

[54] **REEL SEALING AND STORAGE APPARATUS**

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[73] Assignee: **Barry Wright Corporation**, Watertown, Mass.

[22] Filed: **Dec. 24, 1969**

[21] Appl. No.: **887,962**

[52] U.S. Cl.211/13, 206/53

[51] Int. Cl.A47L 7/00

[58] Field of Search211/13, 40; 312/8, 9, 10; 206/53, 59

[56] **References Cited**

UNITED STATES PATENTS

3,095,969 7/1963 Morrison206/53
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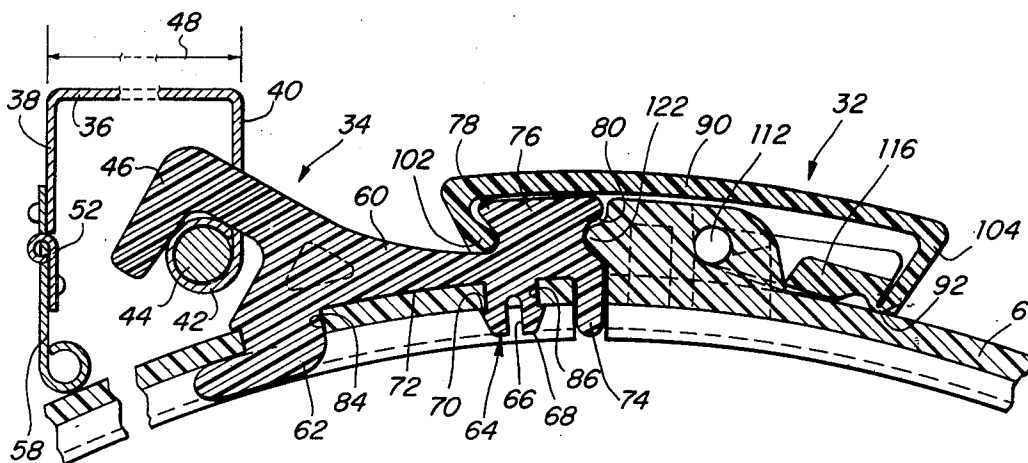
3,310,178 3/1967 Wright211/40
3,472,386 10/1969 Osojnak211/40
3,490,579 1/1970 Kulka206/53

Primary Examiner—Nile C. Byers, Jr.
Attorney—Milton E. Gilbert

[57] **ABSTRACT**

A reel sealing storage device comprising an elongated flexible band having an undulated lower surface for engaging with the sides of a storage reel, the ends of said band being provided with a latching means in which a catch member is of curved configuration to seat upon the curved surface of the band, the latch being in two basic components assembled in a releasable manner to the ends of the band, one element of the latch being provided with a centering tang for mating with guide legs on one band end.

20 Claims, 9 Drawing Figures



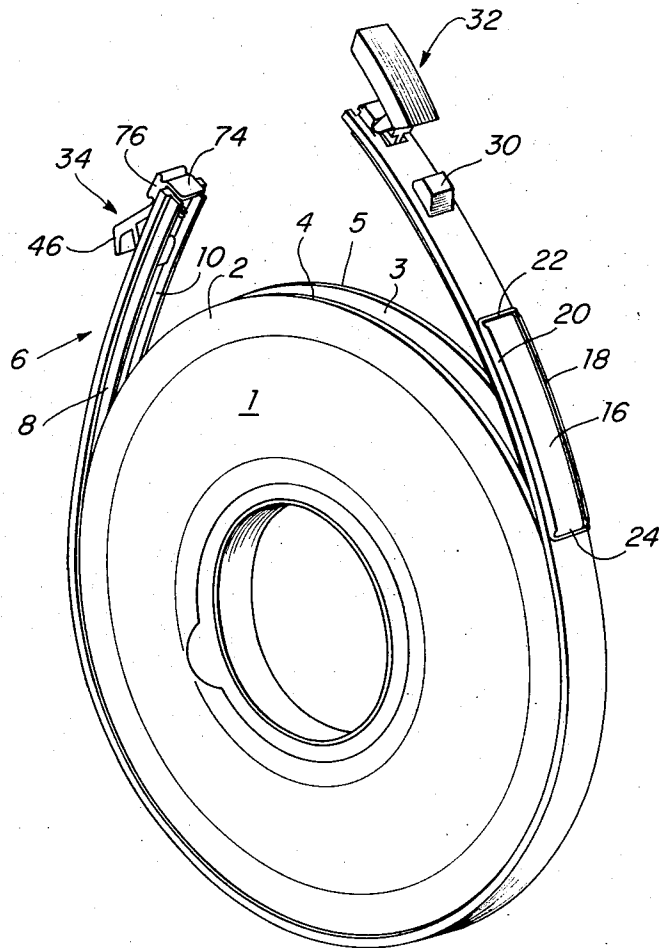


FIG. 1.

