

MOUNTING SYSTEM, DEVICES, METHODS AND USES THEREOF**BACKGROUND**

[001] This application claims the benefit of priority and the filing dates pursuant to 35 U.S.C. 119 to U.S. Provisional Patent Application Serial No. 62/877,270, filed on July 22, 2019, U.S. Provisional Patent Application Serial No. 62/796,494, filed on January 24, 2019, and U.S. Provisional Patent Application Serial No. 62/795,539, filed on January 22, 2019, each of which is hereby incorporated by reference in its entirety.

[002] The subject of this patent application relates generally to devices for securely and releasably mounting and/or protecting devices, equipment or other apparatus (collectively referred to as “devices”).

[003] By way of background, in rugged applications and environments, there is a need for devices, equipment or other apparatus to be protected from impact and moisture. For example, both electrical and mechanical devices can become damaged and their operability impaired or lost upon exposure to moisture, such as, *e.g.*, air moisture or humidity or being submerged in a liquid. Such moisture exposure can affect electrical and/or mechanical mechanisms to such a degree that the device becomes inoperable. Similar damage can occur from the resulting impact if a device is dropped or struck by another object.

[004] In addition, in rugged applications and environments, a user of a device may desire to take a device into an environment where moisture exposure is highly likely or certain to occur and/or device impact is a risk. In such situations, the user wants to protect a device to prevent such damage before entering into this environment. For example, a user may wish to take a photographic device, such as, *e.g.*, a camera or device such as a smart phone or tablet having a camera underwater in order to take pictures of the sea life or environment. Such devices need protection for the inevitable exposure to the fresh or salt-water exposure. Likewise, a user may wish to take a photographic device while hiking or climbing in rugged terrain where there is a real risk of dropping the device or having the device striking the terrain. Again, such devices need protection for the impact when the device is so struck.

[005] Further, in rugged applications and environments, there is a need for a device to be securely mounted (through a mount) on a base. Such device mounting could be done to facilitate operation of the device and/or store the device when not in use. Such mounting could also enable free use of the hands of a user to do other things or complete other tasks. For example, a user may desire to mount a smart phone, tablet, night vision goggle (NVG), ground-positioning system (GPS) or similar device to the dashboard of a vehicle in order to operate a navigational system while operating the vehicle or take a video during vehicle operation. Similarly, a device can be mounted on clothing of a user, for example, vest or harness, in order to attach a device to the person of the user. For example, a use may wish to mount a device on a helmet or vest worn by the user in order to navigate terrain while hiking or riding a bike or videotape the experience.

[006] Moreover, in rugged applications and environments, there is a need for these devices to be quickly removed from the mount and reattached to another mount (or simply stowed), while preventing unintended removal or fumbling. Such quick removal can reduce user frustration, enhances operability of the devices and imparts greater flexibility of use. For example, a user could mount a photographic device on the dashboard of a vehicle in order to navigate to a rock-climbing location, and once there, quickly remove the device from the dashboard and the quickly attach the device to a helmet or vest worn by the user.

[007] However, current devices, systems and methods are unable to achieve or attain all of the attributes discussed above. For example, while certain devices may offer protection to impact or moisture exposure, these devices are either ineffective or so cumbersome that they interfere with the operability of the device. Similarly, while current mounting systems provide a means to secure a device to a base, these systems typically ignore or are ineffective in protecting a device from impact or moisture exposure. These mounting systems also suffer in that they tend to be incompatible with other mounting systems, forcing a user to purchase additional adaptors to enable compatibility or simply choose one mounting system over another. Likewise, although certain mounting systems may offer a means to secure a device quickly to a base or remove the device quickly from the base, attachment security is sacrificed to achieve such each of use. As such, a device can become dislodged from a base and incur damage from the resulting impact or moisture exposure.

[008] Aspects of the present invention fulfill these needs and provide further related advantages as described in the following summary.

SUMMARY

[009] The present systems, devices, and methods provide a mounting system which includes rail and a bracket which is selectively secured to the rail. The bracket is selectively and/or automatically locked to the rail when positioned on the rail, and may be removed from the rail by activating one or more actuators and, optionally, one or more safety actuators. The disclosed systems, devices, and methods enable a device to be protected from impact and moisture exposure, enable a device to be securely mounted on a base, and enable a device to be quickly secured and removed from a base.

[010] Other features and advantages of aspects of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of aspects of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[011] FIG. 1A-C is a mounting system disclosed herein, with FIG. 1A showing a top perspective of a mounting system disclosed herein, illustrating a bracket aligned and ready for attachment to a rail, where the rail is configured as a base; FIG. 1B showing a top perspective of the mounting system of FIG. 1A,

illustrating a bracket attached to a rail; and **FIG. 1C** showing an exploded top perspective view of the rail of **FIG. 1A**;

[012] **FIG. 2** is a front top perspective view of a rail disclosed herein;

[013] **FIG. 3** is a front top perspective view of a rail disclosed herein;

[014] **FIG. 4** is a front top perspective view of a rail disclosed herein;

[015] **FIG. 5** is a front top perspective view of a rail disclosed herein;

[016] **FIG. 6** is a front top perspective view of a rail disclosed herein;

[017] **FIG. 7** is a front top perspective view of a rail disclosed herein.

[018] **FIGS. 8A-B** is a mounting system disclosed herein, with **FIG. 8A** showing a top perspective of a mounting system disclosed herein, illustrating a bracket aligned and ready for attachment to a rail, where the rail is configured as a case contains a device; and **FIG. 8B** showing a top perspective of the mounting system of **FIG. 8A**, illustrating a bracket attached to a rail;

[019] **FIG. 9** is a magnified top perspective view of a mounting system disclosed herein, showing a bracket disclosed herein in a first position on the first end of a rail disclosed herein;

[020] **FIG. 10** is a magnified perspective view of the mounting system of **FIG. 9**, showing a bracket disclosed herein moved to a second position on the first end of a rail disclosed herein;

[021] **FIG. 11** is a bottom perspective of the rail of **FIG. 8A**;

[022] **FIG. 12** is a top plan view of the mounting system of **FIG. 8B**;

[023] **FIG. 13** is a bottom plan view of the rail of **FIG. 8A**;

[024] **FIG. 14** is a first side plan view of the rail of **FIG. 8A**;

[025] **FIG. 15** is a second side plan view of the rail of **FIG. 8A**;

[026] **FIG. 16** is a first end plan view of the rail of **FIG. 8A**;

[027] **FIG. 17** is a second end plan view of the rail of **FIG. 8A**;

[028] **FIG. 18** is an exploded top perspective view of the rail of **FIG. 8A**;

- [029] FIG. 19 is an top perspective view a gasket member disclosed herein;
- [030] FIG. 20 is a magnified partially exploded top perspective view of the second end of the rail of FIG. 8A;
- [031] FIG. 21 is a magnified partial cross-sectional view of the rail of FIG. 17, taken at 21-21;
- [032] FIG. 22 is a magnified partial cross-sectional view of the mounting system of FIG. 12, taken at 22-22;
- [033] FIG. 23 is a magnified partial cross-sectional view of the mounting system of FIG. 12, taken at 23-23;
- [034] FIG. 24 is a magnified partial cross-sectional view of the mounting system of FIG. 12, taken at 24-24;
- [035] FIG. 25 is a cross-sectional view of the mounting system of FIG. 12, taken at 25-25;
- [036] FIG. 26 is a magnified partial cross-sectional view of the rail of FIG. 14, taken at 26-26;
- [037] FIG. 27 is a magnified partial cross-sectional view of the rail of FIG. 15, taken at 27-27;
- [038] FIG. 28 is a front top perspective view of a bracket disclosed herein in the closed configuration;
- [039] FIG. 29 is a back top perspective view of the bracket of FIG. 28 in the closed configuration;
- [040] FIG. 30 is a top plan view of the bracket of FIG. 28 in the closed configuration;
- [041] FIG. 31 is a bottom plan view of the bracket of FIG. 28 in the closed configuration;
- [042] FIG. 32 is a front plan view of the bracket of FIG. 28 in the closed configuration;
- [043] FIG. 33 is a back plan view of the bracket of FIG. 28 in the closed configuration;
- [044] FIG. 34 is a first end plan view of the bracket of FIG. 28 in the closed configuration;
- [045] FIG. 35 is a second end plan view of the bracket of FIG. 28 in the closed configuration;
- [046] FIG. 36 is a front top perspective view of the bracket of FIG. 28 in the open configuration;

- [047] FIG. 37 is a back top perspective view of the bracket of FIG. 28 in the open configuration;
- [048] FIG. 38 is a top plan view of the bracket of FIG. 28 in the open configuration;
- [049] FIG. 39 is a bottom plan view of the bracket of FIG. 28 in the open configuration;
- [050] FIG. 40 is a front plan view of the bracket of FIG. 28 in the open configuration;
- [051] FIG. 41 is a back plan view of the bracket of FIG. 28 in the open configuration;
- [052] FIG. 42 is a first end plan view of the bracket of FIG. 28 in the open configuration;
- [053] FIG. 43 is a second end plan view of the bracket of FIG. 28 in the open configuration;
- [054] FIG. 44 is an exploded front top perspective view of a bracket disclosed herein;
- [055] FIG. 45 is an exploded back top perspective view of the bracket of FIG. 44;
- [056] FIG. 46 is an exploded back perspective view of the bracket adaptor disclosed herein, illustrating attachment of the bracket adaptor to the bracket of FIG. 44;
- [057] FIG. 47 is an exploded front perspective view of the bracket adaptor of FIG. 46, illustrating attachment of the bracket adaptor to the bracket of FIG. 44;
- [058] FIG. 48 is a first side view of a latching pin disclosed herein;
- [059] FIG. 49 is a second side view of the latching pin of FIG. 48;
- [060] FIG. 50 is a side view of a latch bolt disclosed herein;
- [061] FIG. 51 is a cross-sectional top perspective view of the bracket of FIG. 34, showing the bracket in the closed and locked or unlatched configuration, with rotating tab slightly pulled from its recess and ready for rotation;
- [062] FIG. 52 is a cross-sectional top perspective view of the bracket of FIG. 42, showing the bracket in the closed and unlocked or unlatched configuration and ready for opening;
- [063] FIG. 53 is a cross-sectional top perspective view of the bracket of FIG. 42, taken at 53-53, showing the bracket in the open and unlocked or unlatched configuration;

