THROAT HEIGHT ADJUSTMENT IN A BELT LOOP OR BELT CLIP

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ABSTRACT
A belt hanger, such as a belt clip or belt loop, includes a body having opposing inner and outer walls extending downwardly from a bridge portion and defining a throat opening for receiving a user's belt or waistband. A keeper is movably mounted to the body below the bridge portion to form an adjustable lower boundary of the throat opening. The body preferably includes a set of vertically spaced engagement features, such as notches or detents, that are sized for engagement with corresponding lock features of the keeper to facilitate adjustment and positioning of the keeper at a selected one of several possible vertical positions, without the use of tools.
THROAT HEIGHT ADJUSTMENT IN A BELT LOOP OR BELT CLIP

RELATED APPLICATION

[0001] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 60/424,538, filed Nov. 6, 2002, which is incorporated herein by reference.

TECHNICAL FIELD

[0002] This application relates to belt clips and belt loops for supporting an object on a wearer's belt or waistband.

BACKGROUND OF THE INVENTION

[0003] Belt clips having an inverted U-shaped profile are known for grasping a belt or waistband. Such clips are commonly mounted to an object for supporting the object on a person's belt or waistband and may include a spring element for grasping the waistband or belt. Because such clips are not bound at their lower ends, they are subject to tilting on the belt or waistband, especially under the influence of a lateral force or torque applied to the clip or the object being supported by the clip.

[0004] Similarly, belt loops are known devices for suspending a pouch or holster from a belt, such as a duty belt of the type commonly used by law enforcement officers. A belt loop large enough to fit a 2 inch (5.1 cm) wide duty belt, for example, is subject to tilting when used with a belt of shorter height, such as a 1 1/4 inch (3.2 cm) wide dress belt. When such a belt loop is used to support a handgun holster on the belt of a law enforcement officer, for example, a loose fit can allow tilting of the loop on the officer's belt and may adversely affect the officer's ability to quickly and cleanly draw the handgun from the holster when needed.

[0005] U.S. Pat. No. 6,161,741 of French, which is owned by the assignee of the present invention and incorporated herein by reference, describes a belt loop having a pair of flexible elongated securing members extending downwardly along an inner wall of the belt loop and coupled, via a pair of threaded fasteners, to an opposing outer wall of the belt loop. When the fasteners are tightened, the securing members are drawn toward the outer wall to clamp a belt between the securing members and the outer wall. The clamping action of this device helps to prevent sliding of the belt loop along the belt, but does not change the height of the belt loop's throat opening.

[0006] The present inventors have, thus, recognized a need for a belt loop or clip that can be easily adjusted to define a throat opening of a selected height for fitting belts and waistbands of different widths and sizes, and to inhibit tilting.

SUMMARY OF THE INVENTION

[0007] In a belt hanger device such as a belt clip or belt loop, a throat opening is bordered by a pair of opposing inner and outer walls that extend downwardly from an upper bridge portion. The inner and outer walls of a belt clip preferably have free ends distal of the bridge portion that are resiliently biased toward each other for grasping an item such as a belt or waistband. Together with the bridge portion, the inner and outer walls preferably define an inverted generally U-shaped structure for attachment to a belt or waistband of a wearer's trousers. In a belt loop embodiment, a lower bridge portion spaced apart from the upper bridge portion spans between the inner and outer walls, so that a closed loop is formed by the inner wall, the outer wall, the upper bridge portion, and the lower bridge portion, collectively, which define a throat opening of the belt loop for receiving a belt.

[0008] In accordance with the invention, a keeper is adjustably mounted to one of the inner and outer walls of a belt hanger (hereinafter the "supporting wall") and is selectively positionable along the supporting wall to define a height dimension of the throat opening for receiving belts of different heights. The throat opening is bounded at its top by the bridge portion, at its front and back by the respective outer and inner walls, and at its bottom by a jaw of the keeper, which extends from the supporting wall toward the opposite wall of the belt loop or belt clip. In a belt loop embodiment, the keeper is interposed between the upper and lower bridge portions to define a selectively positionable upper or lower bound of the throat opening.

