A tether for securing a variety of instruments. The tether may include a band sized to fit a human wrist, a lanyard formed as a continuous, closed loop, an interface connecting the lanyard to the band, and a lock. The lock may adjustably pinch the lanyard to form two sub-loops therefrom. By adjusting the location where the lock pinches the lanyard, the size of one sub-loop may be continuously increased or decreased, while the size of the other sub-loop may be simultaneously, continuously, and respectively decreased or increased. Accordingly, by adjusting the location where the lock pinches the lanyard, the size of the one sub-loop may continuously vary between a minimum size and a maximum size. In one embodiment, this minimum size may correspond to an interior diameter within the one sub-loop of substantially zero.
Select Band Material

[Select Band Closure Mechanism]

[Select Interface Mechanism]

[Select Interface Closure Mechanism]

Select Lanyard

Select Lock

Assemble Tether

FIG. 15
Apply Band → Position Instrument → Engage Instrument → Utilize Instrument → Release Instrument → Remove Band

Release Lock → Advance Lock → [Tension Loop] → Engage Lock

FIG. 16

FIG. 17
Apply Band

Position First Instrument

Engage First Instrument

Position Second Instrument

Engage Second Instrument

Utilize First Instrument

Utilize Second Instrument

Release First Instrument

Release Second Instrument

Remove Band

FIG. 18
CONTINUOUSLY VARIABLE, CLOSED LOOP, INSTRUMENT TETHER

BACKGROUND

[0001] 1. The Field of the Invention

[0002] This invention relates to object retention systems and, more particularly, to novel systems and methods for tethering to a user instruments such as tools, fasteners, and the like.

[0003] 2. The Background Art

[0004] In many situations, it is inconvenient, costly, or dangerous to drop an instrument (e.g., a tool, fastener, or the like) during use. For example, in the printing business it is often necessary to work on printing machinery that is in use. If a technician, while perform repairs or effecting adjustments, were to inadvertantly drop an instrument into such machinery, the typical solution would require the entire printing line to be stopped while someone retrieves the instrument. Such a solution is certainly inconvenient. It is also costly, as production time would be wasted. Moreover, depending on where the instrument were to fail, it may enter and damage moving mechanisms, resulting in repair cost as well as additional wasted time.

[0005] In automobile repair, there are certain tasks or situations where inadvertently dropping an instrument may render it difficult to retrieve and, as a result, decrease the mechanic’s efficiency. In other situations or professions, dropping an instrument may result in effectively unretrievable. For example, while working over water, a worker may inadvertently drop an instrument. The depth of the water or the inconvenience of diving in may be such that the worker would rather forfeit the value of the instrument than pay the cost of retrieving it.

[0006] In still other situations, dropping an instrument may constitute a safety hazard. For example, while working on scaffolding, if a worker were to inadvertently drop a hammer, the falling hammer may constitute a significant safety hazard to those below. Of course, even if the falling hammer caused no physical damage, the worker must still face the substantial inconvenience of climbing down the scaffolding, retrieving the hammer, and climbing back up the scaffolding before returning to productive labor.

[0007] In summary, there are numerous situations where a user may desire to tether an instrument, rather than face the consequences of inadvertently dropping that instrument. Accordingly, what is needed is an inexpensive tether of sound construction that is able to engage and secure instruments of various sizes and weights. Such a tether should be able to secure instruments when they are being used or manipulated as well as when they are not.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The foregoing features of the present invention will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. Understanding that these drawings depict only typical embodiments of the invention and are, therefore, not to be considered limiting of its scope, the invention will be described with additional specificity and detail through use of the accompanying drawings in which:

[0014] FIG. 1 is a perspective view of a tether comprising a band, interface, lanyard, and lock, wherein the band engages the wrist of a user and the lanyard secures an instrument in accordance with the present invention;

[0015] FIG. 2 is a perspective view of a band showing various alternative closures that may be applied thereto in accordance with the present invention;

[0016] FIG. 3 is a perspective view of a band showing various alternative interfaces that may be applied thereto in accordance with the present invention;

[0017] FIG. 4 is a perspective view of one possible first step in forming a band and interface from a single, continuous piece or strip of material, namely the step of folding the strip to extend at a ninety degree angle with respect to itself, thereby delineating a band portion and an interface portion;

[0018] FIG. 5 is a perspective view of one possible second step in forming a band and interface from a single, continuous piece or strip of material, namely the step of folding the interface portion back over itself toward the band portion;

[0009] A lanyard may be connected to the band. In certain embodiments, a lanyard in accordance with the present invention may be formed as a closed, continuous loop. That is, a lanyard may be formed as a single, closed loop, without any joints or seams. It has been found that an O-ring seal of circular cross-section and sufficient size provides a suitable lanyard.