[064] FIG. 54 is a cross-sectional top perspective view of the bracket of FIG. 34, taken at 54-54, showing the bracket in the closed and relocked or re-latched configuration;

[065] FIG. 55 is a front top perspective view of a bracket having a hinged coupler disclosed herein;

[066] FIG. 56 is a back top perspective view of the hinged coupler of FIG. 55;

[067] FIG. 57 is an exploded front top perspective view of the hinged coupler of FIG. 55;

[068] FIG. 58 is a cross-sectional side plan view of the hinged coupler of FIG. 55, taken at 58-58, showing detent assembly;

[069] FIG. 59 is a first side plan view of the socket of the hinged coupler of FIG. 55, showing hinged coupler in a first angular position;

[070] FIG. 60 is a first side plan view of the socket of the hinged coupler of FIG. 55, showing hinged coupler in a second angular position;

[071] FIG. 61 is a first side plan view of the socket of the hinged coupler of FIG. 55, showing hinged coupler in a third angular position;

[072] FIG. 62 is an exploded front top perspective view of a latching socket and inner knuckle of the hinged coupler of FIG. 55;

[073] FIG. 63 is an exploded front bottom perspective view of a latching socket and inner knuckle of the hinged coupler of FIG. 55;

[074] FIG. 64 is a top plan view of the socket of the hinged coupler of FIG. 55, showing latching pins in a locked position;

[075] FIG. 65 is a top plan view of the socket of the hinged coupler of FIG. 55, showing latching pins in an unlocked position;

[076] FIG. 66 is a front plan view of a coupler disclosed herein;

[077] FIG. 67 is a side plan view of the coupler of FIG. 66;

[078] FIG. 68 is a front plan view of a coupler disclosed herein;

[079] FIG. 69 is a front top perspective view of the coupler of FIG. 68;

[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 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 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 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 proper 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 sloped 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

device **D**, enhancing the seal and protecting against device **D** against the external environment like moisture. Further, a ridge **107** formed adjacent to inner perimeter extending orthogonally from against device **D**, such that against device **D** is protected from impact due to ridge **107** protruding above against device **D**.

[114] In embodiments where top cover **86** and bottom cover **98** are present in device case **56**, **FIGS. 24 & 25**, top and bottom perimeters of gasket member **94** can optionally comprise a groove or step **106** to receive top and bottom covers **86, 98**. In addition, gasket member **94** can be configured to fold over perimetral edges of top and bottom covers **86, 98** at groove or step **106**, 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 top and bottom covers **86, 98**, enhancing the water-tight seal like a water-resistant seal or waterproof seal in device case **56**. Further, a ridge **107** formed adjacent to inner perimeter extending orthogonally from the plane of top cover **86** and bottom cover **98**, such that top cover **86** and bottom cover **98** are protected from impact due to ridge **107** protruding above top cover **86** and bottom cover **98**.

[115] **FIGS. 18-23** illustrate an embodiment for sealing the various data, audio, power, etc. jacks of present on device **D**, yet permitting access to these jacks without compromising the waterproof or water-resistant properties of device case **56**. As shown in **FIG. 20**, a portion of one or more of first frame member **88**, second frame member **90**, and sidewall frame member **92** are concavally shaped to form a mortise portion **342** configured to receive a tenon portion **344** of sealing plate **87**. Sidewall frame member **92** includes an opening configured to receive sealing plate **87**. In some embodiments, and as shown in **FIG. 18 & 21**, sidewall frame member **92** includes through ports **338, 340, 341** configured to receive sealing plate **87** in a manner where sealing plate **87** is in direct opposition to sidewall frame member **92**.

[116] As shown in **FIG. 20**, sealing plate **87** is configured to be detachably connected to device case **56** by threading screws **100'** through sealing plate **87** and into threaded holes **334** and **336**. As shown in **FIGS. 20 & 21** sealing plate **87** includes through ports **326** and **328** formed through sealing plate **87** to permit insertion therethrough various cables for connection to various jacks **J1** and **J2** of device **D** (e.g., the audio jack, the data and/or power jack, etc.). Sealing plate **87** can also include through ports **82** and **84** formed through sealing plate **87** to permit sound therethrough, for example, sound emanating from a speaker of device **D** or sound being picked up by a microphone present on device **D**. Hollow bosses **322** and **324** extend from a back portion of sealing plate **87** and are in alignment with through ports **326** and **328**, respectively. Through ports **338, 340** are configured to received therein hollow bosses **322** and **324**.

[117] Referring now to **FIGS. 20-23**, in some embodiments, leading edges **330** and **332** of each of hollow bosses **322** and **324** of sealing plate **87** are configured to be pushed against gasket member **94**, with leading edges **330** and **332** deforming gasket member **94** so that a leak-tight seal is formed between through ports **322** and **324** and gasket member **94**. Through ports **326** and **328** can be threaded and receive sealing caps **77** and **80**. Each of sealing caps **77** and **80** include an O-ring **312, 314** to provide a leak-tight seal between sealing caps **77** and **80** and their respective through ports **326** and **328**. Lanyard

89 is tied about each of sealing caps **77** and **80** connecting the two, yet permitting independent twisting of each of caps **77** and **80** so that one can be threaded in and out without affecting the other.

[118] Referring to **FIG. 21**, in some embodiments, gasket member **94** includes hollow portions **346** and **348** which are formed partially through gasket member **94**, leaving a thin, yet water-proof wall to permit sound to travel therethrough, for communications through a microphone/speaker port **P**. Ports **82** and **84** align with hollow portions **346** and **348** to permit transmission of sound therethrough. Looking more closely at screws **100'**, which fasten sealing plate **87** to sidewall frame member **92** by threading into threaded inserts **105**.

[119] **FIGS. 18, 26 & 27** illustrate button inserts **96** which can selectively be brought into contact with respective button protrusions **B** formed on gasket member **94**, which permit pushing of various buttons on device **D** while still maintaining a water resistant or waterproof properties of device case **56**. For example, button insert **96'** contacts protrusion **358** on gasket member **94** for activating button **B1** once pushed in by a user. Likewise, button inserts **96''** and **96'''** contact protrusions **356** and **354** on gasket member **94**, respectively, control a rocket switch **B2**. Also, button insert **96''''** contacts protrusion **360** on gasket member **94** for activating button **B3** once pushed in by a user.

[120] Looking at **FIGS. 28-45**, an exemplary example of bracket **54** is illustrated. Bracket **54** includes first jaw member **70** comprising an inner surface and an outer surface **154** and second jaw member **72** comprising an inner surface and an outer surface **156**. Inner surface of first jaw member **70** comprises a first clamping portion **122** including one or more engagement bosses **74** and a first mating portion **150**. Inner surface of second jaw member **72** comprises a second clamping portion **124** including one or more engagement bosses **75** and a second mating portion **152**. Bracket **54** can also include a back plate **73** spanning between first jaw member **70** and second jaw member **72**.

[121] In preferred embodiments, first clamping portion **122** of first jaw member **70** comprises two engagement bosses **74, 74'** and second clamping portion **124** of second jaw member **72** comprises two engagement bosses **75, 75'**. First jaw member **70** and second jaw member **72** are fixed together in a clamping arrangement, with first jaw member **70** and second jaw member **72** configured to slidably translate toward or away from one another. This movement brings first clamping portion **122** including one or more engagement bosses **74** of first jaw member **70** toward or away from the corresponding second clamping portion **124** including one or more engagement bosses **75** of second jaw member **72**. Because first clamping portion **122** including one or more engagement bosses **74** are opposed to second clamping portion **124** including one or more engagement bosses **75**, their respective first and second jaws **70, 72** are configured to be brought toward each other in a clamp-like action. Insertion, or even partial insertion, of one or more engagement bosses **74, 75** into their respective one or more engagement slots **58** creates a strong clamping engagement between bracket **54** and rail **52**, preventing separation of the two even under great force.

[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**.

[125] Referring to FIGS. 29, 33, 37, & 41 back plate 73 of bracket 54, extending cantilevered from first jaw member 70, provides additional guidance and strength to bracket 54 as it is clamped down on rail 52 and opened to release bracket from rail 52. Back plate 73 includes one or more adaptor attachment points 123, for securing another device or component thereof to bracket 54 using compatible mounting systems. Back plate 73 also comprises indexing holes 120, 121 to facilitate proper orientation of another device or component thereof being attached to back plate 73 as well as to prevent misalignment of an attached device or component thereof while secured to bracket 54. 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.

[126] Back plate 73 comprising one or more adaptor attachment points 123 and indexing holes 120, 121 can be employed to attach an adaptor to bracket 54. In some embodiments, and as shown in FIGS. 46 & 47, a bracket adaptor A1, in this case, a GoPro adaptor, comprises an adaptor screw 400 and an adaptor base 410, where adaptor base 410 is secured to back plate 73 by threading adaptor screw 400 into attachment point 123. Adaptor screw 400 comprises a disc 402 having a top surface 404 and a bottom surface 406 and a threaded portion 408 centrally located on bottom surface 406 and extending perpendicularly from the bottom surface 406. Adaptor base 410 comprises a top surface 412, a bottom surface 414, an attachment portion 416 and a through hole 419 configured to align with attachment point 123 once adaptor base 410 is properly oriented to back plate 73. Bottom surface 414 includes a first protrusion 420 and a second protrusion 421 extend perpendicularly from bottom surface. First and second protrusions 420, 421 are configured to align and insert into indexing holes 120, 121 in a manner that properly orientates adaptor A1 to back plate 73 and prevents misalignment while secured.