[0009] A waistband clip embodiment requires no adjustment of the keeper prior to attachment to a waistband. The keeper concentrates the resilient grasping force along a relatively small surface area of the jaw to thereby increase friction and securely grip the waistband of a user's trousers between the jaw and the opposing wall.

[0010] In a preferred embodiment, a track is formed along the supporting wall of the belt clip or belt loop. A body of the keeper may define one or more channels that fit with the track for supporting the keeper on the supporting wall for sliding movement along the track in the vertical direction. At least one of the keeper and the track preferably includes a set of vertically spaced engagement features for engagement with corresponding lock features of the other of the keeper and the track. The engagement features and lock features may include detents, stop blocks, notches, tabs, paws, spring members, ratcheting devices and combinations thereof that interlock to releasably secure the keeper at a selected vertical position along the track. Preferably, the track and engagement features are incorporated in a first unitary structure with the belt loop or belt clip, and the lock features are incorporated in a second unitary structure with the keeper. In alternative embodiments, the keeper may be adjustably secured to the supporting wall by a fastener, such as a screw, thereby allowing the keeper to be precisely positioned at any location along the supporting wall.

[0011] Additional aspects and advantages of this invention will be apparent from the following detailed description of preferred embodiments, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a front perspective view of a belt clip in accordance with a preferred embodiment;

[0013] FIG. 2 is a rear perspective view of the belt clip of FIG. 1, shown attached to a belt, which is illustrated in broken lines;

[0014] FIG. 3 is an auxiliary rear perspective view of the belt clip of FIG. 1, with a keeper of the belt clip omitted;
FIG. 4 is an enlarged bottom perspective view of the belt clip of FIG. 1; and

FIGS. 5 and 6 are perspective views of opposite sides of the keeper of the belt clip of FIG. 1.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIGS. 1 and 2 are respective front and rear perspective views of a belt clip 100 in accordance with a first preferred embodiment. In FIG. 2, belt clip 100 is shown attached to a wearer's duty belt 104, which is illustrated in broken lines. With reference to FIGS. 1 and 2, belt clip 100 includes a body 110 having an inner wall 112 and an opposing outer wall 114 that are joined by a resilient bridge portion 116. Inner and outer walls 112 and 114 have respective inner and outer free ends 122 and 124 located distal of bridge portion 116, so as to form an inverted, generally U-shaped structure 126 defining a throat opening 130. Free ends 122 and 124 are biased toward each other so that they will tend to grasp an item placed therebetween and are preferably flared outwardly, as shown, to facilitate sliding installation of belt clip 100 onto a belt 104 or waistband. A keeper 140 is slidably mounted to inner wall 112, as described below with reference to FIGS. 5 and 6, but may also be mounted to outer wall 114 in an alternative embodiment (not shown).

In a second preferred embodiment, a belt loop is used in the place of belt clip 100. The belt loop embodiment is similar to the belt clip in that it includes inner and outer walls and an upper bridge portion. However, the belt loop also includes a lower bridge portion spaced apart from the upper bridge portion and spanning between the inner and outer walls, so that a closed loop is formed by the inner wall, the outer wall, the upper bridge portion, and the lower bridge portion, collectively, which define a throat opening of the belt loop for receiving a belt. For convenience, the term “belt hanger” is used herein to describe generally belt clips, belt loops, and any other device adapted to be suspended from or attached to a wearer's belt or waistband, thereby forming a base for attachment and/or support of another object, such as a pouch or holster, for example.

