

PATENT SPECIFICATION

(11) 1320 404

DRAWINGS ATTACHED

- (21) Application No. 30918/70 (22) Filed 25 June 1970
 (31) Convention Application No. 837279 (32) Filed 27 June 1969 in
 (33) United States of America (US)
 (44) Complete Specification published 13 June 1973
 (51) International Classification G11B 23/10
 (52) Index at acceptance G2E A6A2
 (72) Inventors DIANNE BEVERLEY AINSLIE and
 ARTHUR HUNT CRAPSEY



(54) REEL 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:—

This invention relates to cartridges for receiving a reel containing an elongate strip of web material, such as motion picture film, the cartridge being positionable on a motion picture projector or other strip using apparatus for removal of the strip from the cartridge and for subsequent rewinding of strip into the cartridge.

According to the present invention there is provided a cartridge having a chamber for rotatably receiving a reel of strip material, the chamber being defined by two spaced parallel side walls and by an edge wall, the chamber receiving the reel with the reel axis perpendicular to the said side walls and with the edge wall extending circumferentially around the reel, and the cartridge comprising two separable complementary parts which together provide these walls and are arranged to be fastened together to enclose a reel in the chamber, both of these parts providing a portion of at least one of the said side walls, and the said one of the side walls having a latching member provided by one of the two parts and having an opening provided in the other of the two parts for receiving the latching member to fasten the two parts together in the closed condition of the cartridge, the latching member being movable into and out of the opening during assembly and disassembly, respectively, of the cartridge.

Preferably, the latch structure on each cartridge part is located on a relatively wide, flat side wall of the cartridge which facilitates flexing of the latch structure during latching and unlatching operations.

Cartridges 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 cartridge according to the present invention;

Fig. 2 is an elevation of the side of the cartridge shown in Fig. 1;

Fig. 3 is an elevation of the opposite side of the cartridge;

Fig. 4 is an enlarged section view taken along line 4—4 of Fig. 2;

Fig. 5 is an elevation of the left side of the cartridge as viewed in Fig. 1;

Fig. 6 is an elevation of one cartridge part according to another embodiment of the invention;

Fig. 7 is an elevation of a second cartridge part which co-operates with the cartridge part shown in Fig. 6; and

Figs. 8 and 9 are views partly in elevation and partly in section taken along lines 8—8 and 9—9 of Figs. 6 and 7, respectively.

Referring now to Figs. 1—3 of the drawings, one cartridge according to this invention is generally designated 10 and comprises two separate cartridge parts 12 and 14 which may be referred to as a base or lower part and a cover part, respectively. Part 12 comprises front and rear side walls 16 and 18, respectively, which are relatively wide, substantially flat rectangular walls. Walls 16 and 18 are joined at opposite side edges thereof by end walls 20 and 22. The walls 16 and 18 are thin, and they are made from a material which permits them to flex towards each other but to spring back to their moulded shape. The walls jointly define a recess 24 extending substantially entirely across the cartridge and opening at the upper end thereof into a similar recess (described later) in the upper cartridge part 14. Cartridge part 14 has a slot 19 extending through side wall 20, the bottom of the cartridge and side wall 22. A film feeding mechanism (not shown) of a projector can enter the cartridge through this slot and engage a roll of film on a reel

therein for removing film from the cartridge through a portion of the slot in the bottom of the cartridge. An asymmetrically located notch 26 in wall 16 and a corresponding notch 28 in wall 18 are aligned with each other and are intended to co-operate with a boss (not shown) on a projector to prevent reverse mounting of the cartridge on the projector. Suitable indicium shown as an arrow 30, on the lower edge of cartridge part 12 is aligned with corresponding indicium (not shown) on a projector for positioning of the cartridge on the projector.

