[080] **FIG. 70** is a back top perspective view of a coupler disclosed herein;

[081] **FIG. 71** is a back top perspective view of the coupler of **FIG. 70**; showing placement of components;

[082] **FIG. 72** is a side plan view of a device case adaptor disclosed herein;

[083] **FIG. 73** is an exploded bottom perspective view of the device case adaptor of **FIG. 72**, illustrating attachment of the device case adaptor to a device case disclosed herein; and

[084] **FIG. 74** is an exploded top perspective view of the device case adaptor of **FIG. 72**, illustrating attachment of the device case adaptor to a device case disclosed herein.

[085] The above described drawing figures illustrate aspects of the invention in at least one of its exemplary embodiments, which are further defined in detail in the following description. Features, elements, and aspects of the invention that are referenced by the same numerals in different figures represent the same, equivalent, or similar features, elements, or aspects, in accordance with one or more embodiments.

DETAILED DESCRIPTION

[086] A mounting system disclosed herein comprises a rail and a bracket. A mounting system disclosed herein can be mounted on or be used as a mounting base for a wide variety of devices. A mounting system disclosed herein enables a device to be protected from impact and moisture exposure, enables a device to be securely mounted on a base, and enables a device to be quickly secured and removed from a base.

[087] A device is an electrical or mechanical instrument, equipment or other apparatus. Exemplary devices include, without limitation, a computational device like a smart phone, a tablet or a computer, a navigational device such as a compass, a ground positioning system (GPS), an altimeter, a pedometer, a medical device, a health monitoring device such as heart rate monitor, blood pulse monitor, or breathing rate monitor, a lighting device such as a flashlight, a night vision goggle (NVG), or infrared laser, an audiovisual device such as a still camera, a video camera, or an audio recorder, a communications device such as a radio or any other device capable of transmitting and/or receiving an analog or digital signal.

[088] A rail disclosed herein serves as an attachment point for a bracket disclosed herein. In aspects of this embodiment, a rail disclosed herein can be secured to a device. In other aspects of this embodiment, a rail disclosed herein can be secured to a surface and serve as a base. A rail is configured to the surface it is to be attached to.

[089] In aspects of this embodiment, a rail is configured to the dimensions of a device, such as, *e.g.*, fully or partially around the outside perimeter of a device. For example, in aspects where a device is a smart phone or tablet, a rail conforms to the perimeter of the smart phone or tablet, and is thus typically rectangular in shape. In other aspects of this embodiment, a rail is configured to the dimensions of a surface to which a device is to be mounted. For example, in aspects where a rail disclosed herein will serve as a base and be mounted on a dashboard, the rail can be a linear structure, for example, a line-structure, and L-shaped structure, or a polygonal structure like a triangular structure, a quadrilateral structure, a pentagonal structure, etc. In further aspects, where a rail disclosed herein will serve as a base and be mounted on a dashboard, rail can be a curvilinear structure, including an open curvilinear structure like a wave or S-shaped curvilinear structure or a closed curvilinear structure like a circle or oval.

[090] A bracket is an apparatus that securely attaches to a rail. A bracket disclosed herein selectively and/or automatically secures or locks to a rail disclosed herein when positioned on the rail. In addition, a bracket disclosed herein may be removed from a rail, *e.g.*, by activating one or more actuators and, optionally, one or more safety actuators. In aspects of this embodiment, a bracket disclosed herein securely and removably attaches to a rail secured to a device. In other aspects of this embodiment, a bracket disclosed herein securely and removably attaches to a rail configured to be a base. In yet other aspects of this embodiment, a bracket disclosed herein securely and removably attaches to a rail secured to a device as well as to a rail configured to be a base, thereby connecting the device to the base.

[091] One exemplary embodiment of a mounting system disclosed herein is mounting system **50** as illustrated in **FIGS. 1A-1C**. Mounting system **50** comprises a rail **52** and a bracket **54**. In this configuration, rail **52** typically serves the singular purpose of receiving bracket **54**, or can serve as a connection between bracket **54** and a support or can serve as a framework or case for containing or supporting another object. A support includes any solid support structure or a portion of a surface area from a solid support structure where a user desires to secure rail **52** in order to receive bracket **54** and employ mounting system **50** to mount a device or component thereof. In some embodiments, a support comprises an article of clothing or other item worn by a user including, without limitation, a helmet, personal protective equipment, a personal load bearing system, or any other item worn about the body. In some embodiments, a support comprises a hard surface or portion thereof, including, without limitation, a portion of an exterior or interior surface of a vehicle like a bicycle, automobile, truck, train, boat or aircraft, such portion of an exterior or interior surface including a dashboard, a handlebar, an exterior panel, or a windshield. In some embodiments, a support comprises an apparatus including, without limitation, a hand-held object, a tripod or other stand, a weapon or weapons system, an electronics housing, or any other apparatus.

[092] Another exemplary embodiment of a mounting system disclosed herein is mounting system **50** as illustrated in **FIGS. 8A-8B**. Mounting system **50** comprises a rail **52** and a bracket **54**. In this configuration, rail **52** serves as a device case **56** as well as serving as an attachment framework for receiving bracket **54**. In this embodiment, the shape of device case **56** conforms to the perimeter shape of the device that

device case **56** is to contain or enclose. In some embodiments, and as shown in **FIGS. 8A-8B**, rail **52** is a quadrilateral structure configured to the dimensions of a device **D** for protectively holding device **D**.

[093] **FIGS. 1A-16** illustrate exemplary embodiments of rail **52**. In some embodiments, and as shown in **FIGS. 1A-7**, rail **52** comprises a rail body that is a linear line-structure, the length of which can vary depending on the desired application. For example, as shown in **FIGS. 2, 5 & 6**, rail body of rail **52** can be of a short length, comprising only a single engagement slot **58**. In some embodiments, and as illustrated in **FIGS. 1A-1C, 3, 4, & 7**, rail body of rail **52** can be longer in length, comprising a plurality of engagement slots **58**. In some embodiments, and as illustrated in **FIGS. 1A-3 & 5-7**, rail **52** can further comprise a base support **55** which provides stability to rail body of rail **52** once secured to a support.

[094] Rail **52** of mounting system **50** can be secured to a support by any known mechanism or process, such as, e.g., by being screwed, adhered, snap-fitted, insertion, welded, brazed, or other appropriate fastening means. In some embodiments, and as shown in **FIGS. 1A-1C, 2, & 5**, rail **52** comprises securing holes **102** which enable pass through of screws **100** so that rail **52** can be secured to a support using screws **100**. In addition, and as shown in **FIGS. 1A-1C**, rail **52** can optionally include one or more securing tabs **104** which comprises a hole to receive screw **100**. In some embodiments, for example rail **52** of **FIG. 5**, besides or in addition to the use of screws **100**, base support **55** can have an adhesive layer on the side that will come in contact with a support to provide the sole or additional mechanism of securing rail **52** to a support. In some embodiments, and as shown in **FIG. 6**, base support **55** can be used as an insert into a base support mount by, *e.g.*, a snap-fit mounting system, *e.g.*, a shroud bracket system, and in this configuration can optionally include a thumb release lock **57** which releases a locking mechanism used to secure rail **52** to the base support mount as well as facilitates insertion and removal of rail **52**. In some embodiments, and as shown in **FIG. 7**, base support **55** is formed into one or more tabs **59** configured for inserted into one or more pockets or pouches on a base support mount, *e.g.*, one or more insert pockets or pouches of a Modular Lightweight Load-carrying Equipment (MOLLE) load bearing system, a Pouch Attachment Ladder System (PALS) load bearing system, Individual Integrated Fighting System (IIFS) load bearing system, or All-purpose Lightweight Individual Carrying Equipment (ALICE) load bearing system. In some embodiments, rail **52** as shown in **FIGS. 1A-7** can be secured to a base support mount by rivets or similar type fasteners. In some embodiments, rail **52** as shown in **FIGS. 1A-3** can be secured to or replace an existing rail system, such as, *e.g.*, a Picatinny rail mount system, an Advanced Combat Helmet (ACH) Accessory Rail Connector (ARC) rail system, a Weaver rail mount system, a Monkey mount rail system, an ABS rail system, an E Track rail system, a VELCRO®-based mount system, and a RAM® Torque mount rail system.

[095] In some embodiments, for example rail **52** of **FIG. 4**, rail **52** is secured to a hand grip or stand, like a tripod stand. In this configuration additional devices and then be secured to the free portions of rail **52**. For example, a hand grip can be secured to a central portion of rail **52** of **FIG. 4** and a video recorder and/or lights can be secured at either side of the hand grip.

[096] Referring to **FIGS. 1A-8B**, rail **52** generally includes rail body comprising a first engagement surface **60** opposite a second engagement surface **62** with a third engagement surface **64** spanning between first engagement surface **60** and second engagement surface **62**. In this example embodiment, first engagement surface **60** is generally parallel to second engagement surface **62**, with third engagement surface **64** being substantially perpendicular to the two, In some embodiments, third engagement surface **64** is within 10 degrees of perpendicular of at least one of first engagement surface **60** and second engagement surface **62**.