FIG. 3 is an auxiliary view of belt clip 100 of FIG. 1, with keeper 140 omitted for clarity. FIG. 4 is an enlarged bottom perspective view of belt clip 100. With reference to FIGS. 1-4, body 110 may include an attachment point 148 for securing an object to body 110. In the embodiment shown, attachment point 148 is integrally formed in body 110 in the form of a dovetail style mounting rail 150 that is sized and configured to fit a battery-powered tactical illuminator (not shown) of the type sold under the trade name M3™ by Insight Technology, Inc. of Londonderry, N.H., USA. See also, U.S. Pat. No. 6,185,854. Body 110 includes a guard shelf 152 for protecting a lens portion of the tactical illuminator from contact with other objects that might otherwise cause damage to or inadvertent activation of the tactical illuminator. Dovetail mounting rail 150 (also called a Picatinny rail or WEATHER™ mount) includes a T-shaped beam 154 extending vertically along outer wall 114 and multiple rail stops 156 spaced apart along an outer face 158 (FIG. 1) of T-shaped beam 152 to define one or more transverse slots 162 therebetween.

Attachment point 148 is not limited to the dovetail mounting rail 150 of the preferred embodiment and the term “attachment point” is defined broadly to encompass any means or mechanism for connecting an object to body 110 or supporting an object on body 110, either directly or indirectly. Furthermore, belt clip 100 can be used to carry any of a variety of objects that a user may want to carry on his or her waistband or belt, such as pouches, holders, weapons, cameras, flashlights, radios, handheld mobile telephones, ammunition magazines, duty gear, stun guns, keys, and personal digital assistants (PDAs), for example. In alternative embodiments (not shown), attachment point 148 may include thread fasteners, hook-and-loop type fasteners, stitching, webbing, or another device that can connect to body 110.

In yet other embodiments, attachment point 148 may include a J-shaped hook for hanging an object from belt clip 100. In still other embodiments, attachment point 148 is omitted entirely, and belt clip 100 is integrally formed with the pouch, holster, or other object to be carried on the user's belt or waistband.

Body 110 (including inner and outer walls 112 and 114, and bridge portion 116, and attachment point 148) is preferably a unitary structure that is injection molded of a high-strength thermoplastic resin, such as KYDEX™ brand acrylic/polyvinyl chloride (acyllic/PVC) alloy sold by Kleerdex Company of Aiken, S.C., USA. Those skilled in the art will appreciate that the preferred embodiment shown in FIG. 3 is designed for moldability to avoid the need in the mold for slides and other expensive high-maintenance tooling components that are sometimes required for molding of parts having more complex configurations. Such a simple mold design generates a single mold parting line extending longitudinally along body 110, including both sides of inner and outer walls 112 and 114. Alternatively, body 110 may be formed using an extrusion method or by using other manufacturing processes and/or materials, for example by stamping of metal such as spring steel. Similarly, keeper 140 is preferably formed as a unitary structure, for example, by injection molding using a resin such as KYDEX™, by stamping a metal such as steel, or by other means.

As noted above, keeper 140 is adjustably mounted to at least one of the inner and outer walls of belt clip 100, which include at least one supporting wall. In the preferred embodiment shown, inner wall 112 is the supporting wall. FIGS. 5 and 6 are perspective views of keeper 140 showing an inner side 172 and an outer side 174 of keeper 140. With reference to FIGS. 1-6, keeper 140 is selectively positionable along inner wall 112 to define a height dimension “H” (FIG. 2) of throat opening 130. Throat opening 130 is bounded at its top by bridge portion 116, at its front and back by the respective outer and inner walls 114 and 112, and at its bottom by a jaw 180 of keeper 140, which extends from the supporting inner wall 112 toward outer wall 114.

