

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN AND RELATING TO MULTIPART CARTRIDGES FOR STRIP MATERIAL

(71) We, AGFA-GEVAERT AKTIENGESELLSCHAFT, a body corporate organised according to the laws of Germany, of Leverkusen, Germany, 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 invention relates to a multipart cartridge for strip material, for example, photographic film. The invention is especially applicable to the field of narrow gauge film cartridges.

It has been proposed, for example, in German Gebrauchsmuster No. 1 865 356, to construct a multipart cartridge both portions of which are releasably connected to one another by a releasable fastening comprising a cylinder, having a stop edge, which is provided on one portion, and a further cylinder, with a rotating projection in the form of a hook, which is provided on the other portion, the hook-line projection of the second portion being releasably locked with the stop edge of the first portion. The disadvantage of this arrangement is that at the point of the releasable connection is a distinct thickening or bulge on the cartridge.

The present invention provides a cartridge for strip material, comprising an inner body and an outer shell which fits over the inner body, the outer shell being retained over the inner body by means of releasable fastening means comprising an arm bearing a hook, which arm is resiliently mounted on the outer shell and a detent located adjacent to a recess in the cartridge which opens onto the outside of the cartridge, the hook being arranged to engage the detent and the arrangement being such that the arm lies within the recess when it is in the said engagement with the detent.

Preferably, neither the arm nor the detent projects substantially beyond the general external outline of the cartridge, as defined by the walls of the outer shell, when the arm

is in engagement with the detent and lying within the recess. Advantageously, the arm lies substantially flush with the wall of the outer shell when it is in engagement with the detent and lying within the recess, and therefore the depth of the recess, in this case corresponds approximately to the thickest part of the arm engaging therein.

Preferably, the area of the outwardly facing recess opening is greater than that area of the arm which faces outwards when the arm is lying in the recess. This facilitates the unlocking of the releasable fastening by the use of a tool inserted into the recess, or by the resilient displacement of the arm.

In one advantageous form of cartridge constructed in accordance with the invention, the outer shell comprises two portions which interlock. In another advantageous form of construction, the outer shell is formed in one piece. With this second mentioned form of construction, the arm preferably comprises a hooked flap which can be deflected to bring it into engagement with the detent, and, advantageously, the arm is formed as an extension of one side of the outer shell, a notch being formed on the inner surface of the outer shell where the arm joins the said one side so that the arm forms a sharp corner with the said one side when deflected to lie along an adjacent side of the cartridge.

Film cartridges constructed in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a perspective view of a first embodiment of a film cartridge;

Fig. 2 is a section through the cartridge taken along the line II—II in Fig. 1;

Fig. 3 is a perspective view of a second embodiment of a film cartridge;

Fig. 4 is a section through an end portion of the second form of cartridge, taken along the line IV—IV in Fig. 3, wherein the continuous line indicates the state of the cartridge in a closed position and the

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broken line the state of the cartridge in a position before closing.

With reference to the accompanying drawings, and initially to Figs. 1 and 2, a narrow gauge film cartridge comprises a cartridge body 1, with four narrow, substantially rectangular sides. On one narrow side there is located a film window or a film locating slot 2. The cartridge body 1 includes winding cores 3 and a spool carrier 4 for the take-up core, in addition to spaces for housing film within the cartridge and film guides (not shown).

A light proof outer cover or shell fits over the cartridge body 1, this outer shell comprising a main portion 5 and a cap portion 6, which interlock and which are releasably fastened together, as described below. The outer shell 5, 6 covers all of the inner cartridge body 1, with the exception of the top of the spool carrier 4, the film window or film locating slot 2, and the two parallel narrow sides of the cartridge which extend at right angles to the narrow side in which the film window is located.

The main portion 5 of the outer shell, and the cap 6, are fastened together as follows:

Each of the two parallel narrow sides of the portion 5 of the outer shell which extend at right angles to the film window 2 is provided with a recess 7 in which is sunk a stop edge or detent 8. From the corresponding sides of the cap 6 extend resilient plastics arms 9. The ends of the resilient arms 9 are formed having hooked portions 10. The length of the arms 9 are such that, when the main portion 5 of the outer shell and the cap 6 are pushed together to enclose the inner cartridge body 1, the hooks 10 snap over the stop edges 8 to hold the shell portions 5 and 6 together. The dimensions of the arms 9 and of the recesses 7 are such that the hooked portions 10 lie completely within the recesses after they have snapped shut over the stop edges 8, and no part of the arms 9 projects beyond the width of the cartridge, as defined by the walls of the outer shell 5, 6. The connection made between the two portions 5 and 6 of the outer shell is releasable, and the cartridge can therefore be used again after the exposure of a film.

