A card reel clip assembly for attaching card reels to clothing. The card reel clip assembly generally includes a reel assembly coupled to a clip assembly having an adjustment mechanism. The adjustment mechanism provides a tactile response to the user to indicate whether the fastener is adequately engaged with the clothing of the user. The haptic or tactile technology implemented in embodiments provides an indication of the success of the engagement. No secondary visual or physical inspection is required to determine engagement. Based on the positioning of components of embodiments when in a closed position, the user is given a tactile response regarding the engagement with the user's clothing.
CARD REEL CLIP ASSEMBLY WITH ADJUSTMENT MECHANISM

PRIORITY CLAIM

[0001] The present application claims the benefit of U.S. Provisional Application No. 61/556,461 filed Nov. 7, 2011, which is incorporated herein in its entirety by reference.

TECHNICAL FIELD

[0002] The invention relates generally to mechanical fasteners, and more particularly, to adjustable fasteners for attaching card reels to clothing, and assemblies thereof.

BACKGROUND

[0003] Identity cards or identity badges provide critical security and identification functions for many institutions, including schools, the military, hospitals, and corporations. Identity badges typically have some sort of identifying information printed on at least one of the sides. For example, the badge holder can have a picture, name, employer, or access status printed on the card. Further, badges are often RFID-capable or are compatible with other interactive electronic protocols in for use with time clock machines or to provide access to secure work areas. Identity badges are typically fastened to the clothing of the user in order to provide ready, visible access to the card and identifying information.

[0004] A card reel or badge reel comprises a tether for the aforementioned identity card or badge. Traditional card reels consist of a line having one end attached to a spool, which has a mechanical biasing force applied to it to maintain the line wound on the spool. The free end of the line is attached to the card. Traditional card reels also provide a simple clip for the attachment of the spool to the clothing of the user. When the user wants to use the card, and thereby extend the card away from the user’s body for identification or security purposes, for example, the user can grasp the card and pull it away from his body. The extension pulls the line from the spool and allows the card to be positioned away from the body, but remains coupled to the spool and clothing. When the user wants to return the card to its original position, the user releases the card from grasp. The mechanical biasing force of the spool reeels the line back in and the card returns to its position next to the body.

[0005] As mentioned above, traditional card reels typically have simple fasteners for coupling the card reel to the clothing of the user. These simple fasteners suffer from a myriad of problems.

[0006] Traditional card reels offer no indication of whether the fastener is adequately engaged with the clothing of the user. For example, with the traditional U-shaped clip of the standard card reel, the clip is threaded around the user’s clothing, thus relying on the tension of the U-shaped clip to secure the card reel. Depending on the clothing, typically a visual inspection of the threaded area with the U-shaped clip is required in order to determine if the clip is adequately engaged. Alternatively, after threading the U-shaped clip with the user’s clothing, a secondary pulling or tugging evaluation can be done on the clip to determine the clip’s engagement. Therefore, no tactile response or haptic technology exists on traditional card reel fasteners signaling that the clip is engaged.

[0007] Additionally, traditional card reel fasteners cannot readily vary the closeness of the closure depending on the thickness of the engaging clothing. Thick clothing, such as a wool sweater, must be forced through traditional clips, thereby adapting the sweater to the clip rather than adapting the clip to the sweater. Such forcing can lead to damage to the clothing as well as the clip.

[0008] Traditional clips, like the U-shaped clips discussed above, are often simply comprised of metal and must be bent to accommodate thick clothing, like the wool sweater discussed above. However, when the clip is bent, it is often difficult or impossible to bend the clip back into a form that is engageable with thin clothing, like a shirt pocket. Further, repeatedly flexing metal clips of the traditional card reels creates stress on the bending portions, thus putting the clip at risk of breaking.

[0009] Further, in traditional reels, the clip is fixed in alignment with the reel. For example, the clip might be aligned vertically with the line spool. This forces the user to only clip to things that align horizontally or relatively horizontally with the user’s clothing. Otherwise, the line and card do not hang perpendicular with the floor. When clipped to a clothing interface that is not horizontal, the line and card hang angled from the spool source. This can affect the readability of any printing on the outward facing face of the reel, as well as the readability of the attached card.

[0010] Therefore, there is a need for a robust card reel clip assembly having an adjustable fastener that provides a tactile response to signal that the clip is engaged with the user’s clothing and that can be selectively adjusted to vary the closure size depending on the thickness of the engaging clothing.

SUMMARY

[0011] Embodiments of the present application substantially meet the aforementioned needs of the industry. Embodiments provide a card reel clip assembly with adjustment mechanism capable of sending a tactile response to the user to indicate whether the fastener is adequately engaged with the clothing of the user. The haptic or tactile technology implemented in embodiments provides an indication of the success of the engagement. No secondary visual or physical inspection is required to determine engagement. Based on the positioning of components of embodiments when in a closed position, the user is given a tactile response regarding the engagement with the user’s clothing.

[0012] In embodiments, a card reel clip assembly generally includes a reel assembly enclosed or positioned within a housing, and an engagement or clip assembly coupled to the reel assembly. The reel assembly can include, for example, a spool having a retractable line wound about the spool. One end of the line extends exterior the housing. A card or other object can be coupled to the end of the line exterior the housing by means of a clip, carabiner, snap fastener, or the like. A biasing mechanism, such as a constant force spring, mounted within the spool allows the line to be retracted and extended from the spool such that the card or other object attached to the end of the line can be extended away from or retracted towards the housing, such that the card is tethered to the reel assembly.

[0013] The clip assembly can include a clothes-receiving clip or engagement mechanism and an adjustment mechanism. The clip assembly can include, for example, a clip or engagement mechanism having one or more engagement members, such as a clamp portion and an optional mounting portion. The clamp portion is positioned relative the mounting portion (if present) or housing of the reel assembly to form
a clothes-receiving gap or aperture. The clamp portion is movable or pivotable relative to the mounting portion (if present) or housing of the reel assembly (if no mounting portion present), such that the clothes-receiving gap is size-variable. The size of the clothes-receiving gap is selectively adjustable via the adjustment mechanism of the clip assembly.