In alternative embodiments, such as a belt loop (not shown), jaw 180 may interrupt a loop opening that has fixed upper and lower bounds. In such alternative embodiments, jaw 180 may define a selectively movable lower bound of a throat opening that is bounded at its upper end by a top bridge portion of the belt loop; or jaw 180 may define a selectively movable upper bound of a throat opening that is bounded at its lower end by a bottom bridge portion of the belt loop. Thus, those skilled in the art will appreciate that keeper 140 may serve a purpose other than a lower bound of throat opening 130 in a belt clip.
With particular reference to FIGS. 5 and 6, jaw 180 preferably includes a ramp portion 184 that provides a lead-in to facilitate sliding of belt clip 100 onto a belt, waistband, or other support strap. Jaw 180 also preferably includes a shell portion 186 extending in a generally horizontal direction, generally perpendicular to inner and outer walls 112 and 114, to prevent belt clip 100 from inadvertently sliding off the wearer’s belt 104 or waistband. Shell portion 186 may also be inclined in the direction of upper bridge portion 116 to “bite” into the belt 104 or waistband for preventing slippage. Advantageously, when keeper 140 is adjusted so that the height H of throat opening 130 is closely matched to a width “W” of belt 104 (also referred to as the belt “height”), jaw 180 may prevent belt clip 100 from rocking or twisting relative to belt 104. To help prevent rocking, shelf portion 186 desirably has a width “x” that is wide enough to extend across a substantial portion of inner wall 112 and a depth “d” that is sufficient to span between inner and outer walls 112 and 114. Depth d may also be sized to maintain a parallel relationship between inner and outer walls 112 and 114. The spacing of inner and outer walls 112 and 114 may be sufficient to allow belt clip 100 to slide along belt 104, when desired. If slidding is not desired, a clamping device of the type described in U.S. Pat. No. 6,161,741, at column 4, line 56 through column 4, line 31, for example, can be added to belt clip 100. Alternatively, slidding can be prevented by sizing depth d so that inner and outer walls 112 and 114 are clamped firmly against belt 104. Other means of preventing belt clip 100 from sliding along belt 104 may also be incorporated in belt clip 100.

Belt clip 100 advantageously may require no adjustment of the vertical position of keeper 140 prior to attachment to a waistband. To further facilitate use of belt clip 100 with a waistband, a ridge 188 may be formed on jaw 180 where ramp portion 184 meets shelf portion 186. Ridge 188 may provide a relatively small surface area where the grasping force of the inner and outer walls 112 and 114 is concentrated when belt clip 100 is clipped to a waistband or other oversize support strip, thereby increasing a frictional resistance to slidding, twisting, rocking, or disengagement of belt clip 100

Turning again to FIGS. 1-4, a track 196 is preferably formed along inner wall 112 of belt clip 100. Track 196 may comprise a pair of rails 198a and 198b extending along the edges of inner wall 112, which are thinner than a central beam 200 of inner wall 112. With reference to FIGS. 4-6, keeper 140 preferably includes a pair of ears 204a and 204b extending from a main section 206 of keeper 140. Ears 204a, 204b and main section 206 are configured to collectively define a channel 210 therebetween that fits with and straddles track 196. Ears 204a and 204b ride on respective rails 198a and 198b to facilitate sliding movement vertically along track 196. The preferred embodiments are desirably simple and inexpensive to manufacture, requiring two injection molded plastic parts that can be assembled manually or by machine, merely by inserting keeper 140 onto track 196 at inner free end 122. However, the invention should not be construed as being limited to devices made of such simple 2-piece construction. Nor should the invention be limited to the particular means of assembly and sliding engagement of the preferred embodiment.

In alternative embodiments (not shown), other structures may be used in place of track 196 and channel 210 to facilitate adjustable movement of keeper 140 along outer wall 114. For example, track 196 may include a slot extending along inner wall 112 and, in place of channel 210, one or more pins, standoffs or dovetail shaped tabs may extend through the slot to slidably join keeper 140 to inner wall 112. In yet other embodiments (not shown), keeper 140 is slidably coupled to outer wall 114, while keeper engages inner wall 112 to effect selective positioning of keeper 140. In still further embodiments (not shown), keeper is guided by tracks on both inner and outer walls 112 and 114.

At least one of the keeper and the track preferably includes a set of vertically spaced engagement features 216 for engagement with corresponding lock features 230 of the other of the keeper and the track. The engagement features 216 and lock features 230 may include detents, stop blocks, notches, tabs, pawls, spring members, ratcheting devices and other structures, including combinations thereof, that interlock to releasably secure the keeper at a selected vertical position along the track. With reference to FIGS. 1-4, track 196 preferably includes a set of engagement features 216 in the form of corresponding sets of left and right notches 220a and 220b formed in spaced apart relation along respective rails 198a and 198b. Engagement features 216 may be molded into body 110 as a unitary structure with body 110 for simplicity of manufacture and economy.