[0010] The connection between a band and a lanyard may be accomplished in any suitable manner. In certain embodiments, a lanyard may connect to a band by simply looping directly therethrough. In other embodiments, an interface may connect the lanyard to the band. In one embodiment, an interface may be a loop of material secured to the band and extending to engage the lanyard.

[0011] In selected embodiments, a lock may be applied to the lanyard. A lock may adjustably pinch the lanyard to form first and second sub-loops. By adjusting the location where the lock pinches the lanyard, the size of the first and second sub-loops may be controlled. It has been found that a cord lock provides a suitable lock.

[0012] In certain embodiments, the first sub-loop may engage the interface. Accordingly, the second sub-loop may be available to engage and secure an instrument. For example, an instrument may be placed and secured within the second sub-loop. The position of the lock on the lanyard may then be adjusted until the second sub-loop is sufficiently small to resist inadvertent removal of the instrument from therewithin. Accordingly, a tether in accordance with the present invention may provide significant convenience and security by controlling the placement, movement, and proximity of a wide variety of instruments.
FIG. 6 is a perspective view of possible third and forth steps in forming a band and interface from a single, continuous piece or strip of material, namely the steps of applying a closure to the interface portion to maintain the single, continuous strip of material in the desired configuration and applying a closure to the band portion;

FIG. 7 is a cross-sectional, side view of one embodiment of a lock in accordance with the present invention with the lock in an engaged position;

FIG. 8 is a cross-sectional, side view of the lock of FIG. 7 with the lock in a disengaged position;

FIG. 9 is a perspective view of an alternative embodiment of a lock in accordance with the present invention, wherein the lock comprises no moving parts;

FIG. 10 is a side, elevation view of a lock positioned on a lanyard to substantially minimize the size of the second sub-loop;

FIG. 11 is a side, elevation view of a lock positioned on a lanyard to substantially maximize the size of the second sub-loop to accommodate an instrument of significant girth;

FIG. 12 is a perspective view of a tether in accordance with the present invention comprising a band, an interface, and multiple lanyards with corresponding locks;

FIG. 13 is a perspective view of a tether comprising a band, interface, lanyard, and lock, wherein the band engages the wrist of a user and the lanyard secures an instrument being manipulated by the user in accordance with the present invention;

FIG. 14 is a perspective view of multiple lanyards chained together in accordance with the present invention;

FIG. 15 is a schematic block diagram illustrating a method for constructing a tether in accordance with the present invention;

FIG. 16 is a schematic block diagram illustrating a method for utilizing a tether in accordance with the present invention;

FIG. 17 is a schematic block diagram illustrating a method for engaging an instrument using a lanyard and lock in accordance with the present invention; and

FIG. 18 is a schematic block diagram illustrating a method for utilizing a tether in accordance with the present invention to secure multiple instruments.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0032] It will be readily understood that the components of the present invention, as generally described and illustrated in the drawings herein, may be arranged and designed in a wide variety of different configurations. Thus, the following more detailed description of the embodiments of the system and method of the present invention, as represented in the drawings, is not intended to limit the scope of the invention, as claimed, but is merely representative of various embodiments of the invention. The illustrated embodiments of the invention will be best understood by reference to the drawings, wherein like parts are designated by like numerals throughout.

[0033] Referring to FIG. 1, in selected embodiments a tether 10 in accordance with the present invention may include a band 12 sized and shaped to engage some portion of a user's hand, forearm, upper arm, belt, tool belt, clothing, or the like. For example, in certain embodiments, a band 12 may be sized and shaped to encircle one or more fingers or a thumb. In other embodiments, a band 12 may be sized and shaped to receive a belt therethrough. In still other embodiments, as illustrated in FIG. 1, a band 12 may be sized and shaped to encircle a wrist 14.

[0034] In certain embodiments, a lanyard 16 may be connected to the band 12. A lanyard 16 in accordance with the present invention may be formed as a closed loop. If desired, a lanyard 16 may also be continuous. That is, a lanyard 16 may be formed as a single, closed loop, without any separable or discontinuous joints or seams.

[0035] A lanyard 16 may be formed of any suitable material. Characteristics that may be considered when selecting the material for a lanyard 16 may include cost, availability, workability, durability, strength, aesthetic appeal, flexibility, tack or frictional engagement with other materials, and the like. Suitable materials may include metals, metal alloys, naturally-occurring fibers, synthetic fibers, polymers, and the like. For example, in selected embodiments, a lanyard 16 be formed of metal strands brided together.