[127] A bracket adaptor, *e.g.*, bracket adaptor A1, can further comprise a detent mechanism to controllably rotate and temporarily fix the rotation of adaptor screw 400 relative to back plate 73 of bracket 54. In some embodiments, detent mechanism includes a detent plunger or equivalent mounted to bracket adaptor A1 and one or more detents 418 (hemispherical depressions formed as concavities) positioned on an underside portion of adaptor screw 400. In some embodiments, and as discussed above, detent plunger include a detent cylinder comprising an open end 424 and an open threaded end opposite open end 424, and a detent ball and a detent compression spring. The detent ball and the detent compression spring are captured within the detent cylinder by a set screw secured to the open threaded end, with the detent compression spring outwardly biasing the 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. One or more detent plungers are located on a side that will be in contact with of the underside portion of adaptor screw 400. One or more detents 418 of adaptor screw 400 are aligned in a manner that the detent ball protruding from an open end 424 will be seated in each of the one or more detents 418 as adaptor screw 400 is screwed into attachment point 123 and the underside portion of adaptor screw 400 comes into close proximity to the side of adaptor A1 that will be in contact with of the underside portion of adaptor screw 400. This detent mechanism ensures that bracket adaptor A1 will remain secured in place and adaptor screw 400 will not become loosened over time.

[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 in 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 through 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 in **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 through 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 second 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

member **72**, with a small diameter portion **118'** intersecting latching pin bore **144**. The full diameter portion of latch bolt bore **118** is configured to receive latch bolt **140**, latch bolt pin **174** first, with latch bolt pin **174** positioned within, and configured to slide within, the small diameter portion **118'**. A rotating tab **132** is fastened to an end **177** of latch bolt **140** by screw **134** into threaded hole **171**, and is permitted to rotate relative to latch bolt **140**. Optional detent structures are formed within a cup on rotating tab **132** and on end **177** on latch bolt **140**, which permits rotating tab **132** to rotate, yet give a user the option to stop rotation at the detent's discrete angles so that rotating tab **132** can be pushed or pulled, by deploying or stowing rotating tab **132** within a tab recess **133**. In this example embodiment, a detent ball assembly **131** includes four recesses **186** formed in rotating tab **132** and configured to each receive a detent ball **135** each pushed into respective recesses **186** by a spring **136** within a cup at an end of latch bolt **140**. As rotating tab **132** is rotated, recesses **186** move out of alignment with detent balls **135**, detent balls **135** are pushed against springs **136**, compressing them, until detent balls **135** realigns with neighboring recess **186**, catching detent balls **135** which also temporarily catches the motion of rotating tab **132**.

[140] In an example assembly method, latching pin **112** is fastened to first jaw member **70**. Guide pin **110** is fastened to second jaw member **72**. Jaw compression springs **166**, **168** are each seated within their respective locating holes. Latch bolt compression spring **170** is positioned within elongated channel **172** of latching bolt **140**. First jaw member **70** is initially manually coupled to second jaw member **72** by inserting latching pin **112** into latching pin bore **144** (guide pin **110** is not yet inserted). Jaw compression springs **166**, **168** are then manually compressed between first and second jaw members **70**, **72** to bring latch bolt hole **190** into alignment with small diameter portion **118'** of latch bolt bore **118**. While holding this alignment, latch bolt **140** is inserted into latch bolt bore **118** with elongated channel **172** facing toward second mating portion **152**, and with latch bolt pin **174** inserted through cylindrical latch bolt hole **190** and small diameter portion **118'**, with terminus **175** protruding externally from small diameter portion **118'**. Screw **114** is inserted through guide pin counterbore **146**, transversely through limiter slot **178** of elongated channel **172**, and threaded into guide pin **110** (where the guide pin **110** was inserted through guide pin bore **142** from the outside). In this manner, screw **114** traps latch bolt compression spring **170** between spring seat **184** and shank **115** and/or threads of screw **114**, with latch bolt bore **118** enclosing elongated channel **172** to restrict latch bolt compression spring **170** within elongated channel **172**.

[141] Once screw **114** is threaded into guide pin **110**, latch bolt **140** is trapped within latch bolt bore **118**. This is because screw **114** is inserted completely through limiter slot **178**, with screw **114** configured to traverse the length of limiter slot **178** (with latch bolt **140** being pushed or pulled relative to screw **114**, manually and by latch bolt compression spring **170**). As screw **114** reaches an end of limiter slot **178**, screw **114** shank or threads contacts one of limiter walls **180**, **181**, which checks the travel of latch bolt **140**. In this way, the travel (e.g., axial translation) of latch bolt **140** limited to the length of limiter slot **178**.

[142] Assembly of the components of bracket **54** create a positive latching mechanism by which first jaw member **70** is slidably translatable relative to second jaw member **72** by which bracket **54** can adopt a closed configuration (or locked configuration) or an open configuration (or unlocked configuration). In an open or unlocked configuration, as shown in FIGS. 36-43, 52 & 53, latch bolt **140** is retracted and against

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

inadvertent unlocking events, due to a user having to both push terminus **175** to expose rotating tab **132** and then pulling rotating tab **132** fully pull out latch bolt **140** to open bracket **54** (i.e., the open or unlocked configuration).

[146] Jaw compression springs **166**, **168** apply a continuous bias to separate first jaw member **70** and second jaw member **72**, the motion of which is checked by latch bolt pin **174**, with either terminus **175** being positioned within bolt channel **188** of latching pin **112** and/or latch bolt pin **174** positioned within latch bolt hole **190** of latching pin **112**. When latch bolt pin **174** is positioned within latch bolt hole **190**, bracket **54** is in the locked configuration, where first jaw member **70** and second jaw member **72** are in close proximity to one another. Once latch bolt pin is removed from latch bolt hole **190** to position terminus **175** within bolt channel **188** of latching pin **112**, first jaw member **70** with attached latching pin **112** is permitted to travel away from second jaw member **72**. The distance of travel of latching guide pin **112** is limited by the length of bolt channel **188**.

[147] As a user pulls rotating tab **132**, jaw compression springs **166**, **168** push first and second jaw members **70**, **72** apart, snapping to the open configuration where first and second jaw members **70**, **72** are furthest away from one another. As latching pin **112** moves relative to terminus **175**, latch bolt pin **174** become misaligned with latch bolt hole **190** of latching pin **112** and become aligned with bolt stop **196** latching pin **112** (which is, in this example embodiment, the floor of bolt channel **188**). Thus, when a user releases rotating tab **132**, latch bolt compression spring **170** within latch bolt **140** forces terminus **175** into contact with bolt stop **196**. So long as latch bolt pin **174** is at least partially misaligned with latch bolt hole **190**, latch bolt **140** will protrude from latch bolt bore **118**, holding rotating tab **132** out from body of bracket **54**.

[148] To lock (or latch) bracket **54** (on rail **52** or in isolated), a user manually pinches first jaw member **70** toward second jaw member **72**. As terminus **175** slides across bolt stop **196** of latching pin **112**, latch bolt pin **174** becomes aligned once again with latch bolt hole **190** (due to the latching guide pin **112** moving deeper within latching pin bore **144**), latch bolt compression spring **170** (still under compression within elongated channel **172**) immediately forces latch bolt pin **174** through latch bolt hole **190**, immediately locking first and second jaw members **70**, **72** together.

[149] As discussed briefly above, rotating tab **132** is capable of rotating relative to latch bolt **140** when rotating tab **132** is pushed out of tab recess **133**, to permit a user to reposition rotating tab **132** so rotating tab **132** can be easily pulled away from body of bracket **54**. While within tab recess **133**, rotating tab **132** is substantially restricted from rotating, due to mechanical interference of tab recess **133**. Thus, once rotating tab **132** is rotated to align it with tab recess **133**, terminus **175** of latch bolt pin **174** is permitted to push back through small diameter portion **118'** of latch bolt bore **118**, protruding from body of bracket **54**. As best shown in FIGS. **51 & 54**, although terminus **175** is described as protruding from body of bracket **54** to serve as a button, terminus **175** may protrude from a button recess **119** formed in body of bracket **54** surrounding opening small diameter portion **118'** of latch bolt bore **118**. The distance of the protrusion

of terminus **175** of latch bolt pin **174** is less than the depth of button recess **119**, so that inadvertent depression of terminus **175** is substantially prevented.

[150] At least one of the purposes of bracket **54** is to create a connection between rail **52** and one or more devices or components thereof (e.g., a camera, a compass, an altimeter, a GPS unit, a night vision goggle (NVG), a battery pack, and/or a large variety of electronic and analog devices and other equipment), where bracket **54** connects directly to the device or component thereof or to the device or component thereof through a positioning arm, a rotating joint, a tilting joint, a hinge joint, a branched arm, and/or a variety of appropriate connectors and/or couplers and the like.

[151] The present specification also discloses alternate embodiments of bracket **54**. As shown in **FIGS. 55 & 56**, a bracket **54'** can comprise a hinged coupler **197**. In this example, bracket **54'** attaches to rail **52** in the same manner (or substantially the same, if modifications are required to accommodate hinged coupler **197**). As such, in this embodiment, bracket **54'** comprises a first jaw **70'**, a second jaw **72'**, and a back plate **73'** along with all components thereof, and functionality thereof as described herein and illustrated in **FIGS. 28-54**. In some embodiments, bracket **54'** can comprise hinged coupler **197** positioned on first jaw member **70'** or second jaw member **72'**. In some embodiments, bracket **54'** can comprise two hinged couplers **197**, with a first hinged coupler **197** positioned on first jaw member **70'** and a second hinged coupler **197'** positioned on second jaw member **72'**.

[152] As best shown in **FIGS. 55-57**, hinged coupler **197** comprises a coupler base **199** and a latching socket **202**. Coupler base **199** includes a first outer knuckle **204**, a second outer knuckle **206**, and a hinge pin **200**. As discussed below, first outer knuckle **204**, second outer knuckle **206**, and hinge pin **200** are used to rotatably connect latching socket **202** to hinged coupler **197**. In some embodiments, coupler base **199** of hinged coupler **197** is integrally formed on first and/or second jaw members **70'**, **72'** as a single component by any known mechanism or process, such as, e.g., by being molded, cast, machined, etc. In some embodiments, coupler base **199** of hinged coupler **197** is a separate component that is attached to first and/or second jaw members **70'**, **72'** by any known mechanism or process, such as, e.g., by being welded, brazed, adhered, screwed, or other appropriate fastening means). In some embodiments, and as illustrated in **FIGS. 55 & 58**, a surface of coupler base **199** is contoured to the shape of hinged coupler **197** to provide a fitted seat of hinged coupler **197** when in close proximity to coupler base **199**.