As best seen in Figs. 1 and 5, the side edges 20 and 22 of cartridge part 12 are stepped from the front side wall 16 to the rear side wall 18 with the stepped portions being complementary to corresponding edge wall portions of the upper edge portion 14 so that the edge walls on the two cartridge parts mate with each other when the parts are properly assembled together. This stepped configuration of the edge walls together with the fact that the rear wall 18 is higher than the front wall 16, helps prevent any attempt to assemble the cartridge parts improperly. Also, the stepped edge wall construction strengthens the cartridge at the ends thereof without unduly limiting flexing in the area of the latching structure described later.

An elongate, rectangular opening 34 extends through the front wall 16 and is adapted to receive a latch member on upper cartridge parts 14. Similarly, two spaced, generally rectangular openings 36 and 38 (Fig. 3) are provided in rear wall 18 for receiving latch portions on the back wall of cartridge part 14. Openings 34, 36 and 38 are each adjacent to the upper edge of the respective side wall of cartridge part 12, but such openings are spaced from the adjacent edge of the cartridge part by latching bars designated 40, 42 and 44, respectively. As shown in Fig. 4, these latching bars are recessed from the adjacent faces of the inner surfaces of side walls 16 and 18.

The upper cartridge part 14 comprises a front side wall 50 which is spaced from and generally parallel to a rear side wall 52. Walls 50 and 52 are joined at their side edges by edge walls 54 and 56 and at their upper edges by an edge or top wall 58. Wall 58 may be recessed as shown in Fig. 1 to accommodate a suitable label 60 used for identifying the film strip within the cartridge. The side and edge walls of part 14 are substantially rectangular in shape, as illustrated, and the lower edge of walls 54 and 56 are stepped to complement the adjacent or corresponding edge of walls 20 and 22 on the lower cartridge part so that the edge walls of the cartridge parts mate with each other when the parts are assembled together. The side walls, edge walls and top walls of cartridge part 14 jointly define a recess 61 (Fig. 4)

which opens to the bottom of the part and which co-operates with recess 24 in the lower cartridge part to form a chamber for a reel of film.

Wall 50 has a generally rectangular shaped opening 62 spaced from all side edges of the wall. Wall 52 has a semi-circular notch or opening 64 along its lower edge which co-operates with a similar semi-circular notch 66 in the upper edge of wall 18 of the lower cartridge part to jointly define a circular opening 62.

Means are provided on the cartridge exterior surface for locating or orienting the cartridge with respect to the motion picture projector. This orienting structure is best illustrated in Fig. 3 of the drawings and comprises ribs 70 and 72 at the side edges of the cartridge wall 18, a cross rib 74 extending between the ribs 70 and 72 along the upper edge of cartridge part 12, and a raised, generally rectangular portion 76 on wall 52 of cartridge part 14. The cartridge can be latched in position on the projector by latch members carried by the projector which are adapted to be received in openings 78 and 80 in wall 18.

Referring now to Fig. 4, cartridge part 14 has latching structure thereon adapted to be received in openings 34, 36 and 38 on part 10 for holding the cartridge parts in assembled relation. This latching structure comprises a flexible finger 82 projecting from the lower edge of wall 50. A portion of the finger 82 is cut away as shown at 84 with the cut away portion being adapted to fit behind bar 40 on part 12 when the parts are assembled. At the lower end of finger 80 there is a latching portion designated 86 which is generally rectangular in shape and is adapted to fit within and substantially fill the opening 34 below bar 40 in cartridge wall 16. Finger 82 is flexed inwardly into the recess 24 formed by the lower cartridge part during insertion of and removal of the latching member from opening 34.

The latching structure and cartridge part 14 further includes two latching fingers 88 and 90 projecting from wall 52 in spaced relation to each other. These fingers also have portions which fit behind bars 42 and 44, respectively, on wall 18. Latching portions 96 and 98 at the lower end of fingers 88 and 90, respectively, are adapted to enter and substantially fill the openings 36 and 38, respectively, in wall 18 when the parts are assembled. Fingers 88 and 90 are flexed inwardly into recess 24 during insertion and removal of the latching members into openings 36 and 38.

