A lace retention clip for use with a plurality of lace ends includes, in one embodiment, a housing and a bore extending into the housing. The housing further includes a lateral slot formed in the housing and disposed generally transverse relative to the bore. The housing also having a hollow formed in the housing and intersecting the lateral slot and the bore of the plunger. A plunger having a transverse bore is arranged so that the plunger is shiftably mounted within the bore and is moveable between a first position, wherein the bore of the plunger is aligned with the hollow, and a second position wherein the bore is offset from the hollow. The lace retention clip being arranged to frictionally retain a lace within the clip when the plunger is in the second position.
LACE RETENTION CLIP
CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a non-provisional application claiming priority from U.S. Provisional Application Ser. No. 60/468,328, filed May 6, 2003, entitled “Shoelace Retention Clip” and incorporated herein by reference.

TECHNICAL FIELD

[0002] The present invention is directed to lace retention and more particularly to a lace retention clip for securing laces, strings, cords, ropes, or other similar items without requiring the tying of a traditional lace knot.

BACKGROUND

[0003] Lace retention clips are used in many applications to aid in the securing of laces. In some instances, lace retention clips may be used to secure the loose ends of a lace such as, for example, a shoe lace. In other instances, lace retention clips may be used to tighten a drawstring such as, for example, a jacket or shorts drawstring.

[0004] Lace retention clips have typically contained a simple base, a spring loaded plunger, and a lace path allowing the passage of laces through the base and the plunger when the plunger is depressed. Upon releasing the plunger, the lace is frictionally retained between the base and the plunger. In some instances, the plunger may be shiftable within the lace path to frictionally retain the lace against the base.

[0005] Despite various lace retention clips, there is a continued need for improved lace clip designs.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The present invention is best understood from the detailed description which follows, taken in conjunction with the accompanying drawings.

[0007] FIG. 1 is a front perspective view of a lace retention clip assembled in accordance with the teachings of a disclosed example of the present invention.

[0008] FIG. 2 is a right elevational view of the lace retention clip of FIG. 1.

[0009] FIG. 3A is a front elevational view of the lace retention clip of FIG. 1.

[0010] FIG. 3B is a front elevational view of the lace retention clip of FIG. 1, showing the plunger in a second position.

[0011] FIG. 4 is a top plan view of the lace retention clip of FIG. 1.

[0012] FIG. 5 is a front elevational view of a plunger for use with the lace retention clip of FIG. 1.

[0013] FIG. 6 is a top plan view of the lace retention clip of FIG. 1, showing a plurality of lace paths.

[0014] FIG. 7 is a top plan view of the lace retention clip of FIG. 1, showing the insertion of a lace therein.

[0015] FIG. 8 is a top plan view of the lace retention clip of FIG. 1, showing the insertion of a lace therein.

[0016] FIG. 9 is a front perspective view of a lace retention clip assembled in accordance with the teachings of a disclosed example of the present invention, and showing a lace retained therein.

[0017] FIG. 10 is a front elevational view of a lace retention clip assembled in accordance with the teachings of a second disclosed example of the present invention.

[0018] FIG. 11 is a top plan view of the lace retention clip of FIG. 10.

[0019] FIG. 12 is a front elevational view of the lace retention clip of FIG. 10.

[0020] FIG. 13 is a front elevational view of a lace retention clip assembled in accordance with the teachings of a third disclosed example of the present invention.

[0021] FIG. 14 is a right elevational view of the lace retention clip of FIG. 13.

[0022] FIG. 15 is a rear elevational view of the lace retention clip of FIG. 13.

[0023] FIG. 16 is a top plan view of the lace retention clip of FIG. 13.

[0024] FIG. 17 is a front elevational view of a lace retention clip assembled in accordance with the teachings of a fourth disclosed example of the present invention.

[0025] FIGS. 18A, 18B, 18C are left elevational views of the lace retention clip of FIG. 17, having alternative plunger designs.

[0026] FIGS. 19A-19D are top plan views of a lace retention clip assembled in accordance with the teachings of the present invention, showing various tab and aperture designs.

[0027] FIG. 20A is a left elevational view of a lace retention clip assembled in accordance with the teachings of the present invention.

[0028] FIG. 20B is a front cross-sectional view of the lace retention clip of FIG. 20A.

[0029] FIG. 21 is a left elevational view of a lace retention clip assembled in accordance with the teachings of a fifth disclosed example of the present invention.

[0030] FIG. 22 is a front elevational view of the lace retention clip of FIG. 21.

[0031] FIG. 23 is a left elevational view of a lace retention clip assembled in accordance with the teachings of a sixth disclosed example of the present invention.

[0032] FIG. 24 is a front elevational view of the lace retention clip of FIG. 23.