[0014] In a feature and advantage of embodiments of the invention, the size of the clothes-receiving gap can be varied depending on the thickness of the clothing that the card reel clip assembly is to be secured to. In embodiments, the adjustment mechanism includes interlocking gears that allow for the engagement of thick clothing such as heavy sweaters. For example, a gear distal the card reel can be chosen to allow for a wider aperture between the engagement members (e.g., corresponding ends of the mounting portion and clamp portion or the clamp portion and reel housing). In contrast, a gear proximate the card reel can be chosen to allow for the engagement of thin clothing, such as dress shirt pockets, and therefore a smaller aperture between clothing engagement members. Likewise, intermediate gears can be chosen to allow for the engagement of materials and thicknesses in between. In embodiments, ratcheting of the clothing-engagement members can be done in order to select the appropriate gear.

[0015] In other embodiments, the size of the clothes-receiving gap is adjusted via an adjustment mechanism comprising a supporting sliding lock that also allows for various thicknesses of clothing. The sliding lock is of a clamp or clip construction, similar in design to a U-shaped tweezers, and is positioned over the clip assembly, such that it sandwiches the clamp portion and mounting portion. As the sliding lock slides longitudinally along the clamp portion and mounting portion, the clamp portion is biased towards mounting portion or reel assembly, thereby narrowing the clothes-receiving gap. The sliding lock can include a lip at its end that slides over and engages or abuts a discontinuous structure, such as a ledge or shoulder, located along the exterior of the clamp portion of the clip assembly. This engagement characterizes the slide (tactile) and/or sound that the sliding lock is fully engaged with the clip assembly, thereby securing the card reel clip assembly to the article of clothing.

[0016] In another feature and advantage of embodiments of the invention, embodiments allow for the seamless transition of elastics between various thicknesses of clothing. For example, where a user is originally wearing a thin dress shirt, becomes cold, and subsequently puts on a sweater or fleecy, the card reel of embodiments is readily adaptable to the sudden change in clothing.

[0017] In another feature and advantage of embodiments of the invention, the clip is automatically adapted to the clothes of the user instead of manual adaptation of the clip to the clothes in traditional versions. Thus, no forcing of the clothes into clips, like is required of traditional card reels, is needed. As a result, clothes are not damaged when they are engaged with embodiments.

[0018] In another feature and advantage of embodiments of the invention, the clip provides a robust clasp without creating undue stress on any portion of the clip. Therefore, the clip is not at risk of breaking.

[0019] In another feature and advantage of embodiments of the invention, when coupled to the reel, the clip can rotate about the face of the reel. Such rotation allows the user to angle the clip in any orientation relative to the circumference of the face of the reel. This allows the user to attach the clip and reel to clothing that is not at perfect alignment with the clip and reel combination. For example, the clip can attach to horizontally-aligned interfaces, like the pocket of a user's jeans, as well as vertically-aligned interfaces, like the gap of a button-down dress shirt, as well as any angled interface in between, such as an angled pocket on dress pants. In any of these cases, the clip is attached perpendicularly with the interface of the clothes, no matter the angle of the interface, and the rotation of the clip with respect to the reel allows the card and spool source to hang perpendicular to the floor, thus allowing for readability of the card and any printing on the outer facing of the reel.

[0020] In another feature and advantage of embodiments of the invention, the clip provides an audible indication of the success of the engagement. A clicking or snapping sound when in a fully closed or engaged position allows the user additional indication of the engagement with the clothing of the user.

[0021] The embodiments described herein are not limited to the attaching of cards or badges. Embodiments providing fasteners for attaching keys, personal GPS systems, pedometers, mobile phones, other electronic accessories, and any other clothing-mountable device are also considered.

[0022] The above summary of the invention is not intended to describe each illustrated embodiment or every implementation of the present invention. The figures and the detailed description that follow more particularly exemplify these embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The invention may be more completely understood in consideration of the following detailed description of various embodiments of the invention in connection with the accompanying drawings, in which:

[0024] FIG. 1A is a side view of a card reel clip in a receiving position, according to an embodiment.

[0025] FIG. 1B is a side view of the card reel clip of FIG. 1A in a closed position, according to an embodiment.

[0026] FIG. 1C is a front view of a reel assembly of a card reel clip according to an embodiment of the invention.

[0027] FIG. 1D is a front view of the reel assembly of FIG. 1C with its face plate removed.

[0028] FIG. 1E is a front view reel assembly of FIG. 1D with its intermediate plate removed to show the spool.

[0029] FIG. 2A is a side view of a card reel clip in a receiving position, according to an embodiment.

[0030] FIG. 2B is a side view of the card reel clip of FIG. 2A in a closed position, according to an embodiment.

[0031] FIG. 3A is a side exploded view of a card reel clip in a receiving position, according to an embodiment;

[0032] FIG. 3B is a side exploded view of the card reel clip of FIG. 3A in a closed position, according to an embodiment;

[0033] FIG. 4 is a perspective view of a card reel clip in a closed position, according to an embodiment.

[0034] While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.
Referring generally to FIGS. 1A through 1E, a card reel clip 100 according to an embodiment is depicted. Card reel clip 100 generally includes a reel assembly 102 enclosing a reel (not shown), engagement mechanism or clip 104, hinge support 106, hinge 108, and ratcheting component 109.

Referring specifically to FIGS. 1C through 1E, reel assembly 102, as described above, acts as a tether for a card. Reel assembly 102 generally includes a housing 1003, a spool 1005 mounted within housing 1003, a line 101, and a biasing mechanism 1009. Housing 1003 generally includes a first wall 1003a spaced apart from a second wall 1003b to create an interior volume for housing spool 1005 within. Housing 1003 will be described in more detail below.