[097] Referring to **FIGS. 1A-8B**, at least one of first engagement surface **60** and second engagement surface **62** includes one or more engagement slots **58**. It is preferred that both first engagement surface **60** and second engagement surface **62** include one or more engagement slots **58**. Although engagement slots **58** are shown as elongated slots with rounded ends, engagement slots **58** can be round, rectangular, square, or other appropriate though hole formed through or recess formed on first engagement surface **60** and/or second engagement surface **62**. As discussed below, the shape of engagement slots **58** are configured to receive one or more engagement bosses **74**, **75** of bracket **54**.

[098] In some embodiments, and as shown in **FIGS. 1A-7**, first engagement surface **60**, second engagement surface **62**, and third engagement surface **64** are third engagement surface **64** are all part of a single component that forms rail **52**, which generally does not require assembly. If rail **52** were to be made in a configuration not requiring assembly, then rail **52** can typically be made from a single type of material that is molded, machined, or manufactured by another appropriate process (although multiple types of material can be used, if appropriate for the application).

[099] In some embodiments, and as best shown in **FIG. 6**, first engagement surface **60** and second engagement surface **62**, and third engagement surface **64** are each part of separate components that are assembled to form rail **52**. In these embodiments, third engagement surface **64** can be made integrally with one of first engagement surface **60** or second engagement surface **62**. If rail **52** were to be made in a configuration requiring assembly, then each component part of rail **52** can be made from the same or different type material, such component parts being molded, machined, or manufactured by another appropriate process.

[100] Referring again to **FIGS. 1A**, **1B**, **8A**, **& 8B**, bracket **54** of mounting system **50** selectively locks to rail **52** by engaging one or more engagement slots **58** (or engagement recesses) formed on rail **52**. For example, as shown in **FIGS. 1A**, **1B**, **8A**, **& 8B**, bracket **54** is illustrated as selectively locked to slot **58'**. Bracket **54** comprises a first jaw **70** and a second jaw **72**, and a back plate **73** spanning between first jaw **70** and second jaw **72**.

[101] Although discussed in greater detail below (see, *e.g.*, **FIGS. 28, 32, 34-36, 40, 42, & 43**), one or more engagement bosses **74** are located on a first clamping portion **122** of first jaw **70** of bracket **54** and one or more engagement bosses **75** are located on a second clamping portion **124** of second jaw **72** of bracket **54**. One or more engagement bosses **74**, **75** are arranged in direct opposition so that one or

more engagement bosses **74** of first clamping portion **122** of first jaw **70** of bracket **54** engage one or more engagement slots **58** on first engagement surface **60** and one or more engagement bosses **75** of second clamping portion **124** of second jaw **72** of bracket **54** engage one or more engagement slots **58** on second engagement surface **62** (hidden from view, but similar or the same as first engagement surface **60**). In some embodiments, engagement bosses **74** of first clamping portion **122** of first jaw **70** can be arranged in opposition, yet staggered (e.g., not in direct opposition or aligned) relative to engagement bosses **74** of second clamping portion **124** of second jaw **72**. Preferably, engagement bosses **74** of first clamping portion **122** of first jaw **70** and engagement bosses **75** of second clamping portion **124** of second jaw **72** are sized and spaced apart so that they both selectively fit within a single engagement slot **58** in order to firmly hold bracket **54** to rail **52**. Alternatively, or in addition to, engagement bosses **74** of first clamping portion **122** of first jaw **70** and engagement bosses **75** of second clamping portion **124** of second jaw **72** are sized and spaced apart so that they both selectively straddle between two adjacent engagement slots **58**. For example, referring to **FIGS. 1A, 1B, 8A & 8B**, one engagement boss engaged within slot **58'** and the other engagement boss engaged within slot **58''** in order to firmly hold bracket **54** to rail **52**. As further shown in **FIGS. 9 & 10** bracket **54** is first shown attached to rail **52** by exclusively engaging first engagement slot **58**. Then, as indicated by arrow **362**, bracket **54** is moved to the left on rail **52** by opening bracket **54**, and reconnected to rail **52** by engaging both first engagement slot **58** and second engagement slot **58'**.

[102] In some embodiments, and referring to **FIG. 8A**, third engagement surface **64** of rail **52** optionally includes series of alternating locking slots **76** and locking teeth **78** (where two adjacent slots **76** form a tooth **78** therebetween), for providing a textured surface to facilitate gripping, holding or otherwise handling device case **56**.

[103] Rail **52** of mounting system **50** as shown in **FIGS. 8A-8B & 11-18** can further function as device case **56** for device **D**. An exploded view of an exemplary example of rail **52** functioning as device case **56** for device **D** inserted therein (a smartphone in this example) is shown in **FIG. 18**. The primary structural components of rail **52** forming device case **56** comprise a first frame member **88**, a sidewall frame member **92**, and a second frame member **90**. Sidewall frame member **92** is sandwiched between first frame member **88** and second frame member **90**. As shown in **FIG. 18**, in embodiments where rail **52** is configured as a device case **56** for device **D**, first frame member **88** comprises first engagement surface **60**, second frame member **90** comprises second engagement surface **62**, and sidewall frame member **92** comprises third engagement surface **64**.

[104] During assembly, and as best seen in **FIG. 18**, first frame member **88** and second frame member **90** compressively bearing down on sidewall frame member **92** by tightening a plurality of screws **100** which insert through and firmly attach first frame member **88** to second frame member **90**. Although screws **100** are only shown as being inserted from the top, *i.e.*, from first a frame member **88** direction to a second frame member **90**, direction, screws in a similar pattern can be threaded in from underneath, *i.e.*, from second a frame member **90** direction to a first frame member **88**, direction. First frame member **88**, second frame member **90**, and a sidewall frame member **92** can be made from a tough material,

preferably a polymer or aluminum material. Because aluminum threads may easily strip, the screws may be threaded into an insert **101**, **103**, **105** made of stainless steel or high-strength material, such as a female-female threaded standoff, nut, binding barrel, or the like.

[105] As shown in **FIGS. 8A**, **11**, **14**, **15**, **& 18**, sidewall frame member **92** of device case **56** can comprise one or more adaptor attachment points **123**, for securing another device or component thereof to rail **52** using compatible mounting systems. Sidewall frame member **92** also comprises indexing holes **120, 121** to facilitate properly orientation of another device or component thereof being secured to device case **56** as well as to prevent misalignment of an attached another device or component thereof while secured to device case **56**. For example, device **D** encased in device case **56** can be secured to a tripod using adaptor attachment point **123**. In some embodiments, adaptor attachment point **123** can be any standard screw thread known in the art, including, without limitation, 1/4-20 UNC thread, a 3/8-16 UNC thread, or any similar screw thread standards known in the art.

[106] In some embodiments, and as shown in **FIGS. 72-74**, a device case adaptor **C1** comprises an indexing plate **500**, an adaptor plate **530**, and a retaining clip **540**, such as, *e.g.*, a C clip. Indexing plate **500** is typically disc-shaped and comprises a top surface **502** and a bottom surface **504**, and a through hole **506** which is centrally located in indexing plate **500**. Top surface **502** of indexing plate **500** comprises a circular ring of detents **518** positioned around through hole **506**. Each detent of the ring of detents **518** is slopped or ramped on the left-hand side to provide stop mechanism in a clock-wise direction. In some embodiments, ring of detents **518** comprise 1 to 12 detents, such as, *e.g.*, 1 to 2 detents, 1 to 4 detents, 2 to 6 detents, 4 to 6 detents, 2 to 8 detents, 4 to 8 detents, 6 to 8 detents, 2 to 10 detents, 4 to 10 detents, 6 to 10 detents, 8 to 10, detents, 2 to 12 detents, 4 to 12 detents, 6 to 12 detents, 8 to 12 detents, or 10 to 12 detents. In some embodiments, and as shown in **FIG. 73**, detents **518** are the same or similar size. In some embodiments, ring of detents **518** can be of two or more different sizes. Bottom surface **504** of indexing plate **500** includes a first indexing pin **520** and a second indexing pin **521** extend perpendicularly from bottom surface **504**. First and second indexing pins **520**, **521** are configured to align and insert into indexing holes **120**, **121** of device case **56** in a manner that properly orientates device case adaptor **C1** to device case **56** in and prevents misalignment while secured.

[107] As shown in **FIGS. 72-74**, adaptor plate **530**, is typically disc-shaped and comprises a top surface **532** and a bottom surface **534**. Top surface **532** of adaptor plate **530** comprises a coupler **543** that is centrally located and extends perpendicularly from top surface **532**. Coupler **543** comprises a body **549**, a circumferential groove **548**, and a head **544**, which includes a leading edge **546** and a shoulder **550**. Coupler **543** can be of any length with most of this length variation due to the length of body **549**. Circumferential groove **548** is located in between body **549** and head **544**. As illustrated in **FIGS. 72-74**, head **544** is configured to conform or substantially conform to the perimeter or circumferential shape of socket **222**. Bottom surface **534** of adaptor plate **530** comprises a threaded screw **508** which includes a groove **542** that is centrally located and extends perpendicularly from bottom surface. Retaining clip **540** is secured in groove **542**.