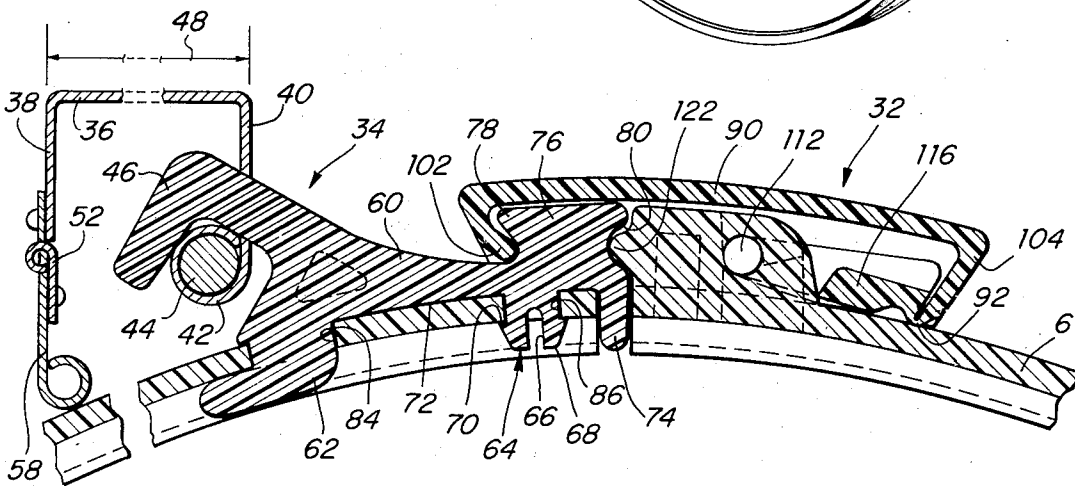


FIG. 2.

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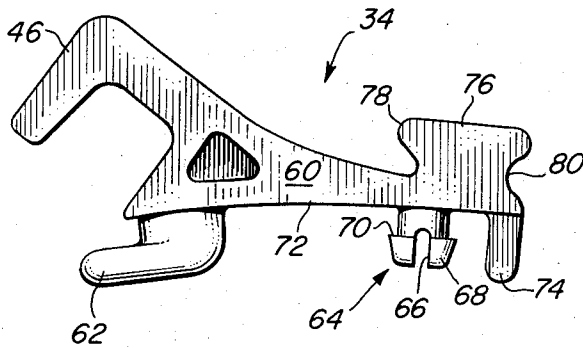


FIG. 3.

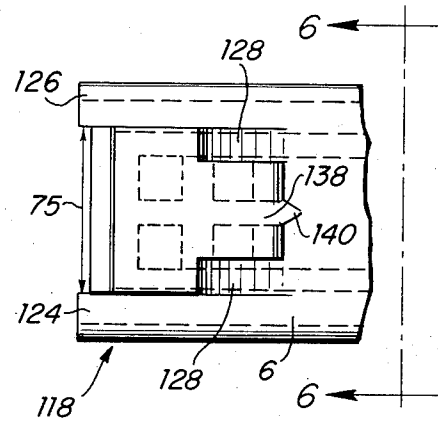


FIG. 4.

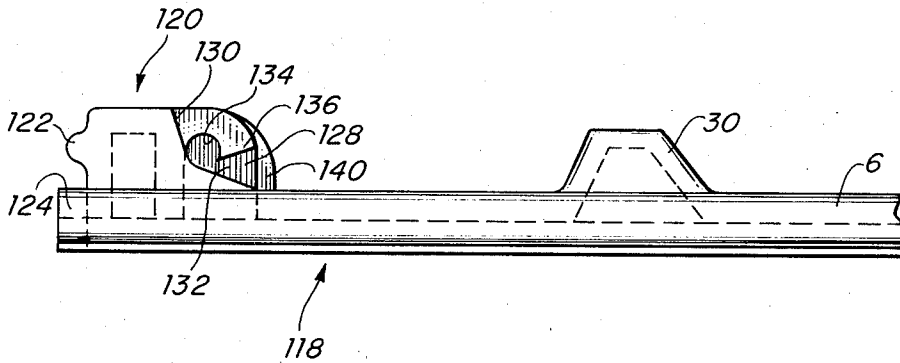


FIG. 5.