Because the latching structures on cartridge part 14 are located intermediate the ends of the relatively wide walls 50 and 52 of the cartridge, and because the cartridge walls are comparatively thin and flexible in the

edge wall 142 with the upper edge of such guide ribs being immediately adjacent the slots and intermediate the ends of the slots. Thus, as the tongues move upwardly they engage the guide ribs and slide along such ribs and into the slots.

An integrally formed latch finger 160 projects from the inner face of wall 140 and extends below the lower edge 162 of the rest of wall 140. Edge 162 is engageable with guide members 130 and 132 on cartridge part 100 during assembly of the cartridge to bring edge 162 on wall 140 into abutting engagement with edge 134 on wall 106. Because the guide members 130 and 132 are spaced apart and do not extend into the space above opening 120 in wall 106 the latch finger 160 is free to pass between the guide members and behind the upper portion of wall 106 during such assembly. At the lower end of finger 160 there is a latching portion designated 164 which projects outwardly from the adjacent portions of finger 160 and is adapted to fit within opening 120 for latching the cartridge parts together. Finger 160 and/or at least the portions of wall 140 adjacent thereto are flexible enough to allow inward movement of finger 160 and latching portion 164 for disengagement of the latch structure and separation of the cartridge parts.

Cartridge part 102 has a rectangular opening 166 which is aligned with opening 116 in wall 104 to accommodate a projector spindle. Mating structure may be provided on the cartridge parts for effecting vertical stacking of cartridges. This structure is illustrated as a projecting annular rim 169 on the outer surface of part 102 around opening 166. Rim 169 is dimensioned so that it will enter the circular opening 116 in wall 104 of a cartridge placed over the part 102. A similar rim may be provided on the earlier described embodiment. The bottom edge of each cartridge is flat for vertical positioning of cartridges in side-by-side relation.

The lower end portion of edge walls 144 and 146 each have openings or recesses therein designated 170 and 172 which receive the nibs 124 and 126 during assembly of the cartridge parts. The cooperation between the nibs and the recesses limit lateral movement of the parts with respect to each other along the interface between the cartridge parts.

WHAT WE CLAIM IS:—

1. A cartridge having a chamber for rotatably receiving a reel of strip material, the chamber being defined by two spaced parallel side walls and by an edge wall, the chamber receiving the reel with the reel axis perpendicular to the said side walls and with the edge wall extending circumferentially around the reel, and the cartridge comprising two separable complementary parts which

together provide these walls and are arranged to be fastened together to enclose a reel in the chamber, both of these parts providing a portion of one of the said side walls, and the said one of the side walls having a latching member provided by one of the two parts and having an opening provided in the other of the two parts for receiving the latching member to fasten the two parts together in the closed condition of the cartridge, the latching member being movable into and out of the opening during assembly and disassembly, respectively, of the cartridge.

2. A cartridge as claimed in Claim 1, wherein each cartridge part comprises two spaced parallel side walls joined by a circumferential edge wall and defining a recess therein, the recesses in the two parts co-operating in the closed condition of the cartridge to form the chamber for the reel.

3. A cartridge as claimed in Claim 1 or Claim 2, wherein the latch member comprises a flexible finger positionable between the said side walls, the said latch portion of the latch member being located on this finger.

4. A cartridge as claimed in Claim 2, wherein the latch member and the opening are each substantially centrally located on the side wall of the respective cartridge part, and the latch member is flexible to permit movement of the latch portion into and out of the opening.

5. A cartridge as claimed in Claim 4 wherein the latch means for the cartridge further comprises two additional openings spaced from one another in the other side wall of the first cartridge part, and two additional latch portions carried by the other side wall of the other cartridge part, the said additional latch portions being spaced from each other and being movable into and out of the said additional openings during assembly and disassembly respectively of the cartridge.

6. A cartridge as claimed in any of Claims 2 to 5, wherein each edge wall of the cartridge parts is stepped from one side wall to the other side wall, the edge walls of one cartridge part being complimentary to the corresponding edge wall of the other cartridge part so that the edge walls mate with each other when the cartridge parts are assembled.