Line 101 of reel assembly 102 has one end (not shown) attached to an outer circumference of spool 1005 and is wound about spool 1005. A second, free end 101b of line 101 extends through an aperture of housing 1003, outside of housing 1003. Second end 101b can include a coupling mechanism 1001, such as a clip, loop, carabiner, lanyard, and the like, for attaching an object (not shown), such as, but not limited to, a card, to card reel clip 100.

Biasing mechanism 1009, such as a constant force spring, is mounted within an interior aperture of spool 1005 to retract and extend line 101 about spool 1005. When a force is applied to second end 101b of line 101, spool 1005 rotates to unwind line 101 thereby under load. When the force is removed, biasing mechanism 1009 causes spool 1005 to rotate in the opposite direction, winding line 101 around spool 1005.

In one particular embodiment, and referring to FIG. 1E, biasing mechanism 1009 comprises a constant force spring. Constant force springs are a variety of extension springs. In particular, a strip 1011 of spring steel with a preset curvature is coiled tightly so that each turn of the strip rests on its inner neighbor. A first end 1011a of strip 1011 is attached to a protrusion 1013 extending from wall 1003b of housing 1003. A second end 1011b of strip 1011 is attached to spool 1005. The spring is actuated in a pulling, linear motion with the deflection resistance originating from the material's stiffness and spring construction. Unlike other extension springs, a consistent degree of force is exerted despite the degree of deflection.

Referring to FIG. 1D, an optional plate 1015 is secured over spool 1005, by fasteners 1017 or screws, or alternatively a friction fit. Plate 1015 prevents or inhibits biasing mechanism 1009 from uncoiling from the interior aperture of spool 1005.

Referring to FIG. 1C, housing 1003 of reel assembly 102 presents a flat or substantially flat surface or wall 1003b proximate to engagement member 104. In embodiments, opposite wall 1003a can be used for display or decorative purposes. For example, logos, graphics, or other printed elements can be printed or otherwise adhered to the surface distal engagement member 104 for display while the user is wearing card reel clip 100. In one particular example, as shown in FIG. 1C, wall 1003a is removable via a friction fit. Wall 1003a can be swapped out with other decorative walls.

In an embodiment, housing 1003 is substantially circular. In another embodiment, housing 1003 is substantially square or rectangular. Other shapes or configurations of housing 1003 are also considered. Housing 1003 can be formed from metal, plastic, or combinations thereof.

Engagement member 104 is substantially elongated and includes a clothing-interfacing first end 105, a ratcheting component-interfacing second end 107, and a hinge-interfacing intermediate area 111. In an embodiment, first end 105 extends from intermediate area 111 towards the card. First end 105 can optionally comprise a clothing-gripping tip 116 that makes up substantially all of first end 105. Clothing-gripping tip 116 can comprise a rubberized, gripping interface or any other clothing-appropriate interface. Clothing-gripping tip 116 can be, for example, a bumper frictionally fitted over end 105, or alternatively can be directly overmolded onto end 105.

Second end 107 extends from intermediate area 111 in a direction opposite first end 105. Second end 107 comprises an aperture and a pin 114 received by the aperture to secure a portion of ratcheting component 109. Intermediate area 111 projects orthogonally from the elongated extension formed by first end 105 and second end 107. Intermediate area 111 can comprise an aperture for receiving hinge 108.

Hinge support 106 projects from the flat or substantially flat surface of reel 102 at a position substantially intermediate real 102. Hinge support 106 comprises an aperture for receiving hinge 108. Hinge support 106 projects at least as far as intermediate area 111 projects orthogonally from the elongated extension formed by first end 105 and second end 107 of engagement member 104 so that intermediate area 111 does not unduly rub against the flat surface of reel 102 and the pivoting action of engagement member 104 can be realized.

Hinge 108 comprises a pin or dowel that allows rotation of engagement member 104 about hinge support 106. Hinge 108 thus extends through the aperture of intermediate area 111 of engagement member 104 and through the aperture of hinge support 106 to openly couple engagement member 104 with hinge support 106. Hinge 108 is secured on the side distal the receiving side of hinge support 106. In an embodiment, the end of hinge 108 distal the end received by engagement member 104 and hinge support 106 has a flat head to prevent hinge 108 from passing completely through the respective apertures. In such an embodiment, the flat head rests on intermediate area 111 to secure hinge 108 on the side distal the side secured at hinge support 106.

With the above-described structure, engagement member 104 is capable of pivoting about hinge 108. The void created by the space between the flat or substantially flat surface of reel 102 and first end 105 is receiving aperture 103. The size of aperture 103 can therefore be increased or decreased depending on the pivoting position of engagement member 104.

Ratcheting component 109 generally includes geared rack 110, geared hammer 112 and a pin 114.

Geared rack 110 can be slightly convex, as depicted, in order to more efficiently engage with the gears of geared hammer 112. In another embodiment, geared rack 110 can be substantially straight as in traditional rack and pinion toothed rods. Geared rack 110 has one or more teeth on the side distal the side facing hinge 108 that are configured to interlock with the one or more teeth of geared hammer 112. Geared rack 110 projects from the flat or substantially flat surface of reel 102 at a position intermediate the projection of hinge support 106 and the end of reel 102.

Geared hammer 112 is substantially hammer-shaped in an embodiment. In another embodiment, geared hammer 112 is L-shaped. Geared hammer 112 comprises a finger-interfacing projection on one end, one or more teeth on
and an end distal the finger-interfacing projection, and an aperture intermediate the finger-interfacing projection and the one or more teeth.

[0051] Pin 114 operably couples second end 107 of engagement member 104 with ratcheting component 109. Specifically, pin 114 extends through the aperture of engagement member 104 and the aperture of geared hammer 112 and is secured on the side distal the receiving side of the aforementioned apertures. By pin 114 providing such a position, the finger-interfacing projection can be pivoted about pin 114 in order to ratchet the one or more teeth of geared hammer 112 along the one or more teeth of geared rack 110 and thus pivot engagement member 104.