[0033] FIG. 25 is a front elevational view of a lace retention clip assembled in accordance with the teachings of a seventh disclosed example of the present invention.

[0034] FIG. 26 is a left elevational view of the lace retention clip of FIG. 25.

DETAILED DESCRIPTION

[0035] The following embodiments described herein are not intended to be exhaustive or to limit the scope of the invention to the precise forms disclosed. Instead, the fol-
ollowing embodiments have been described in order to best explain the principles of the invention and to enable others of ordinary skill in the art to follow its teachings.

[0036] Referring now to FIGS. 1-4 of the drawings, a lace retention clip assembled in accordance with the teachings of an embodiment of the present invention is referred to by the reference numeral 10. The clip 10 includes a housing 12 having a top side 14, a bottom side 16, a front side 17, a back side 18, and a pair of interconnected sides 19A, 19B. The housing 12 also includes a bore 20 which, in the disclosed example is tubular shaped with a generally oval cross section. The bore 20 extends through the top side 14 into the housing 12, and is surrounded by a sidewall 15. As best shown in FIG. 2, the back side 18 may be formed by a sidewall 19 extending between the bottom side 16, and the top side 14. The sidewall 19 is spaced away from the sidewall 15 by a gap.

[0037] The housing 12 also includes a slot 22 defined in the housing 12 and, extending between the sides 19A, 19B transverse relative the bore 20 (the slot 22 is best viewed in FIG. 2). The slot 22 includes a first opening 22A in the side 19A and a second opening 22B in the side 19B. In the disclosed example, the slot 22 is formed by the gap between the sidewall 15 and the sidewall 19.

[0038] The housing 12 further includes a hollow 24 formed in the base 12 and intersecting the bore 20 and the slot 22. In the disclosed example, the hollow 24 is tubular shaped with a generally oval cross section. The hollow 24 extends between the front side 17 and the back side 18 perpendicular relative the bore 20 and the slot 22. The hollow 24 includes a first opening 24A in the back side 18 and a second opening 24B in the front side 17.

[0039] The housing 12 may also include an optional tab 26 having an aperture 28. In the disclosed embodiment, the tab 26 extends downwardly from the front side 17 of the housing 12, below the hollow 24. As will be described in greater detail below, at least a portion of the slot 22, the hollow 24, and optionally, the aperture 28 cooperate to form a lace path for receiving a lace, a cord, a string, a rope, a filament, a thread, an elastic, or any other similar item. It will be understood that the tab 26 may extend from any portion of the housing 12 and may extend in any orientation as desired.

[0040] Turning to FIGS. 1 and 5, a plunger 30 having a first end 32 and a second end 34 is sized such that the first end 32 is insertable into the bore 22. The plunger includes a transverse bore 36 which, in the disclosed example, extends through the plunger 30 and is sized to correspond to the shape of the hollow 24. As best illustrated in FIGS. 3A and 3B, the plunger 30 is shiftably mounted within the bore 20 of the housing 12 and is moveable between a first position (shown in FIG. 3B) and a second position (shown in FIG. 3A). As shown, the bore 36 of the plunger 30 is aligned with the hollow 24 when the plunger 30 is in the first position. Furthermore, the bore 36 of the plunger 30 is offset from the hollow 24 when the plunger 30 is in the second position. The plunger 30 may be biased toward the second position by a spring element 38 or other similar element disposed between the plunger 30 and the housing 12 within the bore 20. It will be understood that the spring element 38 may be any type of device, such as by way of example and not limitation, a coil spring (shown), a torsion spring, a leaf spring, a wire form spring, an “M” spring, a resilient/ elastically deformable material, and/or any other similar biasing device.

[0041] Returning to FIGS. 1 and 5, the plunger 30 may include at least one optional projection 40 extending from the plunger 30 for retaining the plunger 30 within the bore 20 of the housing 12. In the illustrated embodiment, the projection 40 extends directly below the bore 36 and includes a generally flat semi-circular surface 42 and a tapered surface 44 to form a generally shaped one half hemisphere. It will be appreciated, however that the shape of the projection 40 may vary according to desired projection characteristics and may, in fact, be any locking mechanism designed to retain the plunger 30 within the bore 20, including alternatively shaped projections, lips, extensions, recesses, or the like.

[0042] The projection 40 is arranged so as to allow snap-fit insertion of the plunger 30 into the bore 20 of the housing 12. Specifically, as illustrated in FIGS. 3A and 3B, when the plunger is inserted into the bore 20, the projection extends through the hollow 24. When the plunger is in the first position (FIG. 3B), the projection 40 may rest in a notch 46 formed in the hollow 24 and sized to receive the projection 40. When the plunger is in the second position (FIG. 3A), the surface 42 of the projection 40 engages the sidewall 15 above the hollow 24, effectively preventing the plunger from exiting the bore 20.

