(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 December 2011 (15.12.2011)

PCT

(10) International Publication Number
WO 2011/156004 A2

(51) International Patent Classification:
G03B 17/56 (2006.01) *G03B 17/02* (2006.01)

(21) International Application Number:
PCT/US2011/001055

(22) International Filing Date:
9 June 2011 (09.06.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/353,123 9 June 2010 (09.06.2010) US
61/419,155 2 December 2010 (02.12.2010) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

(54) Title: QUICK RELEASE CAMERA MOUNTING DEVICE AND METHODS OF USE

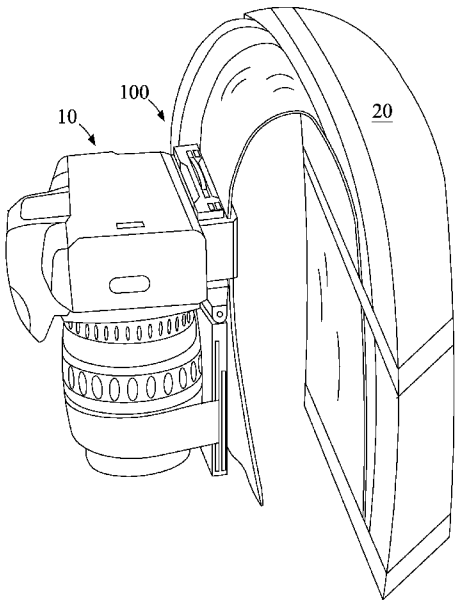


Figure 9

(57) Abstract: A camera mounting device and associated method are disclosed. The device can securely affix a camera to a strap of varying properties. The device provides a strap attachment mechanism used to connect the device to a strap such as a belt or a backpack strap. The device also includes a camera attachment mechanism used to attach a camera to the device while allowing its locking and release through a quick release mechanism. The device also includes a lens support extension with a support extension sized and oriented to provide secondary support to a long lens of a camera, such as a lens of a SLR-type camera.

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QUICK RELEASE CAMERA MOUNTING DEVICE AND METHODS OF USE

Technical Field

The present application relates to a device and methods for securely mounting a camera to a strap. In particular, the present application relates to a device and methods for attaching a camera to a belt or strap that includes a quick release arrangement.

Background

Many bags, straps, and various other sorts of carriers exist to transport cameras, specifically digital and analog SLR cameras. However, these devices typically have a number of drawbacks. Some devices do not adequately secure the camera during transport, causing a risk of damage to the camera if it is not stabilized by a user's hand. Other devices firmly secure the camera, but do not allow immediate accessibility, causing users to miss opportunities for photographs of events occurring during the time it takes to disengage the camera from the bag or strap.

For these and other reasons, improvements are desirable.

Summary

In accordance with the following disclosure, the above and other issues are addressed by the following:

In a first aspect, a camera mounting device is disclosed. The camera mounting device includes a chassis having a front surface and a rear surface, the chassis including a hinged connection to a lens support extension. The device includes a buckle arranged on a rear surface of the chassis and configured for connection to a strap of undetermined thickness. The device also includes a shoe mountable to the front surface of the chassis and including a fastener configured to securely fasten the shoe to a camera and a quick release actuator configured to release the shoe from the chassis.

In a second aspect, a method of attaching a camera to a strap is disclosed. The method includes affixing a shoe to a camera using a fastener associated with the shoe, and attaching a chassis of a camera mounting device to a strap using a buckle. The method also

includes inserting the shoe into a shoe mounting location in the chassis to affix the shoe and camera to the chassis and strap.

In a further aspect, a camera mounting device is disclosed. The camera mounting device includes a chassis having a front surface and a rear surface. The device also includes a shoe which slides into a designated slot on the chassis. The shoe fastens to any camera utilizing the standard ¼" diameter, 20 threads per inch mount (hereafter referred to as "1/4 – 20" connection). The shoe and camera are locked into the designated slot in the chassis by means of the quick release device. The shoe and camera are released from the device by a user activated button on the side of the chassis.

In yet a further aspect, a method of attaching the device to a strap is disclosed. The method includes a third component of the device called the back plate. A strap of undetermined thickness is sandwiched between the chassis and the back plate. The chassis and the back plate are compressed together by means of two screws located on the horizontal extremities of the chassis and the back plate. The screws go through a clear hole in the chassis and thread into a female threaded receiver on the back plate. The screws are tightened to increase the compressive force between the chassis and the back plate and provided a cinched connection to any strap.

Brief Description of the Drawings

Figure 1 is a front elevation view of the camera mounting device, according to a possible embodiment of the present disclosure;

Figure 2 is a right side elevation view of the camera mounting device of Figure 1;

Figure 3 is rear elevation view of the camera mounting device of the camera mounting device of Figure 1;

Figure 4 is an upper right isometric view of the camera mounting device of Figure 1, with the shoe removed;

Figure 5 is a rear isometric perspective view of the camera mounting device of Figure 1 with the strap buckling device removed;

Figure 6 is a front elevation view of a camera mounting device according to a further possible embodiment of the present disclosure;

Figure 7 is a rear elevation view of the camera mounting device of Figure 6;

Figure 8 is a partial isometric view of a lens support extension of the camera mounting device of Figure 6;

Figure 9 is a perspective view of a camera mounting device mounted to a backpack strap and holding a camera, according to a possible embodiment of the present disclosure;

Figure 10 is a perspective view of a camera mounting device mounted to a belt while holding a camera, according to a possible embodiment of the present disclosure;

Figure 11 is an upper right isometric of the camera mounting device, according to a possible embodiment of the present disclosure;

Figure 12 is a bottom isometric view of the camera mounting device of Figure 11 with the shoe removed and its path of travel into the chassis shown; and

Figure 13 is a rear isometric view of the camera mounting device of Figure 11.

