SYSTEMS AND METHODS OF ACCESSORY MOUNTING

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Embodiments according to the present invention provide improved systems and methods for mounting accessories, such as a rangefinder, to supporting structure, such as an archery bow or firearm. The improved accessory mount includes one or more brackets adapted to interface to the accessory and to the supporting structure. Preferred brackets provide universal adaptability between and amongst a variety of supporting structures.
SYSTEMS AND METHODS OF ACCESSORY MOUNTING

RELATED APPLICATIONS


BACKGROUND OF THE INVENTION

[0003] The present invention relates generally to the field of supporting structures, such as brackets and the like, and more particularly to the positioning and support of an accessory, such as a rangefinder, in relation to a weapon, such as an archery bow or a firearm, or other structure.

[0004] Generally, an archery bow comprises a riser body and a pair of limbs extending from opposite ends of the riser body. Strung between the limbs is a bowstring. An archery bow may be provided as a compound bow or a long bow; a compound bow having cams provided on the limbs around which the bowstring is threaded and a long bow not having such cams. Regardless of whether a bow is compound or long, a grip is provided on the riser body to be grasped by one hand of a user while the bowstring is drawn with the other hand. The grip defines a pivot point that is usually engaged by the user’s thumb and forefinger.

[0005] Many accessories have been developed for use with and integration onto archery bows, such as sights, quivers, stabilizers and silencers. However, other accessories that may be of value to a user of an archery bow may not have been designed to be integrated onto or supported by the bow. For instance, a handheld rangefinder, camera, digital music player, microphone, or other accessory, may be desirable to be used in conjunction with an archery bow, but is likely not to have been designed with such a specific use in mind. For convenience, since the operation or firing of an archery bow requires two hands, it may be desirable to mount such an accessory in a convenient location relative to various components of the archery bow.

[0006] Furthermore, a firearm, such as a rifle, generally comprises a stock extending proximally to a butt end. The stock generally supports a barrel extending distally to a muzzle end. Also usually supported by the stock is the firing mechanism, which may include a trigger, a safety, an ammunition chamber, etc. The firing mechanism is usually disposed distally of a hand grip that may be formed into the stock. Situated usually even more distally than the firing mechanism, there may be a means for mounting an accessory to the barrel of the rifle, such as an optical scope or sight.

[0007] While limited mounting locations may be provided on a rifle, other locations, and perhaps other accessories, that may be of value to a shooter may not have been designed to be integrated onto or supported by the rifle. For instance, a handheld rangefinder, camera, digital music player, microphone, or other accessory, may be desirable to be used in conjunction with a rifle, but is likely not to have been designed with such a specific use in mind. For convenience, since the operation or firing of a firearm, and especially a rifle, may require two hands, it may be desirable to mount such an accessory in a convenient location relative to various components of the firearm.

[0008] While devices and methods have been developed for supporting accessories on weapons and other structures, such developments may not have appreciated relative positioning of accessories in relation to the weapon, as well as desired interchangeability between mounting the same accessory on first an archery bow and then on a firearm, or vice versa. Therefore, the art of supporting accessories on or near an archery bow would benefit from an improved apparatus for positioning an accessory in relation to a support structure and to allow for uniform mounting structure to be provided on various weapons to allow for ease of transfer of an accessory from one weapon or support structure to another.

SUMMARY OF THE INVENTION

[0009] An apparatus according to the present invention provides an improved apparatus for positioning an accessory in relation to a support structure and to allow for uniform mounting structure to be provided on various weapons to allow for ease of transfer of an accessory from one weapon or support structure to another.

[0010] In one embodiment of a combination according to the present invention, an archery bow has a riser body with a grip disposed thereon. The riser body has a draw side and a sight side. One or more standoffs may be coupled to, and extend generally longitudinally outward from, the draw side above the grip. An accessory bracket may be supported by one or more of the standoffs. The accessory bracket includes a support structure interface including a first leg and a second leg, which are coupled by a hinge member. A first standoff notch is provided on one of the legs, the notch being configured to lie circumjacent to at least a portion of one of the standoffs.

[0011] According to an aspect of an embodiment according to the present invention, a second standoff notch may be provided on the other of the legs, where the second standoff notch is configured to lie circumjacent to at least a portion of one of the standoffs. The first standoff notch and the second standoff notch may cooperate to form a mounting aperture, which may be formed when the legs are arranged in a substantially parallel relationship to one another. The mounting aperture may have a cross-sectional shape that is mateable with one of the standoffs. The legs may be arranged in a parallel relationship and secured by a threaded fastener extending through one of the legs and threadably engaging the other leg.

[0012] According to another aspect of an embodiment according to the present invention, to each leg there may be attached or formed integrally therewith a yoke arm extending from the hinge member to a free yoke end. The yoke arms may move simultaneously with the legs and when the legs are hingedly moved apart with respect to each other, the yoke arms may be moved toward each other. Each yoke free end preferably includes a longitudinal slot disposed along a slot length. The slots may have a C-shaped, such as a squared-off C-shaped, cross-section. One or both of the slots may be terminated at one end, and the slots are preferably spaced from each other at a relative slot spacing.

[0013] According to still another aspect according to the present invention, an accessory may be supported by the accessory bracket. The accessory preferably has at least substantially parallel rails disposed thereon at a relative rail
spacing with respect to each other. The rail spacing may be at least substantially equal to the slot spacing. The rails preferably have a T-shape or I-shape cross-section adapted to frictionally engage the slots provided on the yoke arms. In one embodiment, the accessory is an electronic range finder.

According to yet another aspect according to the present invention, an accessory may be directly mounted to and supported by one of the standoffs in a spaced relationship from the riser body. Such accessory may be a sight mounting bracket or an arrow quiver, for example.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0015]** FIG. 1 is a left elevation view of a first embodiment of a bracket according to the present invention mounted to an accessory.

