United States Patent

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[54] REEL CASE WITH LOCK

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[52] **U.S. Cl.** .....**206/52 F,** 220/55 C

[51] **Int. Cl.** **B65d 45/00,** B65d 85/67

[58] **Field of Search**.....206/52 F, 52 R; 220/55 C, 55 R; 287/119

[56] **References Cited**

UNITED STATES PATENTS

3,307,688	3/1967	Widmont, Jr.	206/52 F
3,307,689	3/1967	Lyman	206/52 F
3,489,273	1/1970	McKelvey, Jr.	206/52 F
2,942,903	6/1960	Giladett	287/119

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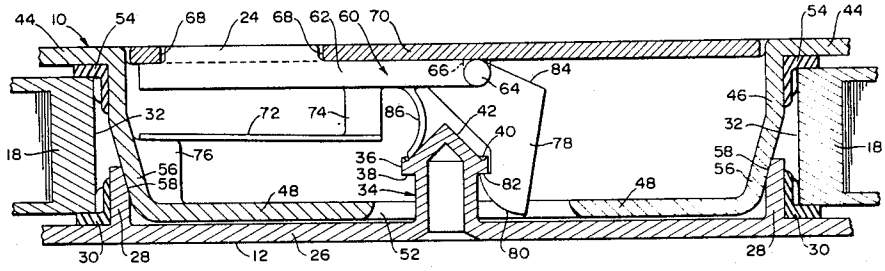
[57] **ABSTRACT**

This disclosure relates to improvements in cases for tape reels and the like. In particular, the improvements relate to a simplified construction of a lock to secure the separable halves of a tape reel case together. The lock includes only a single moving part which is located within a handle formed centrally within one of the halves of the case. The moving art of the lock cooperates with an upstanding post formed integrally with the other half of the reel case to lock the halves of the case together. The moving part of the lock also includes a release button which is exposed through the handle in the case and is disposed on the handle to facilitate gripping of the handle and operation of the release button.