[153] Referring to **FIG. 57**, latching socket **202** includes a socket body **203** including a cylindrical drum portion **212**, an inner knuckle **208** including a cylindrical sleeve portion **210**, a first latching pin **224**, a second latching pin **226**, a first latching spring **241**, a first latching spring **245**, and a coupler **243**. Inner knuckle **208** of latching socket **202** rotatably connects to coupler base **199** through hinge pin **200** passing through a hole **205** of first outer knuckle **204**, a hole **207** of second outer knuckle **206**, and a hole **209** of inner knuckle **208**. In some embodiments, hinge pin **200** is a single piece. In some embodiments, and as shown in **FIG. 57**, hinge pin **200** is a two-part piece that screws together in order to properly attach inner knuckle **208** coupler base **199**.

[154] Hinge pin **200** permits inner knuckle **208** to rotate about coupler base **199**. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 90 degrees to about 270 degrees. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 135 degrees to about 270 degrees. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 135 degrees to about 225 degrees. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 180 degrees to about 225 degrees. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 90 degrees to about 180 degrees. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 180 degrees to about 225 degrees. In some embodiments, the range of angular rotation of latching socket **202** about coupler base **199** is about 135 degrees to about 180 degrees.

[155] Inner knuckle **208** of hinged coupler **197** can be rotated relative to coupler base **199** in a controlled and temporarily fixed position, such as, *e.g.*, a locking mechanism, a friction hinge, or other appropriate means to control or catch the rotation of inner knuckle **208**. In some embodiment, hinged coupler **197** comprises a detent mechanism to controllably rotate and temporarily fix the rotation of inner knuckle **208** relative to coupler base **199**. In some embodiments, detent mechanism includes one or more detent plungers or equivalent mounted to coupler base **199** and one or more detents (hemispherical depressions formed as concavities) positioned on inner knuckle **208**. In some embodiments, as discussed above, detent plunger includes a detent ball captured in a cylinder and spring loaded to bias the detent ball toward the open end of the cylinder.

[156] An exemplary embodiment of a detent mechanism to controllably rotate and temporarily fix the rotation of inner knuckle **208** relative to coupler base **199** is shown in FIGS. 57 & 58. As shown in FIG. 57, inner knuckle **208** includes two parallel rows of detents **218**, **220** positioned about at least a portion of the circumference of the cylindrical surface of inner knuckle **208**. In some embodiments, two parallel rows of detents **218**, **220** are annularly spaced apart and aligned. In some embodiments, each of two parallel rows of detents **218**, **220** comprise 1 to 20 detents, such as, *e.g.*, 4 to 12 detents, 6 to 12 detents, 8 to 12 detents, 4 to 16 detents, 6 to 16 detents, 8 to 16 detents, 10 to 16 detents, 12 to 16 detents, 4 to 20 detents, 6 to 20 detents, 8 to 20 detents, 10 to 20 detents, 12 to 20 detents, or 16 to 20 detents. In some embodiments, as shown in FIG. 57, detents **218**, **220** are the same or similar size. In some embodiments, as shown in FIGS. 62 & 63 detents **218**, **220** can be of two or more different sizes.

[157] In some embodiments, coupler base **199** comprises a first detent plunger **270** and a second detent plunger **270'**. Referring to FIG. 58, each of detent plungers **270**, **270'** comprises a detent cylinder **274** including an open end **278** and a closed end **276** opposite open end **278** and a detent ball **280** and a detent compression spring **282**. Detent ball **280** and detent compression spring **282** are captured in detent cylinder **274**, with detent compression spring **282** loaded to outwardly bias detent ball **280** toward open end **278** of detent cylinder **276** in a manner that causes detent ball **280** to protrude from open end **278** of detent cylinder **276**. First and second detent plungers **270**, **270'** are positioned inside of first and

second outer knuckles **204**, **206** respectively and in a manner where the outwardly biasing first and second detent balls **280** are directed toward and in contact with inner knuckle **208**, with first detent ball **280** in alignment with parallel row of detents **218** in a manner where detent ball **280** is seated in one detent of row of detents **218**, and second detent ball **280** in alignment with parallel row of detents **220** in a manner where detent ball **280** is seated in one detent of row of row of detents **220**.

[158] A detent mechanism disclosed herein enables the radial or angular position of inner knuckle **208** relative to coupler base **199** to be incrementally controlled and arrested at any one of the detents in the series, acting as incremental catches. Rotation or angular positions are controlled by the spacing of detents **218**, **220**. In addition, factors such as spring constant of detent compression spring **282** and the depth of detents **218**, **220** control the degree of force required to change the position of inner knuckle **208**.

[159] Examples of some of the rotation or angular positions possible with latching socket **202** relative to coupler base **199** using a detent mechanism disclosed herein are illustrated in **FIGS. 59-61**. In **FIG. 59**, latching socket **202** is adjusted to a first angular position approximately corresponding to 9 o'clock. In **FIG. 60**, latching socket **202** is adjusted to a second angular position approximately corresponding to 2 o'clock. In **FIG. 61**, latching socket **202** is adjusted to a third angular position approximately corresponding to 10 o'clock. Of course other angular positions are possible. For example, in the illustrated example embodiment, the range of angular rotation is between 9 o'clock and 6 o'clock (e.g., 270 degrees) with one or more catch points to temporarily arrest the motion of the latching socket **202** relative to coupler base **199**.

[160] In addition to rotation of inner knuckle **208** relative to coupler base **199**, inner knuckle **208** of hinged coupler **197** can also be rotated relative to latching socket **202**. In some embodiments, inner knuckle **208** of hinged coupler **197** can be rotated relative to latching socket **202** in a controlled and temporarily fixed position, such as, e.g., a locking mechanism, a friction hinge, or other appropriate means to control or catch the rotation of latching socket **202**. In some embodiment, and similar to the detent mechanism described above, hinged coupler **197** comprises a detent mechanism to controllably rotate and temporarily fix the rotation of latching socket **202** relative to inner knuckle **208**. In preferred embodiments, complete or 360 degrees of rotation is enabled.

[161] An exemplary embodiment of a detent mechanism used to controllably rotate and temporarily fix the rotation of latching socket **202** relative to inner knuckle **208** is shown in **FIGS. 62 & 63**. As shown in **FIGS. 62 & 63**, inner knuckle **208** comprises a barrel portion **207** and a cylindrical sleeve portion **210** which extends perpendicularly from barrel portion **207**. Cylindrical sleeve portion **210** comprises a bottom which includes a centrally located threaded hole **214** and one or more detent cylinders positioned around the threaded hole, the one or more detent cylinders used to assembly one or more detent plungers. Latching socket **202** contains a through hole **216** configured to receive therethrough a screw **217** and a bottom surface of cylindrical drum portion **212** includes ring of detents **218** positioned about at least a portion of the circumference of cylindrical drum portion **212**. In assembly, cylindrical sleeve **210** of

inner knuckle **208** is configured to receive a cylindrical drum portion **212** of latching socket **202** and screw **214** is inserted past through hole **216** of latching socket **202** and secured into threaded hole **214** of inner knuckle **208**. In some embodiments, ring of detents **218** 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, as shown in FIG. 60, detents **218** are the same or similar size. In some embodiments, ring of detents **218** can be of two or more different sizes.

[162] In some embodiment, four detent plungers **270**, **270'**, **270''**, **270'''** are located at a bottom portion of cylindrical sleeve **210**. Referring to FIGS. 62 & 63, each of detent plungers **270**, **270'**, **270''**, **270'''** comprises a detent cylinder **274** including an open end **278** and a closed end **276** opposite open end **278** and a detent ball **280** and a detent compression spring **282**. Detent ball **280** and detent compression spring **282** are captured in detent cylinder **274**, with detent compression spring **282** loaded to outwardly bias detent ball **280** toward open end **278** of detent cylinder **276** in a manner that causes detent ball **280** to protrude from open end **278** of detent cylinder **276**. Detent plungers **270**, **270'**, **270''**, **270'''** are positioned in a manner where the outwardly biasing detent balls **280** are directed toward and in contact with latching socket **202**, with each detent ball **280** in alignment with ring of detents **218** in a manner where each of detent balls **280** is seated in one detent of ring of detents **218** of latching socket **202**.

[163] A detent mechanism disclosed herein enables the rotational position of latching socket **202** relative to inner knuckle **208** to be incrementally controlled and arrested at any one of the detents in the series, acting as incremental catches. Rotation or angular positions are controlled by the spacing of detents of ring of detents **218**. In addition, factors such as spring constant of detent compression spring **282** and the depth of detents **218** control the degree of force required to change the position latching socket **202**.

[164] As shown in FIG. 57, distal end of latching socket **202** includes a socket **222** configured to receive an arm or other coupler therewithin. In this example embodiment, socket **222** is a hexagonal-shaped socket for receiving a hexagonal head **244** of a coupler **243**, which prevents rotation between socket **222** and coupler **243**. However, other socket shapes are compatible with latching socket **202**, including circular, elliptical, polygonal, unique shapes, and other shapes which may allow or restrict rotation of the coupler. As shown in FIG. 57, on each inner side or at least one inner side of socket **222**, parallel latching pin bores **247**, **249** hold corresponding latching pins **224**, **226** in place. As shown in FIG. 57, latching pins **224**, **226** each include a first end **236**, a second end **238** opposite first end **236**. Second end **238** of latching pins **224**, **226** includes a blind hole to form a spring cup (see hole at second end **238** of latching pin **226**). One end of compression spring **241**, **245** are seated in the spring cups of latching pins **224**, **226** respectively. The diameter or circumference of the spring cup of latching pins **224**, **226** is smaller than the diameter or circumference of latching pins **224**, **226** and configured to house compression spring **241**, **245**. Latching pins **224**, **226** can also include a shoulder **239** formed near and spaced apart from first end **236**. In some embodiments, shoulder **239** is oblong or oval in cross-section

shape and serves to prevent rotation of latching pins **224**, **226** within a similarly oblong or oval in cross-section shape of latching pin bores **247**, **249**. Latching pins **224**, **226** can also include a limiter slot **228** near first end **238** formed longitudinally through shoulder **239**.