[108] In some embodiments, adaptor plate **530** can further comprise one or more detent plungers to controllably rotate and temporarily fix the rotation of adaptor plate **530** relative to sidewall frame member **92** of device case **56**. As shown in **FIGS. 72-74**, which illustrates only two of the six detent plungers in this example embodiment, detent plunger **550** includes a detent cylinder **552** comprising an open end **554** and open threaded end **556** opposite open end **554**, and a detent ball **560** a detent compression spring **562**. Detent ball **560** and detent compression spring **562** are captured within detent cylinder **552** by a set screw secured to open threaded end **556**, and detent compression spring **562** outwardly biasing detent ball **560** toward open end **554** of detent cylinder **552** in a manner that causes detent ball **560** to protrude from open end **554** of detent cylinder **552** One or more detent plungers **550** are located on a side that will be in contact with of the underside portion of indexing plate **500**. One or more detents **518** of indexing plate **500** are aligned in a manner that detent ball **560** protruding from an open end **554** will be seated in each of the one or more detents **518** of indexing plate **500** when assembled. This detent mechanism ensures that adaptor **C1** will remain secured in place and that threaded screw **508** of adaptor plate **530** will not become loosened over time.

[109] As shown in **FIGS. 8A**, **11-13**, **17 & 18**, third engagement surface **64** can additionally include various ports **82**, **84**, **326**, **328** for access to speakers, microphones, audio jacks, volume, switches, power supply, etc. Ports **82**, **84**, **326**, **328**, can be uncovered or be associated with threaded sealing caps. In addition ports **82**, **84**, **326**, **328** can be directly incorporated into third engagement surface **64** of sidewall frame member **92** or be incorporated in a sealing plate **87** which attached to third engagement surface **64**. For example, in some embodiment, and referring to **FIGS. 18 & 20**, sidewall frame member **92** is configured to receive sealing plate **87** comprising ports **82**, **84**, **326**, **328**, fastened to an edge of sidewall frame member **92**. As shown in **FIGS. 18 & 20**, threaded inserts **105** are inserted through holes in sidewall frame member **92** for threadably receiving screws **100'** therein for fastening the sealing plate **87** thereto. As shown in **FIGS. 18 & 20**, sealing plate **87** includes one or more through ports **82**, **84**, **326**, **328**, align to one or more speakers, microphones, audio jacks, volume control, switches, power supply of device **D**. As shown in **FIGS. 18 & 19**, one or more through ports, as exemplified by through ports **326**, **328** can be configured to threadably receives one or more sealing caps **77** and **80**, which cover the one or more through ports. As shown in **FIGS. 18 & 19**, one or more through ports, as exemplified by through ports **82**, **84** may not be associated with sealing caps **77** and **80**, relying on gasket member **94** to provide a water-tight seal like a water-resistant seal or waterproof seal. Sealing caps **77** and **80** can be flexibly connected by a lanyard **89** that permits one cap to be removed and held by lanyard **89** to the other cap still threaded within sealing plate **87**. Further, lanyard **89** permits sealing caps **77** and **80** to freely rotate for threading sealing caps **77** and **80** into and out of their respective threaded holes. Sealing plate **87** acts provides a seal between sealing caps **77** and **80** and gasket member **94**, which will be described in more detail below in reference to **FIGS. 20-23**.

[110] In some embodiments, where rail **52** is configured as device case **56** for device **D**, such device case **56** is preferably water resistant or waterproof. For example, in some embodiments, and referring to **FIGS. 18 & 21-27**, assemble device case **56** includes a gasket member, for example gasket member **94,**

fitted around an outer perimeter of device **D**. Gasket member **94** functions to form a barrier between device **D** and the outside environment, thereby providing water resistant or waterproof capabilities. In some embodiments, and referring to **FIG. 19**, gasket member **294** comprises a single component including a side portion **296** that fits around an outer perimeter of device **D** and a bottom portion **298** that covers the back of a device, which functions similar to bottom cover **98**, discussed below. Gasket member **294** includes one or more open portions **299**, for example **299**, **299'** of **FIG. 17**, configured to receive a transparent insert, such as a glass insert, to permit the sight and use of touch screens, cameras, flashes, flashlights, or other light emitting or detecting devices. All or part of gasket member **94**, **294** is made of an elastomeric material or other deformable or sealable material that deforms under the pressure of assembled rail **52** to fill gaps and create a water resistant or water-proof interior space for containing device **D**, such as Buna-N rubber material, fluoroelastomer material (e.g., VITON), silicon, or other appropriate material or combination of materials.

[111] Furthermore, in some embodiments, and referring to **FIGS. 11-13 & 18**, device case **56** further optionally comprises a top cover **86** placed atop device **D**, and/or further optionally comprises a bottom cover **98** placed beneath device **D**. Both top cover **86** and bottom cover **98** function to form a barrier between device **D** and the outside environment, thereby providing water resistant or waterproof capabilities. In addition, both top cover **86** and bottom cover **98** can optionally include a transparent portion, such as a window **99**, to permit the sight and use of touch screens, cameras, flashes, flashlights, or other light requiring, emitting or detecting devices.

[112] A water-tight seal like a water-resistant seal or waterproof seal is further illustrated in detail in **FIGS. 21-27**. As shown in **FIG. 24**, first frame member **88** and second frame member **90** capture sidewall frame member **92** between the two. One or more ridges **108** or other protrusions or shoulders are formed on or near the inner perimeter of sidewall frame member **92**, and is configured to be received within slot **109** (or other concavity or step) of first frame member **88**, which rests upon ridges **108** and is configured to receive second frame member **90**, which similarly rests upon a second ridge **108'** (or on the opposite side on ridge **108**). As first frame member **88** is drawn toward second frame member **90** by tightening the screws **100** (with a second screw, not shown, threaded into a binding barrel **101** through a countersunk hole **103**), gasket member **94** is compressed until first and second frame members **88**, **90** bear against their respective ridges **108**, **108'** of sidewall frame member **92**, or until gasket member **94** can no longer be compressed, *e.g.*, even if there is a slight gap between first and second frame members **88**, **90** and their respective ridges **108**, **108'**. In this example, binding barrel **101** acts as a standoff between first and second frame members **88**, **90** that is sized so that it limits the compression of gasket member **94**.

[113] As shown in **FIGS. 24 & 25**, each of first and second frame members **88**, **90** includes an overhang **104** extending inwardly about an inner perimeter and configured directly or indirectly (e.g., through gasket member **94**) to bear against device **D** and/or if present top cover **86** and bottom cover **98**, respectively. In embodiments where top cover **86** and bottom cover **98** are not present in device case **56**, as shown in **FIGS. 24 & 25**, gasket member **94** can be configured so that overhangs **104** of first and second frame members **88**, **90** can bear down on gasket member **94**, which in turn bears down against

[122] Although bracket **54** is illustrated as having two engagement bosses **74**, **74'** on first clamping portion **122** on first jaw **70**, and two engagement bosses **75**, **75'** on second clamping portion **124** of second jaw **72** configured to engage within one or more engagement slots **58**, engagement bosses **74**, **75** are optional and modifiable. In addition, although a preferred embodiment of bracket **54** includes engagement bosses **74**, **74'**, **75**, **75'**, more or fewer engagement bosses **74**, **75** can be arranged on bracket **54**. In at least one embodiment, engagement bosses **74**, **75** can be excluded and replaced with an alternative engagement face, such as two opposing smooth faces, two opposing knurled faces, two opposing toothed faces, two opposing coated/covered faces (e.g., a layer of rubber or other elastomeric material), and/or any combination thereof, and/or other configuration. In this example, bracket **54** can clamp to any number of attachment points compatible with the particular type of engagement face configuration. which may be on a rail or other object/base.

[123] Bracket **54** is capable of being clamped to rail **52** at any point where one or more engagement bosses **74**, **75** can engage one or more engagement slots **58**. To illustrate this capability, as shown in **FIGS. 9 & 10**, bracket **54** is shown engaged within a first engagement slot **58**, which is located at one of the short sides of rail **52**. Arrow **362** illustrates the movement of bracket **54** from being solely engaged within first engagement slot **58** (which is an elongated slot capable of receiving all of one or more engagement bosses **74**, **75** simultaneously) to being engaged within both first engagement slot **58** and second engagement slot **58'**, with at least one engagement boss **74**, **75** of one or more engagement bosses **74**, **75** being engaged within first engagement slot **58**, and at least one engagement boss **74**, **75** of one or more engagement bosses **74**, **75** being engaged within second engagement slot **58'**, with bracket **54** spanning the gap between first engagement slot **58** and second engagement slot **58'**. Of course, when in the locked or clamped configuration, bracket **54** cannot be simply slid to the left as indicated by arrow **362**. First, bracket **54** must be unlocked to disengage one or more engagement bosses **74**, **75** from first engagement slot **58** achieved by separating first jaw member **70** from second jaw member **72** (which will be discussed in greater detail below). Next, bracket **54** can be either slid over rail **52** or removed altogether from rail **52** to reposition at least one engagement boss **74**, **75** of one or more engagement bosses **74**, **75** overtop second engagement slot **58'** and at least one engagement boss **74**, **75** of one or more engagement bosses **74**, **75** overtop first engagement slot **58**. Thereafter, first jaw member **70** and second jaw member **72** are manually compressed toward each other to reengage one or more engagement bosses **74**, **75** to rail **52**, within first engagement slot **58** and second engagement slot **58'**.