[0043] The plunger 30 may also include an optional post 48 extending from the first end 32 and being arranged to be inserted into the bore 20. The post 48 is further sized to allow the post 48 to be inserted into a coil of the spring element 38, thereby engaging the spring element 38 and preventing substantial relative movement between the spring element 38 and the first end 32 of the plunger 30.

[0044] The second end 34 of the plunger 30 includes a top surface 50 which, in the disclosed example is sized smaller than the bore 20 to prevent insertion of the top surface 50 into the bore 20. The plunger 30 may also contain a removable and/or permanent button 52 (FIG. 5) which may contain advertisement information, such as, for example, logos, slogans, or similar. The button 52 may be attached to the top surface 50 by any desirable method, including, for example, glue, snap-fit, or other mounting method. Moreover, the button 52 may contain a piezoelectric or battery operated lighting device (not shown). The piezoelectric may illuminate the button 52 during movement or other event, such as for instance, in response to outside stimuli (physical, electronic, moisture, light intensity, and/or other), at timed intervals, or the like. The button 52 may also include a powered or passive device such as, by way of example only, a Global Positioning System (GPS) device, a Wireless Fidelity (WiFi) device, a radio frequency identification (RFID) device, a clock, a pedometer, an accelerometer, or similar device.

[0045] Referring now to FIG. 6, a first lace path (illustrated by a line 60A), a second lace path (illustrated by a line 60B), and a third lace path (illustrated by a line 60C) extend through one embodiment of the clip 10. As will be described, each of the first, second and third lace paths 60A, 60B, 60C cooperate to allow the insertion and securement of a lace, or other similar item, in the clip 10.

[0046] As illustrated, the first lace path 60A extends from the first opening 22A of the slot 22 through the first opening
The first lace path 60A being sized to allow the passage of at least a portion of a first lace end into the first opening 22A of the slot 22 and out through the first opening 24A of the hollow 24.

[0047] The second lace path 60B extends from the second opening 22B of the slot 22 through the first opening 24A of the hollow 24. The second lace path 60B being sized to allow the passage of at least a portion of a second lace end into the second opening 22B of the slot 22 and out through the first opening 24A of the hollow 24.

[0048] The third lace path 60C extends from the first opening 24A of the hollow 24 through the second opening 24B of the hollow 24. The third lace path 60C being sized to allow the passage of at least a portion of both the first and second lace ends into the first opening 24A of the hollow 24 and out through the second opening 24B of the hollow 24. The third lace path 60C may optionally extend through the aperture 28 of the tab 26, the aperture 28 also being sized to allow the passage of at least a portion of both the first and second lace ends when the plunger 30 is in the first position as illustrated in FIG. 3B. Furthermore, when the plunger 30 is moved from the first position towards the second position, any lace ends inserted within the lace path 60C will be frictionally retained within the lace path 60C by the plunger 30 pressing the laces against the housing 12. It will further be appreciated that one or both of the lace ends may be tied into a knot, tied to the tab 26 utilizing the aperture 28 or otherwise secured (such as by sewing, or attaching the lace ends to an object) such that the lace ends will not pass through the lace path 60C even when the plunger 30 is in the first position.

[0049] Turning now to FIGS. 7, 8, and 9, a lace 62 having a first lace end 64 and a second lace end 66 is shown being threaded into and retained by the clip 10. In the illustrated example, the lace 62 is a shoelace attached to an athletic sneaker (shown in phantom), however, the lace may be attached to any type of shoe, boot, sporting equipment, and/or apparel. As shown in FIG. 7, the first lace end 64 is threaded through the lace path 60A (FIG. 6) and out the back side 18 of the clip 10 (shown by the Arrow A). Similarly, the second lace end 66 is threaded through the lace path 60B (FIG. 6) and out the back side 18 of the clip 10 (shown by the Arrow B). The plunger 30 may then be pushed towards the first position to align the base 36 of the plunger 30 with the hollow 24 as previously described. Then as shown in FIG. 8, both the first and second lace ends 64, 66 may be reversibly threaded through the third lace path 60C (FIG. 6) and out the front side 17 of the clip 10 (shown by the Arrows C). Once the lace ends 64, 66 are inserted through the third lace path 60C, the plunger 30 may be released, thereby securing the lace 66 in the clip 10. As shown in FIG. 9, the lace ends 64, 66 may be secured, e.g., tied, to the tab 26 utilizing the aperture 28. Alternatively, the lace ends 64, 66 may be tied below the tab 26 (not shown) such that the knotted lace ends may not pass through the aperture 28.