[0052] In an embodiment, a resilient tether 113 is operably coupled to pin 114 and geared hammer 112 to provide tension during the ratcheting process. Resilient tether 113 can therefore be made of any elastic, flexible material such as natural or synthetic rubber, or silicone or other elastomeric material, for example.

[0053] In embodiments, the above-described components of card reel clip 200 are metal. In embodiments, the components can be metal with plastic over-molding. When assembled, in an embodiment, card reel clip 100 is approximately \(\frac{3}{4}'' \times 0.24''\). In another embodiment, card reel clip 100 is approximately \(\frac{3}{8}'' \times 1''\). Other sizes and variations are also considered.

[0054] In operation, engagement member 104 of card reel clip 100 can rotate about the face of housing 103 of reel assembly 102. Such rotation allows the user to angle clip 100 in any orientation relative to the circumference of the face of the reel assembly 102. The ability for reel assembly 102 to freely rotate with respect to engagement member 104 also reduces the load on engagement member 104 when an object attached to line 101 of reel assembly 102 is extended away from reel assembly 102 in any of a variety of directions such that card reel clip 100 remains or is more likely to remain attached to the article of clothing, and is less inclined to pull away.

[0055] Referring to FIG. 1A, card reel clip 100 is depicted in a clothing-receivable open position. Ratcheting component 109 includes teeth of geared hammer 112 locked or with the one or more teeth of geared rack 110 in a position proximate the face of reel 102. In other words, a tooth of geared hammer 112 is positioned win a valley between teeth of geared rack 110. As a result, the pivot about pin 114 combined with the pivot about hinge 108 holds second end 107 of engagement member 104 in a roughly parallel position relative to the face of reel 102 thereby creating a clothing-receiving gap or aperture 103 between end 105 and housing 1003. In embodiments, pin 114 and the pivot about hinge 108 holds second end 107 in a position such that receiving aperture 103 forms an angle with the face of reel 102 along hinge 108 and engagement member 104 is biased past parallel. Because first end 105 of engagement member 104 extends from intermediate area 111 of engagement member 104, aperture 103 is thus configured in an “open” position between the flat or substantially flat surface of reel 102 and first end 105. In other embodiments, engagement member 104 can be pivoted about hinge 108 such that the “open” position of aperture 103 forms an acute angle. Clothing can then be inserted into aperture 103.

[0056] Referring to FIG. 1B, geared hammer 112 has been manipulated to interlock with a tooth of geared rack 110 distal reel assembly 102 compared to the interlocked tooth of geared rack 110 of FIG. 1A such that card reel clip 100 is in a received, closed position. As depicted, geared hammer 112 has been ratched at least once along the direction of arrow A. Specifically, second end 107 is biased in the direction of arrow A such that that the toothed end of geared hammer 112 slides from the initial tooth of geared rack 110 as depicted in FIG. 1A to a subsequent tooth spaced farther from housing 1003 of reel assembly 102 than the initial position. As second end 107 moves away from housing 1003, first end 105 is biased towards housing 1003, thereby narrowing aperture 103. This process can be repeated to narrow aperture 103 appropriately. Once in the desired position, geared hammer 112 is locked by resilient tether 113.

[0057] As geared hammer 112 is ratched, pressure is applied to clothing (not shown) between engagement member 104 and the flat or substantially flat surface of reel assembly 102. Optionally, and as shown in FIGS. 1A and 1B, clothing-gripping tip 116 provides a clothing-appropriate interface to hold the received clothing against reel assembly 102. The pressure of engagement member 104 against reel assembly 102 thus secures card reel clip 100 to the clothing of the user. Note that pushing the finger-interfacing projection of geared hammer 112 in the direction of arrow A forces geared hammer to pivot about pin 114 and thus, the teeth of geared hammer 112 are released from the teeth of geared rack 110. Pressure is thus released from between clothing-gripping tip 116 and reel assembly 102.

[0058] In another embodiment, referring generally to FIGS. 2A and 2B, a card reel clip 200 according to an embodiment is depicted. Card reel clip 200 is substantially similar to card reel clip 100, with some differences described herein. Card reel clip 200 generally includes reel assembly 202, and an engagement or clip assembly including a first engagement member 204, second engagement member 206, hinge 208, and adjustment mechanism or ratcheting component 209.

[0059] Reel assembly 202 is substantially similar to reel 102 as described above, and acts as a tether for a card.

[0060] First engagement member 204 is substantially L-shaped and projects from the flat or substantially flat surface of reel 202 at a position substantially intermediate reel 202. Unlike engagement member 104, first engagement member 204 is fixed in place. First engagement member 204 can optionally comprise a clothing-gripping tip 216a at the end distal reel 202 that makes up substantially all of the clothing-contacting portion of first engagement member 204. Clothing-gripping tip 216a can comprise a rubberized, gripping interface or any other clothing-appropriate interface. First engagement member 204 further comprises an aperture for receiving hinge 208.

[0061] Second engagement member 206 is substantially S-shaped and comprises a first end 205 and a second end 207 with a curve intermediate first end 205 and second end 207. Thus, first end 205 extends from the intermediate curve towards the card attached to the end of reel 202. Second end 207 extends from the opposite end of the intermediate curve in a direction opposite first end 205. First end 205 can comprise a clothing-gripping tip 216b that makes up substantially all of the clothing-contacting portion of first end 205. Clothing-gripping tip 216b is located opposite clothing-gripping tip 216a of first engagement member 204. Clothing-gripping tip 216b can likewise comprise a rubberized, gripping interface or any other clothing-appropriate interface. Second engagement member 206 further comprises an aperture for
receiving hinge 208. The aperture of second engagement member 206 is located at the curve intermediate first end 205 and second end 207.