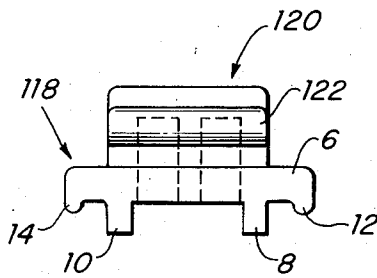


FIG. 6.

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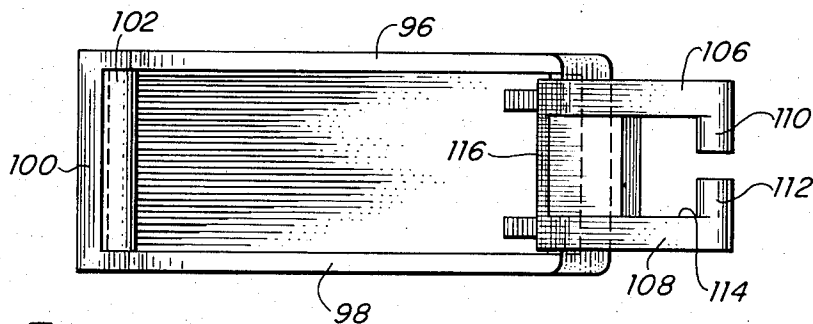


FIG. 7.

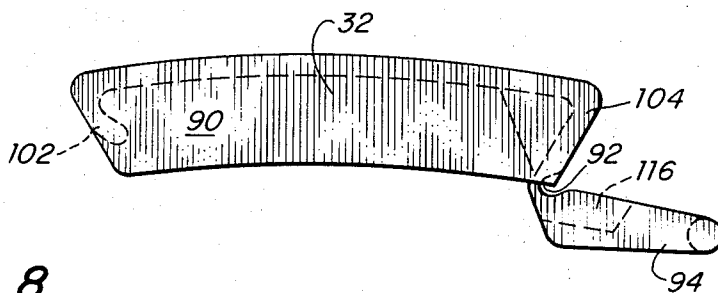


FIG. 8.

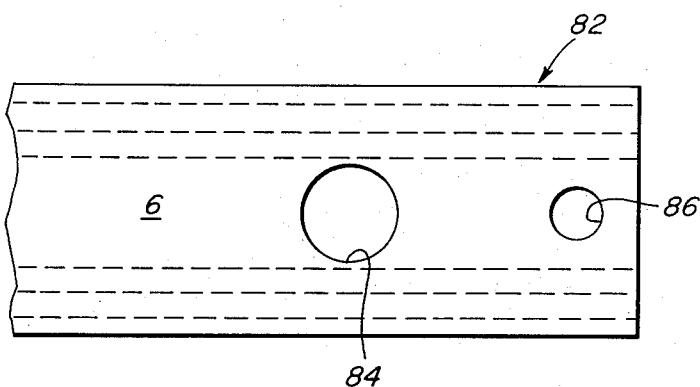


FIG. 9.

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REEL SEALING AND STORAGE APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to reel storage apparatus of the type described in U.S. Pat. No. 3,310,178, granted on Mar. 21, 1967 to D. M. Wright, and is in the nature of an improvement thereover. It is specifically directed to a novel latch means for use with a sealing band of the type described in the aforesaid patent. Various forms of latching means have been employed with sealing bands and it is a constant goal to provide latches which permit easier assembly. Although sealing bands for reel storage apparatus as described in the aforesaid patent are generally satisfactory and have been widely accepted in industry, it is desirable to further reduce the cost thereof, and to permit ready replacement of the latch element in the event it becomes damaged.

SUMMARY OF THE INVENTION

It is one object of the invention to provide an improved latch means for a sealing band used in reel storage apparatus. A further object of the invention is to provide a latch means which may be readily assembled and disassembled from a flexible sealing band.

A still further object of the invention is to provide a reel sealing device which is simple in construction and relatively inexpensive to manufacture. A still further object of the invention is to provide a latch means for a sealing band which avoids misalignment of the band upon the reel to assure rapid mounting of the band on the reel.