[0050] Referring now to FIGS. 10-12, there is illustrated another embodiment of a lace retention clip 110 assembled in accordance with the teachings of the present invention. The clip 110 includes a housing 112 having a top side 114, a bottom side 116, a front side 117, a back side 118, and a pair of interconnecting sides 119A and 119B. The housing 112 also includes a bore 120 which in the disclosed embodiment extends through the side 119A into the housing 112. A slot 122 is defined in the house 112 and extends between the sides 119A, 119B parallel relative the bore 120. The slot 122 includes a first opening 122A in the side 119A and a second opening 122B in the side 119B.

[0051] The housing 112 further includes a hollow 124 formed in the base 112 and intersecting the bore 120. In the disclosed example, the hollow 124 extends between the top side 114 and the bottom side 116 perpendicular relative the bore 120. The hollow 124 includes a first opening 124A in the bottom side 116 and a second opening 124B in the top side 114.

[0052] The housing 112 also include an optional tab 126 having an aperture 128. In the disclosed embodiment, the tab 126 extends downwardly from the front side 117 of the housing 112.

[0053] A plunger 130 having a first end 132 and a second end 134 is sized such that the first end 132 is insertable into the bore 122. The plunger 130 includes a bore 136 which, in the disclosed embodiment, extends through the plunger 130. The plunger 130 is shiftably mounted within the bore 120 of the housing 112 and movable between a first position (shown in FIG. 11) and second position (shown in FIG. 10). As illustrated in FIG. 11, the bore 136 of the plunger 130 is aligned with the hollow 124 when the plunger 130 is in the first position. Furthermore, the bore 136 of the plunger 130 is offset from the hollow 124 when the plunger 130 is in the second position. The plunger 130 may be biased towards the second position by a spring element 138, or other similar element disposed between the plunger 130 and the housing 112 within the bore 120.

[0054] In the illustrated embodiment of FIGS. 10-12, a first lace path 160A extends from the first opening 124A of the hollow 124 through the second opening 124B of the hollow 124. The first lace path 160A being sized to allow the passage of at least a portion of both a first and second lace ends into the first opening 124A of the hollow 124 and out through the second opening 124B of the hollow 124. It will be understood that the first lace path 160A will allow the passage of the first and second lace ends when the plunger 130 is in the first position as illustrated in FIG. 11.

[0055] A second lace path 160B extends from the second opening 124B of the hollow 124 through the first opening 122A of the slot 122. The second lace path 160B being sized to allow the passage of at least a portion of the first lace end into the second opening 124B of the hollow 124 and out through the first opening 122A of the slot 122. The second lace path 160B may optionally extend through the aperture 128 of the tab 126 as shown.

[0056] A third lace path 160C extends from the second opening 124B of the hollow 124 through the second opening 122B of the slot 122. The third lace path 160C being sized to allow the passage of at least a portion of the second lace end into the second opening 124A of the hollow 124 and out through the second opening 122B of the slot 122. The third lace path 160C may optionally extend through the aperture 128 of the tab 126 as shown.

[0057] Similar to FIG. 9, the first and second lace ends may be secured, e.g., tied, to the tab 126 utilizing the aperture 128. Alternatively, the lace ends may be tied below
the tab 126 (not shown) such that the knotted lace ends may not pass through the aperture 128.

[0058] It will further be appreciated that the foregoing lace path description is not intended to limit the scope of the invention to the precise form disclosed. It is contemplated that various changes and modifications to the lace paths and the order of each path may be made by those of ordinary skill in the art without departing from the spirit and scope of the invention.

[0059] Referring now to FIGS. 13-16, there is illustrated another embodiment of a lace retention clip 210 assembled in accordance with the teachings of the present invention. The clip 210 includes a housing 212 having a top side 214, a bottom side 216, a front side 217, a back side 218, and a pair of interconnecting sides 219A, 219B.

[0060] The housing 212 further includes a bore 220 which, in the disclosed embodiment, extends through the front side 217 into the housing 212. A slot 222 is defined in the housing and extends between the sides 219A, 219B transverse relative the bore 220. The slot 222 includes a first opening 222A in the side 219A and a second opening 222B in the side 219B.

[0061] The housing 212 further includes a hollow 224 formed in the base 212 and intersecting the bore 222 and the slot 222. In the disclosed example, the hollow 224 extends between the bottom side 216 and the top side 218 perpendicular relative the bore 220 and the slot 222. The hollow 224 includes a first opening 224A in the top side 214 and a second opening 224B in the bottom side 216.

[0062] The housing 212 also includes a plunger 230 capable of insertion into the bore 222. The plunger 230 includes a transverse bore (not shown) which, in the disclosed embodiment, extends through the plunger 230 and is sized to correspond to the shape of the hollow 224. The plunger 230 is shiftably mounted within the bore 220 of the housing 212 and is movable between a first position (shown in FIG. 16) and a second position (not shown). As illustrated in FIG. 16, the bore 230 of the plunger 230 is aligned with the hollow 224 when the plunger 230 is in the first position. Similar to the previous embodiments, the bore 236 of the plunger 230 is offset from the hollow 224 when the plunger 230 is in the second position. The plunger 230 may be biased towards the second position by a spring element 238, or other similar element disposed between the plunger 230 and the housing 212 of the bore 222.