**[0016]** FIG. 2 is a bottom perspective view of the embodiment of FIG. 1.

**[0017]** FIG. 3 is a right elevation view of a first archery setup including a sight bracket installed on an archery bow.

**[0018]** FIG. 4A is a front left perspective view of the archery setup of FIG. 3.

**[0019]** FIG. 4B is a rear right perspective view of a portion of a second archery setup.

**[0020]** FIG. 5A is a perspective view of a sight bracket with a first embodiment of mounting standoffs according to the present invention.

**[0021]** FIG. 5D is a perspective view of a sight bracket with a second embodiment of mounting standoffs according to the present invention.

**[0022]** FIG. 5C is a perspective view of a sight bracket with a third embodiment of mounting standoffs according to the present invention.

**[0023]** FIG. 5D is a perspective view of a sight bracket with a fourth embodiment of mounting standoffs according to the present invention.

**[0024]** FIG. 6A is a first perspective view of a first embodiment of a support bracket according to the present invention.

**[0025]** FIG. 6B is a second perspective view of the embodiment of FIG. 6A.

**[0026]** FIG. 6C is a rear elevation view of the embodiment of FIG. 6A.

**[0027]** FIG. 7A is a side elevation view of a portion of a second embodiment of a support bracket according to the present invention.

**[0028]** FIG. 7B is a side elevation view of a portion of a third embodiment of a support bracket according to the present invention.

**[0029]** FIG. 7C is a side elevation view of a portion of a fourth embodiment of a support bracket according to the present invention.

**[0030]** FIG. 8 is a first rear right perspective view of an accessory bracket interfacing with a support bracket.

**[0031]** FIG. 9A is a second rear right perspective view of the accessory bracket of FIG. 8 interfacing with the support bracket of FIG. 8.

**[0032]** FIG. 9B is the view of FIG. 9A, further including a remote triggering structure.

**[0033]** FIG. 10 is a left side perspective view of a rifle including an optical scope mounted thereto.

**[0034]** FIG. 11 is a perspective view of an embodiment of a supplemental accessory bracket according to the present invention.

**[0035]** FIG. 12 is a perspective view of the embodiment of FIG. 11 interfacing with the first embodiment of an accessory interface according to the present invention.

**[0036]** FIG. 13 is the view of FIG. 10 further including a first embodiment of a tubular support bracket according to the present invention.

**[0037]** FIG. 14A is a top plan view of an embodiment of an adjustable bracket according to the present invention in a first position.

**[0038]** FIG. 14B is a top plan view of the embodiment of FIG. 14A in a second, extended position.

**[0039]** FIG. 15 is a perspective view of the adjustable bracket of FIG. 14A interfacing with the first embodiment of a tubular support bracket according to the present invention.

**[0040]** FIG. 16 is a top perspective view of the structure shown in FIG. 12 interfacing with the structure shown in FIG. 15.

**[0041]** FIG. 17A is a first bottom perspective view of the structure shown in FIG. 16.

**[0042]** FIG. 17B is the view of FIG. 17A, further including a remote triggering structure and exemplary placement locations.

**[0043]** FIG. 18 is a second bottom perspective view of the structure shown in FIG. 16.

**[0044]** FIG. 19 is a perspective view of a second embodiment of a tubular support bracket according to the present invention.

**[0045]** FIG. 20 is a rear elevation view depicting the embodiment of FIG. 19 installed about a tubular support structure.

**[0046]** FIG. 21 is a perspective view of a third embodiment of a tubular support bracket according to the present invention.

**[0047]** FIG. 22 is a perspective view of a fourth embodiment of a tubular support bracket according to the present invention.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention which may be embodied in other specific structures. While the preferred embodiment has been described, the details may be changed without departing from the invention, which is defined by the claims.

Turning now to the figures, FIG. 1 and FIG. 2 provide a first embodiment 100 of an accessory bracket according to the present invention. The bracket 100 is shown coupled to an accessory 900, which in this case is an embodiment of an optical rangefinder. Generally, the accessory 900 extends from a proximal end 902 to a distal end 904. A rangefinder eyepiece portion 906 may extend distally from the proximal end 902, and may be supported by a portion 908 of an accessory housing 910. Another portion 912 of the housing 910, where the portion 912 may extend proximally from the distal end 904, may contain electronic processing means and a power supply (not shown) for operation of the rangefinder 900. The eyepiece 906 may be operatively coupled to the electronic processing means by way of, e.g., electrical wires (not shown) disposed in a conduit portion 914 of the housing 910.

The accessory bracket 100 preferably provides an accessory interface 110. The accessory interface 110 prefer-
ably includes a structure that may be readily mated to a support interface provided on a support bracket according to the present invention. For instance, the accessory interface 110 may include one or more engagement structures, such as snaps, clips, hook and loop fasteners, etc. A preferred engagement structure is one or more rail members 112. The preferred rail members 112 are preferably provided as a pair of at least substantially parallel rails provided along a rail length 114 and spaced by a rail spacing 116. Preferred rails 112 have a generally T-shaped or I-shaped cross-section. The accessory bracket 100 may further include a mounting plate 120 to which the accessory interface 110 may be mounted. Alternately, the accessory interface 110 may be disposed directly on the accessory 900. If used, the mounting plate 120 has a top surface 122 preferably adapted to mate with a portion of an accessory 900, and a bottom surface 124, which is disposed substantially opposite the top surface 122. The mounting plate 120 may be secured to the accessory 900 by any conventional means, such as by adhesive and/or fastening members 126. The accessory interface 110 may be secured to the bottom surface 124 of the mounting plate 120. Preferred materials for the mounting plate 120 include a thermofomed plastic or a light metal material, such as aluminum or brass, and preferred materials for the rails 112 include same. It is to be appreciated that the rails 112 may be formed integrally with or attached to the mounting plate 120 which may be formed integrally with or attached to the accessory housing 910.