13 Claims, 4 Drawing Figures



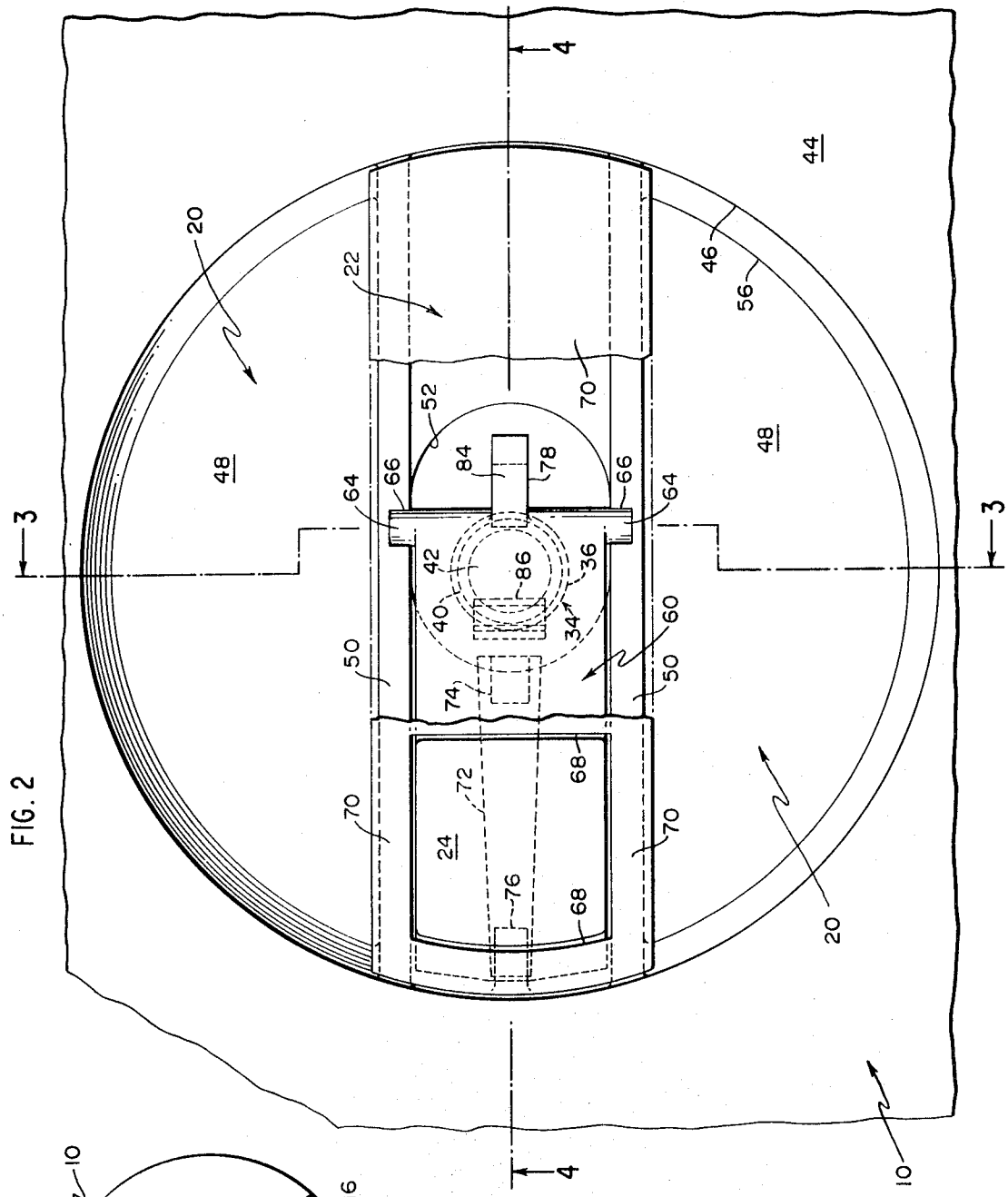


FIG. 2

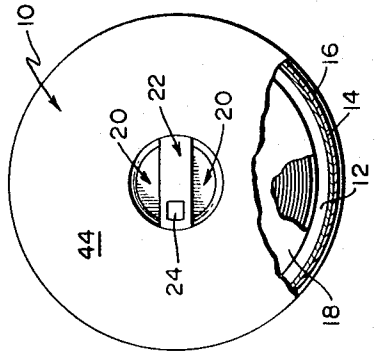


FIG. 1

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FIG. 3

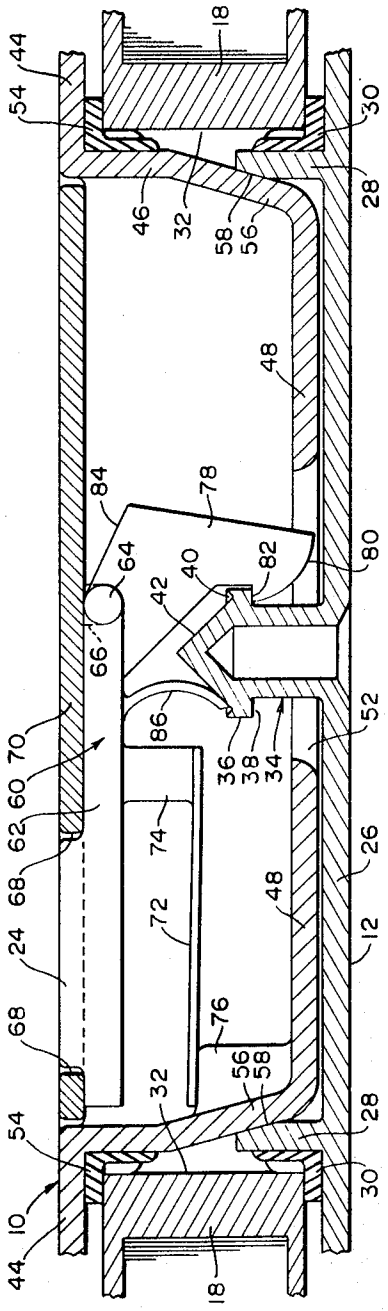
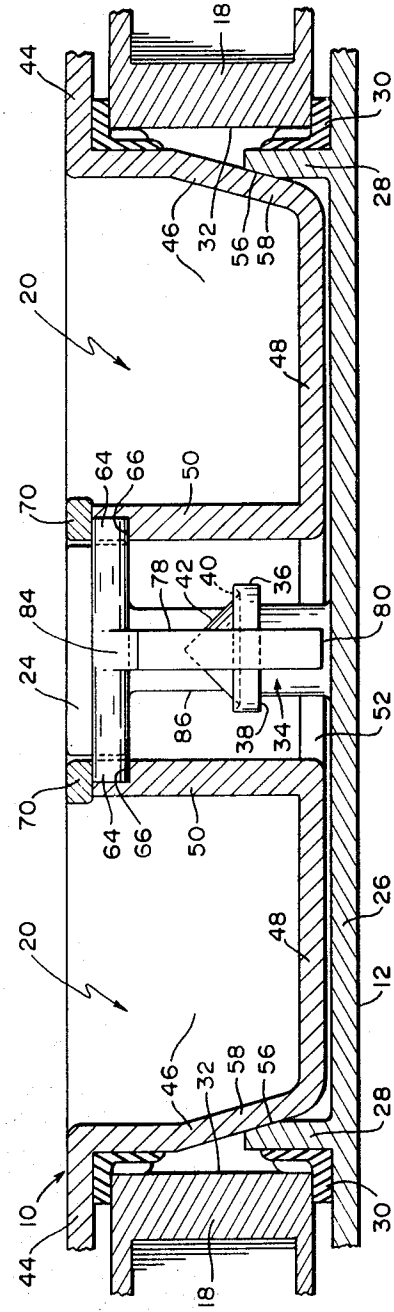