[0063] The housing 212 may also include an optional tab 226 having an aperture 228. In the disclosed embodiment, the tab 226 extends downwardly from and is integrally formed with the plunger 230. It will be understood that the tab 226 may extend from any portion of the plunger 230, and/or the housing 212, and may extend in any orientation as desired.

[0064] Turning now to FIGS. 14 and 15, a first lace path 260A extends from the second opening 224B of the hollow 224 through the first opening 224A of the hollow 124. The first lace path 260A being sized to allow the passage of at least a portion of both a first and second lace ends into the second opening 224B of the hollow 224 and out through the first opening 224A of the hollow 124. It will be understood that the first lace path 260A will allow the passage of the first and second lace ends when the plunger 230 is in the first position as illustrated in FIG. 16.

[0065] A second lace path 260B extends from the first opening 224A of the hollow 224 through the first opening 222A of the slot 222. The second lace path 260B being sized to allow the passage of at least a portion of the first lace end into the first opening 224B of the hollow 224 and out through the first opening 222A of the slot 222. The second lace path 260B may optionally extend through the aperture 228 of the tab 226 as shown.

[0066] A third lace path 260C extends from the first opening 224A of the hollow 224 through the second opening 222B of the slot 222. The third lace path 260C being sized to allow the passage of at least a portion of the second lace end into the first opening 224A of the hollow 224 and out through the second opening 222B of the slot 222. The third lace path 260C may optionally extend through the aperture 228 of the tab 226 as shown.

[0067] Similar to FIG. 9, the first and second lace ends may be secured, e.g., tied, to the tab 226 utilizing the aperture 228. Alternatively, the lace ends may be tied below the tab 226 (not shown) such that the knotted lace ends may not pass through the aperture 228.

[0068] It will further be appreciated that the foregoing lace path description is not intended to limit the scope of the invention to the precise form disclosed. It is contemplated that various changes and modifications to the lace paths and the order of each path may be made by those of ordinary skill in the art without departing from the spirit and scope of the invention.

[0069] Referring now to FIGS. 17 and 18A-18C, there is illustrated an example of another embodiment of a lace retention clip 310 assembled in accordance with the teachings of the present invention. The clip 310 includes a housing 312 having a top side 314, a bottom side 316, a front side 317, a back side 318, and a pair of interconnecting sides 319A and 319B. The housing 312 also includes a bore 320 which in the disclosed embodiment extends through the top side 314 into the housing 312.

[0070] The housing 312 further includes a hollow 324 formed in the base 312 intersecting the bore 320. In the disclosed example, the hollow 324 extends between the front side 317 and the back side 318 perpendicular relative the bore 320. The hollow 324 includes a first opening 324A in the back side 318 and a second opening 324B in the front side 317. The housing 312 further includes a tab 326 having an aperture 328. The tab 328 extends downwardly from the front side 317 of the housing 312, below the hollow 324.

[0071] A plunger 330 is sized such that the plunger 330 is capable of insertion into the bore 320. The plunger 330 includes a transverse bore 336 which, in the disclosed embodiment, extends through the plunger 330. The plunger 330 is shiftably mounted within the bore 320 of the housing 312 and movable between a first position (not shown) and a second position (shown in FIG. 18). The bore 336 of the plunger 330 is aligned with the hollow 324 when the plunger 330 is in the first position. Furthermore, the bore 336 of the plunger 330 is offset from the hollow 324 when the plunger 330 is in the second position. The plunger 330 may be biased towards the second position by a spring element 338 disposed within the bore 320 (not shown).
As illustrated in FIGS. 18A-18C, the plunger 330 includes a top surface 350 which, in the disclosed example, is sized larger than the bore 320 to prevent insertion of the top surface 350 into the bore 320. As is illustrated, the top surface 350 may contain a variety of shapes and sizes, and may include an information display.

A lace path 360 extends from the first opening 324A of the hollow 324 through the second opening 324B of the hollow 324. The lace path 360 being sized to allow the passage of at least a portion of both a first and second lace end into the first opening 324A of the hollow 324 and out through the second opening 324B of the hollow 324. The lace path 360 extends through the aperture 328 of the tab 326. The lace path 360 allows the passage of the first and second lace ends when the plunger 330 is in its first position and frictionally retains any lace ends inserted within the lace path 360 when the plunger 330 is moved towards the second position.