[0051] With reference to FIGS. 3-5D, various views and embodiments of support structures may be seen, to which it may be desirable to mount an accessory 900. For instance, FIG. 3 depicts a portion of an archery bow 800. The archery bow 800 includes a riser body 802 having an upper riser portion 804 and a lower riser portion 806. Depending at least partially rearwardly from the upper portion 804 of the riser body 802 is an upper limb 808. Depending at least partially rearwardly from the lower portion 806 of the riser body 802 is a lower limb (not shown). Coupled to, or formed as a part of the riser body 802, between the upper portion 804 and the lower portion 806, or at the intersection thereof, is a grip 812, which establishes a pivot point 814. When the grip 812 is grasped by a hand of a user, the pivot point 814 normally engages at least the proximal phalanges of the user’s thumb and forefinger.

[0052] Coupled to the riser body 802 is a bow sight 816. This sight 816 happens to include a sight mounting bracket 818 mounted to the riser body 802 with a pair of threaded fasteners 820. As is conventional, there are many bow accessories that are configured to be mounted to the riser body 802 of a bow by the use of threaded fasteners 820. Usually, as can be seen in FIG. 4A, accessories such as the sight mounting bracket 818 may be spaced by one or more spacers or standoff extensions 822 situated between the riser body 802 and the accessory 818, through which the threaded fasteners 820 may pass. Thus, a gap 823 is provided between the riser body 802 and the sight mounting bracket 818. Additionally or alternatively, standoff extensions 824 may be provided, extending away from the riser body 802, as opposed to being situated between the riser body 802 and a mounted accessory 818. Such standoff extensions 824 are preferably formed from a rigid material, such as metal (aluminum or steel) or plastic of sufficient strength, and they may be provided in a variety of configured cross-sections, examples of which can be seen in FIGS. 4B-5D. Such standoff extensions 824 may be provided as separate and distinct extensions 824, for instance having circular 824, triangular 824*, rectangular 824**, or oval 824*** cross-sections. Alternatively, both standoff extensions 824 may be provided as a unitary member 825 configured to span a standard distance provided between the threaded fasteners 820. The standoffs 824 may be provided with smooth or threaded apertures 824* through which the threaded fasteners 820 may be fed and then engaged with the riser body 802 of a bow so as to secure the standoff extensions 824 thereto. While the various cross-sections of standoffs are shown with respect to the standoff extensions 824, it is to be understood that such cross-section configurations may be applied to the standoff extensions 822 that may be disposed between a mounted accessory 818 and the riser body 802.

[0053] Accordingly, it may be desirable to mount an accessory 900, which may be in addition to a previously mounted accessory, such as the sight mounting bracket 818, to an archery bow. Referring now to FIGS. 6A-7C, various views and embodiments of support brackets may be seen, which are preferably configured to interface with an accessory interface 110 provided on an accessory bracket 100 according to the present invention. Generally, a support bracket 200 according to the present invention may provide a bracket interface 210 and a support structure interface 250. The bracket interface 210 is configured to mate with and/or cooperate with the accessory interface 110 provided on or coupled to the accessory 900. For instance, if the accessory interface 110 includes a pair of parallel rails 112, the bracket interface 210 preferably includes a pair of parallel slots 212 disposed along a slot length 214 and, when the bracket 200 is in a desired installed orientation, such as that shown in FIG. 6B, disposed at a slot spacing 216. The slot length 214 and the slot spacing 216 are preferably substantially the same as the rail length 214 and the rail length 114 and the rail spacing 116. The slots 212, which may have a generally C-shaped cross-section adapted to interface with the T-shaped or I-shaped cross-section of the rails 112, may be disposed on a yoke structure 220 including a first arm 222 and a second arm 224. The slots 212 may be terminated at one end or another to provide a seat for the mating rails 112, but more preferably, the slots 212 are open on each end thereof to allow multilateral insertion of the rails 112.

[0054] The support structure interface 250 generally preferably includes a first leg 252 and a second leg 254 which are movable with respect to one another, such as by being coupled to a hinge member 240. The hinge member 240 is configured to allow generally planar separation of the legs 252, 254 so as to create a mounting gap 256 therebetween, as shown in FIG. 6A. Also provided on one or both legs 252, 254 are one or more standoff notches 258. If the standoff notches 258 are provided on each leg 252, 254, then for each standoff notch 258 provided on the first leg 252, there is preferably a mating standoff notch 258 provided on the second leg 254. Alternatively, each notch 258 may be formed entirely into one leg 252 or the other 254. When the mounting gap 256 is closed or at least decreased, the mounting notches 258 preferably cooperate to form mounting apertures 260 configured to interface with a predetermined or unknown arrangement of standoffs 824, previously described. To maintain the legs 252, 254 in a closed or secured position, a thumb screw 262 may be provided, preferably configured to be threadably engaged through the first leg 252 and into the second leg 254. The mounting apertures 260 may be of any shape mateable or cooperable with such standoffs 824. As shown in FIG. 6B, the apertures 260 are provided as generally circular to interface
with standoffs 824 having a generally circular cross-section. In FIG. 7A, the mounting apertures 860' have a generally triangular shape to interface with standoffs 824' having a generally triangular cross-section. Additionally or alternatively, one or more mounting channels 864 may be provided on the support structure interface 250. For instance, in FIG. 7B, a mounting channel 864 is configured to interface with a unitary member standoff 825. While shown with the hinge member 240, such support structure interface 250 may be provided as a stationary interface with the legs 252, 254 disposed at a predetermined channel gap 266 from each other. In this way, the legs 252, 254 may be positioned in a downward mounting direction 268 to straddle the standoff 825. Such an arrangement is particularly useful if obstructions are provided in relatively close proximity on both sides of the standoff 825. Where an obstruction is provided only on a single side of the standoff(s), it may be desirable to provide mounting capability in a lateral proximal (not shown) or distal direction 270. Such capability may be provided by the support structure interface 250 provided in FIG. 7C, in which one or more laterally accessible mounting channels 272 are provided to cooperate with standoffs 824. A mounting pin 274, which may be secured to the support structure interface 250 with a threaded thumbscrew 263, may be used to close off the channels 272 once the channels 272 have been cooperated with the standoffs 824.

