) wegschnellt, derart, dass der Filmstreifen teilweise außer Eingriff mit dem Schlit (18) gelangt, ehe er aus dem Schlit (18) herausgezogen wird, wobei eine Längsseite des Filmstreifens auf einem der Stege derart auf liegt, dass beim Herausziehen des Filmstreifens dessen Öffnung nicht mit dem Vorsprung in Eingriff gelangt.

d) weiteres Einführen des Endabschnitts (40) des Filmstreifens in der ersten Richtung in den Schlit (18), derart, dass die Öffnung (42) über die rampenartige Fläche (26) hinweggleitet, derart, dass der Filmstreifen außer Eingriff mit dem Vorsprung gelangt und wegen des Vorsprungs eine gebogene Form annimmt, und dass der Ausschnitt (44) die Stege (22, 24) wegschnellt, derart, dass der Filmstreifen teilweise außer Eingriff mit dem Schlit (18) gelangt, ehe er aus dem Schlit (18) herausgezogen wird, wobei eine Längsseite des Filmstreifens auf einem der Stege derart auf liegt, dass beim Herausziehen des Filmstreifens dessen Öffnung nicht mit dem Vorsprung in Eingriff gelangt.

2. A film strip for use in the method according to claim 1, the film strip having an end (40) which has a substantially U shaped cut-out portion (44) located on the longitudinal side thereof, spaced from an aperture (42) in said end which engages with a protrusion having a ramped surface (26) inclined in the film insertion direction in the slot (18) in the body portion (12) of a spool (10) of a film cassette, the cut-out portion (44) allowing partial disengagement from the slot (18) and subsequent withdrawal of the film strip therefrom.

Patentansprüche

1. Revendications

1. Procédé de fixation de façon amovible d’une bande de film à une bobine de cassette de film (10), la bobine de cassette (10) comprenant une partie de corps (12) comportant une fente (18) formée dans celle-ci, la fente (18) comportant un moyen de retenue (20) destiné à retenir une extrémité (40) de la bande de film comprenant une saillie présentant une surface en pente (26) inclinée dans le sens d’insertion de la bande de film dans la fente et deux parties d’épaulement (22, 24) formée chacune au niveau d’un côté de la saillie, la bande de film com-
portant une ouverture (42) en vue d'un positionnement avec le moyen de retenue et une partie découpée sensiblement en forme de U (44) située sur un côté longitudinal de la bande, le procédé comportant les étapes consistant à :

a) insérer dans un premier sens l'extrémité (40) de la bande de film dans la fente (18) de la partie de corps (12), la bande de film étant montée sur la surface en pente (26),

b) mettre en prise l'ouverture située au niveau de l'extrémité (40) de la bande de film avec la saillie (20) pour réaliser la fixation de la bande de film à la bobine (10), et

c) retirer la bande de film dans un sens qui est opposé au premier sens, de la fente (18) pour réaliser la séparation de la bande de film de la bobine (10) en

d) insérer davantage l'extrémité (40) de la bande de film dans la fente (18) dans le premier sens de sorte que l'ouverture (42) passe au-dessus de la surface en pente (26) pour permettre que la bande se dégage de la saillie de sorte que la bande de film dans la fente devienne courbée en raison de la saillie, que la partie découpée (44) atteigne les parties d'épaulement (22, 24) de sorte qu'en raison de l'élasticité de la bande de film courbée, la bande de film bascule en dehors de l'une des parties d'épaulement (24) pour permettre à la bande de se dégager en partie de la fente (18) avant le retrait de la bande de film de la fente (18), et que ladite une des parties d'épaulement supporte le côté longitudinal de la bande de film de sorte que ladite ouverture ne vienne pas en prise avec la saillie lors du retrait.

2. Bande de film destinée à l'utilisation dans le procédé selon la revendication 1, la bande de film comportant une extrémité (40) qui présente une partie découpée sensiblement en forme de U (44) située sur le côté longitudinal de celle-ci, espacée d'une ouverture (42) de ladite extrémité, laquelle se met en prise avec une saillie comportant une surface en pente (26) inclinée dans le sens de l'insertion du film dans la fente (18) de la partie de corps (12) d'une bobine (10) d'une cassette de film, la partie découpée (44) permettant un dégagement partiel de la fente (18) et un retrait qui s'ensuit de la bande de film de celle-ci.