Referring now to FIGS. 19A-19D, there is illustrated another embodiment of a lace retention clip 410 assembled in accordance with the teachings of the present invention. The clip 410 includes a tab 426 having an aperture 428, the tab 426 extending from the housing 410. The tab 426 including a plurality of projections 429 extending inwardly from the tab 426 towards the center of the aperture 428. The projections 429, in the disclosed example, being generally triangular shaped and being arranged to aid in the securment of a lace within the aperture 428.

Similarly, referring to FIGS. 20A and 20B, there is illustrated the lace retention clip 410 wherein a plunger 430 is insertable within the clip 410. The plunger 430 having a bore 436 which in the disclosed example extends through the plunger 430. The plunger 430 having a plurality of projections 431 extending inwardly from the plunger 430 into the bore 436. The projections 431, in the disclosed example, being generally triangular shaped and being arranged to aid in the securment of a lace within the aperture 428.

Referring now to FIGS. 21 and 22, there is illustrated an example of yet another embodiment of the a lace retention clip 510 assembled in accordance with the teachings of the present invention. The clip 510 includes a housing 512 having a top side 514, a bottom side 516, a front side 517, a back side 518, and a pair of interconnecting sides 519A and 519B. The housing 512 also includes a bore 520 which in the disclosed embodiment extends through the top side 514 and into the housing 512.

The housing 512 further includes a hollow 524 formed in the base 512 intersecting the bore 520. In the disclosed example, the hollow 524 extends between the front side 517 and the back side 518 perpendicular relative to the bore 520. The hollow 524 includes a first opening 524A in the back side 518 and second opening 524B in the front side 517. The housing 512 further includes a tab 526 having an aperture 528. The tab 528 extends downwardly from the front side 517 of the housing 512, below the hollow 524.

A plunger 530 is sized such that the plunger 530 is capable of insertion into the bore 520. The plunger 530 includes a transverse bore 536 which, in the disclosed embodiment, extends through the plunger 530. The plunger 530 is shiftably mounted within the bore 520 of the housing 512 and movable between a first position (not shown) and a second position (shown in FIG. 22). The bore 536 of the plunger 530 is aligned with the hollow 524 when the plunger 530 is in the first position. Furthermore, the bore 536 of the plunger 530 is offset from the hollow 524 when the plunger 530 is in the second position. The plunger 530 may be biased towards the second position by a pair side extension 539A and 539B which may act similar to a leaf spring.

Referring now to FIGS. 23 and 24, there is illustrated an example of still another embodiment of a lace retention clip 610 assembled in accordance with the teachings of the present invention. The clip 610 includes a housing 612 having a top side 614, a bottom side 616, a front side 617, and a back side 618, and a pair of interconnecting sides 619A and 619B. The housing 612 also includes a bore 620 which in the disclosed embodiment extends through the top side 614 into the housing 612.

The housing 612 further includes a hollow 624 formed in the base 612 intersecting the bore 620. In the disclosed example, the hollow 624 extends between the front side 617 and the back side 618 perpendicular relative the bore 620. The housing 612 further includes a tab 626 having an aperture 628.

A plunger 630 is sized such that the plunger 630 is capable of insertion into the bore 620. The plunger 630 includes a transverse bore 636 which, in the disclosed embodiment, extends through the plunger 630. The plunger 630 is shiftably mounted within the bore 620 of the housing 612 and movable between a first position (shown in FIG. 23) and a second position (not shown) when the plunger 630 is in its first position. Furthermore, the bore 636 of the plunger 630 is offset from the hollow 624 when the plunger 630 is in the first position. The plunger 630 may be biased towards the second position by a pair side extension 639A and 639B which may act similar to a leaf spring.

Referring now to FIGS. 25 and 26, there is illustrated an example of yet another embodiment of a lace retention clip 710 assembled in accordance with the teachings of the present invention. The clip 710 includes a housing 712 having a top side 714, a bottom side 716, a front side 717, a back side 718, and a pair of interconnecting sides 719A and 719B. The housing 712 also includes a bore 720 which in the disclosed embodiment extends through the side 719A and into the housing 712.

The housing 712 further includes a hollow 724 formed in the base 712 intersecting the bore 720. In the disclosed example, the hollow 724 extends between the front side 717 and the back side 718 perpendicular relative the bore 720. The hollow 724 includes a first opening 724A in the back side 718 and a second opening 724B in the front side 717.
side 717. The housing 712 further includes a tab 726 having an aperture 728. The tab 728 extends downwardly from the front side 717 of the housing 712, below the hollow 724.