[124] As best shown in **FIGS. 28, 32, 34, 35, 36, 40, 42 & 43**, within a throat region of bracket **54** (between first jaw member **70** and second jaw member **72**) is a recessed portion formed in first jaw **70** and a recessed portion formed in second jaw **72**, to provide clearance for third engagement surface **64** of rail **52** or sidewall frame member **92**. In addition, recessed portions also prevent suction forces to occur when bracket **54** is in the closed configuration as well as facilitate removal of debris, thereby ensuring and maintaining proper operability of bracket **54**.

[128] As best seen in **FIGS. 41 & 45**, back plate **73** extends from first jaw member **70** toward second jaw member **72**. Second jaw member **72** includes a back-plate recess **128** configured to receive back plate **73**, permitting back plate **73** to slide within back-plate recess **128**. Of course, this arrangement can be reversed, where, in one example, back plate **73** is cantilevered from second jaw member **72** and back-plate recess **128** is formed on first jaw member **70**. Back-plate recess **128** includes a bottom wall **158** and sidewalls **160**, **162**, **164**. In a preferred embodiment, and as shown in **FIGS. 41 & 45**, bottom wall **158** is arranged as being planar parallel to the direction of travel of back plate **73.** Sidewalls **160**, **162**, **164** are configured to form three contiguous and/or adjacent sides. Sidewalls **160**, **162** aid in limiting side-to-side tilt of first jaw member **70** relative to second jaw member **72** when in a locked configuration, due to back plate **73** contacting one or both of sidewalls **160**, **162**. Further, bottom wall **158** prevents back tilt of first jaw member **70** relative to second jaw member **72** due to back plate **73** contacting bottom wall **158**. This is particularly important is designs where one or more engagement bosses **74** are spread apart from one or more engagement bosses **75** due to back tilt. Thus, because side-to-side tilt and back tilt is sufficiently limited or prohibited, one or more engagement bosses **74**, **75** are prevented from disengaging their respective engagement slots **58**, creating an exceptionally strong clamp for secure mounting on bracket **54** of further accessories.

[129] Although back plate **73** is an optional feature, without back plate **73**, more stress would be carried by pin assembly of bracket **54**. Nonetheless, bracket **54** would still function in an embodiment without back plate **73**.

[130] Referring to **FIGS. 40, 44, 45 & 51-54**, movement of first jaw member **70** relative to second jaw member **72** is guided by a pin assembly comprising a guide pin **110** and a latching guide pin **112**. A pin assembly of bracket **54** comprising guide pin **110** and latching pin **112** serve to guide movement of first and second jaw members **70, 72** relative to each other. Looking initially at guide pin **110**, this component is cylindrical in shape and comprises a first end and a second end, the second end comprising a notch **195** and a threaded bore formed axially through second end and configured to receive a screw **114**.

[131] Referring to **FIGS. 40-45 & 51-54**, guide pin **110** is positioned within a guide pin bore **142** of first jaw **70**, with the first end of guide pin **110** facing outer surface **154**. In some embodiments, and as shown in **FIGS. 40-45 & 51-54**, guide pin bore **142** is a through hole formed perpendicularly through first jaw member **70** from first mating portion **150** to outer surface **154**. Guide pin **110** is configured to slide within guide pin bore **142**; thus, the tolerance of the two parts should be designed to form a sliding fit. A guide pin counterbore **146** is formed perpendicularly on second mating portion **152** of second jaw member **72** and is configured to receive the second end portion of guide pin **110**. A bottom surface of guide pin counterbore **146** includes a step **147** that is configured to receive notch **195** of the first end of guide pin **110**. This notch **195** and step **147** configuration prevents guide pin **110** from rotating and/or becoming misaligned within guide pin bore **142** and guide pin counterbore **146**. Guide pin counterbore **146** also includes through hole formed perpendicularly though bottom surface of guide pin counterbore **146** to outer surface **156**. Through hole of guide pin counterbore **146** is configured to receive therethrough screw **114**. Screw **114** inserts through second jaw member **72** and threads tightly into threaded bore of

second end of guide pin **110** to fasten guide pin **110** to second jaw member **72**. A countersink can be formed on outer surface **156** of second jaw member **72** to provide clearance for receiving screw **114** head flush to or beneath the plane of outer surface **156**.

[132] Once secured, screw **114** (or other appropriate fastener, adhesive, weld, braze, or other appropriate bonding or fastening means) firmly holds guide pin **110** within the larger hole of guide pin counterbore **146**. In this way, guide pin **110** serves to guide the movement of first jaw member **70** relative to second jaw member **72** with guide pin **110** held to second jaw member **72** via screw **114**. Although described as being perpendicular to first mating portion **150**, guide pin bore **142** and guide pin counterbore **146** can also be oriented parallel to the direction of jaw travel, if first mating portion **150** is irregular or angled.

[133] Looking at latching pin **112**, and as shown in **FIGS. 48 & 49**, latching pin **112** is cylindrical in shape and comprises a first end **192** and a second end **194**, second end **194** comprising a notch **198** and a threaded bore formed axially through second end **194** and configured to receive a screw **116**. As shown if **FIGS. 48 & 49**, latching pin **112** further comprises a bolt channel **188,** a latch bolt hole **190,** and a bolt stop **196**. Bolt channel **188** runs along the length of latching pin **112** to an appropriate depth to define bolt stop **196** on a shelf-like area. Latch bolt hole **190** is radially formed within bolt channel **188** nearest second end **194**, perpendicular to and through the longitudinal axis of latching pin **112**. Bolt channel **188** is formed closer in proximity first end **192** of latching pin **112** (e.g., bolt channel **188** is offset from the middle of latching pin **112**, and toward first end **192**). As discussed below, latching pin **112** additionally receives latch bolt pin **174** of latch bolt **140** through latch bolt hole **190**.

[134] Referring to **FIGS. 40-45, 48, 49 & 51-54**, latching pin **112** is positioned within a latching pin bore **144** of second jaw **72**, with first end **192** of latching pin **112** facing outer surface **156**. In some embodiments, and as shown in **FIGS. 40-45, 48, 49 & 51-54**, latching pin bore **144** is a through hole formed perpendicularly through second jaw member **72** from second mating portion **152** to outer surface **156**. Latching pin **112** is configured to slide within latching pin bore **144**; thus, the tolerance of the two parts should be designed to form a sliding fit. A latching pin counterbore **148** is formed perpendicularly on first mating portion **150** of first jaw member **70** and is configured to receive second end **194** of latching pin **112**. A bottom surface of latching pin counterbore **148** includes a step **149** that is configured to receive notch **198** of first end **192** of latching pin **112**. This notch **198** and step **149** configuration prevents latching pin **112** from rotating and/or becoming misaligned within latching pin bore **144** and latching pin counterbore **148**. Latching pin counterbore **148** also includes through hole formed perpendicularly though bottom surface of latching pin counterbore **148** to outer surface **154**. Through hole of latching pin counterbore **148** is configured to receive therethrough a screw **116** that is threaded into the threaded bore formed axially through send end **194** of latching pin **112**. Screw **116** inserts through first jaw member **70** and threads tightly into threaded bore of second end **194** of latching pin **112** to fasten latching pin **112** to first jaw member **70**. A countersink can be formed on outer surface **154** of first jaw member **70** to provide clearance for receiving screw **116** head flush to or beneath the plane of outer surface **154**.

[135] Once secured, screw **116** (or other appropriate fastener, adhesive, weld, braze, or other appropriate bonding or fastening means) firmly holds latching pin **112** within the larger hole of latching pin counterbore **148**. In this way, latching pin **112** serves to guide the movement of second jaw member **72** relative to the first jaw member **70** with latching pin **112** held to first jaw member **70** via screw **116**. As discussed further below, but for a bolt **174** checking its motion, latching pin **112** would be permitted to slide up and down axially within latching pin bore **144**. Although described as being perpendicular to second mating portion **152**, latching pin bore **144** and latching pin counterbore **148** can also be oriented parallel to the direction of jaw travel, if second mating portion **152** is irregular or angled. Through hole of latching pin counterbore **148** is configured to receive therethrough a screw **116** that is threaded into a threaded bore formed axially through latching pin **112**.

[136] As shown in **FIGS. 44, 45, & 51-54**, jaw compression springs **166**, **168** of bracket **54** are located between first jaw member **70** and second jaw member **72.** Jaw compression springs **166**, **168** are positioned in bracket **54** by a first and a second ends within respective locating holes formed in first and second mating portions **150**, **152** of first and second jaw members **70**, **72** respectively. As discussed further below, but for a bolt **174** checking its motion, jaw compression springs **166**, **168** provide a separating bias that forces first jaw member **70** and second jaw member **72** apart.

[137] As best shown in **FIGS. 44 & 45**, a latch bolt assembly comprises a latch bolt **140** and a latch bolt bore **118** where a latch bolt **140** is capable of sliding within latch bolt bore **118** to lock and unlock bracket **54**. In some embodiments, latch bolt assembly is housed within of second jaw member **72**. Referring to **FIG. 50**, latch bolt **140** of latch bolt assembly includes a cylindrical body **176** with a latch bolt pin **174** protruding axially from an end of cylindrical body **176**, where latch bolt pin **174** is smaller in diameter than cylindrical body **176** forming an annular shoulder **184**. An elongated channel **172** runs along the length of cylindrical body **176** to form an enclosure for latch bolt compression spring **170** with a spring seat **182** being formed within elongated channel **172** nearest annular shoulder **184**. Optionally, and as shown in **FIGS. 44, 45 & 51-54**, latch bolt compression spring **170** further comprises a spring insert **169**. A limiter slot **178** is formed within elongated channel **172**, where elongated channel **172** and limiter slot **178** are formed through cylindrical body **176** perpendicular to and through the longitudinal axis of cylinder body **176** (i.e., along the radial direction), defining a first limiter wall **180** and a second limiter wall **181**. Limiter slot **178** prevents latch bolt compression spring **170** from contacting guide pin **110** and screw **114**.