7. A cartridge as claimed in Claim 1, wherein latch means for the cartridge further comprises a second opening spaced from the first opening and located on another wall of the cartridge, and a flexible latch portion carried by a cartridge wall portion and engageable in said second opening for securing said parts together.

8. A cartridge as claimed in Claim 7, wherein the latch means further comprises at least one elongate slot in an edge wall of the



edge wall 142 with the upper edge of such guide ribs being immediately adjacent the slots and intermediate the ends of the slots. Thus, as the tongues move upwardly they engage the guide ribs and slide along such ribs and into the slots.

An integrally formed latch finger 160 projects from the inner face of wall 140 and extends below the lower edge 162 of the rest of wall 140. Edge 162 is engageable with guide members 130 and 132 on cartridge part 100 during assembly of the cartridge to bring edge 162 on wall 140 into abutting engagement with edge 134 on wall 106. Because the guide members 130 and 132 are spaced apart and do not extend into the space above opening 120 in wall 106 the latch finger 160 is free to pass between the guide members and behind the upper portion of wall 106 during such assembly. At the lower end of finger 160 there is a latching portion designated 164 which projects outwardly from the adjacent portions of finger 160 and is adapted to fit within opening 120 for latching the cartridge parts together. Finger 160 and/or at least the portions of wall 140 adjacent thereto are flexible enough to allow inward movement of finger 160 and latching portion 164 for disengagement of the latch structure and separation of the cartridge parts.

Cartridge part 102 has a rectangular opening 166 which is aligned with opening 116 in wall 104 to accommodate a projector spindle. Mating structure may be provided on the cartridge parts for effecting vertical stacking of cartridges. This structure is illustrated as a projecting annular rim 169 on the outer surface of part 102 around opening 166. Rim 169 is dimensioned so that it will enter the circular opening 116 in wall 104 of a cartridge placed over the part 102. A similar rim may be provided on the earlier described embodiment. The bottom edge of each cartridge is flat for vertical positioning of cartridges in side-by-side relation.

The lower end portion of edge walls 144 and 146 each have openings or recesses therein designated 170 and 172 which receive the nibs 124 and 126 during assembly of the cartridge parts. The cooperation between the nibs and the recesses limit lateral movement of the parts with respect to each other along the interface between the cartridge parts.

WHAT WE CLAIM IS:—

1. A cartridge having a chamber for rotatably receiving a reel of strip material, the chamber being defined by two spaced parallel side walls and by an edge wall, the chamber receiving the reel with the reel axis perpendicular to the said side walls and with the edge wall extending circumferentially around the reel, and the cartridge comprising two separable complementary parts which

together provide these walls and are arranged to be fastened together to enclose a reel in the chamber, both of these parts providing a portion of one of the said side walls, and the said one of the side walls having a latching member provided by one of the two parts and having an opening provided in the other of the two parts for receiving the latching member to fasten the two parts together in the closed condition of the cartridge, the latching member being movable into and out of the opening during assembly and disassembly, respectively, of the cartridge.

2. A cartridge as claimed in Claim 1, wherein each cartridge part comprises two spaced parallel side walls joined by a circumferential edge wall and defining a recess therein, the recesses in the two parts co-operating in the closed condition of the cartridge to form the chamber for the reel.

3. A cartridge as claimed in Claim 1 or Claim 2, wherein the latch member comprises a flexible finger positionable between the said side walls, the said latch portion of the latch member being located on this finger.

4. A cartridge as claimed in Claim 2, wherein the latch member and the opening are each substantially centrally located on the side wall of the respective cartridge part, and the latch member is flexible to permit movement of the latch portion into and out of the opening.

5. A cartridge as claimed in Claim 4 wherein the latch means for the cartridge further comprises two additional openings spaced from one another in the other side wall of the first cartridge part, and two additional latch portions carried by the other side wall of the other cartridge part, the said additional latch portions being spaced from each other and being movable into and out of the said additional openings during assembly and disassembly respectively of the cartridge.