[165] As shown in FIG. 57, latching pins **224**, **226** can also include a keyway cutout **230** a notch formed longitudinally through and parallel with the length of the body of latching pins **224**, **226**. Each of latching pins **224**, **226** include the same or similar keyway cutout **230** shape. In addition, the shape of keyway cutout **230** is configured to be the same or substantially similar to a portion of the perimeter or circumferential shape of socket **222** and/or coupler **243**. For instance, in the illustrated example of FIG. 57, socket **222** and/or coupler **243** are hexagonal in shape and keyway cutout **230** of latching pins **224**, **226** each have a shape that is the same or substantially the same to one-half of a hexagon, *i.e.*, three sides of a hexagon. In addition, each of keyway cutout **230** of latching pins **224**, **226** is configured to be arranged opposite to one another, so that latching pins **224**, **226** can be moved within their respective latching pin bores **247**, **249** so that each keyway cutout **230** aligns with the interior wall of socket **222** so that socket **222** is unobstructed by any portion of latching pins **224**, **226** (as shown in FIG. 68). In this way, latching pins **224**, **226** do not protrude (or minimally protrude) into socket **22**, such that coupler **243** can be fully inserted or removed from socket **222** without substantial mechanical interference.

[166] Referring to FIGS. 57, 64, 65, second end **238** of latching pin **224** extends toward a spring cylinder **242** while second end **238** of latching pin **226** extends toward a spring cylinder **240**. Each of spring cylinders **240**, **242** includes a blind hole located internally at the back end of latching pin bores **247**, **249** to form a spring cup (not shown). One end of compression spring **241**, **245** are seated within the spring cups at the back end of latching pin bores **247**, **249** respectively. The diameter or circumference of the spring cup is generally smaller than the diameter or circumference of latching pin bores **247**, **249** and is configured to house compression spring **241**, **245**. Thus, when hinged coupler **197** assembled, one end of compression spring **241**, **245** are seated within the spring cups at the back end of latching pin bores **247**, **249** respectively while the opposite end of compression spring **241**, **245** are seated in the spring cups of latching pins **224**, **226** respectively. In this configuration, spring cylinder **240** holds a compression spring **245** of latching pin **226** in a manner that compression spring **245** bias latching pin **224** outward from spring cylinder **240**. Similarly, spring cylinder **242** holds a compression spring **241** of latching pin **224** in a manner that compression spring **241** bias latching pin **226** outward from spring cylinder **242**.

[167] Referring to FIG. 57, spring bias of compression spring **245** is limited by a pin **232** (which can be threaded) held within a pin hole **234** of spring cylinder **242**. Pin **232** extends perpendicularly through the housing of spring cylinder **242**, into latching pin bore **249** and in close proximity or in contact with limiter slot **228** of latching pin **226**, such that as latching pin **226** move within latching pin bore **249**, latching pin **226** movement is limited by the distance defined by limiter slot **228**. Similarly, spring bias of compression spring **241** is limited by a pin **231** (which can be threaded) held within a pin hole **233** of spring cylinder **240**. Pin **231** extends perpendicularly through the housing of spring cylinder **240**, into latching pin bore **247** and in close proximity or in contact with limiter slot **228** of latching pin **224**, such that as latching pin

224 move within latching pin bore **247**, latching pin **224** movement is limited by the distance defined by limiter slot **228**.

[168] Referring to **FIG. 57**, coupler **243** comprises a body **249**, one or more circumferential grooves **248**, and one or more heads **244**, each including a leading edge **246** and a shoulder **250**. Coupler **243** can be of any length with most of this length variation due to the length of body **249**. In preferred embodiments, and as illustrated in **FIG. 57**, coupler **243** comprises a centrally located body **249** with a first end and a second end, where a first head **244** located at the first end of body **249**, a second head **244** located at the second end of body **249**, and where a first circumferential groove **248** is located in between the first end of body **249** and first head **244** and a second circumferential groove **248'** is located in between the second end of body **249** and second head **244'**.

[169] Although body **249** of coupler **243** is illustrated as a linear component with first and second ends, body **249** can furcate into two or more branches, where a terminus of each branch includes head **244'**, each configured for selectively receiving an accessory. In some embodiments, coupler **243** is comprised of three bodies **249** each having a terminus and arranged, e.g., in a T-shaped or Y-shaped configuration, with head **244'** located at each terminus. In some embodiments, coupler **243** is comprised of four bodies **249** each having a terminus and arranged, e.g., in a x-shaped or cross-shaped configuration, with head **244'** located at each terminus. In some embodiments, coupler **243** is comprised of five bodies **249** each having a terminus and arranged, e.g., in a star-shaped configuration, with head **244'** located at each terminus.

[170] The perimeter or circumferential shape of at least one or more heads **244** is configured to conform or substantially conform to the perimeter or circumferential shape of socket **222**, although as shown in **FIG. 57** the perimeter or circumferential shape of all or substantially all of coupler **243** conform to the perimeter or circumferential shape of socket **222**. As shown in example embodiment of **FIG. 57**, first and second heads **244**, **244'** each have a perimeter or circumferential shape that is hexagonal and conform or substantially conform to the perimeter or circumferential shape of socket **222**. Similarly, perimeter or circumferential shape of body **249** of coupler **243** is hexagonal and conforms or substantially conforms to the perimeter or circumferential shape of socket **222**. However, as with socket **222**, the perimeter or circumferential shape of heads **244** as well as the perimeter or circumferential shape of all or substantially all of coupler **243** can be any shape, including circular, elliptical, polygonal, unique shapes, and other shapes so long as that shape conforms or substantially conforms to the perimeter or circumferential shape of socket **222**.

[171] As illustrated in **FIGS. 66-71**, while at least one or more heads **244** is configured to conform or substantially conform to the perimeter or circumferential shape of socket **222**, one or more other heads can be configured to receive alternative sockets or adaptors. In some embodiments, and as illustrated in **FIGS. 66 & 67**, while head **244** is configured to conform or substantially conform to the perimeter or circumferential shape of socket **222**, head **244'** is configured as an adaptor **A1**, in this case, a Go-Pro adaptor. In some embodiments, and as illustrated in **FIGS. 68 & 69**, while head **244** is configured to

conform or substantially conform to the perimeter or circumferential shape of socket **222**, head **244'** is configured as an adaptor **A2**, in this case, a screw adaptor.

[172] In some embodiments, and as illustrated in **FIGS. 70 & 71**, while head **244** is configured to conform or substantially conform to the perimeter or circumferential shape of socket **222**, head **244'** is configured as an adaptor **A3**. As shown in **FIGS. 70 & 71**, adaptor **A3** comprises inner knuckle **208** comprises a barrel portion **207** with a first end and a second end and a coupler **243** which extends perpendicularly from barrel portion **207**. Device holder **308** extends from the first end of barrel portion **207** of inner knuckle **208** while device holder **310** extends from the second end of barrel portion **207** of inner knuckle **208**. Inner knuckle **208** of adaptor **A3** can be rotated about coupler base **199** relative to coupler base **199** in a controlled and temporarily fixed position as disclosed herein using, *e.g.*, a detent mechanism as disclosed herein. In some embodiments, device holders **308** is configured to receive and secure ground positioning system (GPS) device **D1**, and device holders **310** is configured to receive and secure compass **D2** and flashlight **D3**.

[173] Referring to **FIGS. 57, 64 & 65**, in operation, latching pins **224, 226** are each normally biased to push latching pin **226** into socket **222**, where edge **229** and locking edge **223** of each of latching pins **224, 226**, are located within socket **222**, in a misaligned configuration (as shown in **FIG. 64**). Radiused leading edge **246** (or beveled or otherwise configured obliquely) of coupler **243** is configured to obliquely contact beveled edge **229** (or radiused or otherwise configured obliquely) of latching pins **224, 226** as radiused leading edge **246** is inserted into socket **222**. Insertion of radiused leading edge **246** pushes each of latching pins **224, 226** laterally outward through latching pin bores **247, 249** so that radiused leading edge **246** is pushed past latching pins **224, 226**. When circumferential groove **248** of coupler **243** aligns with latching pins **224, 226**, circumferential groove **248** provides clearance for latching pins **224, 226** to immediately move inward through their respective latching pin bores **247, 249** back into the misaligned configuration, where locking edge **223** of each of latching pins **224, 226** is positioned within circumferential groove **248** and over shoulder **250** of coupler **243**. Because shoulder **250** and locking edge **223** have faces substantially parallel to one another, locking edge **223** prevents inadvertent withdrawal of coupler **243** due to locking edge **223** providing mechanical interference by contacting shoulder **250**.

[174] Coupler **243** is firmly held within socket **222** by latching pins **224, 226**. In order to remove coupler **243**, a user simultaneously presses on first ends **236, 237** of latching pins **224, 226**, pushing inwardly and toward socket **222**, as indicated by arrows **254** and **252** of **FIG. 65**; for example, by pinching with a forefinger and thumb. This positions latching pins **224, 226** back into the aligned configuration, where locking edge **223** is withdrawn from circumferential groove **248** and no longer remains in contact shoulder **250**, allowing coupler **243** to be freely removed from socket **222**.

[175] Coupler **243** selectively forms a connection between bracket **54'** and another component, *e.g.*, an accessory for a device, another device, or an adaptor or connector for another component. In particular, head **244** of coupler **243** inserts within socket **222** (as shown ready to occur in **FIG. 57**), with head **244'** at

the opposite end ready to receive a component having a socket like socket **222**. This entire assembly can also be mounted to rail **52** through bracket **54'**. A component includes, without limitation, a device, a flashlight, LED lights, armor back plates, knives, pepper spray, alarms, magnetic mounts, grip attachments permitting remote or local control of a device, any device-mounted accessory, sirens, tethers, lanyards, locks, mounts, suction cups, straps, timepieces, writing instruments, weapons, batteries, an attachment to motor vehicles or bicycles or aircraft, stationary or mobile object with clams, anything that attaches to a screw thread, and so on, or other mechanical or electronic component. Examples of screw threads include 1/4-20 UNC thread, a 3/8-16 UNC thread, or any other similar screw thread standards known in the art.