With reference to FIGS. 1, 2, 5 and 6, lock features 230 are preferably formed as a unitary structure with keeper 140. Lock features 230 may include first and second outwardly extending cantilever arms 234a and 234b that extend laterally from main section 206 of keeper 140. First and second stops 236a and 236b are formed at the ends of cantilever arms 234a and 234b and sized to seat in and engage notches 220a and 220b, respectively, to secure keeper at a selected one of a plurality of discrete vertical positions along track 196. First and second thumb pads 238a and 238b are provided at distal ends of cantilever arms 234a and 234b, respectively, to facilitate manual disengagement of stops 236a and 236b simultaneously by flexing of cantilever arms 234a and 234b, and without the use of tools.

Preferably, each of the sets of notches 220a and 220b is spaced apart at ¼-inch (0.64 cm) intervals to facilitate adjustment of the position of keeper 140 in ¼ inch (0.64 cm) increments ranging from ¼ inches (3.2 cm) to 2¾ inches (5.7 cm), to accommodate various belt widths. For example, the ¾-inch (0.64 cm) intervals of notches 220a and 220b allow belt clip 100 of the preferred embodiment to fit a ¼ inch (3.2 cm) dress belt, a ½ inch (3.8 cm) pant belt, a ½ inch (4.4 cm) garrison belt, a 2 inch (5.1 cm) ULTRA® belt made by Michaels of Oregon Co., Oregon City, Ore., USA, and a 2½ inch (5.7 cm) duty belt. Skilled persons will appreciate that engagement features 216 and lock features 230 can be spaced more or less closely and can have a wider or small range of adjustment, if desired. Furthermore, engagement features 216 and lock features 230 can be reversed so that engagement features 216 are spaced apart along keeper 140 and lock features 230 are located on body 110.

In alternative embodiments (not shown), keeper 140 may be adjustably secured to the supporting wall by a fastener, such as a set screw or bolt, thereby allowing keeper 140 to be precisely positioned at any location along the supporting wall, without limiting the position of keeper 140.
to only the ones corresponding to the fixed engagement features of the preferred embodiment. In yet another alternative embodiment (not shown), keeper 140 is adjustably secured to the supporting wall by way of a friction jamb, for example a wedge, cam, lever, or other device that can be interposed between keeper 140 and the supporting wall to increase frictional forces and thereby prevent vertical movement of keeper 140 along the supporting wall. Such a friction jamb device can also be formed directly in keeper 140, the supporting wall, and/or another part of the belt clip 100. Friction jamb devices may also include a high friction material, such as rubber or a rubber-like material.

It will be obvious to those having skill in the art that many changes may be made to the details of the above-described embodiments without departing from the underlying principles of the invention. The scope of the present invention should, therefore, be determined only by the following claims.

1. A belt hangar, comprising:
   a body including opposing inner and outer walls and a bridge member spanning between the inner and outer walls; and
   a keeper movably supported on the body and extending between the inner and outer walls distal from the bridge member, the inner wall, the outer wall, and the keeper bordering a throat opening adapted to receive a belt or a waistband, the keeper being selectively moveable along at least one of the inner and outer walls to adjust the size of the throat opening.

2. A belt hangar according to claim 1, further comprising:
   a set of engagement features spaced apart along the body; and
   a corresponding locking member operably associated with the keeper and adapted to interlock with the engagement features at multiple discrete positions for adjusting the position of the keeper.

3. A belt hangar according to claim 1, wherein the body is formed by injection molding.

4. A belt hangar according to claim 1, further comprising a track for guiding the movement of the keeper.

5. A belt hangar according to claim 4, wherein the track extends along one of the inner and outer walls.

6. A belt hangar according to claim 5, wherein the keeper includes a channel that fits the track for slidably supporting the keeper on the track.