The apparatus of the invention is adapted to be employed preferably with a tape storage reel of the type having a central hub separating a pair of spaced and generally circular sides. The sealing ring comprises a strip of flexible material adapted to be formed into a looped configuration to encircle the reel by engagement with the outer edges of the circular sides. The band is provided with a latch means which stretchably draws the band into engagement with the periphery of the reel and in which the catch element of the latch is curved to lie flat on the curved surface of the band. Thus, more positive overcenter loading of the catch is provided and accidental backing off of the catch is prevented. Additionally, the latch is provided with various shaped tang elements to engage in appropriately formed openings at the ends of the band, thus eliminating riveting or other permanent fastening of the latch to the band. Such construction enables ready replacement of the latch should it become defective without requiring the employment of any tools.

According to another feature of the invention, one element of the latch is provided with a centering tang which engages with the edge of the opposite end of the band to insure self-alignment of the band upon the reel when the band is engaged thereon and latched.

These and further objects of the invention will become more readily apparent upon a reading of the detailed description following hereinafter and upon an examination of the drawings, wherein:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of a flexible band employing the latch means of the invention;

FIG. 2 is a cross sectional view through the ends of the band illustrating the latch means of FIG. 1 and the mounting thereof in storage apparatus;

FIG. 3 is a side view of the hanger element of the latch;

FIG. 4 is a top view of one end of the band upon which the catch element of the latch is mounted;

FIG. 5 is a side view of the end of the band shown in FIG. 4;

FIG. 6 is a view taken along lines 6—6 of FIG. 4;

FIG. 7 is a bottom view of the catch element of the latch means of the invention;

FIG. 8 is a side view of the catch element of the latch shown in FIG. 7; and

FIG. 9 is a top view of the end of the band upon which the hanger element of the latching means of the invention is mounted.

DETAILED DESCRIPTION OF THE INVENTION

With reference to FIG. 1 it is seen that the tape storage reel 1 is provided with circular sides 2 and 3, which present peripheral edges 4 and 5, respectively. The flexible band 6 is provided on its underside with ribs 8 and 10. These ribs 8 and 10 engage the inner surfaces of the sides 2 and 3, respectively, of the reel 1.

As shown more clearly in FIG. 6 the underside of the band 6 may be further provided with smaller ribs 12 and 14 to engage the outer surfaces of the sides 2 and 3 of the reel 1.

Labeling for the reels can be conveniently applied to a integrally molded label holder 16 formed on the band 6 on the exterior thereof. This label holder may be generally rectangular in configuration and is constructed with overhanging ridges 18, 20, 22 and 24 to form a pocket for retention of a thin label strip which can be inserted into this pocket from either end of the holder. Such a label may be provided with adhesive on its under surface or may be of such thickness as to be held within the holder.

In order to prevent accidental release of the catch, as described hereinafter, the band 6 is provided with the externally projecting protrusion 30 which projects substantially as high above the exterior of the band surface as does the catch portion 32 of the latch, and is spaced close thereto so as to deflect any interfering items from engagement with the catch member. The protrusion may be of a hollow integrally molded configuration.

The latching means is formed into two portions which are referred to hereinafter as the catch portion 32 and the hanger portion 34.

As described in the aforementioned U.S. Pat. No. 3,310,178 the storage reels are mounted into a storage apparatus which includes a horizontally oriented suspended metal rack member 36 adapted to support the load of a plurality of reels. This rack member is generally of an inverted U-shaped form as shown in FIG. 2 with depending sides 38 and 40. The depending side 40 is formed into a looped end 42 for engagement with a hanger bar 44, upon which the hooked end 46 of the hanger portion 34 of the latch means is mounted.

The distance 48 between the depending sides 38 and 40 of the suspended rack member is of a dimension preferably less than half the over-all diameter of the reel 1. As described more fully in the aforementioned

US Patent the rack member may be provided with ejection assist means, including an ejection assist plate 50 which is suspended below the depending side 38 by means of a spring loaded hinge 52.