[176] Although latching socket **202** and hinged coupler **197** are shown in the illustrated embodiments as being connected or integral with one another and with bracket **54'**, each is useful in themselves and/or in connection with other devices, known or unknown. For example, hinged coupler **197** can be used in a variety of applications where one component is required to be rotated relative to a second component connected through hinged coupler **197**. In a further example, latching socket **202** can be used separately (e.g., without necessarily being permanently attached to another component) to temporarily attach to a second component.

[177] Aspects of the present specification can be described as follows:

1. A bracket comprising a) a first jaw member, the first jaw member comprising an inner surface including a first mating portion and a first clamping portion, the first clamping portion including one or more engagement bosses, b) a second jaw member, the second jaw member comprising an inner surface including a second mating portion and a second clamping portion, the second clamping portion including one or more engagement bosses, c) a pin assembly comprising a latching pin including a latch bolt hole and a guide pin, the latching pin and the guide pin being perpendicular to the first and second clamping portions of the first and second jaw members, and d) a latch bolt assembly comprising a latch bolt slidably insertable through a latch bolt bore, the latch bolt having a cylindrical body and including a first end and a second end, wherein the latch bolt assembly is housed in the second jaw member, wherein the pin assembly connects the first and second jaw members, wherein the pin assembly is configured to slidably translate the first and second jaw members toward one another in a first direction or away from one another in a direction opposite the first direction, and wherein the bracket can adopt an open configuration and a closed configuration.
2. The bracket of embodiment 1, wherein the latching pin is secured to the first jaw member and slidably insertable through a latching pin bore present on second jaw member,
3. The bracket of embodiment 1 or 2, wherein the guide pin is secured to the second jaw member and slidably insertable through a guide pin bore present on first jaw member.
4. The bracket of any one of embodiments 1-3, wherein the latch bolt assembly is located in a direction perpendicular to the second clamping portion of the second jaw member.
5. The bracket of any one of embodiments 1-4, further comprising one or more jaw compression springs, each of the one or more jaw compression springs including a first end and a second end, wherein the first end is seated in a locating hole present on the first mating portion of the first jaw

member and the second end is seated in a locating hole present on the second mating portion of the second jaw member, wherein one or more jaw compression springs provide a separating bias that forces the first jaw member and the second jaw member apart.

6. The bracket of any one of embodiments 1-5, wherein the latch bolt further comprises latch bolt spring that provides a separating bias that forces the latch bolt in a direction outward of latch bolt bore.
7. The bracket of any one of embodiments 1-6, wherein the latch bolt further comprises an elongated channel perpendicular to the longitudinal axis of the latch bolt, the elongated channel forming an enclosure to house the latch bolt spring.
8. The bracket of any one of embodiments 1-7, wherein the elongated channel further comprises a limiter slot.
9. The bracket of any one of embodiments 1-8, wherein the latch bolt further comprises a latch bolt pin protruding axially from the second end of the latch bolt, the latch bolt pin being cylindrical in shape and of smaller diameter than the cylindrical body of the latch bolt.
10. The bracket of any one of embodiments 1-9, wherein the latch bolt further comprises a rotating tab attached to the first end of the latch bolt.
11. The bracket of any one of embodiments 1-10, wherein when in the closed configuration, first and second jaw members are in close proximity to one another and the latch bolt is inserted in latch bolt hole of the latching pin.
12. The bracket of any one of embodiments 1-11, wherein when in the open configuration, first and second jaw members are apart from one another and the latch bolt is removed from latch bolt hole of the latching pin.
13. The bracket of any one of embodiments 1-12, wherein the one or more engagement bosses of the first clamping portions are two engagement bosses.
14. The bracket of any one of embodiments 1-13, wherein the one or more engagement bosses of the second clamping portion are two engagement bosses.
15. The bracket of any one of embodiments 1-14, further comprising a back plate and a back-plate recess, the back plate is cantilevered from the first jaw member and the back-plate recess is formed on the second jaw member.
16. The bracket of embodiment 15, wherein the back plate further comprises an attachment point and one or more indexing holes.
17. A device case comprising a) a first frame member, the first frame member including a first engagement surface comprising one or more engagement slots and a plurality of through holes, b) a second frame member, the second frame member including a second engagement surface comprising one or more engagement slots and a plurality of through holes, c) a sidewall frame member, the sidewall frame member including a 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.

18. The device case of embodiment 17, further comprising a plurality of inserts, each insert of plurality of inserts aligned with each paired through hole of the plurality of paired through holes from the first and second frame member.
19. The device case of embodiment 17 or 18, wherein a front inner perimeter the sidewall frame member includes a front ridge and a back inner perimeter the sidewall frame member includes a back ridge, the front ridge being inserted within a slot of first frame member and the back ridge being inserted within a slot of second frame member.
20. The device case of any one of embodiments 17-19, wherein the sidewall frame member further comprises an attachment point and one or more indexing holes.
21. The device case of any one of embodiments 17-20, wherein the gasket comprises one or more contacts protrusions, the one or more contacts protrusion located in the vicinity of one or more buttons present of the device to be encased.
22. The device case of any one of embodiments 17-21, wherein the gasket comprises one or more thin portions that are water-tight and located in the vicinity of one or more speaker or microphone ports present of the device to be encased.
23. The device case of any one of embodiments 17-22, further comprising a sealing plate, the sealing plate comprising one or more through ports.
24. The device case of embodiment 23, wherein a portion of the sidewall frame member is configured to receive the sealing plate.
25. The device case of embodiment 24, wherein a portion of the first frame member, the second frame member, or both the first and second frame members is configured to receive the sealing plate.
26. The device case of embodiment 23, wherein at least one of the one or more through ports include a sealing cap, the sealing cap comprising an O-ring.
27. The device case of embodiment 23, wherein at least one of the one or more through ports is located in the vicinity of one or more audio or power jacks present of the device to be encased.
28. The device case of any one of embodiments 17-27, further comprising one or more button inserts, the one or more button inserts being secured by the sidewall frame member.
29. An adaptor comprising a) an indexing plate, the indexing plate being disc-shaped and including a top surface, a bottom surface and a through hole centrally located in the indexing plate, the top surface of the indexing plate including a circular ring of detents positioned around the through hole, and the bottom surface of the indexing plate including one or more indexing pins extending perpendicularly from the bottom surface, b) an adaptor plate, the adaptor plate being disc-shaped and including a top surface, a bottom surface, the adaptor plate housing one or more detent plungers, the top surface of the adaptor plate including a coupler extending perpendicularly from the top surface, and the bottom surface of the adaptor plate including a threaded screw extending perpendicularly from the bottom

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

- 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.
37. The rail of embodiment 36, wherein the third engagement surface further comprises a plurality of through holes.
38. The rail of embodiment 36 or 37, further comprising a base support.
39. The rail of embodiment 38, wherein the base support comprises an adhesive layer on the side that will come in contact with a support.
40. The rail of embodiment 38, wherein the base support comprises one or more tabs configured for inserted into one or more pockets or pouches on a base support mount.
41. A mounting system comprising a) a device case of any one of embodiments 17-28, the sidewall frame member further comprises an attachment point and one or more indexing holes, and b) 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.
42. A hinged coupler bracket comprising a bracket of any one of embodiments 1-16 and further comprising a hinged coupler.
43. The hinged coupler bracket of embodiment 42, wherein the hinged coupler comprises a coupler base including a first outer knuckle and a second outer knuckle, an inner knuckle and a latching socket including a socket body and a socket formed within the socket body.
44. The hinged coupler bracket of embodiment 42 or 43, wherein the inner knuckle is rotatably coupled to the coupler base by a hinge pin inserted through the first outer knuckle, the inner knuckle and the second outer knuckle.
45. The hinged coupler bracket of any one of embodiments 42-44, wherein the coupler base further comprises a first detent plunger and a second detent plunger, the first and second detent plungers each 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 inner knuckle further comprises a first row of detents that are annularly spaced apart and aligned and a second row of detents that are annularly spaced apart and aligned, the first and second row of detents being parallel to each other, wherein the first and second detent plungers are aligned with the first and second row of detents respectively, in a manner that the detent ball protruding from the open end of the detent cylinder will be seated in a detent from the first and second row of detents, and wherein an angular position of the inner knuckle is selectively controlled when a detent from the first 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.
46. The hinged coupler bracket of embodiment 45, 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.

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.

51. The hinged coupler bracket of embodiment 50, 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.
52. The hinged coupler bracket of any one of embodiments 48-51, 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.
53. The hinged coupler bracket of any one of embodiments 43-52, wherein the socket is hexagonally shaped.
54. A hinged coupler bracket comprising a) a first jaw member, the first jaw member comprising an inner surface including a first mating portion and a first clamping portion, the first clamping portion including one or more engagement bosses, and an outer surface comprising a hinged coupler, b) a second jaw member, the second jaw member comprising an inner surface including a second mating portion and a second clamping portion, the second clamping portion including one or more engagement bosses, c) a pin assembly comprising a latching pin including a latch bolt hole and a guide pin, the latching pin and the guide pin being perpendicular to the first and second clamping portions of the first and second jaw members, and d) a latch bolt assembly comprising a latch bolt slidably insertable through a latch bolt bore, the latch bolt having cylindrical body and including a first end and a second end, wherein the latch bolt assembly is housed in the second jaw member, wherein the pin assembly connects the first and second jaw members, wherein the pin assembly is configured to slidably translate the first and second jaw members toward one another in a first direction or away from one another in a direction opposite the first direction, and wherein the bracket can adopt an open configuration and a closed configuration.
55. The hinged coupler bracket of embodiment 54, wherein the hinged coupler comprises a coupler base including a first outer knuckle and a second outer knuckle, an inner knuckle and a latching socket including a socket body and a socket formed within the socket body.
56. The hinged coupler bracket of embodiment 54 or 55, wherein the inner knuckle is rotatably coupled to the coupler base by a hinge pin inserted through the first outer knuckle, the inner knuckle and the second outer knuckle.
57. The hinged coupler bracket of any one of embodiments 54-56, wherein the coupler base further comprises a first detent plunger and a second detent plunger, the first and second detent plungers each 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 inner knuckle further comprises a first row of detents that are annularly spaced apart and aligned and a second row of detents that are annularly spaced apart and aligned, the first and second row of detents being parallel to each other, wherein the first and second detent plungers are aligned with the first and second row of detents respectively, in a manner that the detent ball protruding from the open end of the detent cylinder will be seated in a detent from the first and second row of detents, and wherein an angular position of the inner knuckle is selectively controlled when a detent from the first

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

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.