[0062] Similar to hinge 108, hinge 208 comprises a pin or dowel that allows rotation of second engagement member 206 about first engagement member 204. Hinge 208 thus extends through the aperture of first engagement member 204 and through the aperture of second engagement member 206 to operably couple first engagement member 204 and second engagement member 206. Hinge 208 is secured on the side distal the receiving side of second engagement member 206.

In an embodiment, the end of hinge 208 distal the end received by first engagement member 104 and second engagement member 206 has a flat head to prevent hinge 208 from passing completely through the respective apertures. In such an embodiment, the flat head rests on first engagement member 204 to secure hinge 208 on the side distal the side secured at second engagement member 206. The location of hinge 208, and therefore the aperture of first engagement member 204, is at least as far as the extension of the intermediate curve of second engagement member 206 between first end 205 and second end 207 so that the intermediate curve does not unduly rub against the flat surface of reel assembly 202 and the pivoting action of second engagement member 206 can be realized.

[0063] Ratcheting component 209 generally includes geared rack 210 and geared hammer 212 and is operably coupled to second end 207 of second engagement member 206.

[0064] Geared rack 210 can be slightly convex, as depicted, in order to more efficiently engage with the gears of geared hammer 212. In another embodiment, geared rack 210 can be substantially straight as in traditional rack and pinion toothed rods. Geared rack 210 has one or more teeth on the side distal the side facing hinge 208 that are configured to interlock with the one or more teeth of geared hammer 212. Geared rack 210 projects from the flat or substantially flat surface of reel 202 at a position intermediate the projection of first engagement member 204 and the end of reel 202.

[0065] Geared hammer 212 is substantially hammer-shaped in an embodiment. In another embodiment, geared hammer 212 is L-shaped. Geared hammer 212 comprises a finger-interfering projection on one end and one or more teeth on an opposite side of the hammer projection.

[0066] In embodiments, the above-described components of card reel clip 200 are metal. In embodiments, the components are made of plastic or other similar material. In embodiments, the components can be metal with plastic over-molding. When assembled, in an embodiment, card reel clip 200 is approximately ¾"×⅜". In another embodiment, card reel clip 200 is approximately ⅛"×⅜". Other sizes and variations are also considered.

[0067] In operation, card reel clip 200 can rotate about the face of reel assembly 202. Such rotation allows the user to angle clip 200 in any orientation relative to the circumference of the housing of reel assembly 202, as described above.

[0068] Referring to FIG. 2A, card reel clip 200 is depicted in a clothing-receivable open position. Ratcheting component 209 has the teeth of geared hammer 212 locked with the one or more teeth of geared rack 210 in a position distal the face of reel assembly 202. As a result, the pivot about hinge 208 holds second end 207 of second engagement member 206 in a roughly parallel position relative to the face of reel assembly 202. In embodiments, the pivot about hinge 208 holds second end 207 in a position such an angle is formed with the face of reel assembly 202. Because first end 205 of second engagement member 206 extends from intermediate curve, aperture 203 is thus configured in an “open” position between first engagement member 204 and second engagement member 206. Clothing can then be inserted into aperture 203.

[0069] Referring to FIG. 2B, geared hammer 212 has been manipulated to interlock with a tooth of geared rack 210 proximate reel assembly 202 compared to the interlocked tooth of geared rack 210 of FIG. 2A such that card reel clip 200 is in a received, closed position. As depicted, geared hammer 212 has been ratcheted at least once along the direction opposite arrow B. Specifically, second end 207 is biased in the direction opposite arrow B such that the toothed end of geared hammer 212 slides from the initial tooth of geared rack 210 as depicted in FIG. 2A to a subsequent tooth proximate the face of reel assembly 202. As second end 207 is biased towards reel assembly 202, first end 205 is biased towards end 216a, thereby narrowing gap or aperture 203. This process can be repeated to narrow aperture 203 appropriately. Once in the desired position, geared hammer 212 is locked by the face of the teeth of geared rack 210.

[0070] As geared hammer 212 is ratched toward reel assembly 202, pressure is applied to clothing (not shown) between clothing-gripping tips 216a and 216b of first engagement member 204 and second engagement member 206, respectively. Optional clothing-gripping tips 216a and 216b provides a clothing-appropriate interface to hold the received clothing. This pressure thus secures card reel clip 200 to the clothing of the user. Note that pushing the finger-interfering projection of geared hammer 212 in the direction of arrow B forces geared hammer to pivot in the direction of arrow B and thus, the teeth of geared hammer 212 are released from the teeth of geared rack 210. Pressure is thus released from between clothing-gripping tips 216a and 216b. In an embodiment, the pivoting of geared hammer 212 may be via the pin and aperture coupling described in card reel clip 100 and depicted in FIGS. 1A-1B.

[0071] Thus, unlike the embodiment of FIGS. 1A and 1B, pressure is applied between first engagement member 204 and second engagement member 206 by ratcheting geared hammer toward reel assembly 202. Pressure is released by the pivoting of geared hammer 212 about second end 207 of second engagement member 206 to release the teeth of geared hammer 212 from the teeth of geared rack 210.

[0072] In another embodiment, referring generally to FIGS. 3A and 3B, a card reel clip 300 according to an embodiment is depicted. Card reel clip 300 generally includes reel assembly 302, engagement mechanism 304, locking slide 306, fastener 308, and cover 310.

[0073] Reel assembly 302 is substantially similar to reel assemblies 102 and 202 as described above, and functions as a tether for a card, coupling the card to the clip.