As shown more clearly in FIGS. 2 and 3, the hanger portion of the latch means 34 comprises a base 60 which is preferably a molded element, which has formed on the underside thereof an L-shaped locking tab element 62. The element 62 extends rearwardly as viewed in FIGS. 2 and 3. The body 60 also is formed with a depending furcated tang 64 which is formed with a central slot 66 in order to provide a spring effect. This tang 64 is tapered at its lower end to form a tapered detent portion 68 which provides a detenting surface 70. The distance between the surface 70 and the underside 72 of the base 60 is preferably slightly less than the thickness of the band 6 in order to provide a tight engagement of the detenting surface 70 with the underside of the band 6 as viewed in FIG. 2. The forward portion of the body 60 is provided with a depending alignment flange 74 which is of a width slightly less than the dimension 75 (see FIG. 4) between the guide legs 124 and 126 of the band 6. The upper portion of the body 60 is provided with the hooked end 46, as described previously, and the forward portion of the body is provided with an alignment boss 76. The boss 76 is formed at its rear with a catch retaining ridge 78 and the forward portion of the boss is provided with the alignment recess 80.

As shown in FIG. 9, the end 82 of the band 6 is provided with spaced apart circular openings 84 and 86 to accommodate the locking tab element 62 and tang 64, respectively of the hanger portion 34 of the latch means. The employment of round holes is desirable in forming plastic since it avoids stresses and the problem of cracking.

The catch portion 32 of the latch means is shown more clearly in detail in FIGS. 7 and 8. It comprises a hollow body 90 and a mounting element 94 joined by a flexure point 92. The hollow body 90 is provided with side walls 96 and 98 and an angled front wall 100. The side walls 96 and 98 are slightly curved at the lower end, as shown in FIG. 8, to conform closely to the curved surface presented by the band 6 when assembled on a reel. The lowermost portion of the front wall 100 is formed with an inwardly extending end lip 102 which engages under the catch retaining ridge 78 as shown in FIG. 2. The flexure point 92 is a thin section of the molded material of the catch portion 32 and acts as a hinge joining the bottom of the rear wall 104 of the hollow body 90 with the mounting element 94.

The mounting element 94 is provided with two side rails 106 and 108, each of which is formed with inwardly projecting spaced-apart pivot bars 110 and 112, respectively. The side rails 106 and 108 are joined by a flange 116 which is of less thickness than the thickness of the side rails and extends only partially for the length of the side rails so as to form a central opening 114 therebetween.

The other end of the band 118 shown in FIGS. 4-6 is specially formed so as to provide a mounting for the catch portion 32 and also to provide a mating arrangement for the hanger portion 34. The forward end of the band portion 118 is provided with a mounting stud 120. This mounting stud has a centering ridge 122 formed

on its forward portion. The band 118 is provided with guide legs 124 and 126 which are spaced apart by the dimension 75 shown in FIG. 74 and extend outwardly a distance somewhat greater than the thickness of spacer flange 74. The mounting stud 120 is formed on each side with rearwardly extending guide ramps 128 the forward portion of the ramps terminating in forward ramp walls 130. The inner portion of the mounting stud is hollowed out to form a recess 132 adjacent the guide ramps 128, and the mounting stud 120 is so formed as to provide a partial journal 134 which has a rearwardly and downwardly extending retention lip 136. The central portion of the mounting stud 120 is provided with a central web 138 which has a rearwardly extending tapered edge 140.

The assembly and operation of the latch means of the invention is more clearly understood with reference to the foregoing figures and more particularly with reference to the showing in FIGS. 1 and 2. The hanger portion 34 of the latch means is first assembled to the end 82 of the band 6 by inserting the locking tab element 62 into the opening 84 then rotating the portion 34 until the tang 64 enters the opening 86. Pressure upon the alignment boss 76 will then cause slight compression of the furcated portion of the tang 64 because of the presence of the slot 66 and the tang 64 will pass through the opening 86 until the detenting surface 70 is underneath the central web of the band 6. At this time the entire under surface 72 of the base 60 will be contiguous to the band surface and the depending spacer flange 74 will be located just forward of the band end 82, all as shown in FIG. 2.

Next, the catch portion 32 of the latch means is assembled to the band end 118 by placing the pivot bars 110, 112 on either side of the tapered edge 140 of the central web 138 and exerting forward pressure on the side rails 106 and 108. The side rails will then slide forward along the guide ramps 128 and by application of additional pressure the pivot bars will be caused to enter the recess 132 and come to rest within the partial journals 134. Because of the flexible nature of the material of which the band 6 is composed the retention lip 136 will snap around the pivot bars and cause positive retention of the catch portion 32 within the mounting stud 120.