63. The hinged coupler bracket of embodiment 62, 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.
64. hinged coupler bracket of any one of embodiments 60-63, 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.
65. The hinged coupler bracket of any one of embodiments 55-64, wherein the socket is hexagonally shaped.
66. A hinged joint comprising: an inner knuckle rotatably coupled to an outer knuckle by a hinge pin passing through the inner knuckle and the outer knuckle; a detent mechanism that checks the relative motion about the hinge pin between the inner knuckle and the outer knuckle, the detent mechanism includes a detent plunger configured to engage a detent, wherein an angular position of the inner knuckle is selectively held when the detent plunger is engaged within the detent.
67. The hinged joint of embodiment 66 wherein the detent plunger is positioned on an outer knuckle body and oriented radially toward the inner knuckle, the detent is positioned on the inner knuckle and is selectively brought into alignment with the detent plunger by relative rotation between the inner knuckle and the outer knuckle.
68. The hinged joint of embodiment 66 or 67, wherein the detent is a plurality of depressions formed about the inner knuckle.
69. A bracket comprising: a first jaw member; a second jaw member slidably translatable parallel to a first direction, the second jaw member sliding relative to the first jaw member, a latching pin bore formed in the second jaw member arranged parallel to the first direction, a latch bolt bore being formed in the second jaw member arranged parallel to a second direction and perpendicular to the first direction, the latch bolt bore intersecting the latching guide pin bore; a latching pin extending from the first jaw member arranged parallel to the first direction and slidably inserted within the latching pin bore to guide travel of the second jaw member relative to the first jaw member in the first direction, a bolt channel being formed lengthwise on the latching pin, a bolt hole being formed within the bolt channel and being deeper than the bolt channel; and a latch bolt slidably inserted within the latch bolt bore, a terminus of the latch bolt being inserted within the bolt hole in a locked configuration where movement of the second jaw member away from the first jaw member is substantially prevented, the terminus of the latch bolt configured to be positioned out of the bolt hole and within the bolt channel in an unlocked configuration where sliding of the second jaw member away from the first jaw member is permitted, with the terminus riding within the bolt channel as the second jaw member moves away from the first jaw member.

70. The bracket of embodiment 69 further comprising: a guide pin extending from the second jaw member arranged parallel to the first direction and slidably inserted within a guide pin bore formed in the first jaw member arranged parallel to the first direction to guide travel of the first jaw member relative to the second jaw member in the first direction.
71. The bracket of embodiment 69 or 70 further comprising: a jaw expanding spring positioned between the first jaw member and the second jaw member, the jaw expanding spring configured to normally bias the first jaw member and the second jaw member away from one another; wherein, in the unlocked configuration, the first jaw member and the second jaw member are forced to slide away from one another by the jaw expanding spring.
72. The bracket of any one of embodiments 69-71, wherein the bolt channel limits travel of the first jaw member away from the second jaw member due to the terminus of the latch bolt being restricted to travel within the bolt channel.
73. The bracket of any one of embodiments 69-72, wherein the latch bolt comprises a limiter slot is formed lengthwise on the latch bolt, wherein a limiter extends through the limiter slot to limit travel of the latch bolt within the latch bolt bore as the latch bolt travels relative to the limiter.
74. The bracket of embodiment 73, wherein the latch bolt further comprises a body and a bolt axially extending from the body, the terminus distally located on the bolt, a spring channel being formed lengthwise on the body, the limiter slot located within the spring channel.
75. The bracket of embodiment 74, wherein the limiter slot includes a spring seat closest to the bolt, a retraction spring is positioned within the spring channel between the spring seat and the limiter, wherein, as the terminus of the latch bolt is manually forced from the bolt hole, the retraction spring biases the latch bolt back toward the latching guide pin due to the retraction spring being compressed between the spring seat and the limiter.
76. The bracket of embodiment 75, wherein a bolt stop is defined within the bolt channel adjacent to the bolt hole, the terminus of the bolt is configured to pushed against the bolt stop in the unlocked configuration under the bias of the retraction spring.
77. The bracket of embodiment 76, wherein, as the latching guide pin is moved relative to the terminus of the bolt, the terminus of the bolt is configured to ride against the bolt stop during the transition from the unlocked configuration to the locked configuration, wherein, when the bolt hole is brought into alignment with the terminus of the bolt, the retraction spring forces the bolt into the bolt hole to complete the transition to the locked configuration.
78. The bracket of any one of embodiments 69-77, wherein the latch bolt bore is formed completely through the second jaw member, and wherein the latch bolt is configured to extend through the latching guide such that the terminus of the latch bolt protrudes from the second jaw member in the locked configuration.
79. The bracket of embodiment 78, wherein the latch bolt bore comprises a rotating tab on an end of the latch bolt opposite the terminus, the rotating tab configured to rotate relative to the latch bolt, and wherein the rotating tab is positioned closely adjacent to the second jaw member in the locked configuration, to initiate the transition from the locked configuration to the unlocked configuration, the terminus is manually pushed into the latch bolt bore which causes the rotating tab to move away from

- second jaw member which provides clearance for manual purchase of the rotating tab for further pulling.
80. The bracket of embodiment 79, wherein a tab recess is formed on the second jaw member adjacent to the latch bolt bore and configured to receive the rotating tab when in the locked configuration to prevent inadvertent rotation of the tab.
81. The bracket of embodiment 79, wherein the rotating tab includes a detent mechanism interfacing between the end of the latch bolt and the rotating tab to temporarily arrest the rotation of the rotating tab at predetermined angular positions, wherein the rotating tab is configured to be rotated to an angular position where a portion of the rotating tab overhangs the second jaw member for improving manual purchase.
82. The bracket of any one of embodiments 69-81, wherein the first jaw member includes a first clamping face and the second jaw member includes a second clamping face spaced apart from and opposing the first clamping face in a clamping arrangement.
83. The bracket of embodiment 82, wherein a first engagement boss protrudes from the first clamping face and a second engagement boss protrudes from the second clamping face.
84. The bracket of embodiment 83, wherein the first engagement boss and the second engagement boss are each configured as an elongated boss.
85. The bracket of any one of embodiments 69-84, wherein a throat region is defined between the first jaw member and the second jaw member, a back side of the bracket defined opposite the throat region, a back plate is configured to slide within a back-plate recess to prevent undue flexure between the first jaw member and the second jaw member.
86. The bracket of embodiment 85, wherein the back plate is cantilevered from the first jaw member and the back-plate recess is formed on the second jaw member.
87. A bracket comprising: a first jaw member, a latching portion extending from the first jaw member arranged parallel to a first direction, a bolt channel being formed lengthwise on the latching portion, a bolt hole being formed within the bolt channel and being deeper than the bolt channel; a second jaw member slidably translatable relative to the first jaw member parallel to the first direction, a latching bore formed in the second jaw member arranged parallel to the first direction, a latch bolt bore being formed in the second jaw member arranged parallel to a second direction and perpendicular to the first direction, the latch bolt bore intersecting the latching guide pin bore, the latching portion slidably inserted within the latching bore; and a latch bolt slidably inserted within the latch bolt bore, a terminus of the latch bolt being inserted within the bolt hole in a locked configuration where movement of the second jaw member away from the first jaw member is substantially prevented, the terminus of the latch bolt configured to be positioned out of the bolt hole and within the bolt channel in an unlocked configuration where sliding of the second jaw member away from the first jaw member is permitted, with the terminus riding within the bolt channel as the second jaw member moves away from the first jaw member.
88. The bracket of embodiment 87, wherein the latching portion is a latching guide pin slidably inserted within the latching bore to guide travel of the second jaw member relative to the first jaw member in the first direction.

89. A rail for receiving a clamp having a first engagement boss spaced apart and in-line with a second engagement boss, the first engagement boss and the second engagement boss each having a boss width and a boss length, a first distance being defined between a first innermost edge of the first engagement boss and a second innermost edge of the second engagement boss, a second distance being defined between a first outermost edge of the first engagement boss and a second outermost edge of the second engagement boss, the rail comprising: a rail body having a first engagement surface, a second surface adjacent to the first engagement surface, and a third surface parallel, spaced apart, and facing oppositely of the first engagement surface with the second surface spanning between the first engagement surface and the third surface; a first engagement slot formed on the first engagement surface and configured to receive the first engagement boss and the second engagement boss, the first engagement slot having a first slot length at least as long as the second distance, and a first slot width at least as wide as the boss width; and a second engagement slot formed on the first engagement surface spaced apart and in-line with the first engagement slot, a slot spacing length between the first engagement slot and the second engagement slot, the slot spacing length at most as long as the first distance, and a second slot width at least as wide as the boss width; wherein, the combination of one or more of the first slot length, the first slot width, the slot spacing length, and the second slot width providing a fit that locates the first engagement boss and the second engagement boss of the clamp within at least the first engagement slot and prevents substantial movement of the clamp relative to the rail.
90. The rail of embodiment 89, wherein the first engagement slot and the second engagement slot are through slots.
91. The rail of embodiment 89 or 90, wherein the first engagement slot and the second engagement slot are the same length.
92. The rail of any one of embodiments 89-91, wherein the first engagement slot is longer than the second engagement slot.
93. The rail of embodiment 92, wherein the second engagement slot having a second slot length longer than the boss length and shorter than the second distance.
94. The rail of any one of embodiments 89-93, wherein the first engagement slot and the second engagement slot include a lead-in to ease the transition between the first engagement surface and each of the first engagement slot and the second engagement slot.
95. The rail of embodiment 94, wherein the lead-in is one or both of a chamfer and a fillet.
96. The rail of any one of embodiments 89-95, wherein the first engagement slot provides a locational clearance fit for receiving the first engagement boss and the second engagement boss for locating the clamp relative to the rail.
97. The rail of any one of embodiments 89-96, wherein the third surface is configured as a third engagement surface with a third engagement slot and a fourth engagement slot, the third engagement slot aligned with and matching the first engagement slot, the fourth engagement slot aligned with and matching the second engagement slot.
98. The rail of any one of embodiments 89-97, wherein the rail body comprises a first frame member, a second frame member, and a sidewall member, the first engagement surface being defined on a first frame member, the third surface being defined on a second frame member, and the second surface

being defined on a sidewall frame member, the sidewall member being sandwiched between and spacing apart the first frame member and the second frame member, with the first frame member fastened to the second frame member.