FIG. 4



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REEL CASE WITH LOCK

BACKGROUND OF THE INVENTION

This invention relates to improvements in cases for storing tape reels and the like and, more particularly, to an improved arrangement for locking the separable halves of the case together.

The increasing use of magnetic tapes, as in association with computers, for storing information has required more effective techniques for storing and protecting tape reels when not in use. Accordingly, a variety of cases for storing such tape reels have been employed to isolate the tape reel in a substantially clean and dust-free environment. Among the more common of such cases is a circular case which is separable into a pair of circular halves. The halves of the case are provided with appropriate seals at their mating regions to isolate the reel therein. The case sections also include surfaces which receive the tape reel and retain the reel firmly within the case. Additionally, the cases often include an integral central handle or knob formed in the cover half of the case which also includes a hand operable lock disposed within the handle for securing the case halves together.

Although prior reel cases have in general proved satisfactory, they are not entirely free from difficulties. For example, the locks employed in such cases usually are of somewhat complex construction having many parts. These more complicated locks are relatively expensive and, because of their multiplicity of parts, are more likely to fail or to become jammed. Additionally, the handle and locked arrangements employed in the prior art are arranged in a somewhat awkward configuration which is uncomfortable and difficult to operate when gripped by the user. It is among the primary objects of the invention to provide a handle and locking arrangement for a reel case of the type described which avoids the foregoing difficulties.

SUMMARY OF THE INVENTION

In brief, the invention is embodied in a somewhat conventional reel case which is separable into circular halves defining a bottom half and a cover. The bottom half of the case has a central, concentric and upwardly extending wall which fits into the central hole in the tape reel to retain the reel in position in the case. Additionally, at the center of the bottom half of the case, an upstanding integral locking post is provided which is mateable with the lock mechanism on the cover. The upper end of the post includes a circumferential flange having upwardly and downwardly facing surfaces which cooperate with the locking mechanism as described.

The cover half of the case includes a central circular depression which is adapted to pass downwardly through the central hole in the tape reel when the case is closed. The sidewalls defining the depression engage the circular wall on the bottom half of the case to aid in registration of the case halves and for gripping the tape reel securely in position. The depression is designed to permit the user's fingers to be inserted into the depression comfortably and without awkwardness.

The cover also includes an integrally formed handle within the depression. The handle extends diametrically along and within the depression. The locking mechanism is mounted within the hollow handle and includes a latch member which is engageable with the flange on the central post on the bottom half of the case. The latch member engages the underside of the flange and is biased upwardly against the underside of the flange by a resilient finger which is formed integrally with the latch and which is adapted to bear against the upper surface of the flange. When the halves of the case are locked together, the resilient finger biases the latching member firmly into engagement with the underside of the flange. The resilient finger and latch member thus act in opposition on the central post to effect a firm grip on the post.

The case is locked simply by pressing the two halves together until the latch and post engage automatically. The latch is released by a button which is exposed through the top

of the handle. The button is integrally formed with the one-piece latch member and is pressed downwardly to overcome the bias of the resilient finger and to pivot the catch out of engagement with the underside of the flange on the post. The button, handle and depression are designed for comfortable, unawkward use.

It is among the primary objects of the invention to provide a case for a reel which includes a locking mechanism of simple construction and operation.