[0036] In other embodiments, a lanyard 16 may be formed of an elastic material. For example, if desired, a lanyard 16 may be formed of an elastomeric polymer. It has been found that an O-ring seal of circular cross-section and sufficient size provides a suitable lanyard 16. Such seals are readily available in a variety of sizes, having sufficient tensile strength, have sufficient durability, and provide an excellent, almost tacky, non-slip frictional engagement with a wide variety of materials.

[0037] The connection between a band 12 and a lanyard 16 may be accomplished in any suitable manner. In certain embodiments, a lanyard 16 may connect to a band 12 by simply looping directly therethrough. In other embodiments, an interface 18 or bracket 18 may connect the lanyard 16 to the band 12. In one embodiment, an interface 18 may be a loop of material secured to the band 12 and extending to engage the lanyard 16.

[0038] In selected embodiments, a lock 20 may be applied to the lanyard 16. In some embodiments, a lock 20 may adjustably pinch the lanyard 16 to form a first sub-loop 22 and a second sub-loop 24. By adjusting the location where the lock 20 pinches the lanyard 16, the size of the first and second sub-loops 22, 24 may be controlled. Movement of the lock 20 on the lanyard 16 may continuously increase or decrease the size of the first sub-loop 22, while simultaneously, continuously, and respectively decreasing or increasing the size of the second sub-loop 24. The sub-loops 22, 24 may be reduced to zero open area in the absence of anything captured therein, due to the resilience or elasticity of the material.

[0039] In certain embodiments, the first sub-loop 22 may engage the interface 18. Alternatively, in embodiments were the interface 18 is omitted, the first sub-loop 22 may directly engage the band 12. Accordingly, the second sub-loop 24 may be available to engage and secure an instrument 26.
That is, an instrument 26 may be placed and secured within the second sub-loop 24. The position of the lock 20 on the lanyard 16 may then be adjusted until the second sub-loop 24 is sufficiently small to resist inadvertent removal of the instrument 26 from therewithin.

[0040] An instrument 26 in accordance with the present invention may be a component, fastener, tool, or any other item for which tethering is desired. For example, an instrument 26 may be a screw, nail, staple, bolt, nut, rivet, pin, pair of scissors, pair of pliers, wrench, driver, ratchet, hammer, pneumatic tool, power tool, or the like. The ability of the lock 20 to control the size of the second sub-loop 24 facilitates securement of instruments 26 of various dimensions with a single apparatus 10. Accordingly, a tether 10 in accordance with the present invention may provide significant convenience and security by controlling the placement, movement, and proximity of instruments 26 of various sizes and weights.

[0041] Referring to FIG. 2, in selected embodiments, a band 12 in accordance with the present invention may be discontinuous. That is, a band 12 may include a discontinuity 28 facilitating application of the band 12 to a wrist 14, arm, finger, thumb, belt, or the like. Such a discontinuity 28 may be coupled with a closure 30 selectively and adjustably closing the discontinuity 28.

[0042] For example, in some embodiments 32, a closure 30 such as a hook-and-loop arrangement or securement (e.g., Velcro®) may be applied to a discontinuity 28. In other embodiments 34, a closure 30 such as a snap may be used. In still other embodiments 36, a closure 30 such as a buckle may be used. In general, a closure 30 may be any mechanical arrangement providing the desired adjustability and securement strength.

[0043] A band 12 in accordance with the present invention may be formed of any suitable material. Suitable materials maybe chosen based on cost, comfort, availability, workability, durability, strength, aesthetic appeal, flexibility, and the like. Suitable materials may include natural as well as synthetic materials. For example, in selected embodiments, a band 12 may be formed of leather. In other embodiments, a band 12 may be formed of woven polymeric strands (e.g., nylon, polyester, or the like).

[0044] In still other embodiments, a band 12 may be formed of an elastomeric material. If desired, a band 12 may be formed of a solid, continuous piece of elastomeric material. Alternatively, the band 12 may be formed of woven strands of elastomeric material. In certain embodiments 38, band 12 formed of elastomeric material may be formed without any discontinuity 28. In such embodiments, the resilience of the material may facilitate easy application and securement of the band 12 to the wrist 14, arm, finger, thumb, or the like, with minimal adjustment.