[138] As best shown in **FIGS. 44 & 45**, latch bolt **140** engages with latching pin **112** to lock and unlock bracket **54**. As shown in **FIGS. 44, 45 & 51-54**, latch bolt pin **174** rides within a bolt channel **188** of latching pin **112**. At least a portion of latch bolt pin **174** is biased to reside within bolt channel **188** by latch bolt compression spring **170**. In operation, and in the closed configuration, latching pin **112** additionally receives latch bolt pin **174** of latch bolt **140** through latch bolt hole **190**.

[139] As best shown in **FIGS. 45 & 51-52**, both latching pin bore **144** and latching pin counterbore **148** are intersected (preferably through the center and perpendicular to both their longitudinal axes) by a latch bolt bore **118**. Latch bolt bore **118** is a counterbored through hole drilled through the length of second jaw

the bias of latch bolt compression spring **170**, and first jaw member **70** and second jaw member **72** are forced apart by the force of jaw compression springs **166**, **168**. Retraction of latch bolt 140 also causes rotating tab **132** to extend from bracket **54**. In an open or unlocked configuration, first mating portion **150** and/or one or more engagement bosses **74** of first jaw member **70** are the furthest apart from second mating portion **152** and/or one or more engagement bosses **75** of second jaw member **72**. In an open or unlocked configuration, bracket **54** can be easily removed from rail **52** and/or repositioned to a different location of rail **52**.

[143] In a closed or locked configuration, as shown in **FIGS. 28-35, 51 & 54**, latch bolt **140** is forced into latch bolt hole **190** of latching pin **112** by the force of latch bolt compression spring **170** and first jaw member **70** and second jaw member **72** are in close proximity to each other and against the bias of jaw compression springs **166**, **168**. In addition, movement of latch bolt **140** into latch bolt hole **190** causes rotating tab **132** to become seated in tab recess **133** of bracket **54**. In a closed or locked configuration, first mating portion **150** and/or one or more engagement bosses **74** of first jaw member **70** are in close proximity to second mating portion **152** and/or one or more engagement bosses **75** of second jaw member **72**. In a closed or locked configuration, bracket **54** can be secured in place on rail **52**.

[144] In operation, referring to **FIG. 51 & 52**, and presuming that bracket **54** is initially in a locked configuration as shown in **FIG. 51**, a user grasps bracket **54** (and/or rail **52** and/or any appropriate attached accessory or purchase) and manually presses in terminus **175** of latch bolt pin **174**, which forces latch bolt **140** to translate, as shown by arrow **159** such that rotating tab **132** is pushed out of tab recess **133**, as shown by arrow **137**. Tab recess **133** provides a cavity within which rotating tab **132** normally rests when in a locked configuration, so that rotating tab **132** is not inadvertently rotated and/or becomes snagged, thus unintentionally causing bracket **54** to unlock. Additionally, tab recess **133** can be expanded to permit locking when rotating tab **132** is rotated ninety degrees. With rotating tab **132** positioned out of tab recess **133**, a user can rotate rotating tab **132** relative to latch bolt **140**, so that rotating tab **132** extends beyond and/or at a sufficient distance from body of bracket **54** to permit a user to manually further pull rotating tab **132**, thus further pulling latch bolt **140** axially out of latch bolt bore **118**. The axial travel of latch bolt **140** is outwardly limited by screw **114** contacting the limiter wall **180**. Latch bolt **140** is spring biased inward, such that latch bolt **140** is biased to retract into latch bolt bore **118**.

[145] When in a locked configuration (as in **FIGS. 51, 52 & 54**), latch bolt pin **174** is inserted through latch bolt hole **190** (generally fully through, but at least partially within) of latching pin **112**, which prohibits latching guide pin **112** from traveling axially within latching pin bore **144**. Preferably, terminus **175** extends out of small diameter portion **118'** to permit a user to press terminus **175**, which serves as a button and/or actuator to initiate a first step of an unlocking process. As a user pulls rotating tab **132**, latch bolt pin **174** of latch bolt **140** is pulled out of latch bolt hole **190** of latching pin **112** such that terminus **175** is positioned within bolt channel **188**, where limiter wall **180** contacting screw **114** prevents terminus **175** from being further retracted out of bolt channel **188**. Thus, terminus **175** (and a portion of latch bolt pin **174** near terminus **175**) remain within bolt channel **188**, when in a second step in an unlocking process is completed and bracket **54** is in the unlocked configuration. This two-step unlocking process reduces

surface, wherein each of the one or more detent plungers comprising a detent cylinder with an open end and an open threaded end opposite the open end and a detent ball and a detent compression spring, and wherein the detent ball and the detent compression spring captured within the detent cylinder by a set screw secured to open threaded end, the detent compression spring outwardly biasing detent ball toward the open end of the detent cylinder in a manner that causes the detent ball to protrude from the open end of the detent cylinder, and c) a retaining clip, the retaining clip securing the indexing plate to the adaptor plate, wherein each of the one or more detent plungers is aligned with the ring of detents in a manner that the detent ball protruding from the open end of the detent cylinder of each of the one or more detent plungers will be seated in a detent from the ring of detents, and wherein a rotational position of the adaptor plate is selectively controlled when a detent from the ring of detents is selectively brought into alignment with the detent ball of each of the one or more detent plungers by relative rotation between the adaptor plate and the indexing plate.

30. A rail comprising a rail body, the rail body comprising a) a first engagement surface comprising one or more engagement slots, b) a second engagement surface comprising one or more engagement slots, c) a third surface, wherein the first engagement surface is adjacent the third surface, the second engagement surface is adjacent the third surface and the second engagement surface is parallel, spaced apart and facing oppositely the first engagement surface, with the third surface spanning between the first engagement surface and the second engagement surface.
31. The rail of embodiment 30, wherein the third engagement surface further comprises a plurality of through holes.
32. The rail of embodiment 30 or 31, further comprising a base support.
33. The rail of embodiment 32, wherein the base support comprises an adhesive layer on the side that will come in contact with a support.
34. The rail of embodiment 32, wherein the base support comprises one or more tabs configured for inserted into one or more pockets or pouches on a base support mount.
35. A mounting system comprising a) a bracket of any one of embodiments 1-16, and b) a rail of any one of embodiments 30-34, wherein the one or more engagement slots of the first engagement surface of the rail body are configured to receive the one or more engagement bosses of the first jaw member of the bracket and the one or more engagement slots of the second engagement surface of the rail body are configured to receive the one or more engagement bosses of the second jaw member of the bracket.
36. A mounting system comprising a) a bracket of any one of embodiments 1-16, and b) a rail, the rail comprising a rail body, the rail body comprising i) a first engagement surface comprising one or more engagement slots, ii) a second engagement surface comprising one or more engagement slots, and iii) a third surface, wherein the first engagement surface is adjacent the third surface, the second engagement surface is adjacent the third surface and the second engagement surface is parallel, spaced apart and facing oppositely the first engagement surface, with the third surface spanning between the first engagement surface and the second engagement surface, and wherein the one or more engagement slots of the first engagement surface of the rail body are configured to receive the one or more engagement bosses of the first jaw member of the bracket and the one or more

47. The hinged coupler bracket of any one of embodiments 42-46, wherein the inner knuckle is rotatably coupled to the latching socket by a detent mechanism, wherein a cylindrical drum portion of the latching socket is inserted into a cylindrical sleeve portion of the inner knuckle causing an end surface portion of the cylindrical sleeve portion to come into close proximity to an end surface of the cylindrical drum portion, wherein the inner knuckle further comprises one or more detent plungers, each of the one or more detent plungers comprising a detent cylinder with an open end and a closed end opposite the open end and a detent ball and a detent compression spring captured within the detent cylinder, the detent compression spring outwardly bias detent ball toward the open end of the detent cylinder in a manner that causes the detent ball to protrude from the open end of the detent cylinder, wherein the end surface of the cylindrical drum portion of the latching socket further comprises a ring of detents that are annularly spaced apart and located near the perimeter of the end surface of the cylindrical drum portion, wherein each of the one or more detent plungers is aligned with the ring of detents in a manner that the detent ball protruding from the open end of the detent cylinder of each of the one or more detent plungers will be seated in a detent from the ring of detents, and wherein a rotational position of the latching socket is selectively controlled when a detent from the ring of detents is selectively brought into alignment with the detent ball of each of the one or more detent plungers by relative rotation between the latching socket and the inner knuckle.
48. The hinged coupler bracket of any one of embodiments 42-47, wherein the latching socket includes a) a latching pin bore formed blindly in the body transversely to the socket and intersecting the socket, a spring bore being formed at a blind end of the latching pin bore and an open end of the latching pin bore opening through the socket body, b) a latching pin slidably fitted within the latching pin bore, the latching pin having a keyway notched laterally therein, the keyway including a locking edge, a purchase end of the latching pin protruding from the open end and a spring end positioned within the spring bore; c) a spring positioned within the spring bore between the blind end of the latching pin bore and the spring end of the latching pin, the spring biasing the latching pin toward the open end of the spring bore; wherein, in a locked configuration, the keyway is biased to be misaligned with the latching pin bore so that the locking edge of the keyway is positioned within the latching pin bore; and wherein, in a unlocked configuration, the first end of the latching pin is manually pressed axially further into the latching pin bore to move the locking edge toward the spring bore.
49. The hinged coupler bracket of embodiment 48, wherein the latching pin bore is formed orthogonally to the socket.
50. The hinged coupler bracket of embodiment 48 or 49, wherein the latching socket further comprises a) a second latching pin bore formed blindly in the body transversely to the socket and intersecting the socket, a second spring bore being formed at a second blind end of the second latching pin bore and an second open end of the latching pin bore opening through the socket body, the second latching pin bore positioned apart from the latching pin bore; and b) a second latching pin slidably fitted within the second latching pin bore, the second latching pin having a second keyway notched laterally therein, the second keyway including a second locking edge, a second purchase end of the latching pin protruding from the second open end and a second spring end positioned within the second spring bore.

and second row of detents is selectively brought into alignment with the detent ball of first and second detent plungers by relative rotation between the inner knuckle and the coupler base.