99. The rail of embodiment 98, wherein a plurality of female threaded standoffs extend between the second frame member and the first frame member, a plurality of male threaded fasteners extend through each of the first frame member and the second frame member to thread into the plurality of female threaded standoffs to firmly fasten the first frame member and the second frame member.
100. The rail of embodiment 98 or 99, wherein the rail body is configured as a device protective case for a portable electronic device, and is configured to enclose a perimeter of the portable electronic device, the rail further comprising: a top cover plate configured to cover a screen of the portable electronic device and a bottom cover plate configured to cover a back of the portable electronic device; wherein, when assembled, the first frame member overlaps the top cover plate, the second frame member overlaps the bottom cover plate, the portable electronic device is configured to be sandwiched between the top cover plate and the bottom cover plate, the top cover plate is configured to be sandwiched between the first frame member and the screen, and the bottom cover plate is configured to be sandwiched between the second frame member and the back; and wherein, fastening the first frame member to the second frame member firmly holds device protective case and the portable electronic device therein firmly together in assembly.
101. The rail of embodiment 100 further comprising: an elastomeric gasket member having a groove configured to receive a perimeter edge of the portable electronic device with the elastomeric gasket member surrounding the perimeter edge; wherein the elastomeric gasket member is positioned between the first frame member and the top cover plate and positioned between the second frame member and the bottom cover; and wherein a water-tight seal is formed between the elastomeric gasket member and both the top cover plate and the bottom cover plate.
102. An adaptor comprising a) a hinged coupler comprising a coupler base and an inner knuckle, the inner knuckle comprising a barrel portion with a first end and a second end and a coupler extending perpendicularly from barrel portion, and b) a first device holder, the first device holder attached to the first end of the barrel portion of the inner knuckle,
103. An adaptor of embodiment 102 further comprising a second device holder, the second device holder attached to the second end of the barrel portion of the inner knuckle,
104. An adaptor of embodiment 102 or 103, wherein the inner knuckle is rotatably coupled to the coupler base.
105. An adaptor of embodiment 104, wherein the coupler base further comprises a first detent plunger and a second detent plunger, the first and second detent plungers each 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 inner knuckle further comprises a first row of detents that are annularly spaced apart and aligned and a second row of detents that are annularly spaced apart and aligned, the first and second row of detents being parallel to each other, wherein the first and second detent plungers are aligned with the first and second row of

detents respectively, in a manner that the detent ball protruding from the open end of the detent cylinder will be seated in a detent from the first and second row of detents, and wherein an angular position of the inner knuckle is selectively controlled when a detent from the first 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.

106. An adaptor comprising a coupler base including a first outer knuckle and a second outer knuckle, an inner knuckle and a latching socket including a socket body and a socket formed within the socket body.
107. The adaptor of embodiment 106, wherein the inner knuckle is rotatably coupled to the coupler base by a hinge pin inserted through the first outer knuckle, the inner knuckle and the second outer knuckle.
108. The adaptor of any one of embodiments 106 or 107, wherein the coupler base further comprises a first detent plunger and a second detent plunger, the first and second detent plungers each 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 inner knuckle further comprises a first row of detents that are annularly spaced apart and aligned and a second row of detents that are annularly spaced apart and aligned, the first and second row of detents being parallel to each other, wherein the first and second detent plungers are aligned with the first and second row of detents respectively, in a manner that the detent ball protruding from the open end of the detent cylinder will be seated in a detent from the first and second row of detents, and wherein an angular position of the inner knuckle is selectively controlled when a detent from the first 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.
109. The adaptor of embodiment 108, 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.
110. The adaptor of any one of embodiments 106-109, 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.

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 user 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 as 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 as 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 threaded pin and securing the threaded pin in a manner that attached the video recorder to the bracket attachment. If 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 user 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 as 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 as 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 user 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 as 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 as 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

the dashboard and then attach the device case to the rail secured on the load bearing equipment vest using any of the procedures described in Example 3.

[202] In an alternative example, instead of the device case, the user employs the mounting system disclosed herein for a video recorder. In this case, when entering a vehicle the user can attach the video recorder to the rail secured on dashboard using any of the procedures described in Example 5. When leaving the vehicle the user can detach the video recorder from the rail on the dashboard and then attach the video recorder to the rail secured on the load bearing equipment vest using any of the procedures described in Example 3 or attach the video recorder to the rail secured on a helmet using any of the procedures described in Example 1.

[203] In closing, it is to be understood that although aspects of the present specification are highlighted by referring to specific embodiments, one skilled in the art will readily appreciate that these disclosed embodiments are only illustrative of the principles of the subject matter disclosed herein. Therefore, it should be understood that the disclosed subject matter is in no way limited to a particular compound, composition, article, apparatus, methodology, protocol, and/or reagent, etc., described herein, unless expressly stated as such. In addition, those of ordinary skill in the art will recognize that certain changes, modifications, permutations, alterations, additions, subtractions and sub-combinations thereof can be made in accordance with the teachings herein without departing from the spirit of the present specification. It is therefore intended that the following appended claims and claims hereafter introduced are interpreted to include all such changes, modifications, permutations, alterations, additions, subtractions and sub-combinations as are within their true spirit and scope.

[204] Certain embodiments of the present invention are described herein, including the best mode known to the inventors for carrying out the invention. Of course, variations on these described embodiments will become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventor expects skilled artisans to employ such variations as appropriate, and the inventors intend for the present invention to be practiced otherwise than specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described embodiments in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

[205] Groupings of alternative embodiments, elements, or steps of the present invention are not to be construed as limitations. Each group member may be referred to and claimed individually or in any combination with other group members disclosed herein. It is anticipated that one or more members of a group may be included in, or deleted from, a group for reasons of convenience and/or patentability. When any such inclusion or deletion occurs, the specification is deemed to contain the group as modified thus fulfilling the written description of all Markush groups used in the appended claims.

[206] Use of the terms “may” or “can” in reference to an embodiment or aspect of an embodiment also carries with it the alternative meaning of “may not” or “cannot.” As such, if the present specification discloses that an embodiment or an aspect of an embodiment may be or can be included as part of the inventive subject matter, then the negative limitation or exclusionary proviso is also explicitly meant, meaning that an embodiment or an aspect of an embodiment may not be or cannot be included as part of the inventive subject matter. In a similar manner, use of the term “optionally” in reference to an embodiment or aspect of an embodiment means that such embodiment or aspect of the embodiment may be included as part of the inventive subject matter or may not be included as part of the inventive subject matter. Whether such a negative limitation or exclusionary proviso applies will be based on whether the negative limitation or exclusionary proviso is recited in the claimed subject matter.

[207] The terms “a,” “an,” “the” and similar references used in the context of describing the present invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. Further, ordinal indicators – such as “first,” “second,” “third,” etc. – for identified elements are used to distinguish between the elements, and do not indicate or imply a required or limited number of such elements, and do not indicate a particular position or order of such elements unless otherwise specifically stated. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein is intended merely to better illuminate the present invention and does not pose a limitation on the scope of the invention otherwise claimed. No language in the present specification should be construed as indicating any non-claimed element essential to the practice of the invention.

[208] When used in the claims, whether as filed or added per amendment, the open-ended transitional term “comprising”, variations thereof such as “comprise” and “comprises”, and equivalent open-ended transitional phrases thereof like “including,” “containing” and “having”, encompasses all the expressly recited elements, limitations, steps, integers, and/or features alone or in combination with unrecited subject matter; the named elements, limitations, steps, integers, and/or features are essential, but other unnamed elements, limitations, steps, integers, and/or features may be added and still form a construct within the scope of the claim. Specific embodiments disclosed herein may be further limited in the claims using the closed-ended transitional phrases “consisting of” or “consisting essentially of” (or variations thereof such as “consist of”, “consists of”, “consist essentially of”, and “consists essentially of”) in lieu of or as an amendment for “comprising.” When used in the claims, whether as filed or added per amendment, the closed-ended transitional phrase “consisting of” excludes any element, limitation, step, integer, or feature not expressly recited in the claims. The closed-ended transitional phrase “consisting essentially of” limits the scope of a claim to the expressly recited elements, limitations, steps, integers, and/or features and any other elements, limitations, steps, integers, and/or features that do not materially affect the basic and novel characteristic(s) of the claimed subject matter. Thus, the meaning of the open-ended transitional phrase “comprising” is being defined as encompassing all the specifically recited elements, limitations, steps and/or features as well as any optional, additional unspecified ones. The meaning of the closed-ended transitional phrase “consisting of” is being defined as only including those elements,

limitations, steps, integers, and/or features specifically recited in the claim whereas the meaning of the closed-ended transitional phrase “consisting essentially of” is being defined as only including those elements, limitations, steps, integers, and/or features specifically recited in the claim and those elements, limitations, steps, integers, and/or features that do not materially affect the basic and novel characteristic(s) of the claimed subject matter. Therefore, the open-ended transitional phrase “comprising” (and equivalent open-ended transitional phrases thereof) includes within its meaning, as a limiting case, claimed subject matter specified by the closed-ended transitional phrases “consisting of” or “consisting essentially of.” As such embodiments described herein or so claimed with the phrase “comprising” are expressly or inherently unambiguously described, enabled and supported herein for the phrases “consisting essentially of” and “consisting of.”

[209] Lastly, the terminology used herein is for the purpose of describing particular embodiments only and is not intended to limit the scope of the present invention, which is defined solely by the claims. Accordingly, the present invention is not limited to that precisely as shown and described.

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 compression 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 or 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 surface, and the second engagement surface disposed 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;

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 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 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 the 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.