A further object of the invention is to provide a reel case of the type described in which the lock is not likely to become jammed or otherwise malfunction.

A further object of the invention is to provide a reel case of the type described having a lock which is self-biasing in a locked configuration and which is not likely to become unlatched accidently.

Still another object of the invention is to provide a reel case of the type described including a cover having an integral handle and lock mechanism in which the handle may be gripped comfortably and the lock operated easily without any awkward manipulations.

DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will be understood more fully from the following detailed description thereof, with reference to the accompanying drawings wherein:

FIG. **1** is a fragmented plan view of the reel case embodying the invention;

FIG. **2** is an enlarged illustration, in plan and fragmented, of the central region of the case cover;

FIG. **3** is a section of the combined cover halves illustrating the locking mechanism as viewed along the line **3—3** of FIG. **2**; and

FIG. **4** is a sectional elevation through the combined cover halves and locking mechanism as seen along the line **4—4** of FIG. **2**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. **1** shown the general arrangement of the reel case having generally circular upper and lower halves **10**, **12**, respectively. The halves of the case include peripheral skirts **14**, **16** which mate concentrically in the usual manner. The tape reel **18** is retained within the case. The cover **10** includes a central depression **10** and a handle **22** which extends diametrically through the depression. The handle **22**, depression **20** and cover **10** may be formed as an integral unit by conventional plastic molding techniques or, alternatively, the depression and handle portions may be formed separately and then later assembled at the center of the cover **10**. The handle **22** is substantially hollow and retains a latching mechanism described more fully below. The latching mechanism includes a release button **24** which is exposed upwardly through a hole in the handle to permit the locket cover **10** and lower half **12** of the case to be separated when desired. As described more fully below, the release button **24** preferably is located at one end of the handle **22**.

As shown in FIGS. **2**, **3**, and **4**, the bottom half **12** of the case includes a circular bottom wall **26** having an integrally formed concentric, circular rib **28** extending upwardly from the bottom wall **26**. The outer, circular corner defined by the rib **28** and bottom wall **26** preferably is provided with a resilient pad **30** which may extend fully about the circular rib **28**. The rib **28** and pad **30** are arranged to project into and be received by the central hole **32** in the tape reel **18**. The cover **10** includes a similar arrangement, described below, which cooperates to grip and retain the tape reel **18** firmly within the case when the halves **10**, **12** are assembled.

The lower half **12** of the case also includes a central, integrally formed, upstanding locking post, indicated generally by the reference character **34**. The post **34** includes an annular flange **36** at its upper end. The flange defines a downwardly

facing surface 38 and an upwardly facing surface 40 which is in the form of an endless groove. The upper end of the post 34 is of convex configuration and may be conical in shape at 42.

The cover half 10 of the case includes a generally circular top wall 44 having the central depression 20 formed integrally therein. The depression 20 is defined by a generally circular sidewall 46 and a bottom wall 48. The bottom wall 48 is formed integrally with a pair of upstanding handle walls 50 which parallel the diameter of the case and which are disposed on opposite sides of the center of the cover 10. A hole 52 is formed centrally in the bottom wall 48 of the depression 20 to permit the locking post 34 to extend upwardly into the region defined between the handle walls 50 when the upper and lower halves 10, 12 of the case are mated.

The circular corner region defined at the juncture of the top wall 44 of the cover 10 and the integral sidewall 46 is provided with annular pad 54 which engages and grips the other side of the reel 18 in the same manner as the pad 30 on the lower half 12 of the case. Additionally, in order to insure proper registration of the halves of the case when they are mated, the lower portion of the sidewall 46 defining the central portion 20 may be tapered inwardly (as shown in 56) to mate with a chamfered surface 58 formed at the upper, inner side of the circular rib 28.

A latching member, indicated generally by the reference character 60 is disposed within the region between the handle wall 50 and cooperates with the locking post 34 to lock the halves 10, 12 of the case together when they are mated. The latching member 60 is of one-piece construction and may be molded from a resilient plastic according to conventional molding techniques. The latching member includes an elongate lever 62 having integral, transversely extending pins 64 formed at one end thereof. The pins 64 are pivotally connected to the handle walls 50 by a slot 66 formed in each of the handle walls 50. The other, free end of the lever 62 extends toward one end of the handle 22 and includes an integrally formed, raised release button 24. The button 24 is exposed through a hole 68 which is formed in a handle cap 70 which, in turn, is secured to an extends across and along the upper ends of the handle walls 50. The handle cap 70 also covers the slot 66 to retain the pins 64 of the latching member 60 in place.