Referring now to FIG. 1, the band 6 is assembled around the reel 1 with the peripheral edges 2 and 3 of the sides 4 and 5 located between the ribs 8, 10, 12 and 14. The band is then drawn around the reel and the two ends 82 and 118 are drawn towards one another. The guide legs 124 and 126 are placed on either side of the spacer flange 74, with the centering ridge 122 placed within the alignment recess 80. In this manner even without the latch being engaged the band is securely positioned around the reel with no misalignment. The latch can then be engaged by moving the body 90 forward, pivoting about the pivot bars 110, 112, and slightly downwardly so that the lip 102 is located behind the catch retaining ridge 78. By then exerting slight downward pressure on the rear of the body 90 the latch is engaged in the position shown in FIG. 2. Because of the overcentered arrangement of the latch and the close proximity of the lower curved edges of the side walls 96, 98 of the body 90 to the now looped band 6, a very positive latching is accomplished, which

cannot be released by dropping the reel. Furthermore, when a reel is in use, the band can be latched closed in loop form, and also will remain in this form without suddenly unwrapping if jarred or dropped.

The preferred embodiment of the invention above described provides a band for sealing a storage reel which is self aligning for easier assembly and in which a more positive retention of the closed band can be maintained. It is readily understood that various modifications of individual features of construction may be made without departing from the spirit or scope of the invention as defined in the appended claims.

What I claim is:

1. Reel sealing and storage apparatus comprising, in combination:

a flexible band including a hanger member and adapted to be formed into a looped configuration with abutting ends so as to enwrap a reel having a central hub and circular sides attached thereto, said band having means on the underside thereof for engaging the sides of said reel;

reel storing means including a hanger means for receiving the hanger member of said band; and overcentered latch means for releasably joining the abutting ends of said band, said latch means including a catch portion having a body member provided with a curvilinear lower surface for nesting against and substantially conforming to the curved surface of said band only when said band is in looped configuration.

2. The storage apparatus of claim 1 wherein:

said latch means additionally includes a second portion providing an alignment boss, said alignment boss being provided with means cooperating with said body member to form a latch retention means, and

both of said catch portion and second portion of the latch means being releasably mounted each upon an abutting end of said band in such manner that disassembly can be accomplished without the use of tools.

3. The storage apparatus of claim 2 wherein:

said second portion is provided with a depending tang element and a locking tab, one of said band ends being provided with openings to receive said tang and tab respectively, said tab being angled to provide a surface which is positioned parallel and contiguous to said band undersurface when assembled thereto, and said tang being so formed as to provide a releasable detent means.

4. The storage means of claim 2 wherein:

said second portion is provided at its forward end with a depending spacer flange which is positioned forwardly of a band end when said second portion is assembled to said band, said flange being of a width less than the width of said band.

5. The storage means of claim 4 wherein:

said catch portion is mounted on a band end which is provided with a pair of guide legs so located and arranged as to entrap therebetween the flange of said second portion when said band is assembled in looped configuration with the abutting ends of said band in engagement, whereby lateral misalignment of said band ends is prevented;

and means formed on said second portion and said opposed band end to prevent vertical misalignment of said band ends.

6. The storage means of claim 1 wherein:

said catch portion includes a mounting element hingedly connected to said body member, said band end to which said catch portion is mounted being provided with a mounting stud; and

means formed upon said mounting element and mounting stud for releasably pivotally mounting said mounting element to said band.

7. The storage means of claim 6 wherein:

said mounting element includes a pair of rails and pivot bars, said mounting stud being provided with a journal means and guide means leading thereto for permitting assembly of said pivot bars into said journal means.

8. The storage apparatus of claim 2 wherein:

said catch portion includes a mounting element hingedly connected to said body member, said band end to which said catch portion is mounted being provided with a mounting stud; and

means formed upon said mounting element and mounting stud for releasably pivotally mounting said mounting element to said band.

9. The storage apparatus of claim 5 wherein:

said catch portion includes a mounting element hingedly connected to said body member, said band end to which said catch portion is mounted being provided with a mounting stud; and

means formed upon said mounting element and mounting stud for releasably pivotally mounting said mounting element to said band.

10. The storage apparatus of claim 8 wherein:

said mounting element includes a pair of rails and pivot bars, said mounting stud being provided with a journal means and guide means leading thereto for permitting assembly of said pivot bars into said journal means.