7. A belt hangar according to claim 4, further comprising:
   a set of engagement features spaced apart along the track and associated with one of the body and the keeper; and
   a corresponding locking member associated with the other of the body and the keeper, the locking member adapted to interlock with the engagement features at multiple discrete positions along the track for adjusting the position of the keeper.

8. A belt hangar according to claim 1, wherein the body is formed of unitary one-piece construction.

9. A belt hangar according to claim 1, wherein the inner and outer walls include free ends opposite the bridge member.

10. A belt hangar according to claim 9, wherein the free ends of the inner and outer walls are biased toward each other.

11. A belt hangar according to claim 1, wherein the body includes a belt loop.

12. A belt hangar according to claim 1, wherein the keeper is selectively adjustable to fit a belt having a width of between approximately 1.25 inch and approximately 2.25 inches.

13. A belt hangar according to claim 1, wherein the keeper further comprises a jaw extending between the inner and outer walls.

14. A belt hangar according to claim 1, further comprising an attachment point supported on the body for removably securing an object to the body.

15. A belt hangar according to claim 14, wherein the attachment point includes a dovetail mounting rail.

16. A belt clip comprising:
   a body including opposing inner and outer walls and a bridge portion spanning between the inner and outer walls, the inner wall, the outer wall, and the bridge portion defining a throat opening of the belt clip adapted to receive a belt or a waistband; and
   a keeper supported on the body for selective movement along at least one of the inner and outer walls, the keeper extending adjacent the throat opening and opposite the bridge portion to thereby form an adjustable boundary of the throat opening.

17. A belt clip according to claim 16, further comprising:
   a set of engagement features spaced apart along the body; and
   a corresponding locking member operably associated with the keeper and adapted to interlock with the engagement features at multiple discrete positions for incrementally adjusting the position of the keeper.

18. A belt clip according to claim 16, wherein the body is formed by injection molding.

19. A belt clip according to claim 16, further comprising a track extending along one of the inner and outer walls.

20. A belt clip according to claim 16, wherein the keeper includes a channel that fits the track for slidably supporting the keeper on the track.

21. A belt clip according to claim 19, further comprising:
   a set of engagement features spaced apart along the track and associated with one of the body and the keeper; and
   a corresponding locking member associated with the other of the body and the keeper, the locking member adapted to interlock with the engagement features at multiple discrete positions along the track for adjusting the position of the keeper.

22. A belt clip according to claim 16, wherein the inner and outer walls include free ends opposite the bridge member that are biased toward each other.

23. A belt clip according to claim 16, wherein the keeper further comprises a jaw extending between the inner and outer walls.

24. A belt clip according to claim 16, further comprising an attachment point supported on the body for removably securing an object to the body.

25. A belt clip according to claim 24, wherein the attachment point includes a dovetail mounting rail.
26. In a belt clip including opposing inner and outer walls extending downwardly from a bridge portion, the bridge portion and the inner and outer walls defining a throat opening therebetween for fitting the belt clip over a belt or a waistband, the improvement comprising:

a keeper slidably mounted to at least a supporting one of the inner and outer walls for movement in a generally vertical direction therealong, the keeper positioned below the bridge portion and extending from the supporting wall toward the other of the inner and outer walls to thereby form a lower boundary of the throat opening, and the keeper further including means for securing the keeper at a selected position along the supporting wall.

27. A belt clip according to claim 26, wherein the means for securing the keeper at a selected position along the body includes:

a set of engagement features spaced apart along the body; and

a corresponding locking member operably associated with the keeper and adapted to interlock with the engagement features at multiple discrete positions for incrementally adjusting the position of the keeper.

28. A belt clip according to claim 26, wherein the keeper is formed by injection molding.

29. A belt clip according to claim 26, further comprising a track formed in one of the inner and outer walls, and wherein the keeper includes a channel that fits the track for slidably supporting the keeper on the track.

30. A belt clip according to claim 26, wherein the keeper further comprises a jaw extending between the inner and outer walls.

31. A belt clip according to claim 26, further comprising an attachment point supported on the body for removably securing an object to the body.

32. A belt clip according to claim 31, wherein the attachment point includes a dovetail mounting rail.