[0045] In certain applications, it may be desirable to stow a tether 10 when it is not being used. Accordingly, in some embodiments, a band 12 may include a securement mechanism facilitating stowage. For example, a band 12 may include a first patch of hook-and-loop material. A user may apply a corresponding second patch of hook-and-loop material to a desired stowage location. Accordingly, by applying the first patch to the second patch, the tether 10 may be secured at a location facilitating subsequent use.

[0046] Referring to FIG. 3, the connection between a band 12 and a lanyard 16 may be accomplished in any suitable manner. Accordingly, the connection may be made with or without an interface 18. In embodiments 40 without an interface 18, a lanyard 16 may connect to a band 12 by simply looping through the interior 42 thereof. In embodiments including an interface 18, that interface 18 (or bracket 18) may comprise any suitable mechanism capable of securing a lanyard 16 to a band 12. A hook, clamp, slot, ring, loop, or the like may form a bracket of any suitable material to receive and retain a lanyard 16.

[0047] In selected embodiments, an interface 18 may comprise a loop of material secured to the band 12 and extending to engage the lanyard 16. In such embodiments, an interface 18 may include a closure 44. The nature of the closure 44 may determine whether the interface 18 provides permanent or non-permanent securement of a lanyard 16 to a band 12, to the interface 18, or to both 12, 18.

[0048] For example, in certain embodiments 46, an interface 18 may include a closure 44 in the form of a snap. Accordingly, the closure 44 may be snapped to secure the lanyard 16 and unsnapped to permit removal of the lanyard 16. In other embodiments 48, a closure 44 in the form of a hook and loop securement may likewise provide non-permanent securement of a lanyard 16 to a band 12.

[0049] In other embodiments, the closure 44 may be in the form providing permanent securement of a lanyard 16 to a band 12. For example, in selected embodiments 50, a closure 44 may comprise stitching closing an interface 18 and permanently securing any engaged lanyard 16 to the corresponding band 12. In other embodiments 52, a closure 44 in the form of a rivet may likewise provide permanent securement of a lanyard 16 to a band 12. The interface may even be a solid, continuous ring 18.

[0050] In selected embodiments, an interface 18 in accordance with the present invention may include configurations other than the looped arrangements discussed hereinabove. For example, in some embodiments 54, a strip of material 56 may be positioned along a band 12. The strip of material 56 may be secured to the band 12 by first and second closures 44a, 44b. Accordingly, a middle portion 58 positioned between the first and second closures 44a, 44b may provide an enclosed space through which a lanyard 16 may pass.

[0051] In the illustrated embodiment 54, the first and second closures 44a, 44b are illustrated as stitching. However, any closure 44 or combination of closures 44 may be used. For example, if a non-permanent engagement with a lanyard 16 is desired, a first closure 44a may be stitching, while the second closure 44b may comprise a snap.

[0052] If desired, an interface 18 may include more than one component 60. For example, in certain embodiments 62, an interface 18 may include first and second components 60a, 60b. A first component 60a may be patterned after the strip or loop type interfaces 18 discussed hereinabove. A second component 60b may engage this first component 60a and extend to engage a lanyard 16. In selected embodiments, the second component 60b may be a mechanical device such as a clip, carabiner, or the like.

[0053] Referring to FIGS. 4-6, an interface 18 in accordance with the present invention may be formed of any suitable material. As with a band 12, suitable material for an
interface 18 may be chosen based on cost, comfort, availability, workability, durability, strength, aesthetic appeal, flexibility, and the like. Accordingly, suitable materials may include natural as well as synthetic materials. For primarily aesthetic reasons, the interface 18 is typically formed of a material comparable to that of the corresponding band 12. Accordingly, if the band 12 is to be formed of a particular leather, the interface 18 may also be formed of that particular leather. However, mixing and matching of various materials is also contemplated within the present invention.

[0054] In selected embodiments, it may be desirable to form a band 12 and interface 18 from a single, continuous piece or strip of material 64. This may be accomplished in any suitable manner. For example, in one embodiment, a single, continuous strip of material 64 may be folded to extend at substantially a ninety degree angle with respect to itself, thereby delineating a band portion 12 and an interface portion 18.

[0055] The interface portion 18 may then be folded back over itself toward the band portion 12. An appropriate closure 44 for the interface portion 18 may then be selected and applied. For example, in the illustrated embodiment, the closure 44 for the interface portion 18 comprises stitching maintaining the single, continuous strip of material 64 in the desired configuration. Finally, an appropriate closure 30 may be selected and applied to the band portion 12. For example, in the illustrated embodiment, a hook and loop closure 30 has been applied to the band portion 12. Alternatively, a ring 18 may slip over the bank 12 and through the lanyard 16.