6. A cartridge as claimed in any of Claims 2 to 5, wherein each edge wall of the cartridge parts is stepped from one side wall to the other side wall, the edge walls of one cartridge part being complimentary to the corresponding edge wall of the other cartridge part so that the edge walls mate with each other when the cartridge parts are assembled.

7. A cartridge as claimed in Claim 1, wherein latch means for the cartridge further comprises a second opening spaced from the first opening and located on another wall of the cartridge, and a flexible latch portion carried by a cartridge wall portion and engageable in said second opening for securing said parts together.

8. A cartridge as claimed in Claim 7, wherein the latch means further comprises at least one elongate slot in an edge wall of the



* C L M S *

1,320,404

3

3

area of the latching structure, the latching fingers can be deflected inwardly into the recess 24 formed in the lower cartridge part during assembly and disassembly of the cartridge without unduly stressing the walls of the cartridge. In addition, each of the latching fingers is relatively narrow and sufficiently long to permit flexing of the fingers alone without damage thereto. Thus, the fingers may be flexed inwardly, the upper cartridge part moved into its assembled position on the lower cartridge part, and the latching fingers released to allow them to snap outwardly to engage the latching portions 86, 96 and 98 in their respective openings in the lower cartridge part.

Parts 12 and 14 preferably have rails 99 on the inner surfaces of the edge walls. These rails project into the space between reel flanges in the cartridge to limit clockspringing film on the reel to the area between the reel flanges.

Referring now to Figs. 6—9 of the drawings, another embodiment of the invention is shown which is particularly suitable for receiving comparatively large size rolls of film, such as rolls of 200 or 400 foot film lengths. This cartridge comprises a first cartridge part 100, which may be referred to as the base or lower portion of the cartridge, and a second cartridge part generally designated 102 which may be referred to as the upper or cover portion of the cartridge. Cartridge part 100, as well as the lower cartridge part 12 in the previously described embodiment may be made of materials which are not necessarily readily flexible. On the other hand, it is desirable to form the upper cartridge part 102 (and part 14) of a material capable of easily flexing to at least a limited extent, thereby permitting deflection of a latch member in a manner described hereinafter.

Cartridge part 100 has a wall 104 forming substantially one entire side of the cartridge. A second wall 106 on part 100 is relatively short and forms only a portion of a second side of the cartridge. Positioned between walls 104 and 106 and extending upwardly along wall 104 above wall 106 are edge walls 108 and 110. The edge walls hold walls 104 and 106 in substantially parallel relation and co-operate with such walls to jointly define a portion of a chamber for a reel of film (not shown). An elongate slot 111 is provided through the edge walls and the bottom of the cartridge for passage of a film feeding mechanism and film.

Projecting from the upper edge of wall 104, i.e. the edge opposite wall 106, are two spaced integrally formed tongue members 112 and 114 that form part of the latching structure for holding the two cartridge parts assembled. Wall 104 has a centrally located circular opening 116 for

receiving a spindle of a motion picture projector. A rib 118 may be provided on wall 104 to limit flexing of the wall between its edge portions. Structure generally designated 119 may be provided on the outer surface of wall 104 for orienting the cartridge on a projector. Such orienting structure may be identical to that shown in Fig. 3.

Wall 106 has an elongate, substantially rectangular opening 120 which is adapted to receive a latch member on part 102 in the manner described later. Wall 106 preferably includes an arrow 122 or other suitable mark-indicium positionable in alignment with corresponding indicium on a projector for determining the position of the cartridge with respect to the projector. It will be observed that arrow 122 may be asymmetrically located, and such is especially desirable where, as in the present instance, the two cartridges disclosed are adapted to fit on a single projector having a movable spindle, therefore requiring the orienting structure 119 on the cartridge to be asymmetrically located.