58. The hinged coupler bracket of embodiment 57, wherein the first detent plunger is positioned by the first outer knuckle and oriented radially toward the inner knuckle and the second detent plunger is positioned by the second outer knuckle and oriented radially toward the inner knuckle.
59. The hinged coupler bracket of any one of embodiments 54-58, wherein the inner knuckle is rotatably coupled to the latching socket by a detent mechanism, wherein a cylindrical drum portion of the latching socket is inserted into a cylindrical sleeve portion of the inner knuckle causing an end surface portion of the cylindrical sleeve portion to come into close proximity to an end surface of the cylindrical drum portion, wherein the inner knuckle further comprises one or more detent plungers, each of the one or more detent plungers comprising a detent cylinder with an open end and a closed end opposite the open end and a detent ball and a detent compression spring captured within the detent cylinder, the detent compression spring outwardly bias detent ball toward the open end of the detent cylinder in a manner that causes the detent ball to protrude from the open end of the detent cylinder, wherein the end surface of the cylindrical drum portion of the latching socket further comprises a ring of detents that are annularly spaced apart and located near the perimeter of the end surface of the cylindrical drum portion, wherein each of the one or more detent plungers is aligned with the ring of detents in a manner that the detent ball protruding from the open end of the detent cylinder of each of the one or more detent plungers will be seated in a detent from the ring of detents, and

    wherein a rotational position of the latching socket is selectively controlled when a detent from the ring of detents is selectively brought into alignment with the detent ball of each of the one or more detent plungers by relative rotation between the latching socket and the inner knuckle.
60. The hinged coupler bracket of any one of embodiments 54-59, wherein the latching socket includes a) a latching pin bore formed blindly in the body transversely to the socket and intersecting the socket, a spring bore being formed at a blind end of the latching pin bore and an open end of the latching pin bore opening through the socket body, b) a latching pin slidably fitted within the latching pin bore, the latching pin having a keyway notched laterally therein, the keyway including a locking edge, a purchase end of the latching pin protruding from the open end and a spring end positioned within the spring bore, c) a spring positioned within the spring bore between the blind end of the latching pin bore and the spring end of the latching pin, the spring biasing the latching pin toward the open end of the spring bore; wherein, in a locked configuration, the keyway is biased to be misaligned with the latching pin bore so that the locking edge of the keyway is positioned within the latching pin bore; and wherein, in a unlocked configuration, the first end of the latching pin is manually pressed axially further into the latching pin bore to move the locking edge toward the spring bore.
61. The hinged coupler bracket of embodiment 60, wherein the latching pin bore is formed orthogonally to the socket.
62. The hinged coupler bracket of embodiment 60 or 61, wherein the latching socket further comprises a) a second latching pin bore formed blindly in the body transversely to the socket and intersecting the socket, a second spring bore being formed at a second blind end of the second latching pin bore and

plungers is aligned with the ring of detents in a manner that the detent ball protruding from the open end of the detent cylinder of each of the one or more detent plungers will be seated in a detent from the ring of detents, and wherein a rotational position of the latching socket is selectively controlled when a detent from the ring of detents is selectively brought into alignment with the detent ball of each of the one or more detent plungers by relative rotation between the latching socket and the inner knuckle.

111. The adaptor of any one of embodiments 106-110, wherein the latching socket includes a) latching pin bore formed blindly in the body transversely to the socket and intersecting the socket, a spring bore being formed at a blind end of the latching pin bore and an open end of the latching pin bore opening through the socket body, b) a latching pin slidably fitted within the latching pin bore, the latching pin having a keyway notched laterally therein, the keyway including a locking edge, a purchase end of the latching pin protruding from the open end and a spring end positioned within the spring bore, c) a spring positioned within the spring bore between the blind end of the latching pin bore and the spring end of the latching pin, the spring biasing the latching pin toward the open end of the spring bore; wherein, in a locked configuration, the keyway is biased to be misaligned with the latching pin bore so that the locking edge of the keyway is positioned within the latching pin bore; and wherein, in a unlocked configuration, the first end of the latching pin is manually pressed axially further into the latching pin bore to move the locking edge toward the spring bore.

112. The adaptor of embodiment 111, wherein the latching pin bore is formed orthogonally to the socket.

113. The adaptor of embodiment 111 or 112, wherein the latching socket further comprises a) a second latching pin bore formed blindly in the body transversely to the socket and intersecting the socket, a second spring bore being formed at a second blind end of the second latching pin bore and an second open end of the latching pin bore opening through the socket body, the second latching pin bore positioned apart from the latching pin bore; and b) a second latching pin slidably fitted within the second latching pin bore, the second latching pin having a second keyway notched laterally therein, the second keyway including a second locking edge, a second purchase end of the latching pin protruding from the second open end and a second spring end positioned within the second spring bore.

114. The adaptor of embodiment 113, wherein the latching pin bore and the second latching pin bore are formed orthogonally to the socket, with the latching pin bore and the second latching pin bore axially parallel to one another.

115. The adaptor of any one of embodiments 111-114, wherein the locking edge of the keyway is configured to be engaged with the latch engagement portion of the attachment when the attachment is inserted within the socket in the locked configuration.

116. The adaptor of any one of embodiments 106-115, wherein the socket is hexagonally shaped.

EXAMPLES

[178] The following non-limiting examples are provided for illustrative purposes only in order to facilitate a more complete understanding of representative embodiments now contemplated. These examples

should not be construed to limit any of the embodiments described in the present specification, including those pertaining to the compounds, pharmaceutical compositions, or methods and uses disclosed herein.

Example 1

[179] This example illustrates how to employ a mounting system disclosed herein to attach a video recorder onto a helmet.

[180] A user has an motorcycle helmet and desires to secure a video recorder to the helmet. The user obtains a rail disclosed herein as shown in **FIG. 5** and secures this rail, peels off a protective sheet from an adhesive layer present on the bottom side of the rail, and affixes the rail to an exterior surface portion of the helmet. The user then secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the rail by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The use then attaches the video recorder to the helmet by screwing the threaded screw of a coupler disclosed herein as shown in **FIG. 68** into a threaded hole present on the video recorder and then attaches the video recorder to the motorcycle helmet by inserting the other end of the coupler into the socket the hinged coupler thereby securing the video recorder to the motorcycle helmet.

[181] In an alternative example, instead of employing a bracket comprising a hinged coupler as shown in **FIG. 55**, the user employs a bracket a shown in **FIG 28** and a bracket adaptor comprising a disc including first and second threaded screws centrally located, with the first threaded screw perpendicular to the top surface of the disc and the second threaded screw perpendicular to the bottom surface of the disc. The user attaches the bracket adaptor to the video recorder by screwing the first threaded screw of bracket adaptor into a threaded hole present on the video recorder. Either before or after attachment of bracket to rail affixed to the motorcycle helmet, the user attaches the video recorder to the bracket by screwing the second threaded screw of bracket adaptor into a threaded hole of an attachment point present on the bracket. If not already attached, the user then attaches the video recorder to the helmet by engaging the engagement bosses of first and second jaw members of the bracket to engagement slots present on the rail, thereby securing the video recorder to the motorcycle helmet.

[182] In an alternative example, the video recorder is a Go-Pro video recorder, and the user employs a bracket a shown in **FIG 28** and the bracket adaptor is the one shown at **FIG. 46**. Either before or after attachment of bracket to rail affixed to the helmet, the user attaches the bracket adaptor to the bracket by screwing the threaded screw of bracket adaptor into a threaded hole of an attachment point present on the bracket. The user then attaches the video recorder by aligning the holes present on the bracket adaptor and the bracket present on the video recorder, inserting a treaded pin and securing the threaded pin in a manner that attached the video recorder to the bracket attachment. In not already attached, the user then secures the bracket to the rail by engaging the engagement bosses of first and second jaw members of the bracket to engagement slots present on the rail, thereby securing the video recorder to the motorcycle helmet.