The yoke arms 222, 224 on which the slots 212 are preferably supported may be fixedly arranged with respect to one another, but more preferably, each arm extends into or is coupled to one of the legs 252, 254 of the support structure interface 250. As shown, when the legs 252, 254 are separated to form the mounting gap 256, the yoke arms 222, 224 move towards each other. An alternative scissor arrangement (not shown) may be desirable for some applications, in which when the legs 252, 254 are separated to form the mounting gap 256, the yoke arms 222, 224 move away from each other. In such scissor arrangement, the first arm 222 would extend into or be coupled to the second leg 254, and the second arm 224 would extend into or be coupled to the first leg 252. The yoke arms 222, 224 may include a plurality of holes 226 formed therethrough to lighten the weight of the bracket 200. Additionally, the yoke arms 222, 224 extend preferably from a left lateral surface 227 to a right lateral surface 228. At least one of the lateral surfaces may be extensively coplanar with a side of the legs 252, 254 so as to aid mounting the bracket up against, for example, a bow riser 802. Alternatively, the lateral surfaces may be formed substantially symmetrically, such as by the left lateral surface 227 flaring outwardly similar to the right lateral surface 228. The legs 252, 254 preferably have a thickness 259 sized and configured to be disposed in a desired mounting location, such as the mounting gap 823.

FIG. 8 depicts a support bracket 200 that has been installed on an archery bow 800. Such installation involved cooperating the support structure interface 250 of the bracket 200 with standoffs 824 disposed between the sight bracket 818 and the bow riser body 802. An accessory 900 is to be coupled to the bow 800. Fitted to or formed integrally with the accessory 900, or disposed between the accessory 900 and the support bracket 200, is an accessory bracket 100. Since the rail spacing 116 of the accessory bracket 100 is operatively configured to interface with the slot spacing 216 of the slots 212 on the support bracket 200, it is possible to slide the rails 112 into the slots 212, frictionally engaging same therewith, in a mounting direction 830. The various components of the support bracket 200 are preferably formed from aluminum, though other materials may be used.

FIG. 9A depicts the accessory 900 having been situated at a desired position. In this position, although not necessary, it is preferred that all or substantially all of the rails 112 are situated within the slots 212 provided on the support bracket 200. This arrangement tends to minimize corruption of accessory bracket interface, such as by dirt getting disposed within the slots 212 or upon the rails 112. FIG. 9B is the same view as FIG. 9A, further including a remote triggering mechanism 930, which may be a normally open or normally closed push-button switch 932 that may be used to activate the accessory 900. The switch 932 is in electrical communications with an electrical circuit (not shown) in the accessory housing 910. Such electrical communications may be provided via wireless means, but is preferably provided with one or more electrical conductors 934 disposed between the accessory housing 910 and the switch 932. The conductors 934 may be adhered or otherwise coupled to the bow riser body 802, such as by being strapped or clipped thereto, to ensure that they preferably will not interfere with use of the sights 816. In this manner, the accessory 900 may be activated, powered-on, and/or controlled from a physical location separate and apart from the accessory housing 910. The switch 932 may be supported by the bow riser body 802, such as by being adhered thereto. However, the switch is preferably removably coupled to the bow riser body 802, opposite the grip 812, for easy operation with the fingers of a user's hand. The removable coupling is preferably a magnetic arrangement including a magnet or magnetic material (not shown) securedly disposed on the switch 932 and a magnet or magnetic material, or a magnet, respectively, (not shown) disposed on the bow riser body 802. The magnet or magnetic material disposed on the bow riser body 802 may be secured thereto relatively permanently, such as by welding or adhesive, or relatively selectively removably, such as by a strap or clip disposed substantially around the riser body 802 or by a hook and loop type fastener. The magnet or magnetic material disposed on the switch 932 is preferably adhered thereto.

Where a remote switch 932 is used, there may be times when it is desirable for the accessory 900 to be used separate and apart from any mounting structure, such as by being supported by or in the hand of a user. In such cases, it may be desirable to mount the switch 932 to one of one or more docking locations 940 provided on the accessory housing 910. A docking location 940 may include a magnet or magnetic material that is disposed on, inset into, or disposed within the accessory housing 910 configured to cooperate with the magnet or magnetic material provided on the switch 932 to temporarily secure the switch 932 preferably directly adjacent the housing 910 when desired. A plurality of docking locations 940 may be provided on the accessory housing 910, such as one on each side of the left and right (shown) sides of the accessory 900 to facilitate a variety of manipulations.