[0056] Referring to FIGS. 7 and 8, a lock 20 in accordance with the present invention may have any suitable configuration and method of operation. For example, in selected embodiments, a lock 20 may be configured as a cord lock. Such a lock 20 may include a housing 66, a pin 68, and a biasing member 70.

[0057] When the pin 68 is urged to compress or deflect the biasing member 70, an aperture 72 in the pin 68 may align with an aperture 74 in the housing 66. Accordingly, in a compressed configuration 76, a lanyard 16 may pass through the aligned apertures 72, 74. Alternatively, when in a non-compressed configuration 78, the biasing member 70 may urge the aperture 72 in the pin 68 out of alignment with the aperture 74 in the housing 66. Thus, in a non-compressed configuration 78, the pin 68 and housing 66 may pinch a previously inserted lanyard 16 sufficiently to resist further movement of the lock 20 therealong.

[0058] Referring to FIG. 9, in selected embodiments, the operation of a lock 20 may be simplified sufficiently to avoid moving parts. For example, in one embodiment, a lock 20 may simply comprise an object 80 with an aperture 82 passing therethrough. The size and shape of the aperture 82 may be selected to provide a frictional engagement with the lanyard 16. That is, the aperture 82 may be sized and shaped to travel along the lanyard 16 when intentionally manipulated, yet grip the lanyard 16 with sufficient friction to resist inadvertent travel therealong.

[0059] Referring to FIGS. 10 and 11, in selected embodiments, a lanyard 16 may be formed as a closed loop. Accordingly, a lock 20 may adjustably pinch such a lanyard 16 to form two sub-loops 22, 24. In such an arrangement, adjusting the location where the lock 20 pinches the lanyard 16 will continuously increase or decrease the size of one sub-loop 22, 24, while simultaneously, continuously, and respectively decreasing or increasing the size of the other sub-loop 24, 22. Accordingly, by adjusting the location where the lock 20 pinches the lanyard 16, the size of the second sub-loop 24 may transition between a minimum size 84 and a maximum size 86. Alternatively, each sub-loop 22, 24 may be sized independently by its own lock 20.

[0060] At is minimum size 84, the second sub-loop 24 may have an interior diameter of substantially zero. So configured, the second sub-loop 24 may encircle and secure very slender instruments 26 (e.g., needles, pins, or the like). Conversely, at its maximum size 86, the majority of the lanyard 16 is included within the second sub-loop 24. So configured, the second sub-loop 24 may encircle and secure instruments 26 of significant girth (e.g., power tools or the like).

[0061] Referring to FIG. 12, in selected situations or applications, it may be desirable to simultaneously tether more than one instrument 26. For example, it may be desirable to tether a screw as well as a corresponding screwdriver. Accordingly, in selected embodiments, a user may apply and simultaneously utilize more than one tether 10 in accordance with the present invention.

[0062] For example, in one embodiment, a user may secure a first instrument 26 using a first tether 10 applied to one wrist 14, while securing a second instrument 26 using a second tether 10 applied to the other wrist 14. In other embodiments, a user may apply multiple tethers 10 in accordance with the present invention. For example, a user may apply two or more tethers 10 to the same wrist 14.

[0063] In still other embodiments, a tether 10 in accordance with the present invention may include a single band 12, but multiple lanyards 16. For example, a single band 12 may support a single interface 18 that, in turn, may support multiple lanyards 16, each having a corresponding lock 20.

[0064] In one embodiment, a tether 10 in accordance with the present invention may be provided with multiple lanyards 16 representing various sizes (e.g., diameters, cross-sectional areas), multiples of similar sizes, or some combination thereof as well as an interface 18 having a non-permanent closure 44. Accordingly, before securing any instruments 26, a user may connect an arrangement of lanyards 16 sufficient to perform the task or tasks contemplated. If desired, in addition, or as an alternative, to securing various lanyards 16, an interface 18 may engage other types of structures for securement of instruments 26. For example, an interface 18 may secure one or more strap securements using hook-and-loop arrangements to rap and secure an instrument 26.

[0065] Referring to FIG. 13, in selected embodiments, a tether 10 in accordance with the present invention may be used to secure diminutive instruments 26 or parts. For example, as illustrated, a tether 10 may be used to secure a screw, even while that screw is being manipulated (e.g., started, rotated). Also, the interface 18 and lanyard 16 may be centered on the user’s palm, permitting work in tight or constricting environments.