[183] In an alternative example to the ones above, the helmet is a bicycle helmet.

Example 2

[184] This example illustrates how to employ a mounting system disclosed herein to attach a night vision google onto a helmet.

[185] A user has an ACH helmet comprising a shroud bracket and desires to secure a night vision google (NVG) using this bracket. The user obtains a rail disclosed herein as shown in **FIG. 6** and secures this rail into the shroud bracket. The use then obtains a rail disclosed herein as shown in **FIG. 2** and secures this rail to a portion of the NVG. The user then secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the rail secured on the shroud bracket by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The user similarly secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the rail secured on the NVG by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The use then attaches the NVG to the helmet by inserting a coupler disclosed herein as shown in **FIG. 57** into the sockets of both hinged couplers thereby securing the NVG to the helmet. In this set-up, when the user desires to stow away the NVG, the user can fold the NVG up in close proximity to the rail affixed to the helmet. Likewise, when use is desired, the use can move the NVG downward from the helmet in a manner that aligns the optical sights of the NVG with one or both eyes of the user to view the environment using the NVG.

Example 3

[186] This example illustrates how to employ a mounting system disclosed herein to attach a device in a device case disclosed herein onto a load bearing equipment vest.

[187] A user has a smart phone and desires to secure the phone to a load bearing equipment vest, like a MOLLE load bearing system, a PALS load bearing system, an IIFS load bearing system, or an ALICE load bearing system. The user obtains a rail disclosed herein as shown in **FIG. 3** and secures this rail on the load bearing equipment vest using screws, rivets or both. The user then obtains a rail disclosed herein designed as a device case as shown in **FIGS. 8A-8B** and encloses the phone inside the device case. The user then secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the rail secured on the load bearing equipment vest by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The user similarly secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the device case by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the device case. The user then attaches the device case to the load bearing equipment vest by inserting a coupler disclosed herein as shown in **FIG. 57** into the sockets of both hinged couplers thereby securing the device case to the load bearing equipment vest. In this set-up,

when the user desires to stow away the device case, the user can fold the device case in close proximity to the load bearing equipment vest. Likewise, when use is desired, the use can extend the device case away from the load bearing equipment vest to view the device encased in the device case.

[188] In an alternative example, instead of employing both brackets comprising a hinged coupler as shown in **FIG. 55**, the user employs a bracket a shown in **FIG 28** and a bracket adaptor comprising a disc including first and second threaded screws centrally located, with the first threaded screw perpendicular to the top surface of the disc and the second threaded screw perpendicular to the bottom surface of the disc. The user attaches the bracket adaptor to the device case by screwing the first threaded screw of bracket adaptor into a threaded hole of an attachment point present on the device case. Either before or after attachment of bracket to rail affixed to the load bearing equipment vest, the user attaches the device case to the bracket by screwing the second threaded screw of bracket adaptor into a threaded hole of an attachment point present on the bracket. If not already attached, the user then attaches the device case to the load bearing equipment vest by engaging the engagement bosses of first and second jaw members of the bracket to engagement slots present on the rail, thereby securing the device case to the load bearing equipment vest.

Example 4

[189] This example illustrates how to employ a mounting system disclosed herein to attach a device in a device case disclosed herein onto a dashboard of a vehicle.

[190] A user has a smart phone and desires to secure the phone to the dashboard of a car. The user obtains a rail disclosed herein as shown in **FIG. 3** and secures this rail, peels off a protective sheet from an adhesive layer present on the bottom side of the rail, and affixes the rail to an exterior surface portion of the dashboard. The user then obtains a rail disclosed herein designed as a device case as shown in **FIGS. 8A-8B** and encloses the phone inside the device case. The user then secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the rail secured on the dashboard by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The user similarly secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the device case by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the device case. The user then attaches the device case to the dashboard by inserting a coupler disclosed herein as shown in **FIG. 57** into the sockets of both hinged couplers thereby securing the device case to the dashboard.

[191] In an alternative example, instead of employing both brackets comprising a hinged coupler as shown in **FIG. 55**, the user employs a bracket a shown in **FIG 28** and a bracket adaptor comprising a disc including first and second threaded screws centrally located, with the first threaded screw perpendicular to the top surface of the disc and the second threaded screw perpendicular to the bottom surface of the disc. The user attaches the bracket adaptor to the device case by screwing the first threaded screw of bracket adaptor into a threaded hole of an attachment point present on the device case. Either before or

after attachment of bracket to rail affixed to the dashboard, the user attaches the device case to the bracket by screwing the second threaded screw of bracket adaptor into a threaded hole of an attachment point present on the bracket. If not already attached, the user then attaches the device case to the dashboard by engaging the engagement bosses of first and second jaw members of the bracket to engagement slots present on the rail, thereby securing the device case to the dashboard.

[192] In an alternative example to the ones above, the rail is affixed to an interior surface of a window present in the car, like a windshield, rear window, driver window or passenger window.

Example 5

[193] This example illustrates how to employ a mounting system disclosed herein to attach a video recorder onto a dashboard of a vehicle.

[194] A user has a video recorder and desires to secure the video recorder to the dashboard of a car. The user obtains a rail disclosed herein as shown in **FIG. 3** and secures this rail, peels off a protective sheet from an adhesive layer present on the bottom side of the rail, and affixes the rail to an exterior surface portion of the dashboard. The user then secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the rail by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The use then attaches the video recorder to the dashboard by screwing the threaded screw of a coupler disclosed herein as shown in **FIG. 68** into a threaded hole present on the video recorder and then attaches the video recorder to the dashboard by inserting the other end of the coupler into the socket the hinged coupler thereby securing the video recorder to the dashboard.

[195] In an alternative example, instead of employing a bracket comprising a hinged coupler as shown in **FIG. 55**, the user employs a bracket a shown in **FIG 28** and a bracket adaptor comprising a disc including first and second threaded screws centrally located, with the first threaded screw perpendicular to the top surface of the disc and the second threaded screw perpendicular to the bottom surface of the disc. The user attaches the bracket adaptor to the video recorder by screwing the first threaded screw of bracket adaptor into a threaded hole present on the video recorder. Either before or after attachment of bracket to rail affixed to the dashboard, the user attaches the video recorder to the bracket by screwing the second threaded screw of bracket adaptor into a threaded hole of an attachment point present on the bracket. If not already attached, the user then attaches the video recorder to the dashboard by engaging the engagement bosses of first and second jaw members of the bracket to engagement slots present on the rail, thereby securing the video recorder to the dashboard.

[196] In an alternative example, the video recorder is a Go-Pro video recorder, and the user employs a bracket a shown in **FIG 28** and the bracket adaptor is the one shown at **FIG. 46**. Either before or after attachment of bracket to rail affixed to the dashboard, the user attaches the bracket adaptor to the bracket by screwing the threaded screw of bracket adaptor into a threaded hole of an attachment point

present on the bracket. The user then attaches the video recorder by aligning the holes present on the bracket adaptor and the bracket present on the video recorder, inserting a treaded pin and securing the threaded pin in a manner that attached the video recorder to the bracket attachment. In not already attached, the user then secures the bracket to the rail by engaging the engagement bosses of first and second jaw members of the bracket to engagement slots present on the rail, thereby securing the video recorder to the dashboard.

[197] In an alternative example to the ones above, the rail is affixed to an interior surface of a window present in the car, like a windshield, rear window, driver window or passenger window.

Example 6

[198] This example illustrates how to employ a mounting system disclosed herein to attach a device in a device case disclosed herein onto a load bearing equipment vest and additional components of the mounting system disclosed herein to the device case.

[199] A user attaches a device case to a rail secured on a load bearing equipment vest using any of the procedures described in Example 3. The user then secures a bracket comprising a hinged coupler as shown in **FIG. 55** to the device in a position opposite the location of where the device case is attached to the rail by engaging the engagement bosses of first and second jaw members of the bracket comprising a hinged coupler to engagement slots present on the rail. The user then obtains an adaptor as shown in adaptor and attaches the adaptor to the device case by inserting a coupler disclosed herein as shown in **FIG. 70** into the socket of the hinged coupler thereby securing the adaptor to the device case. The user then attached a GPS, a compass and a flashlight to the adaptor as shown in **FIG. 71**. In this set-up, when the user desires to stow away the devices, the user can fold the adaptor in close proximity to one side of the device case and then fold the device case-adaptor assembly in close proximity to the load bearing equipment vest. Likewise, when use is desired, the use can extend the device case-adaptor assembly away from the load bearing equipment vest to view the device encased in the device case, and then further extend the adaptor to view the devices contained therein.

Example 7

[200] This example illustrates how to employ a mounting system disclosed herein to attach a device in a device case disclosed herein alternatively onto a dashboard or a load bearing equipment vest.