Turning now to FIGS. 10-22, an alternate support structure and support structure interface may be described. Another example, aside from an archery bow as previously described, in which it may be desirable to mount an accessory 900 in the event of a tubular or other support structure. Presented in FIG. 10 is a generic representation of an embodiment of a firearm 850, in this instance a rifle or shotgun. As described above, the firearm 850 may include a stock 852. Supported by the stock 852, or molded integrally therewith, may be a grip 854 that is formed generally proximal from a
trigger 856. Extending distally, and mounted to or supported by the stock 852, is a barrel 858. Coupled on top of or to either the stock 852 or the barrel 858 may be an optical sight 860, such as an optical scope. The scope 860 extends from a proximal end 862 to a distal end 864, along a longitudinal sight axis 866, which may be disposed generally parallel to a longitudinal barrel axis 859 about which the barrel 858 is formed. The proximal end 862 of the scope 860 is the end into which a user peers with his or her eye to aim the firearm 850. The scope 860 in this instance is mounted to the firearm 850 by a plurality of scope mounting clips 870. The scope mounting clips 870 interface with a cooperative structure on top of the barrel 858 or the stock 852 to maintain the scope 860 in a stationary position relative thereto. The clips 870 generally extend about a central tubular portion 868 of the scope 860. The central tubular portion 868 is disposed on either side of a scope adjustment mechanism 872 as is standard in the art. The scope mounting clips 870 are shown spaced from the scope adjustment mechanism 872 so as to provide vacant tubular mounting space 874. Alternatively, one or both of the mounting clips 870 may be disposed immediately adjacent to the scope adjustment mechanism 872, thereby creating or providing vacant tubular mounting space 874 proximal or distal to either scope mounting clip 870. In general, it is to be understood that the tubular support structure 868 could be any tubular support structure. For example, the structure could be a railing, or a handle or support on a vehicle. The present invention provides embodiments that are adaptable to both continuous tubular structures, as well as to tubular structures that have a discontinuous, interrupted or incongruous outer surface portion.

0060] Having generally described a support structure to which an accessory 900 is to be mounted, we turn now to a structure and method of mounting such accessory 900. FIG. 11 shows an intermediate or supplemental accessory bracket 300 which may be coupled to the accessory bracket 100 previously described. Generally, the supplemental accessory bracket 300 extends between a top interface 310 and a bottom interface 330. The top interface 310 comprises a mating interface to the accessory interface 110 provided on the accessory bracket 100. In one embodiment, as described above, the accessory interface 110 includes a plurality of substantially parallel rails 112. Thus, the supplemental bracket 300 includes a plurality of substantially parallel slots 312, which may be substantially the same as or similar to the slots 212 provided on the accessory bracket 100. The slots 312 are preferably provided along a slot length 314 and are disposed at a slot spacing 316 from each other. The slots 312 may be formed into or provided by slot members 320. The slot members 320 may be reinforced by one or more reinforcement struts 322 coupled thereto. Preferably, a plurality of reinforcement struts 322 is provided, each of which is secured to each slot member 320.

0061] Also, provided on the bottom interface 330 is a substantially tubular support member 332, which may have a desirable cross-section shape. Example of cross-section shapes may be circular or rectangular. The tubular member 332 is preferably formed along a pivot axis 334 for a length 336 that is preferably greater than the supplemental bracket slot spacing 316. The tubular member 332 is preferably hollow throughout its length 336. Extending through a wall of the tubular member 332 is an optional securing member 340 which interfaces to a tubular support structure bracket, such as the bracket 400 described below, to preferably stabilize the supplemental bracket 300. Thus, where a securing member 340 is used, it may be desirable to use a tubular member 332 having a rectangular cross-section so as to provide at least one flat external surface to work with. The securing member 340 may include a threaded set screw or thumb screw 342 which is configured to at least partially extend into the tubular member 332. The screw 342 is configured to threadably engage either the wall 338 of the tubular member 332 or an intermediate collar 344 that may be securely disposed on the tubular member 332. As can be seen in FIG. 12, the supplemental bracket 300 is configured to interface and cooperate with the accessory bracket 100, such as with the plurality of rails 112 being slid into and frictionally engaged with the plurality of slots 312. The various components of the supplemental bracket 300 are formed from aluminum, or some other lightweight, sufficiently strong material. Other materials such as brass, plastic or even steel may be employed, the latter being perhaps less desirable due to oxidation, unless sufficient stainless treatment has been provided thereto. FIG. 12 shows that the supplemental bracket 300 has been coupled to an accessory 900 at through an accessory bracket 100. Alternatively, the bottom interface 330 of the supplemental bracket 300 may comprise or be included on the accessory bracket 100.

0062] Although as herein described, the top interface 310 of the supplemental bracket 300 is configured to interface with the accessory interface 110 of the accessory bracket 100, it is to be appreciated and understood that the rails 112 and the slots 312 could be done away with altogether, and the bottom interface 330 of the supplemental bracket 300 could be disposed directly onto or formed integrally with the accessory 900 or the accessory bracket 100.