[0085] A plunger 730 is sized such that the plunger 730 is capable of insertion into the bore 720. The plunger 730 includes a transverse bore 736 which, in the disclosed embodiment, extends through the plunger 730. The plunger 730 is pivotally and shiftably mounted within the bore 720 of the housing 712 and moveable between a first position (not shown) and a second position (shown in FIG. 25). The bore 736 of the plunger 730 is aligned with the hollow 724 when the plunger 730 is in the first position. Furthermore the bore 736 of the plunger 730 is offset from the hollow 724 when the plunger 730 is in the second position, as shown. The plunger 730 may be pivotally mounted to the housing 712 by a pin 757 to form a pivot point. The plunger 730 may be biased towards the second position by a biasing spring 738, which in the disclosed embodiment may be torsion spring about the pin 757, however, any type of biasing element may be utilized. It will also be appreciated that the pivot point may be any type of pin, four bar mechanism, and/or similar device which may allow the plunger to travel between the first position and the second position by rotation, and/or translation.

[0086] A lace path 760 extends from the first opening 724A of the hollow 724 through the second opening 724B of the hollow 724. The lace path 760 being sized to allow the passage of at least a portion of both a first and second lace end into the first opening 724A of the hollow 724 and out through the second opening 724B of the hollow 724. The lace path 760 extends through the aperture 728 of the tab 726. The lace path 760 allows the passage of the first and second lace ends when the plunger 730 is in the first position and frictionally retains any lace ends inserted within the lace path 760 when the plunger 730 is moved towards the second position.

[0087] The foregoing description is not intended to limit the scope of the invention to the precise form disclosed. It is contemplated that various changes and modifications may be made by those skilled in the art without departing from the spirit and scope of the invention.

What is claimed is:

1. A lace retention clip comprising:
   a base plate;
   a first side wall extending between the base plate and the top plate, the first side wall surrounding a bore, the bore extending through the top plate;
   a second side wall extending between the base plate and the top plate, the second side wall spaced away from the front side wall by a gap;
   a plunger shiftably mounted within the bore of the first sidewall and moveable between a first position and a second position, the plunger including a transverse bore; and
   a transverse hollow extending through each of the second side wall, and the bore of the first side wall, the bore of the plunger aligned with the transverse hollow when the plunger is in the first position, the bore of the plunger offset from the transverse hollow, the bore of the plunger offset from the transverse hollow when the plunger is in the second position.

2. The clip of claim 1, further comprising a tab extending from the base plate, the tab having an aperture.

3. The clip of claim 2, wherein the aperture includes a plurality of projections extending from the tab towards the interior of the aperture.

4. The clip of claim 1, wherein the base plate includes a downwardly depending tab.

5. The clip of claim 1, wherein the bore of the plunger includes a plurality of projections extending from the plunger towards the interior of the bore.

6. The clip of claim 1, further comprising a spring element engaging the plunger and arranged to bias the plunger toward the second position.

7. The clip of claim 6, wherein the plunger includes a bottom surface and a post extending from the bottom surface, the post arranged to engage the spring.

8. The clip of claim 1, wherein the plunger includes at least one retaining projection extending from the plunger, the retaining projection sized to permit snap-fit securement of the plunger within the bore.

9. The clip of claim 1, wherein the plunger includes a first end and a second end, the first end of the plunger being sized to permit insertion into the bore of the first side wall, the second end of the plunger being sized to prevent insertion into the bore of the first side wall.

10. The clip of claim 1, wherein the plunger includes a top surface, the top surface arranged to receive indicia.

11. The clip of claim 1, wherein the base plate includes a first side and a second side, the base plate converging inwardly from one of the first and second sides toward the opposite side.

12. The clip of claim 1, wherein the gap between the first side wall and the second side wall is sized to permit passage of a lace between the first side wall and the second side wall.

13. The clip of claim 1, wherein the transverse hollow is sized to permit passage of a plurality of laces through the transverse hollow.

14. The clip of claim 1, wherein the gap between the first side wall and the second side wall and the transverse hollow cooperate to define a lace path for passage of a plurality of laces when the plunger is in the first position, wherein the plunger is arranged to frictionally retain the laces within the lace path when the plunger is moved toward the second position.

15. The clip of claim 1, further comprising a tab extending from the base plate, the tab having an aperture, wherein the gap between the first side wall and the second side wall, the transverse hollow, and the aperture in the tab cooperate to define a lace path for passage of a plurality of laces when the plunger is in the first position, wherein the plunger is arranged to frictionally retain the laces within the lace path when the plunger is moved toward the second position, and wherein the aperture in the tab is arranged to secure the laces when the laces are knotted.

16. A clip for use with a plurality of lace ends, the clip comprising:
   a housing;
   a bore extending into the housing;
   a lateral slot formed in the housing and disposed transverse relative to the bore;
a plunger shiftably mounted within the bore and moveable between a first position and a second position the plunger including a transverse bore; and

a hollow formed in the housing and intersecting the bore and the lateral slot, the bore of the plunger aligned with the hollow when the plunger is in the first position and the bore of the plunger offset from the hollow when the plunger is in the second position.