[201] A user secures a rail disclosed herein as shown in **FIG. 3** to a load bearing equipment vest using any of the procedures described in Example 3. The user secures a rail disclosed herein as shown in **FIG. 3** to a dashboard using any of the procedures described in Example 4. The user encases a device in a device case disclosed herein as shown in **FIGS. 8A-8B** as described in Example 3. In use, when entering a vehicle the user can attach the device case to the rail secured on dashboard using any of the procedures described in Example 4. When leaving the vehicle the user can detach the device case from the rail on

CLAIMS

1. A bracket, the bracket comprising

   a first jaw member, the first jaw member comprising an inner surface including a first clamping portion,

   a second jaw member, the second jaw member comprising an inner surface including a second clamping portion,

   a pin assembly comprising a latching pin including a latch bolt hole, the pin assembly configured to connect the first and second jaw members and enable the first and second jaw members to slidably translate toward one another in a first direction or away from one another in a direction opposite the first direction, and

   a latch bolt assembly comprising a latch bolt slidably fitted within a latch bolt bore, the latch bolt including a first end and a second end, the latch bolt comprising a latch bolt spring capable of providing a separating bias that forces the latch bolt in a direction outward from the latch bolt bore,

   wherein the bracket can adopt an open configuration and a closed configuration, and

   wherein when the bracket is in the closed configuration, the first and second jaw members are in close proximity to one another and the latch bolt is inserted in the latch bolt hole of the latching pin.

2. The bracket of claim 1, wherein the first clamping portion including one or more engagement bosses, the second clamping portion including one or more engagement bosses, or both the first and second clamping portions each include one or more engagement bosses.

3. The bracket of claim 1 or 2, wherein the latch bolt assembly is housed in the second jaw member.

4. The bracket of any one of claims 1-3, wherein the bracket further comprises one or more jaw compression springs, the one or more jaw compression springs capable of providing a separating bias that forces the first jaw member and the second jaw member apart.

5. The bracket of claim 4, wherein each of the one or more jaw compression springs including a first end and a second end, wherein the first end is seated on a first mating portion of the first jaw member and the second end is seated on a second mating portion of the second jaw member.

6. The bracket of any one of claims 1-5, wherein the pin assembly further comprises a guide pin, the guide pin configured for disposal perpendicular to the first and second clamping portions of the first and second jaw members.

7. The bracket of any one of claims 1-6, configured for, when the bracket is in the open configuration, the first and second jaw members are apart from one another and the latch bolt is removed from the latch bolt hole of the latching pin.

8. The bracket of any one of claims 1-7, wherein the bracket further comprises a back plate and a back plate recess, the back plate being cantilevered from the first jaw member and the back plate recess being formed on the second jaw member, the back plate recess configured to receive the back plate.

9. The bracket of claim 8, wherein the back plate includes one or more attachment points configured to reversibly secure a device or component thereof to the back plate.

10. The bracket of claim 9, wherein each of the one or more attachment points is a blind screw hole capable of receiving a threaded screw.

11. The bracket of claim 9 or 10, wherein the back plate further includes one or more indexing holes configured to properly orientate the device of component thereof to the back plate.

12. The bracket of any one of claims 1-9, wherein the bracket further comprises an outer surface comprising a hinged coupler, the hinged coupler comprising a coupler base including a latching socket, the latching socket comprising a socket body and a socket formed within the socket body, the latching socket configured to reversibly secure a coupler.

13. The bracket of claim 12, wherein the outer surface is located on the first jaw member or the second jaw member.

14. The bracket of claim 12 or 13, wherein the coupler base includes a first outer knuckle, a second outer knuckle, and an inner knuckle.

15. The bracket of claim 14, configured for the inner knuckle to be rotatably coupled to the coupler base by a hinge pin inserted through the first outer knuckle, the inner knuckle and the second outer knuckle.

16. The bracket of claim 14 or 15, configured for the inner knuckle to be rotatably coupled to the latching socket.

17. The bracket of any one of claims 12-16, wherein the socket body further comprises a first latching pin bore, a first latching pin, and a first latching pin spring,

    the first latching pin bore located transversely to the socket and intersecting the socket, the first latching pin bore having a first open end and a second closed end and configured to slidably receive the first latching pin, and

    the first latching pin having a keyway notched laterally therein, the keyway including a locking edge,

    wherein the second closed end of the first latching pin bore includes a spring cup configured to receive the first latching pin spring, the first latching pin spring capable of providing a separating bias that forces the locking edge of the first latching pin into the socket.

18. The bracket of claim 17, wherein the socket body further comprises a second latching pin bore, a second latching pin, and a second latching pin spring,

the second latching pin bore located transversely to the socket and intersecting the socket, the second latching pin bore having a first open end and a second closed end and configured to slidably receive the second latching pin, and

the second latching pin having a keyway notched laterally therein, the keyway including a locking edge,

wherein the second closed end of the second latching pin bore includes a spring cup configured to receive the second latching pin spring, the second latching pin spring capable of providing a separating bias that forces the locking edge of the second latching pin into the socket.

19. The bracket of any one of claims 1-18, wherein the latch bolt further comprises a tab attached to the first end of the latch bolt, the tab capable of rotating relative to latch bolt.

20. A mounting system comprising

a bracket according to any one of claims 2-19; and

a rail including a rail body, the rail body comprising

a first engagement surface comprising one or more engagement slots,

a second engagement surface comprising one or more engagement slots,

a third surface,

wherein the rail is configured to have the first engagement surface disposed adjacent the third surface, the second engagement surface disposed adjacent the third engagement surface, and the second engagement surface disposed parallel, spaced apart and facing oppositely the first engagement surface, with the third engagement surface spanning between the first engagement surface and the second engagement surface;

wherein the one or more engagement slots of the first engagement surface of the rail body are configured to receive the one or more engagement bosses of the first jaw member of the bracket and the one or more engagement slots of the second engagement surface of the rail body are configured to receive the one or more engagement bosses of the second jaw member of the bracket.

21. The mounting system of claim 20, wherein the third engagement surface of the rail further comprises a plurality of through holes.

22. The mounting system of claim 20 or 21, wherein the rail further comprising a base support.

23. The mounting system of claim 22, wherein the base support of the rail comprises an adhesive layer on the side that will come in contact with a support.

24. The mounting system of claim 22, wherein the base support of the rail comprises one or more tabs configured to be inserted into one or more pockets or pouches on a base support mount.

25. The mounting system of claim 20, wherein the rail is a device case, the device case comprising

a. a first frame member, the first frame member including the first engagement surface, the first engagement surface further comprising a plurality of through holes,

b. a second frame member, the second frame member including the second engagement surface, the second engagement surface further comprising a plurality of through holes,

c. a sidewall frame member, the sidewall frame member including the third engagement surface, and

d. a gasket, the gasket being composed of an elastomeric material and shaped to configure to at least fit around an outer perimeter of a device and align in close proximity with an inside surface of the sidewall frame member,

wherein the sidewall frame member is sandwiched between and spaces apart the first frame member and the second frame member, and in a manner that forming an interior space for a device to fit therein and aligns each through hole of the plurality of through holes from the first frame member with each through hole of the plurality of through holes from the second frame member to form a plurality of paired through holes,

wherein the first frame member and the second frame member compressively bear down on the sidewall frame member by securing the first frame member to the second frame member using a plurality of screws, each screw of the plurality of screws inserted through a paired through hole of the plurality of paired through holes from the first and second frame member, and

wherein the device case forms a water-tight seal preventing moisture from entering the interior space.

26. The mounting system of claim 25, wherein the sidewall frame member further comprises an attachment point and one or more indexing holes.

27. The mounting system of claim 26, further comprising a device case adaptor, the device case adaptor comprising an indexing plate and an adaptor plate, the indexing plate including one or more indexing pins configured to align and insert into one or more indexing holes and the adaptor plate including a coupler on a first surface of the adaptor plate and a threaded screw on a second surface of the adaptor plate.

28. The mounting system of any one of claims 25-27, wherein the sidewall frame member is configured to receive the sealing plate, the sealing plate comprising one or more through ports.

29. A lock assembly comprising a latch bolt assembly and a housing,

the latch bolt assembly including a positive latching mechanism comprising a latch bolt and a latch bolt compression spring, the latch bolt compression spring being housed within an elongated channel running axially within the latch bolt, and

the housing including a latch bolt bore, the latch bolt bore being configured to slidably receive the latch bolt,

wherein the latch bolt assembly is configured to adopt an unlocked position and a locked position,

wherein in the unlocked position, the latch bolt is compressed against a bias of the latch bolt compression spring, and

wherein in the locked position, release of the bias of the latch bolt compression spring causes the latch bolt to insert into the latch bolt bore.

30. The lock assembly of claim 29, wherein the housing further includes a positive separating mechanism comprising one or more compression springs located in the housing.

31. The lock assembly of claim 30, wherein in the locked position, each of the one or more compression springs is compressed against its respective bias.

32. The lock assembly of claim 30 or 31, wherein in the unlocked position, a bias of each of the one or more compression springs is released.

33. The lock assembly of any one of claims 30-32, wherein release of a bias of each of the one or more compression springs causes compression of the latch bolt compression spring.

34. The lock assembly of any one of claims 30-33, wherein release of the bias of the latch bolt compression spring causes compression of each of the one or more compression springs.

35. The lock assembly of any one of claims 30-34, wherein the bias of each of the one or more compression springs is oriented perpendicular to a direction that the latch bolt slidably inserts into the latch bolt bore.

36. The lock assembly of any one of claims 29-35, wherein a limiter slot is formed within the elongated channel and a limiter pin is contained in the housing, the limiter pin configured to traverse the limiter slot and to restrict travel of the latch bolt within the lock assembly.

37. The lock assembly of any one of claims 29-36, wherein the latch bolt bore is contained in a jaw member of the housing.