0063] Turning now to FIG. 13, a first embodiment of a tubular support bracket 400 is shown. In this case, it is to be understood that the term “tubular support bracket” does not necessarily mean that the bracket, itself, is tubular, but rather that the bracket 400 is configured to interface with a tubular support structure. The tubular support structure may be round, rectangular, etc., but the tubular support bracket 400 may be generally in the form of a band that is configured to lay substantially circumferential to a tubular support structure. It is also to be appreciated that a tubular support structure may be of any cross-sectional shape, and it is not required to be hollow or formed in a substantially linear orientation. It is to be understood that the tubular support structures to which the tubular support bracket 400 is configured to interface according to the present invention include a structural portion adapted to be wrapped substantially completely circumferentially with a band, for example. In this case, the tubular support bracket 400 includes at least one, but preferably a plurality of tubular support bands or clips 402. The bands 402 are sized and configured to wrap substantially completely around vacant tubular support structure 874, such as that previously described that may be located adjacent to the mounting clips 870 of an optical scope 860 mounted on a firearm 850. These support bands 402 may be fastened in a plurality of ways. In the first embodiment shown in FIG. 13, the bands 402 have been secured by threaded fastening members 406, so as to frictionally engage the tubular support structure 874 with the bands 402. The bands 402 may be formed of a substantially rigid material, such as metal (e.g., aluminum, steel, etc.), an elastically deformable material (e.g. rubber, spring steel, etc.), or plastically deformable material (e.g., sheet steel, etc.).
Extending substantially radially outwardly from the support bands 402, which may be substantially perpendicular to a tangent of the tubular support structure 868, or substantially perpendicular to the tubular support axis 866, is at least one, but preferably a plurality of mounting studs 412. The mounting studs 412 preferably extend for a mounting stud length 414 away from the mounting bands 402, along a longitudinal axis 408 that is, as mentioned, preferably perpendicular to the longitudinal axis 866 of the tubular support structure 868. These mounting stud lengths 414 may be a matter of preference or they may be a function of the size of the accessory 900 to be mounted. In other words, sufficient space should be provided to allow for desired positioning of the accessory 900 relative to the tubular support structure 868. These mounting studs 412 may be arranged or disposed in a plurality of configurations, but they are provided at a preferred stud spacing 416, which is measured preferably substantially parallel to the barrel axis 859, or an axis 866 about which the tubular support structure 868 is formed. Where a plurality of mounting studs 412 is provided, it is preferred that these studs 412 are formed or arranged relatively parallel to each other and accessible from a free end 410, the free end 410 extending out into space away from the mounting bands 402. The mounting studs 412 are preferably formed from plastic or aluminum, but other materials may be used.

Shown in FIGS. 14A and 14B is an adjustable accessory bracket 500. This adjustable accessory bracket 500 is adapted to interface to the one or more mounting studs 412 provided coupled to the tubular mounting band or bands 402. Preferably, the adjustable bracket 500 is provided with a plurality of receivers 512, each receiver 512 being disposed along a receiver length 514, and spaced from each other receiver 512 by an adjustable receiver spacing 516. The receiver spacing 516 is adjustable so as to accommodate various mounting stud spacing 416 arrangements that may be provided, which may depend on the tubular support structure 868 provided. In other words, depending on the arrangement of a predetermined or provided tubular support structure 868 and the availability of vacant tubular structure mounting space 874, the mounting stud spacing 416 may vary. For instance, with reference to the optical scope 860 shown in FIG. 13, the scope 860 includes a scope adjustment mechanism 872, as is common in the art. However, the scope adjustment mechanism 872 interrupts, interferes with, or creates a discontinuity along the outer surface of the tubular support structure 868. Other tubular support structures 868 may not have such interruption or discontinuity, so that a plurality of mounting studs 412 may be disposed in parallel or adjacent to each other, thus decreasing the mounting stud spacing 416. Alternatively, a scope mount location on a firearm 850 may require that the scope mounting clips 870 be positioned immediately adjacent to the scope adjustment mechanism 872. In such case, vacant tubular mounting space 874 would be provided proximal to one of the bands 402 and distal to the other band 402, thus increasing the mounting stud spacing 416. Additionally, the adjustability of the receiver spacing 516 is advantageous so as to allow for variations in the mounting stud spacing 416 that may arise due to minimally inaccurate installation of the bands 402 and/or studs 412. Thus, stud spacing 416 may vary between a plurality of tubular support brackets 400, each of which may be disposed on a distinct tubular support structure 868, but interfaced with the same adjustable bracket 500. The adjustable bracket 500 also has a mounting spur 520. When mounted to a tubular support structure 868, the mounting spur 520 extends preferably substantially parallel to the longitudinal axis 866 of the tubular support structure 868 and/or substantially perpendicular to at least one of the receivers 512. The spur 520 extends along a spur length 522, which may be any desirable length, but is preferred to be at least a majority of the tubular member length 333. The mounting spur 520 preferably has a round cross-section, although various configurations are envisioned. If the cross-section is round, the supplemental accessory bracket 300 may be disposed on the spur 520 and continuously rotatable therearound. The various components of the adjustable bracket 500 are preferably formed from a relatively rigid material, such as plastic, aluminum or brass.
cient clearance is provided between the spur 520 and the tubular support member 332. As shown in FIG. 18, the accesso-
ry 900 may be rotated in rotational adjustment direction 920, which may be substantially circumferential about an axis
that is parallel to the tubular support structure axis 866 and/or the barrel axis 859.

[0069] Returning to FIG. 17B, FIG. 17B is the same view as FIG. 17A, further including a remote triggering mechanism
930, which may be a normally open or normally closed push-
button switch 932 that may be used to activate the accessory
900. The switch 932 is in electrical communications with an
electrical circuit (not shown) in the accessory housing 910.
Such electrical communications may be provided via wire-
less means, but is preferably provided with one or more elec-
trical conductors 934 disposed between the accessory
housing 910 and the switch 932. The conductors 934 may be
adhered or otherwise coupled to the firearm stock 852, such
as by being strapped or clipped thereto, to ensure that they
preferably will not interfere with use of the scope 860. In this
manner, the accessory 900 may be activated, powered-on,
and/or controlled from a physical location separate and apart
from the accessory housing 910. The switch 932 may be
supported by the firearm 850, such as by being adhered
thereto at a variety of positions. However, the switch is pref-
errably removably coupled to firearm 850, for easy operation
with the fingers of a user’s hand. The removable coupling is
preferably a magnetic arrangement including a magnet or
magnetic material (not shown) securely disposed on the
switch 932 and a magnet or magnetic material, or a magnet,
respectively, (not shown) disposed on or comprising the fire-
arm 850. The magnet or magnetic material disposed on the
firearm 850 may be secured thereto relatively permanently,
such as by welding or adhesive, or relatively selectively
removably, such as by a strap or clip disposed substantially
around the stock 852 or grip 854 or by a hook and loop type
fastener. The magnet or magnetic material disposed on the
switch 932 is preferably adhered thereto. As mentioned,
the switch 932 may be placed in a variety of positions on a bow
800 or firearm 850. A first position 9511, may be the left side
of the stock 852, thereby providing convenient activating position for the left thumb of a right-handed user or one or
more right fingers of a left-handed user. Another position
951R may be the right side of the stock 852, thereby providing
convenient activating position for one or more left fingers of
a right-handed user or the right thumb of a left-handed user.
The switch 932 may be positioned for use with the trigger
hand. For instance the switch 932 may be disposed for oper-
ation with the trigger finger of a user, such as at a third position
952L on the left hand side of the action of the firearm 850 for
use by a left hand trigger finger, or at a fourth position 952R
on the right hand side of the action for use by a right hand
trigger finger. Other mounting locations for the switch 932
may be on the left side 953L or right side 953R, top side 954T
or bottom side 954B of the grip 854. Of course, the relative
positions are exemplary and any use by any other digit of a
user’s hand is not excluded by the preferred uses described.