The lever 62 is biased in the uppermost position shown in FIG. 3 by an integrally formed leaf-like spring 72 which extends freely beneath the free end of the lever 62. The spring 72 is secured to the underside of the lever 62 by an integrally molded connecting member 74. The free end of the leaf spring 72 rests on a shoulder 76 which is molded integrally with the sidewall 46 of the depression 20. The leaf spring 72 is spaced from the underside of the lever 62 to permit limited downward pivotal movement of the free end of the lever in opposition to the upward biasing effect of the leaf spring 72.

The latching member 60 includes an integrally formed catch 78 at its pivoted end which extends downwardly toward the hole 52 in the bottom wall 48 of the depression 20. The catch 78 is formed so that its lower end will be disposed on one side of the locking post 34 when the halves of the case are mated. The lower end of the catch 78 includes a cam surface 80 which extends upwardly and terminates in a lug 82 having a generally horizontal surface. The lug 82 is formed so that when the halves of the case are mated and the lever 62 is in its uppermost position (clockwise as seen in FIG. 3) the horizontal surface of the lug 82 will engage the underside 38 of the flange 36 on the locking post 34. When the halves of the case are brought together, the cam surface 90 on the latch 78 engages the flange of the post which causes the entire latching member 60 to pivot toward an open position (counterclockwise and seen in FIG. 3). When the lug 82 has passed below the flange 36 it then snaps back into the position shown to lock the parts together. Thus, the entire latching member 60 operates in a manner similar to that of a bellcrank pivotable about an axis intermediate its ends. The extent of pivotal movement of the latching member 60 toward an open position is limited by a flat 84 formed on the upper portion of the catch 78 which abuts the underside of the handle cap 70 when the latching member 60 has been pivoted to its most open position.

The latching device also includes a supplemental spring device which resiliently engages the upper surface 40 of the flange 36 when the halves 10, 12 of the case are mated. This arrangement includes an integral, resilient spring 86 which extends downwardly from a point intermediate the pivoted and free ends of the lever 62. The lower end of the spring 86 is spaced from the lug 82 so that when the case is assembled, the end of the spring 86 will engage the flange 36 diametrically opposite to the point of its engagement with the lug 82. The spring 86 is designed, in relation to the lug 82 and post 34 so that when the parts are brought together, the end of the spring 86 will engage the flange 36 before the lug 82 has snapped into engagement with the lower surface 38 of the flange 36. Thus, in order to lock the parts together, the upper and lower halves 10, 12 of the case must be urged together under a slightly increased force to overcome the force of the spring 86. When the lug 82 has snapped into position beneath the flange 36, the spring 86 has been loaded to bias the cover 10 and latching member 60 upwardly. Thus, the spring 86 acts downwardly on the flange 36 while the lug 82 acts upwardly on the opposite side of the flange to effect a firm grip on the locking post 34.

In order to release the locked parts, the button 24 is depressed to pivot the catch 78 to an open position. The spring 86 is designed to present a considerable force in opposition to depression of the button 24. This reduces substantially any likelihood of the button 24 being depressed inadvertently. A definite forceful effort is required in order to overcome the tendency of the spring 86 to bias the latching member 60 in a locked position. Additionally, the increased force developed by the loaded spring 86 is particularly useful in effecting separation of the case halves. Ordinarily, case reel sections employed to store computer tapes and the like are sealed to preclude entry of dust or dirt particles. The seals are nearly airtight which ordinarily tends to retard separation of the case halves even after the latching mechanism has been unlocked. In the instant invention, as the button is depressed to release the latch, the biasing effect of the spring 86 is increased further which tends to force the case sections apart as soon as the latch has become disengaged from the surface 38 of the flange 36.

An additional feature of the invention resides in the location of the button 24 and the configuration of the depression 20 with the handle extending diametrically through the depression 20. One may grip the handle by its sidewalls 50 and place his forefinger on the button 24. This is a comfortable, natural and relaxed hand position and is considerably less awkward than that employed in prior devices.

In addition to the biasing of the latching member toward a closed position by the spring 86, the cooperation between the tapered sidewall 56 of the depression and the chamfered portion 58 of the circular rib 28 on the lower half 12 of the case may be employed to bias the halves 10, 12 away from each other to urge the lug 82 firmly into engagement with the underside 38 of the flange 36 on that post.