The resilient arms 9 do not extend over the whole area of the recesses 7, thus permitting the cartridge to be easily opened by inserting a tool into the unoccupied space of each of the recesses and prising the hooked portions 10 away from the stop edges 8.

Referring now to Figs. 3 and 4, which show a second form of cartridge, an outer cover shell made up from a single portion 11 fits over the inner cartridge body 1, covering substantially the same regions of the body 1 as are covered by the outer shell 5, 6 in the

cartridge described with reference to Figs. 1 and 2, except that the rear of the cartridge, which is seen in Fig. 3, is also left substantially uncovered except for arms 12 as is described below. From both the top and bottom edges of that side of the shell 11 lying parallel to the side in which the film window (not shown) is located, there extend two resilient arms 12 provided with hooked portions 13. The resilient arms 12, as can be seen from Fig. 4, are not as thick as the wall of the shell 11. A notch 14 is provided on the inner surface of the wall of the shell 11 at the place where each resilient arm 12 extends from the shell, so that when each arm is swung from an initial position, indicated by broken lines in Fig. 4 for the upper arm, into its position in which the outer shell is fastened about the inner cartridge body 1, in which the arms lie at approximately 90° to its initial position, a sharp corner is formed by the arm and the flat portion of shell wall from it extends. The inner cartridge body 1 is thickened in regions 1a so that it lies substantially flush with the wall of the outer shell 11 in the region of that side of the cartridge from the edges of which extend the resilient arms 12, that is, the rear side of the cartridge.

In the rear side of the cartridge body 1 there are provided recesses 1b, the recesses being so located that the arms 12 lie within them when they are deflected to lie on the rear side of the cartridge, in the positions shown in Figure 3. Detents 1c are located within the recesses 1b.

The shell 11 is closed about the inner cartridge body 1, after having been pushed over it, by folding the resilient arms 12, which initially extend away from the cartridge as indicated by the broken line in Fig. 4, into the plane of the rear narrow side of the cartridge so that their hooked portions 13 snap in behind the detents 1c and thus lock the outer shell about the inner cartridge body.

The cartridge can be reopened either by inserting a tool into the spaces of the recess 1b not occupied by an arm 12 and prising the hooked portions 13 away from the detents 1c, or by compressing the shell 11 in the direction of the arrows 15 in Fig. 4, so that the hooked portions are released from the detents 1c by the spring action of the arms 12.

It will be apparent that it is possible to have other cartridges constructed in accordance with the invention, in addition to the two embodiments described with reference to the drawings. For example, the resilient arms could be shaped onto one or more of the narrow sides of the cartridge, and fit neatly into recesses on the flat upper or lower sides. As a further example, the embodiment shown in and described with

reference to Fig. 1 could be modified by providing the detents with which the main shell portion 5 and the cap portion 6 cooperate on the inner body 1 so that they act in relation to the surface of the shell as if positioned in a recess, wherein the shell and cap would have to have suitable apertures into which their resilient arms would fit when locking with the detents of the inner cartridge body.

A cartridge constructed in accordance with the invention need not, of course, be a film cartridge but could, for example, be a cartridge or cassette for recording tape.

WHAT WE CLAIM IS:—

1. A cartridge for strip material, comprising an inner body and an outer shell which fits over the inner body, the outer shell being retained over the inner body by means of releasable fastening means comprising an arm bearing a hook which arm is resiliently mounted on the outer shell and a detent located adjacent to a recess in the cartridge which opens onto the outside of the cartridge, the hook being arranged to engage the detent and the arrangement being such that the arm lies within the recess when it is in the said engagement with the detent.

2. A cartridge for strip material as claimed in claim 1, wherein neither the arm nor the detent projects substantially beyond the general external outline of the cartridge, as defined by the walls of the outer shell, when the arm is in engagement with the detent and lying within the recess.

3. A cartridge for strip material as claimed in claim 2, wherein the arm lies substantially flush with the wall of the outer shell when it is in engagement with the detent and lying within the recess.

4. A cartridge for strip material as claimed in any one of claims 1 to 3, wherein the hooked arm is made from resilient material.

5. A cartridge for strip material as claimed in claim 4, wherein the arm is formed integrally with the outer shell of the cartridge.

6. A cartridge for strip material as claimed in claim 4 or claim 5, wherein the arm engages the detent in a snap fit.

7. A cartridge for strip material as claimed in any one of claims 1 to 6, wherein

the area of the outwardly facing recess opening is greater than that area of the arm which faces outwards when the arm is lying in the recess.

8. A cartridge for strip material as claimed in any one of claims 1 to 7, wherein the outer shell comprises two portions which interlock.