[0070] As mentioned above, where a remote switch 932 is
used, there may be times when it is desirable for the accessory
900 to be used separate and apart from any mounting struc-
ture, such as by being supported by or in the hand of a user.
In such cases, it may be desirable to mount the switch 932 to one
or more locations 940 provided on the accessory
housing 910. A docking location 940 may include a magnet or magnetic material that is disposed on, inset into, or
disposed within the accessory housing 910 configured to
cooperate with the magnet or magnetic material provided on
the switch 932 to temporarily secure the switch 932 prefer-
dably directly adjacent the housing 910 when desired. A plu-
rality of docking locations 940 may be provided on the access-
ory housing 910, such as one on each side of the left (shown)
and right sides of the accessory 900 to facilitate a variety of
manipulations.

[0071] FIGS. 19-22 depict alternate embodiments of tubular
support brackets 400, or components thereof. A first alter-
ate embodiment 602 of a tubular support band is shown in
FIGS. 19 and 20. The band 602 generally includes a first
section 610 and a second section 630, wherein when the first
section 610 and the second section 630 are interfaced, they
generally form a circumferential structure to be placed about
a tubular support member 868. The first section 610 may
include a generally C-shaped, or convex portion 612, which
may be flanked by one or more smaller radius concave
portions 614. It is to be understood that the convex portion 612
may be of other shapes to correspond with other tubular
support members 868. Extending radially outwardly from the
first section 610 is preferably one or more mounting studs
616, which are the same as or similar to the mounting studs
412 previously described. On or in a bottom concave portion
614b, one or more hinge notches 618 may be provided. The
notches 618 are preferably formed through the entirety of the
bottom concave portion 614b at discrete longitudinal posi-
tions. On or in a top concave portion 614a, one or more latch
notches or apertures 620 may be provided. The notches or
apertures 620 are preferably formed through the top concave
portion 614a at one or more discrete longitudinal positions.
Where a notch is used, it is preferably formed through the
entirety of the top concave portion 614b.

[0072] The second section 630 may include a generally
C-shaped, or convex portion 632, which may be flanked by
one or more smaller radius concave portions 634. It is to be
understood that the convex portion 632 may be of other
shapes to correspond with other tubular support members
868. Extending from a bottom edge 636 of the convex portion
632 may be one or more hinge toggles 638 may be provided.
The toggles 638 are preferably formed as T-shaped toggles
having rounded heads 638a, and the toggles 638 are prefer-
dably disposed at discrete longitudinal positions. Preferably,
the same number of hinge toggles 638 on the second section
630 is provided as hinge notches 618 on the first section 610.
On or in a top concave portion 634a, one or more latch
notches or apertures 640 may be provided. The notches or
apertures 640 are preferably formed through the top concave
portion 634 at one or more discrete longitudinal positions.
Where a notch is used, it is preferably formed through the
entirety of the top concave portion 634a. Preferably, the same number of latch notches or apertures 640 on the second section 630 is provided as latch notches or apertures 620 on the first section
610. The first section 610 and second section 630 are prefer-
ably each members of unitary structure that may be formed
from desirable materials, such as plastic, aluminum, brass,
steel, etc. The sections 610, 630 may be cast, machined or
otherwise constructed.

[0073] A latching mechanism 650 is provided to secure the
first section 610 and the second section 630 in a band con-
figuration. The latching mechanism 650 generally preferably
includes a latch arm 652, a shank 654, and a latch toggle 656.
The latch arm 652 extends from a head portion 652a to a free
tail portion 652b. The head portion 652a is preferably formed
as having an oblong camming orientation. The shank 654 is preferably a threaded rod that is at least planarly pivotally attached to the latch arm head portion 652a. The latch arm 652 may be formed with a curve provided between the head 652a and the tail 652b, where such curve may have a radius that is substantially similar to a radius of the first section 610 and/or the second section 630. The latch toggle 656 has a threaded aperture 658 formed therein, perhaps therethrough, where the aperture 658 is adapted to cooperate with the shank 654. The latch toggle 656 is preferably provided as a substantially cylindrical body that may rest in the top concave portion 614c of the first section 610. To utilize the embodiment 602, the hinge toggles 638 may cooperate with the hinge notches 618 so as to form a rotational hinge mechanism 639, thus allowing the first section 610 and the second section 630 to operate like a clam shell to be disposed about a tubular support member 868. The latch shank 654 may be inserted into the latch aperture 640, and the latch toggle 656 may be threaded onto the shank 654. After wrapping the band 602 about a tubular support structure 868, the shank 654 may be situated in the latch notch 620 and the latch toggle 656 may be situated in the top concave portion 614c. The latch arm 652 may be turned so as to thread the shank 654 through the toggle aperture 658 to cause the top concave portions 614c, 634c to approach each other, and perhaps to lie immediately adjacent to each other in a secured relationship. The latch arm 652 may then be forced towards a convex portion 632 to allow the oblong camming head 652a of the latch arm 652 to further tighten the engagement. The latch arm 652 may then lie substantially adjacent to a portion of the convex portion 632. The various components of the latching mechanism 650 may be formed from a variety of materials, such as aluminum, brass and/or steel, for instance.