[0066] During certain uses, a tether 10 may inadvertently snag on moving machinery. If such a tether 10 were overly
strong, it may pull the hand, arm, or entire body of a user into a dangerous and harmful environment. To eliminate the potential for such accidents, a tether 10 in accordance with the present invention may provide a specified breakaway strength. That is, a tether 10 may be designed to fail, thereby freeing the user, when loads greater than a specified amount are applied to a tether 10 or lanyard 16. In selected embodiments, such specified loads may reside somewhere above loads representing normal use, but well below loads representing an inadvertent snag.

[0067] The breakaway strength of a tether 10 or lanyard 16 in accordance with the present invention may be controlled in any suitable manner. For example, in selected embodiments, a lanyard 16 may be designed to fail at loadings above the specified limit. In other embodiments, the closure 44 of an interface 18 may be designed to fail at loadings above the specified limit. In other embodiments, the closure 30 of a band 12 may be designed to fail at loadings above the specified limit. In still other embodiments, one or more, or some combination, of the lanyard 16, closure 44 of the interface 18, and closure 30 of the band 12 may be designed to fail at loadings above the specified limit.

[0068] In selected embodiments, it may be desirable to increase the effective tethering distance 88 (i.e., the distance 88 between the band 12 and the instrument 26). For example, when securing instruments 26, the size of the first sub-loop 22 largely determines the tethering distance 88. However, the size of the first sub-loop 22 is controlled by, and varies inversely with, the size of the second sub-loop 24. Accordingly, unlike the illustrated arrangement incorporating an instrument 26 of diminutive size, when securing instruments 26 of substantial girth, the majority of the lanyard 16 may be included within the second sub-loop 24. In such situations, the tethering distance 88 may be limited. If too limited, the tethering distance 88 may preclude proper manipulation of the instrument 26.

[0069] Additional tethering distance 88 may be provided in any suitable manner. For example, in selected embodiments, a lanyard 16 having a greater size or circumference may be selected when securing larger instruments 26. With a greater circumference, sufficient length or size may remain in the first sub-loop 22, even when the second sub-loop 24 encircles an instrument 26 of substantial girth.

[0070] In other embodiments, the length 90 of an interface 18 may be increased to provide the necessary or desired tethering distance 88. By increasing the length 90 of an interface 18, the tethering distance 88 may be less dependent on the size of the first sub-loop 22. Accordingly, even when the majority of the lanyard 16 is included within the second sub-loop 24, the length 90 of the interface 18 may provide a desired or necessary tethering distance 88.

[0071] In certain embodiments, an interface 18 in accordance with the present invention may have an adjustable length 90. For example, the closure 44 of an interface 18 may accommodate an array of securement locations. Each such securement location may correspond to a different length 90.

[0072] Referring to FIG. 14, in selected embodiments, to provide additional tethering distance 88, lanyards 16 in accordance with the present invention may be chained together. For example, as stated hereinafter, a tether 10 in accordance with the present invention may be provided with multiple lanyards 16a, 16b representing various sizes, multiples of similar sizes, or some combination thereof, as well as an interface 18 having a non-permanent closure 44. Accordingly, one or more of these lanyards 16a, 16b may be removed from the interface 18 and chained together to increase the tethering distance 88. In such arrangements, even when substantially all of the last lanyard 16b on the chain is consumed within a second sub-loop 24b encircling a large instrument 26, the other lanyard 16a or lanyards 16 are still available to provide the desired tethering distance 88.

[0073] Referring to FIG. 15, a method 92 for manufacturing a tether 10 in accordance with the present invention may begin with the selection 94 of the material for the band 12. For example, this step may comprise selection 94 of a woven, polymeric, strap from which a band 12 may be formed. Depending on the nature of the material selected 94 for the band 12, a closure 30 for the band 12 may also be selected 96. That is, if the material for the band 12 is elastomeric, perhaps a closure 30 may be omitted. On the other hand, if the material for the band 12 is inextensible, a closure 30 may be useful. In certain embodiments, a hook-and-loop arrangement may be selected 96 as the closure 30 for the band 12.

[0074] If an interface 18 is to be included within the tether 10, the material for that interface 18 may then be selected 98. In general, the selection 98 of the material for the interface 18 may mirror or complement the selection 94 of the material for the band 12. Accordingly, in one embodiment, a common material may be selected 94, 98 for both the band 12 and the interface 18. Depending on whether a permanent or non-permanent securement of a lanyard 16 is desired, the interface 18 may include any of various closures 44. For example, if permanent securement is desired, stitching or a rivet-type closure 44 may be selected 100. Alternatively, if non-permanent securement is desired, a snap, hook-and-loop, or clip-type of closure 44 may be selected 100.