17. The clip of claim 16, wherein the at least a portion of the lateral slot and at least a portion of the hollow cooperate with the bore of the plunger to form a lace path.

18. The clip of claim 16, wherein the lateral slot includes a first opening at one end of the lateral slot and a second opening at the other end of the lateral slot, the hollow includes a first opening at one end of the hollow and a second opening at the other end of the hollow, the first opening of the lateral slot and the first opening of the hollow cooperating to form a first lace path, the first lace path arranged to allow the insertion of a first one of the lace ends, the second opening of the lateral slot and the first opening of the hollow cooperating to form a second lace path, the second lace path arranged to allow the insertion of a second one of the lace ends, the first opening of the hollow, the plunger bore, and the second opening of the hollow cooperating to form a third lace path, the third lace path arranged to allow the insertion of the first and second lace ends, and wherein the bore of the plunger is arranged to frictionally retain the first and second lace ends within the third lace path when the plunger is moved towards the second position.

19. The clip of claim 16, wherein the housing includes a tab extending from the housing, the tab having an aperture.

20. The clip of claim 19, wherein the lateral slot includes a first opening at one end of the lateral slot and a second opening at the other end of the lateral slot, the hollow includes a first opening at one end of the hollow and a second opening at the other end of the hollow, the first opening of the lateral slot and the first opening of the hollow cooperating to form a first lace path, the first lace path arranged to allow the insertion of a first one of the lace ends, the second opening of the lateral slot and the first opening of the hollow cooperating to form a second lace path, the second lace path arranged to allow the insertion of a second one of the lace ends, the first opening of the hollow, the plunger bore, and the second opening of the hollow cooperating to form a third lace path, the third lace path arranged to allow the insertion of the first and second lace ends, and wherein the bore of the plunger is arranged to frictionally retain the first and second lace ends within the third lace path when the plunger is moved towards the second position and the aperture of the tab is arranged to secure the first and second lace ends when the first and second lace ends are knotted.

21. The clip of claim 16, further comprising a spring element engaging the plunger and arranged to bias the plunger toward the second position.

22. The clip of claim 16, wherein the plunger includes at least one retaining projection extending from the plunger, the retaining projection sized to permit snap-fit securement of the plunger within the bore.

23. The clip of claim 16, wherein the plunger includes a first end and a second end, the first end of the plunger being sized to permit insertion into the bore, the second end of the plunger being sized to prevent insertion into the bore, wherein the second end is arranged to receive indicia.

24. A clip for use with a plurality of lace ends, the clip comprising:

a housing;

a bore extending into the housing;

a plunger shiftably mounted within the bore and moveable between a first position and a second position the plunger including a transverse bore;

a hollow formed in the housing and intersecting the bore and the lateral slot, the bore of the plunger aligned with the hollow when the plunger is in the first position and the bore of the plunger offset from the hollow when the plunger is in the second position; and

a tab extending from the housing, the tab having an aperture.

25. The clip of claim 24, wherein at least a portion of the hollow and at least a portion of the bore of the plunger cooperates with the aperture of the tab to form a lace path.

26. The clip of claim 24, wherein the hollow includes a first opening at one end of the hollow and a second opening at the other end of the hollow, the first opening of the hollow, the plunger bore, and the second opening of the hollow cooperating to form a lace path, the lace path arranged to allow the insertion of a first and second lace ends, and wherein the bore of the plunger is arranged to frictionally retain the first and second lace ends within the lace path when the plunger is moved towards the second position.

27. The clip of claim 24, wherein the plunger is pivotally mounted within the bore and wherein a spring element engages the plunger and biases the plunger toward the second position.

28. The clip of claim 27, wherein the spring element is a torsion spring.

29. The clip of claim 24, further comprising a spring element engaging the plunger and arranged to bias the plunger toward the second position.

30. The clip of claim 29, wherein the spring element is a coil spring seated within the bore of the housing.

31. The clip of claim 29, wherein the spring element is seated external of the bore of the housing.

32. The clip of claim 31, wherein the spring element is a leaf spring.

33. The clip of claim 29, wherein the housing includes a projection which extends from the housing, and the plunger is pivotally mounted to the rear projection at a pivot point, and wherein the spring element is a spring seated within the pivot point.

34. The clip of claim 24, wherein the plunger includes at least one retaining projection extending from the plunger, the retaining projection sized to permit snap-fit securement of the plunger within the bore.

35. The clip of claim 24, wherein the plunger includes a first end and a second end, the first end of the plunger being sized to permit insertion into the bore, the second end of the plunger being sized to prevent insertion into the bore, wherein the second end is arranged to receive an information display.