[0074] Engagement mechanism or clip 304 comprises a substantially flat mounting portion 320 and a clamp portion 322 coupled to mounting portion 320 at a first end of each via an arcuate portion 317 extending therebetween such that clamp portion 322 is a cantilever. In a particular embodiment, clamp portion 322 is curved; alternatively, clamp portion 322 can be flat such that it is substantially parallel and spaced apart from mounting portion 320. In an embodiment, engagement mechanism 304 is made of a plastic-based material. In another embodiment, engagement mechanism 304 is made of metal.
Mounting portion 320 is substantially flat member that extends from a first end 305 beginning intermediate reel assembly 302 to a second end 307 at an edge of reel assembly 302. However, mounting portion 320 can be longer or shorter than depicted. Mounting portion 320 can be mounted to the housing of reel assembly 302 by mounts 312. Mounts 312 can be any appropriate type of fastener, such as a screw, nail, or pin, for example. In other examples, mounts 312 can be a welded, glued, or otherwise joined separator. In an embodiment, mounting portion 320 is mounted flush against the face of reel assembly 302. In such embodiments, apertures are positioned where appropriate along the face of mounting portion 320 where required to fasten to mounts 312. In another embodiment, mounting portion 320 is mounted away from the face of reel assembly 302 using separators without apertures present along the face of mounting portion 320. Mounting portion 320 forms one side of engagement mechanism 304.

Clamp portion 322 extends from second end 307 of mounting portion 320 via arcuate portion 317 as described above. Clamp portion 322 forms an arc therefrom that extends substantially orthogonal outward briefly and subsequently back toward the end of mounting portion 320 proximate the card to a curved portion second end 315. Between clamp portion 322 and mounting portion 320 aperture 303 is created. In the receiving position depicted in FIG. 3A, the respective ends of mounting portion 320 and clamp portion 322 do not touch, and thus aperture 303 comprises a clothing-receivable gap. Clamp portion 322 thus forms a second side of engagement mechanism 304.

Within aperture 303, one or more clothing-gripping projections or bars 314 are present. Specifically, clothing-gripping projections 314 are positioned on the side of mounting portion 320 distal reel assembly 302 near first end 305 of mounting portion 320. Likewise, clothing-gripping projections 314 are positioned on the concave side of clamp portion 322 near second end 315 of clamp portion 322. Clothing-gripping projections 314 can comprise a rubberized, gripping interface or any other clothing-appropriate interface.

Locking slide 306 is of a size such that the inner sides of locking slide 306 make flush contact around the outer sides of engagement mechanism 304, creating a friction fit, and creating a biasing or pinching force such that clamp portion 322 is biased towards mounting portion 320 such that aperture 303 is selectively and adjustably sized. As such, locking slide 306 comprises a substantially flat portion 330 to interface with mounting portion 320 and a curved or clamp portion 332 to interface with clamp portion 322. Curved portion 332 is extends from mounting portion 330 via an arcuate portion 334, such that curved portion 332 is camillevered relative to mounting portion 330.

In an embodiment, curved portion 332 extends to the length of clamp portion 322 of engagement mechanism 304. In another embodiment, curved portion 332 extends only intermediate the length of clamp portion 322 of engagement mechanism 304. In an embodiment where mounting portion 320 is flush with card reel assembly 302, mounting portion 320 can further comprise a track or elongated recesses formed in an exterior thereof to allow movement of locking slide 306.

Additionally, mounting portion 330 of locking slide 306 can include an elongated slot (not shown) to accommodate mounts 312 and to inhibit complete removal of locking slide 306 from engagement mechanism 304. In such a configuration, it is desirable to have mounts 312 along the center of flat portion 320 of engagement mechanism 304 to maintain integrity of both flat portion 320 and flat portion 330. In an embodiment, locking slide 306 can be made of metal.

Curved portion 332 can optionally include a lip 336 at its free end. Lip 336 is engageable with a ledge or shoulder (not shown) formed on an exterior of clamp portion 322 of engagement mechanism 304 when locking slide completely engages or is completely flush with engagement mechanism 304.

Fastener 308 comprises any appropriate fastener for mounting cover 310 to the body or housing of reel assembly 302. In embodiments, fastener 308 can comprise a screw, nail, or pin, for example. In another embodiment, fastener 308 further mounts engagement mechanism 304 to reel assembly 302. In embodiments, cover 310 can be mounted to the body of reel assembly 302 without a fastener by means of a friction fit, glue, threaded grooves on the face of reel assembly 302, or any other suitable implementation. Fastener 308 further allows for clip 300 to rotate about the face of reel assembly 302.

Cover 310 comprises frame 316 and decorative body 318. Frame 316 is operably coupleable to decorative body 318 to provide a decorative cover, for example, for card reel clip 300. In the embodiment depicted in FIGS. 3A and 3b, frame 316 comprises a gold, silver, or metallic frame and decorative body 318 comprises a resin mother-of-pearl gem. Other frames 316 and decorative bodies 318 are considered.

In embodiments, the above-described components of card reel clip 300 are metal. In embodiments, the components can be metal with plastic over-molding. When assembled, in an embodiment, card reel clip 300 is approximately ¾“×⅛“. In another embodiment, card reel clip 300 is approximately ¾“×⅟₁₆“. Other sizes and variations are also considered.

In operation, card reel clip 300 can rotate about the face of reel assembly 302 by rotation about fastener 308. Such rotation allows the user to angle clip 300 in any orientation relative to the circumference of the face of the reel assembly 302.

Referring to FIG. 3A, card reel clip 300 is depicted in a clothing-receivable open position. Locking slide 306, as depicted, is in an “up” position. As a result, engagement mechanism 304, and specifically clamp portion 322, is not compressed toward mounting portion 320, and instead allowed to flex freely open. Thus, aperture 303 is created as described above. Clothing can then be inserted into aperture 303. Clothing-gripping projections 314 likewise are separated to allow for the insertion of clothing (not shown) into aperture 303.

Referring to FIG. 3B, locking slide 306 is in a “down” position, creating a friction fit with engagement mechanism 304. During the conversion of locking slide 306 from the “up” position to the “down” position, the aperture or apertures of locking slide 306 receives mounts 312 where appropriate. Thus, locking slide 306 is able to freely encompass engagement mechanism 304. When locking slide 306 is fully engaged with engagement mechanism 304, a clicking or snapping sound is present, caused by abutting engagement of lip 336 with the shoulder or ledge formed on the exterior of clamp portion 322, thereby creating a difference in the gap between locking slide 306 and engagement mechanism 304 when engaged compared to disengaged.