11. A flexible band adapted to be formed into a looped configuration with abutting ends so as to enwrap a reel having a central hub and circular sides attached thereto, said band having means on the underside thereof for engaging the sides of said reel; and

overcentered latch means for releasably joining the ends of said band, said latch means including:

a catch retainer on the outer surface of said band at one of said ends;

a mounting stud on the outer surface of an integral with said band at the other of said ends; and

a catch adapted to lock to said catch retainer, said catch comprising a hollow body member that is pivotally mounted to said stud and means on said body member for locking to said catch retainer;

said stud having a smaller width than said band and said hollow body member having side walls that are spaced from each other by an amount sufficient for said body member to fit over said stud, said side walls having curvilinear lower surfaces that substantially conform to the curvature of the other surface of said band when said band is in looped configuration and can substantially nest against said outer surface when said body member is disposed over said stud and is locked to said catch retainer.

12. A flexible band adapted to be formed into a looped configuration with abutting ends so as to wrap a reel having a central hub and circular sides attached thereto, said band having means on the underside thereof for engaging the sides of said reel; and

overcentered latch means for releasably joining the abutting ends of said band, said latch means including a catch portion on one end of said band having a body member provided with a curvilinear lower surface for nesting against and substantially conforming to the curved surface of said band only when said band is in looped configuration;

said latch means additionally including a second portion on the other end of said band providing an alignment boss,

said alignment boss being provided with means cooperating with said body member to form a latch retention means,

both said catch portion and said second portion of said latch means being releasably mounted to said band in such manner that disassembly can be accomplished without the use of tools.

13. The flexible band of claim 12 wherein:

said second portion is provided with a depending tang element and a locking tab, one of said band ends being provided with openings to receive said tang and tab respectively, said tab being angled to provide a surface which is positioned parallel and contiguous to said band undersurface when assembled thereto, and said tang being so formed as to provide a releasable detent means.

14. The flexible band of claim 12 wherein:

said second portion is provided at its forward end with a depending spacer flange which is positioned forwardly of a band end when said second portion is assembled to said band, said flange being of a width less than the width of said band.

15. The flexible band of claim 14 wherein:

said one end of said band is provided with a pair of guide legs so located and arranged as to entrap therebetween the flange of said second portion when said band is assembled in a closed loop configuration, whereby lateral misalignment of said band ends is prevented; and

means formed on said second portion and the op-

posed band end to prevent vertical misalignment of said band ends.

16. a flexible band adapted to be formed into a looped configuration with abutting ends so as to wrap a reel having a central hub and circular sides attached thereto, said band having means on the underside thereof for engaging the sides of said reel; and

overcentered latch means for releasably joining the abutting ends of said band, said latch means including a lower surface for nesting against and substantially conforming to the curved surface of said band only when said band is in looped configuration;

said catch portion also including a mounting element hingedly connected to said body member, and a mounting stud on one end of said band; and means formed upon said mounting element and mounting stud for releasably pivotally mounting said mounting element to said band.

17. The flexible band of claim 16 wherein: said mounting element includes a pair of rails and pivot bars, said mounting stud being provided with a journal means and guide means leading thereto for permitting assembly of said pivot bars into said journal means.

18. The flexible band of claim 12 wherein:

said catch portion includes a mounting element hingedly connected to said body member; a mounting stud on said one end of said band; and means formed upon said mounting element and mounting stud for releasably pivotally mounting said mounting element to said band.

19. The flexible band of claim 15 wherein:

said catch portion includes a mounting element hingedly connected to said body member; a mounting stud on said one end of said band; and means formed upon said mounting element and mounting stud for releasably pivotally mounting said mounting element to said band.

20. The flexible band of claim 18 wherein:

said mounting element includes a pair of rails and pivot bars, said mounting stud being provided with a journal means and guide means leading thereto for permitting assembly of said pivot bars into said journal means.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,696,935
DATED : October 10, 1972
INVENTOR(S) : Carl J. Dean

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 2:	Delete numeral "50" and substitute therefor the numeral "58"
Column 6, line 51:	Delete the word "an" and substitute therefor the word "and"
Column 8, line 3:	Delete "a" in the first instance and substitute therefor "A"
Column 8, line 10:	Insert after the article "a" the following: "catch portion having a body member provided with a curvilinear"
Column 8, line 15:	Delete the word "and"
Column 8, line 41:	Delete the word "or" and substitute therefor the word "of"

Signed and Sealed this

Twenty-eighth **Day of** *October* 1980

[SEAL]

Attest:

SIDNEY A. DIAMOND

Attesting Officer

Commissioner of Patents and Trademarks