9. A cartridge for strip material as claimed in claim 8, wherein the outer walls of the two portions of the outer shell lie substantially flush with each other when the two shell portions are interlocked.

10. A cartridge for strip material as claimed in claim 8 or claim 9, wherein one portion of the outer shell is provided with the detent, the other portion of the outer shell being provided with the hooked arm.

11. A cartridge for strip material as claimed in claim 8 or claim 9, wherein detents are provided on the inner body of the cartridge and there is a resiliently mounted hooked arm on each portion of the outer shell, each arm being arranged to engage a detent on the inner body of the cartridge.

12. A cartridge for strip material as claimed in any one of claims 1 to 7, wherein the outer shell is formed in one piece.

13. A cartridge for strip material as claimed in claim 12, wherein the detent is mounted on the inner body of the cartridge.

14. A cartridge for strip material as claimed in claim 12 or claim 13, wherein the arm comprises a hooked flap which can be deflected to bring it into engagement with the detent.

15. A cartridge for strip material as claimed in claim 14, wherein the arm is formed as an extension of one side of the outer shell, a notch being formed on the inner surface of the outer shell where the arm joins the said one side so that the arm forms a sharp corner with the said one side when deflected to lie along an adjacent side of the cartridge.

16. A cartridge substantially as hereinbefore described with reference to, and as shown in Figs. 1 and 2, Figs. 3 and 4, of the accompanying drawings.

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reference to Fig. 1 could be modified by providing the detents with which the main shell portion 5 and the cap portion 6 cooperate on the inner body 1 so that they act in relation to the surface of the shell as if positioned in a recess, wherein the shell and cap would have to have suitable apertures into which their resilient arms would fit when locking with the detents of the inner cartridge body.

A cartridge constructed in accordance with the invention need not, of course, be a film cartridge but could, for example, be a cartridge or cassette for recording tape.

WHAT WE CLAIM IS:—

1. A cartridge for strip material, comprising an inner body and an outer shell which fits over the inner body, the outer shell being retained over the inner body by means of releasable fastening means comprising an arm bearing a hook which arm is resiliently mounted on the outer shell and a detent located adjacent to a recess in the cartridge which opens onto the outside of the cartridge, the hook being arranged to engage the detent and the arrangement being such that the arm lies within the recess when it is in the said engagement with the detent.

2. A cartridge for strip material as claimed in claim 1, wherein neither the arm nor the detent projects substantially beyond the general external outline of the cartridge, as defined by the walls of the outer shell, when the arm is in engagement with the detent and lying within the recess.

3. A cartridge for strip material as claimed in claim 2, wherein the arm lies substantially flush with the wall of the outer shell when it is in engagement with the detent and lying within the recess.

4. A cartridge for strip material as claimed in any one of claims 1 to 3, wherein the hooked arm is made from resilient material.

5. A cartridge for strip material as claimed in claim 4, wherein the arm is formed integrally with the outer shell of the cartridge.

6. A cartridge for strip material as claimed in claim 4 or claim 5, wherein the arm engages the detent in a snap fit.

7. A cartridge for strip material as claimed in any one of claims 1 to 6, wherein

the area of the outwardly facing recess opening is greater than that area of the arm which faces outwards when the arm is lying in the recess.

8. A cartridge for strip material as claimed in any one of claims 1 to 7, wherein the outer shell comprises two portions which interlock.

9. A cartridge for strip material as claimed in claim 8, wherein the outer walls of the two portions of the outer shell lie substantially flush with each other when the two shell portions are interlocked.

10. A cartridge for strip material as claimed in claim 8 or claim 9, wherein one portion of the outer shell is provided with the detent, the other portion of the outer shell being provided with the hooked arm.

11. A cartridge for strip material as claimed in claim 8 or claim 9, wherein detents are provided on the inner body of the cartridge and there is a resiliently mounted hooked arm on each portion of the outer shell, each arm being arranged to engage a detent on the inner body of the cartridge.

12. A cartridge for strip material as claimed in any one of claims 1 to 7, wherein the outer shell is formed in one piece.

13. A cartridge for strip material as claimed in claim 12, wherein the detent is mounted on the inner body of the cartridge.

14. A cartridge for strip material as claimed in claim 12 or claim 13, wherein the arm comprises a hooked flap which can be deflected to bring it into engagement with the detent.

15. A cartridge for strip material as claimed in claim 14, wherein the arm is formed as an extension of one side of the outer shell, a notch being formed on the inner surface of the outer shell where the arm joins the said one side so that the arm forms a sharp corner with the said one side when deflected to lie along an adjacent side of the cartridge.

16. A cartridge substantially as hereinbefore described with reference to, and as shown in Figs. 1 and 2, Figs. 3 and 4, of the accompanying drawings.

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