[0075] Next, one or more lanyards 16 may be selected 102. In certain embodiments, selection 102 of a lanyard 16 may include the selection of an “off-the-shelf” type of product. For example, in one embodiment, selection 102 of a lanyard 16 may comprise the selection of an O-ring have the desired cross-sectional shape, cross-sectional thickness, and overall circumference. Loops 16 of tubing (e.g., plastic, polymers, elastomers, etc.) or cord 16 may serve as lanyards as well. Frictional capacity to grip may vary according to the material.

[0076] One or more locks 20 may be selected 104 according to the number of lanyards 16. In selected embodiments, selection 104 of a lock 20 may similarly include the selection of an “off-the-shelf” type product. For example, in one embodiment, selection 104 of a lock 20 may include selection of a cord lock corresponding in size to the cross-sectional thickness of the lanyard 16.

[0077] Finally, once the various pieces have been collected, the tether 10 may be assembled 106. Assembling 106 a tether 10 in accordance with the present invention may include cutting materials for the band 12 and interface 18 to the desired length, processing cut edges to resist fraying, then folding, sewing, riveting, applying closures 30, 44, securing lanyards 16, applying locks 20, or the like.
[0078] Referring to FIG. 16, a method 108 of utilizing a tether 10 in accordance with the present invention may begin with application 110 of the band 12. In selected embodiments, this application 110 simply comprises securing the band 12 at an appropriate location on the user (e.g., the user’s wrist 14, belt, clothing, or the like). In alternative embodiments, the band 12 may be either augmented or replaced by a clip or pin securing the system 10 to clothing, such as a sleeve of a shirt, jacket, or coveralls.

[0079] An instrument 26 may then be positioned 112 for securement. In general, such positioning 112 may comprise placing the instrument 26 within the second sub-loop 24. The size of the second sub-loop 24 may then be adjusted (reduced) to engage 114 the instrument 26. Once secured, the instrument 26 may be utilized 116 as desired or necessary.

[0080] When the user has finished using 116 the instrument 26, it may be released 118 from the second sub-loop 24. The user may then position 112 another instrument 26 and repeat the process. Alternatively, if the user has no more need for tethering, the band 12 may be removed 120 and the tether 10 stowed for future use.

[0081] Referring to FIG. 17, the step of engaging 114 an instrument 26, as set forth hereinabove, may include various sub-steps. For example, in selected embodiments, engaging 114 an instrument 26 may begin with release 122 of a lock 20. This may free the lock 20 to travel along the lanyard 16. Accordingly, the lock 20 may be advanced 124 toward the instrument 26 being secured. This may have the effect of constricting the second sub-loop 24 around some portion of the instrument 26. Alternatively, the instrument 26 or tool 26 may be pulled to stretch the lanyard 16 or loop 16, adding elastic forces before tightening the lock 20. The sub-loop 24 may then apply more force to support friction for retaining the instrument 26.

[0082] The lock 20 may be advanced 124 until the second sub-loop 24 appropriately secures or grips the instrument 26. How tightly the second sub-loop 24 should grip the instrument 26 may depend on how the instrument 26 is to be utilized 116. For example, in embodiments where the instrument 26 will be rotated, less gripping may be required. That is, the second sub-loop 24 may sufficiently grip the instrument 26 to provide the desired tethering, but may not sufficiently grip the instrument 26 to resist rotation of the instrument 26 within the second sub-loop 24.

[0083] Alternatively, in selected embodiments, it may be desirable for the second sub-loop 24 to grip the instrument 26 sufficiently to resist all relative motion therebetween. In such embodiments, the lock 20 may be advanced toward the instrument 26 until sufficient tension is generated 126 in the second sub-loop 24. In embodiments where the lanyard 16 comprises an elastomeric material, this tensioning 126 may include elastic deformation (e.g., stretching) of the second sub-loop 24.

[0084] Once the lock 20 has been advanced 124 to the desired position with respect to the instrument 26, the lock 20 may be engaged 126. So engaged 126, the lock 20 may resist further travel along the lanyard 16. Accordingly, the lock 20 may prevent the second sub-loop 24 from expanding and loosening its grip on the instrument 26.

[0085] Referring to FIG. 18, the present invention may be used to simultaneously secure multiple instruments 26. A method 130 of so utilizing the present invention may involve applying 110 a single band 12 supporting multiple lanyards 16. Alternatively, it may involve applying 110 various bands 12 (or clips, etc.) at various locations (e.g., one band 12 on a left wrist and another on a right wrist). For purposes of discussion, this method 130 will be presented as involving two instruments 26. However, within the scope of the present invention, the principles of this method 130 may be applied to more than two instruments 26, such as a set of several tools 26, or tools 26 and parts.