As a result of the pushing of locking slide 306 onto engagement mechanism 304, and specifically, mounting por-
tion 320 and clamp portion 322, clamp portion 322 is gently forced towards mounting portion 320. Aperture 303 is thereby lessoned. Clothing-gripping projections 314 within aperture 303 interface with opposing clothing-gripping projections 314 or the opposing face of mounting portion 320 or concave face of clamp portion 322, respectively, to securing the inserted clothing. When in a locked or closed position, a slight detent of engagement mechanism 304 allows for a tactile response indicating the locked or closed position. Note that to release the gripped clothing from engagement mechanism 304, locking slide 306 is merely slid back into the "up" position. Clamp portion 322 is thus allowed to again flex freely open and the clothing can be removed.

[0089] In another embodiment, referring to FIG. 4, a card reel clip 400 according to an embodiment is depicted. Card reel clip 400 is substantially similar to card reel clip 300, with some differences described herein. Card reel clip 400 generally includes reel assembly 402, engagement mechanism 404, locking slide 406, and fastener 408.

[0090] Reel assembly 402 is substantially similar to reel assemblies 102, 202, and 302 as described above, and functions as a tether for a card.

[0091] Engagement mechanism 404 is substantially similar to engagement mechanism 304 as described above and comprises a substantially flat mounting portion 420 and a curved portion 422 coupled via arcuate portion 421 such that curved portion 422 is cantilevered. For the sake or brevity, the details of engagement mechanism 404 are not repeated here but are assumed to be similar if not identical to details of engagement mechanism 304. In an embodiment, engagement mechanism 404 is made of a plastic-based material. In another embodiment, engagement mechanism 404 is made of metal.

[0092] Locking slide 406 is substantially similar to locking slide 306 as described above and is of a size such that the inner sides of locking slide 406 make flush contact around the outer sides of engagement mechanism 404. As such, locking slide 406 is U-shaped to receive the outer sides of engagement mechanism 404, and includes a clamp portion 410 and a mounting portion 412 coupled by arcuate portion 407 such that clamp portion 410 is cantilevered. Mounting portion 412 includes elongate slot 413 for accommodating fastener 408, and to inhibit complete removal of locking slide 406 from engagement mechanism 404. Clamp portion 410 of locking slide 406 also includes curved lip 414 at its free end. Lip 414 is engageable with ledge 418, formed in recessed track 416 on an exterior surface of clamp or curved portion 422 of engagement mechanism 404 when locking slide 406 complete engages or is completely flush with engagement mechanism 404. Again for the sake or brevity, additional details of locking slide 406 are not repeated here but are assumed to be similar if not identical to the locking slide 306 of card reel clip 300.

[0093] Fastener 408 comprises any appropriate fastener for mounting engagement mechanism 404 to the body of reel assembly 402. In embodiments, fastener 408 can comprise a screw, nail, or pin, for example.

[0094] In embodiments, the above-described components of card reel clip 400 are metal. In embodiments, the components can be metal with plastic over-molding. When assembled, in an embodiment, card reel clip 400 is approximately 3/4"×3/4". In another embodiment, card reel clip 400 is approximately 5/8"×1¼". Other sizes and variations are also considered.

[0095] In operation, card reel clip 400 can rotate about the face of reel assembly 402 by rotation about fastener 408. Such rotation allows the user to angle clip 400 in any orientation relative to the circumference of the face of the reel assembly 402.

[0096] Similar to card reel clip 300, and referring to FIG. 4, card reel clip 400 is depicted in a clothing-receivable open position. Locking slide 406, as depicted, is in an "up" position. As a result, engagement mechanism 404, and specifically curved portion 422, is not compressed toward mounting portion 420, and instead allowed to flex freely open. Aperture 403 is thereby created. Clothing can then be inserted into aperture 403.

[0097] Similar to FIG. 3B, but not depicted, locking slide 406 can be put in a "down" position, creating a friction fit with engagement mechanism 404. During the conversion of locking slide 406 from the "up" position to the "down" position, the aperture or apertures 413 of locking slide 406 receives fastener 408 where appropriate. Thus, locking slide 406 is able to fully encompass engagement mechanism 404. Similar to clip 300, when locking slide 406 is fully engaged with engagement mechanism 404, a clicking or snapping sound is present, due to lip 414 sliding over and abutting ledge 418.

[0098] As a result of the pushing of locking slide 406 onto engagement mechanism 404, curved portion 422 is gently forced towards mounting portion 420. Aperture 403 is thereby lessoned. The opposing faces of mounting portion 420 and concave face of curved portion 422 securing the inserted clothing. Note that to release the gripped clothing from engagement mechanism 404, locking slide 406 is merely slid back into the "up" position. Curved portion 422 is thus allowed to again flex freely open and the clothing can be removed.

[0099] Therefore, embodiments provide a tactile response to the user to indicate whether the clip is adequately engaged with the clothing of the user. The haptic technology implemented in embodiments provides an indication of the success of the engagement. Additionally, embodiments allow for the closeness of the closure to be varied depending on the thickness of the engaging clothing. Embodiments also allow for the seamless transition of clipping between varying thicknesses of clothing. Further, no forcing of clothes into the clip is required. Embodiments further allow for a robust, sturdy clip such that the clip is not at risk of breaking.

[0100] Various embodiments of systems, devices and methods have been described herein. These embodiments are given only by way of example and are not intended to limit the scope of the invention. It should be appreciated, moreover, that the various features of the embodiments that have been described may be combined in various ways to produce numerous additional embodiments. Moreover, while various materials, dimensions, shapes, configurations and locations, etc. have been described for use with disclosed embodiments, others besides those disclosed may be utilized without exceeding the scope of the invention.