[0074] FIG. 21 depicts an alternate embodiment 702 of a tubular support band, where like numbers refer to like structures in the prior embodiment 602. However, in this embodiment, the first section 710 and the second section 730 have been formed with a wraparound feature 770. The wraparound feature 770 may be formed in one or both of the sections 710, 730 to accommodate for interruptive or disruptive features that may be provided on a tubular support member 868, such as the scope adjustment mechanism 872. Thus, while the prior embodiment featured a substantially circumferential band 602 provided along the entire length of the sections 610, 630, this embodiment 710 may be used where the circumference of the tubular support member 868 is not continuous, but may be interrupted with other structures. Thus, the wraparound feature 770 may generally be formed as a notched or aperture formed into or through one or both of the sections 710, 730. The first section 710 and second section 730 are preferably each members of unitary structure that may be formed from desirable materials, such as plastic, aluminum, brass, steel, etc. The sections 710, 730 may be cast, machined or otherwise constructed.

[0075] FIG. 22 shows an alternate embodiment 602' of a mounting band according to the present invention, where the same numbers refer to the same structure as described in the previously described embodiment 602. This embodiment, however, uses an elastic latching structure 680 instead of the latching mechanism 650 described above. The elastic latching structure 680 generally includes two toggles 682 disposed on an elastic member 684 either immediately adjacent to each other or at a predetermined distance from one another. The toggles 682 are configured to rest in the top concave portions 614c, 634c of the first section 610 and second section 630, respectively, while the elastic member 684 is configured to stretch between the toggles 682 and extend through the latch notch 620 on the first section 610 and the latch notch 640 on the second section 630. Also disposed on the elastic member 684, or on one of the toggles 682, is a handle member 686, which is configured to be grasped by the fingers of an adult human so as to cause the toggles 682 to separate when one of the toggles 682 is stationarily disposed, as can be seen in the phantom extension figure. The toggles 682 may be formed from any material able to perform the latching function, such as plastic, aluminum, brass, steel, wood, etc., as may the handle 686.

[0076] The foregoing is considered as illustrative only of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described. For instance, though the accessory 900 is shown as being installed on what would normally be referred to as the left side of the firearm 850 in FIGS. 16-18, it is to be appreciated that the positioning about the tubular support structure 868 is not limited to a specific orientation, and the same embodiments of the invention may be advantageously used in various configurations to adapt to right-handed, as well as left-handed weapon users. As another example, it is to be appreciated that various adjustability of the preferred embodiments may be done away with to simplify some of the mounting structures, such as by providing fixed rail spacing 116 and/or fixed stud spacing 416. Additionally, it will be appreciated that various components of the devices described herein, and combinations thereof, may be provided in a kit form, such as in the same packaging. While the preferred embodiment has been described, the details may be changed without departing from the invention, which is defined by the claims.

1 claim:

1. In combination with an archery bow having a riser body with a grip disposed thereon, the riser body having a draw side and a sight side, one or more standoffs coupled to, and extending generally longitudinally outward from, the draw side above the grip, an accessory bracket comprising:

a. support structure interface including a first leg and a second leg, the first leg and second leg being coupled by a hinge member; and

a first standoff notch provided on one of said first and second legs, the first standoff notch configured to lie circumjacent to at least a portion of one of the standoffs, wherein the accessory bracket is supported by the one or more standoffs.

2. A combination according to claim 1 further comprising a second standoff notch provided on the other of said first and second legs, the second standoff notch configured to lie circumjacent to at least a portion of one of the standoffs.

3. A combination according to claim 2 wherein the first standoff notch and the second standoff notch cooperate to form a mounting aperture.

4. A combination according to claim 3, wherein the mounting aperture is formed when the legs are arranged in a substantially parallel relationship to one another.

5. A combination according to claim 4, wherein the parallel relationship is secured by a threaded fastener extending through one of the legs and threadably engaging the other leg.
6. A combination according to claim 3, wherein the mounting aperture has a cross-section mateable with one of the standoffs.

7. A combination according to claim 1, further comprising a yoke arm fixed to each leg, each yoke arm extending away from the hinge member to a free yoke end.

8. A combination according to claim 7, wherein when the legs are hingedly moved apart with respect to each other, the yoke arms are moved toward each other.

9. A combination according to claim 7, each yoke free end including a longitudinal slot disposed along a slot length.

10. A combination according to claim 9, said slots having a C-shaped cross-section.

11. A combination according to claim 9, at least one slot being terminated at one end.

12. A combination according to claim 9, wherein the slots are parallel and disposed at a relative slot spacing.

13. A combination according to claim 12, further comprising an accessory supported by said accessory bracket, the accessory having two parallel rails disposed thereon, the rails being disposed at a relative rail spacing, wherein the rail spacing is substantially equal to the slot spacing.

14. A combination according to claim 13, wherein the rails are frictionally engaged with the slots.

15. A combination according to claim 14, wherein the accessory is an electronic range finder.

16. A combination according to claim 1 further including an accessory mounted in a spaced relationship from the riser body and supported by the one or more standoffs.

17. A combination according to claim 15, wherein the accessory is a sight mounting bracket.

18. A combination according to claim 15, wherein the accessory is a quiver.

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