Thus, I have provided an improved locking arrangement for reel cases in which a simplified, yet highly effective latch is employed and in which the latch may be operated comfortably by the user.

It should be understood, however, that the foregoing description of the invention is intended merely to be illustrative thereof and that other embodiments and modifications will be apparent to those skilled in the art without departing from its spirit.

Having thus described the invention, what is claim is:

1. In a reel case having mateable, separable sections defining said case, an improved locking mechanism comprising:

a post formed integrally with and upstanding from one of said sections;

means forming a flange secured to said post, said flange being disposed interiorly of said case, said flange having a first surface formed thereon;

a latching member pivotally mounted to the other of said case sections and having a lug engagable with said first surface of said flange, said latching member being pivotable between a locked position in which said lug engages said first surface of said flange and an unlocked position in which said lug is out of engagement with said first surface of said flange, said lug and said first surface of said flange being arranged to preclude separation of said case sections when in said locked position;

bias means secured to said latching member and being engagable with a region of said post to bias said latching member toward said locked position when said latching member is in said locked position; and

means forming said other section to expose the free, pivotable portion of said latching member therethrough and to permit said latching member to be pivoted to an unlatched position in opposition to said bias means.

2. A reel case as defined in claim **1** further comprising:

said flange being formed about the upper end of said post with said first surface thereof defining an annular configuration.

3. A reel case as defined in claim **2** further comprising:

said latching member being pivoted to said other section above and in proximity to said post when said sections are mated, the lug of said latching member being disposed on one side of said post and the free, pivotable end of said latching member being disposed on the other side of said post.

4. A reel case as defined in claim **2** further comprising:

a second surface formed on said flange on the opposite side thereof than said first surface;

said bias means comprising a spring finger mounted to said latch member and engagable with said second surface of said flange when said sections are mated, said bias means being arranged to urge said latch member toward said locked position when in engagement with said flange, said spring finger acting on said flange in a direction opposite to that of said lug.

5. A reel case as defined in claim **4** wherein said biasing finger engages said second surface of said flange at a location that is on the opposite side of said post than that which is engaged by said lug.

7. A reel case as defined in claim **5** wherein said bias finger is so constructed that when said case sections are mated, said bias finger will engage the second surface of said flange before said lug engages said first surface of said flange, whereby said sections must be pressed together in opposition to the force of said bias finger to permit locking engagement of said lug with said flange.

7. A reel case as defined in claim **6** further comprising:

said second surface of said flange defining an annular groove adapted to retain the free end of said bias finger.

8. A reel case as defined in claim **7** further comprising:

the top of said post extending above and within said grooved second surface being of convex configuration to guide the free end of said bias member into said groove when said case sections are mated.

9. A reel case as defined in claim **8** wherein said bias means further comprises:

a resilient leaf spring formed integrally with and secured to said latch member, said leaf spring having a free end thereof extending generally parallel to and below the free end of said latch member; and

means formed on said one section for restraining pivotal movement of the free end of said leaf spring in unison with said latching member.

10. A reel case as defined in claim **9** wherein said other case section to which said latch member is mounted further comprises:

said other section being formed to define a depression therein adapted to receive one's fingers, said depression being defined by a bottom wall and a generally integral surrounding sidewall, said bottom wall being adapted to be disposed in close proximity to said one section when mated therewith;

a handle formed integrally with said walls defining said depression, said handle including spaced upstanding sidewalls defining a void therebetween; and

means mounting said latching member in said void of said handle, said bottom wall of said depression having a hole therein to permit entry of said post on said one section and engagement of said flange with said latching member.

11. A reel case as defined in claim **10** further comprising:

said lower end of said sidewall being tapered inwardly; and

a rib formed integrally with and upstanding from said one section, said rib extending about said post, said rib having a chamfered inner wall to receive said tapered sidewall to register said sections when mated.

12. A reel case as defined in claim **10** wherein said means mounting said latching member to said handle comprises:

pins formed integrally with said latching member and extending laterally therefrom; and

means forming sockets in said sidewalls defining said handle to receive said pins.

13. A reel case as defined in claim **1** further comprising:

said other section being formed to define a depression to receive one's fingers and a handle extending diametrically across said depression; and

said exposed portion of said latching member being exposed at one end of said handle.

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