[0086] The method 130 may continue with positioning 112 of the first instrument 26. Such positioning 112 may comprise placing the first instrument 26 within an appropriate second sub-loop 24. The size of that second sub-loop 24 may then be reduced to engage 114 the first instrument 26. A similar positioning 112 of and engaging 114 of process may be implemented to secure the second instrument 26 within some other second sub-loop 24, and so on until a last tool 26 or part is engaged. Once secured, both the first and second instruments 26 may be utilized 116a, 166b as desired or necessary.

[0087] When the user has finished using the first or second instrument 26 or part, one or both may be released 118a, 118b from the corresponding second (or nth sub-loop 24. The user may then position 112a, 112b other instruments 26 and repeat the process. Alternatively, if the user has no more need for tethering, the band 12 or bands 12 may be removed 120 and the tether 10 or tethers 10 stowed for future use. The loop may simply be slipped along an arm out of the way.

[0088] The present invention may be embodied in other specific forms without departing from its basic functions or essential characteristics. The described embodiments are to be considered in all respects only as illustrative, and not restrictive. The scope of the invention is, therefore, indicated by the appended claims, rather than by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by United States Letters Patent is:

1. an apparatus comprising:
   - a band sized to fit a human wrist;
   - a first lanyard formed as a continuous, closed loop;
   - an interface connecting the first lanyard to the band;
   - first lock adjustable pinching the first lanyard to form first and second sub-loops therefrom.

2. The apparatus of claim 1, wherein the band is discontinuous and comprises a closure facilitating application and securement of the band to a human wrist.

3. The apparatus of claim 2, wherein the closure is selected from the group consisting of a snap, buckle, and hook and loop arrangement.

4. The apparatus of claim 3, wherein the first lanyard is formed of an elastomeric material.

5. The apparatus of claim 4, wherein the first lanyard comprises an O-ring seal.

6. The apparatus of claim 5, wherein the first lock comprises a cord lock.

7. The apparatus of claim 6, further comprising an instrument.
8. The apparatus of claim 7, wherein the first sub-loop engages the instrument.

9. The apparatus of claim 8, wherein the second sub-loop engages the interface.

10. The apparatus of claim 9, wherein the instrument is selected from the group consisting of a screw, bolt, nail, nut, rivet, pin, wrench, driver, hammer, and power tool.

11. The apparatus of claim 1, wherein the wherein the band further comprises a closure facilitating application and securement of the band to a human wrist, the closure being selected from the group consisting of a snap, buckle, and hook and loop arrangement.

12. The apparatus of claim 1, wherein the first lanyard is formed of an elastomeric material.

13. The apparatus of claim 1, wherein the first lock comprises a cord lock.

14. The apparatus of claim 1, further comprising an instrument and wherein the first sub-loop engages the instrument and the second sub-loop engages the interface.

15. The apparatus of claim 1, further comprising a second lanyard formed as a continuous, closed loop and wherein the interface connects the second lanyard to the band.

16. The apparatus of claim 15, further comprising a second lock adjustably pinching the second lanyard to form first and second sub-loops therefrom.

17. An apparatus comprising:

a band sized to fit a human wrist;

at least one lanyard formed as a continuous, closed loop;

an interface connecting the at least one lanyard to the band;

at least one lock adjustably pinching the at least one lanyard to form at least two sub-loops, wherein adjusting the location where the at least one lock pinches the at least one lanyard continuously increases or decreases the size of one sub-loop of the at least two sub-loops while simultaneously, continuously, and respectively decreasing or increasing the size of another sub-loop of the at least two sub-loops.

18. The apparatus of claim 17, wherein the other sub-loop engages the interface.

19. The apparatus of claim 18, wherein adjusting the location where the at least one lock pinches the at least one lanyard continuously adjusts the size of the one sub-loop between a minimum size and a maximum size, the minimum size corresponding to an interior diameter within the one sub-loop of substantially zero.

20. A method comprising:

selecting an apparatus comprising a band sized to fit a human wrist, a lanyard formed as a continuous, closed loop, the lanyard being connected to the band, and a lock adjustably pinching the lanyard to form first and second sub-loops;

applying the band to a human wrist;

positioning an instrument within the first sub-loop; and

adjusting the location where the lock pinches the lanyard to decrease the size of the first sub-loop until the instrument is sufficiently secured therewithin.