[0101] Persons of ordinary skill in the relevant arts will recognize that the invention may comprise fewer features than illustrated in any individual embodiment described above. The embodiments described herein are not meant to be an exhaustive presentation of the ways in which the various features of the invention may be combined. Accordingly, the embodiments are not mutually exclusive combinations of features, rather, the invention may comprise a combination of
different individual features selected from different individual embodiments, as understood by persons of ordinary skill in the art.

[0102] Any incorporation by reference of documents above is limited such that no subject matter is incorporated that is contrary to the explicit disclosure herein. Any incorporation by reference of documents above is further limited such that any claims included in the documents are incorporated by reference herein. Any incorporation by reference of documents above is yet further limited such that any definitions provided in the documents are not incorporated by reference herein unless expressly included herein.

What is claimed is:
1. A reel clip assembly for securing an object, such as a card, to an article of clothing, the card reel clip assembly comprising:
   a reel assembly including—
   a reel housing,
   a reel enclosed within the reel housing, and
   a tether line coupled to the reel, wherein a first end of the tether line is attached to the reel, and a second end of the tether line extends outside of the reel housing and is adapted to receive an object thereon, wherein the tether line is selectively extendable and retractable about the reel thereby enabling the object to be spaced at variable distances from the reel assembly;
   an engagement mechanism coupled to an exterior face of the reel housing, the engagement assembly being shiftable between an engaged position in which the engagement mechanism clamps the article of clothing, and a release position in which the engagement mechanism disengages the article of clothing; and
   a locking member positioned in a shiftable relationship to the engagement mechanism, the locking member being selectively shiftable between a locked position, in which the engagement mechanism is maintained in the engaged position to secure the reel assembly to the article of clothing, and an unlocked position in which the engagement mechanism is in the release position such that the reel assembly is free from engagement of the article of clothing.

2. The reel clip assembly of claim 1, wherein the engagement mechanism comprises a first mounting portion coupled to the exterior surface of the reel housing, and a clamp portion coupled to and spaced apart from the mounting portion at a first end of each via an arcuate portion extending therebetween,
   wherein the clamp portion is shiftable relative to the mounting portion, thereby defining a variable-sized clothing-receivable gap at a second end of the mounting portion and the clamp portion.

3. The reel clip assembly of claim 2, wherein the locking member comprises a mounting portion coupled to the reel housing such that it is sandwiched between the mounting portion of the engagement mechanism and the exterior surface of the reel housing, and a clamp portion coupled to the mounting portion via an arcuate portion, wherein the locking member is positioned over the engagement mechanism.

4. The reel clip assembly of claim 3, wherein the locking member is slidable relative to the engagement mechanism such that when the locking member is shifted from the unlocked position to the locked position, the mounting portion of the locking member slides along an exterior of the mounting portion of the engagement mechanism toward the second end, and the clamp portion of the locking member slides along an exterior of the clamp portion toward the second end, thereby biasing the clamp portion of the engagement mechanism toward the mounting portion of the engagement mechanism to adjust the clothing-receivable gap.

5. The reel clip assembly of claim 1, wherein the locking member provides a tactile response to a user when the reel assembly is securely fastened to the article of clothing.

6. The reel clip assembly of claim 1, wherein the locking member provides a sound indicator to a user when the reel assembly is securely fastened to the article of clothing.

7. The reel clip assembly of claim 2, wherein the variable-sized clothing-receivable gap provides sufficient clearance for accommodating a variety of articles of clothing.

8. The reel clip assembly of claim 2, wherein the mounting portion is substantially flat in profile such that the mounting portion is substantially flush with the exterior surface of the reel housing, thereby minimizing a profile of the reel clip assembly.

9. The reel clip assembly of claim 2, wherein a rubber bumper is positioned over the second end of the clamp portion of the engagement mechanism to provide a clothing-friendly surface.

10. The reel clip assembly of claim 1, wherein the engagement mechanism is rotatably coupled to the reel assembly such that reel assembly freely rotates when the tether line is selectively extended and retracted about the reel without disengaging the engagement mechanism from the article of clothing.

11. A card reel with clip assembly for tethering a card to an article of clothing, the card reel with clip assembly comprising:
   a reel including a spring-biased spool and a tether, a first end of the tether being coupled to the spool, and a second end of the tether being coupleable to the card, wherein the tether is retractable and extendable about the spool;
   a clip operably coupled to the reel, the clip including a mounting portion mounted to the reel, and a clamp portion extending, at a first end, from a first end of the mounting portion, wherein the clamp portion is shiftable relative to the mounting portion, thereby defining a variable-sized clothing-receivable gap at a second end of the mounting portion and the clamp portion; and
   an adjustment mechanism for selectively adjusting the clothing-receivable gap.

12. The card reel with clip assembly of claim 11, wherein the adjustment mechanism provides a tactile response to a user when the reel assembly is securely fastened to the article of clothing.

13. The card reel with clip assembly of claim 11, wherein the adjustment mechanism comprises a sliding member positioned over the clip, the sliding member being slidable relative to the clip between an unlocked position in which the clothing-receivable gap is maximized, and a locked position in which the clothing receivable gap is minimized for a particular article of clothing thereby securing the reel to the article of clothing.

14. The card reel with clip assembly of claim 13, wherein the sliding member is slidable along an exterior of clip, thereby biasing the clamp portion of the clip toward and away from the mounting portion of the clip to adjust the clothing-receivable gap.
15. The card reel with clip assembly of claim 11, wherein the adjustment mechanism comprises a ratchet mechanism including—
   a geared rack having a plurality of protrusions and valleys therebetween, and
   a hammer presenting an actuating portion and a toothed portion,
   wherein the toothed portion of the hammer shifts along the geared rack upon actuation of the actuating portion, thereby adjusting the clothing-receivable gap.

16. The card reel with clip assembly of claim 15, wherein the geared rack is fixedly mounted to the reel, and the hammer is pivotably mounted to the clip.

* * * * *