Edge walls 108 and 110 having, at their upper edges, projecting nibs 124 and 126. These nibs enter corresponding recesses in part 102 as the cartridge is assembled. Ribs 128 may be provided on edge walls 108 and 110 for entering the space between two reel flanges to limit clockspringing of film material on the reel.

Projecting inwardly toward each other from edge walls 108 and 110 are a pair of guide members or flanges 130 and 132. The guide members are positioned so that their axially outermost face (as viewed in Fig. 6) is recessed from the outer surface of wall 106. Guide members 130 and 132 function to guide a wall on cartridge part 102 into abutting engagement with the upper edge 134 of wall 106. This guiding movement also facilitates insertion of a latch portion on part 102 into opening 120.

Referring now to Figs. 7 and 9, cartridge part 102 comprises a side wall 140 and an edge wall projecting outwardly therefrom along the top edge and two adjacent side edges of wall 140. The top edge wall portion is designated 142 and the other two portions thereof are indicated at 144 and 146. Supported by the edge wall portions are a pair of projecting rails 148 adapted to enter the space between reel flanges as described earlier in connection with the similar rails on the other cartridge parts. Edge wall 142 has two elongate, spaced slots 150 and 152 adjacent the edge of the end wall opposite from side wall 140. These slots receive the projecting tongues 112 and 114 on the upper edge of the wall 104 and form part of the latching structure of this invention. In order to guide the tongues into their respective slots, guide means shown in the form of ribs 154 and 156 are provided between rails 148 and

cartridge, and a tongue on one of said side walls positionable in said slot.

9. A cartridge as claimed in Claim 1, wherein the first cartridge part comprises a first wall forming one side of the cartridge and a second wall forming only a portion of a second side of the cartridge, an edge wall positioned between the first and second walls for positioning these walls in spaced relation and in parallel planes to define therebetween a portion of the chamber for receiving a reel of strip material, the said first wall having along an edge thereof spaced from the second wall a pair of tongue members spaced from each other, and the second wall having an opening therein for receiving latch structure; and the second cartridge part comprising a first side wall and an edge wall arranged to extend along one end of the said first cartridge part and partly along each of two adjacent edges of the first cartridge part, said edge wall having a pair of elongate spaced slots extending therethrough for receiving the said tongue members on the first cartridge part when the parts are assembled together, and the said side wall of the second cartridge part having a latch finger extending therefrom at an edge thereof opposite from the said slot, and the said finger having a latching portion positionable within the said opening in the said second wall of the first cartridge part when the parts are assembled together, the said side wall of the second second cartridge part being flexible in the area of the finger to permit flexing of the finger for moving the said latching portion into and out of said opening in the said second wall during assembly and disassembly of the parts.

10. A cartridge as claimed in Claim 9, further comprising guide means carried by the said second cartridge part adjacent to the slots therein, this guide means being positioned to be engageable by the said tongue members on the first cartridge part for guiding the tongue members into the slots.

11. A cartridge as claimed in Claim 9, further comprising guide means carried by the first cartridge part adjacent to one edge of the second wall thereof, this guide means being engageable by a portion of the said side wall of the second cartridge part for guiding such wall into abutting relation with an edge of the said second wall of the first cartridge part.

12. A cartridge as claimed in any preceding claim, wherein one of the cartridge parts has a portion on one face thereof adapted to mate with a co-operating portion on another face of a similar cartridge to interlock the cartridges when they are stacked on top of each other.

13. A cartridge as claimed in Claim 12, wherein the said portion on the cartridge part comprises a rim surrounding an opening for receiving a reel supporting spindle, the rim projecting from one side wall of the cartridge part, the other side wall of the cartridge having a recess in which the rim of an adjacent cartridge may be received.

14. A cartridge substantially as hereinbefore described with reference to Figures 1, 2, 3, 4 and 5, or to Figures 6, 7, 8 and 9, of the accompanying drawings.

L. A. TRANGMAR, B.Sc. C.P.A.,
Agent for the Applicants.

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1973.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