Detailed Description

Various embodiments of the present invention will be described in detail with reference to the drawings, wherein like reference numerals represent like parts and assemblies throughout the several views. Reference to various embodiments does not limit the scope of the invention, which is limited only by the scope of the claims attached hereto. Additionally, any examples set forth in this specification are not intended to be limiting and merely set forth some of the many possible embodiments for the claimed invention.

In general terms, the present disclosure relates to a camera mounting device, usable primarily for securing cameras to backpack straps, other straps, or belts and utilizing a quick release attachment. Various embodiments of the camera mounting device can include a number of components including a structural chassis to attach to the strap and receive the "shoe", a buckle which securely cinches the chassis to a strap of variable or undetermined thickness, a shoe which screws into the camera and slides into or otherwise engages a corresponding space in the chassis, a quick release mechanism for releasing the shoe from the chassis, and a hinged extension which allows a lens extending from a camera body (such as a lens of a SLR-type camera) to be securely fastened using straps.

Figure 1 is a front elevation of a camera mounting device 100. The camera mounting device includes a chassis 101 including a camera shoe 102. The chassis 101 has a front major surface to which a camera can be mounted, and a rear major surface that mounts to a

strap. In Figure 1, the chassis 101 is shown with the camera shoe 102 clipped into place. The chassis 101 both accepts the camera shoe 102 at a shoe connection location, as well as securely connects to either a backpack strap or a belt using either a strap buckle 103 or a belt buckle 107 (shown in Figure 5, described below). A lens support extension 105 attaches to and extends from the chassis 101. The lens support extension 105 has a hinged connection to the chassis 101 provided by a metal pin. This hinged connection allows for movement to accept the curvature of a user's body, and to contour to a user's body.

A camera (e.g., camera 10 as illustrated in Figures 9-10,) can be attached to the shoe 102 at a fastener 106, shown as a ¼" mounting screw. Other fasteners could be used as well. In the embodiment shown, the fastener 106 is sized and selected to screw into the bottom of a camera, as is typically found in most tripod systems for cameras. A quick release actuator 104 resides along a top edge of the chassis 101. The quick release actuator 104 is capable of being depressed to allow the shoe 102 to be slid upwards and out of the chassis 101. In the embodiment shown, the quick release actuator 104 and associated shoe 102 is a spring loaded device configured to release the shoe and any camera attached thereto. The quick release actuator 104 can include a retractable spring mechanism capable of ejecting the shoe upon depression of a tab, which causes the shoe and associated camera to quickly separate from the chassis 101, which remains affixed to any strap while the camera is used.

Figure 2 is a side elevation view of the camera mounting device 100. In this view, it can be seen that there are two slots in the lens support extension 105. Each of these slots is designed to hold a strap (e.g., as illustrated in Figure 9). The strap can take any of a number of forms. In certain embodiments, the strap can include a Velcro connection to wrap around the barrel of a lens. In certain further embodiments, the strap can include an elastic component to allow for some stretching as necessary to firmly encircle a camera lens. The slot for the body strap will function to keep the lens support extension secured to the body. The strap will be able to go completely around the circumference of the user's torso (or leg, in the case of the belt application). This slot is also accessible through the bottom of the lens support extension for the purpose of being able to use a strap on the user's body like a backpack's existing chest strap if the user has a pack with that function.

Figure 3 is a rear elevation view of the camera mounting device 100. As shown in this Figure, on one side of the device 100 the strap buckle 103 can be a rigid piece of

aluminum which fits into grooves on the side of the chassis 101. The location where the strap buckle 103 fits into the chassis 101 serves as a hinge point, and the other side of the strap buckle 103 will attach into the side of the chassis 101 via a different set of grooves corresponding to the shape of a clasp on the strap buckle 103. This will allow the strap buckle 103 to cinch a strap between it and the chassis 101.

Figure 4 is a perspective isometric view of the camera mounting device 100 with the shoe 102 removed to provide visual access to a quick release wedge 107. The wedge 107 retracts into the chassis 101 when the quick release actuator 104 is depressed.

In the embodiment shown, the wedge 107 retracts automatically when the shoe 102 is inserted into the shoe connection location, due to the inclined plane of the wedge 107. When the shoe 102 is far enough down into the shoe connection location of the chassis 101, a cavity formed in a rear surface of the shoe 102 and corresponding to the shape of the wedge 107 allows the wedge to spring up into the cavity and lock the shoe in place. To remove the shoe, the quick release actuator 104 is depressed, causing the wedge 107 to retract into the chassis 101 and freeing the shoe 102. In certain embodiments, a compression spring beneath the center of the wedge 107 biases the wedge into an engaged position to prevent the wedge from accidentally disengaging from the shoe 102.

Figure 5 provides a rear isometric view of the camera mounting device 100. In place of the strap buckle 103 of Figure 3 is the belt buckle 108. The belt buckle 108 allows for the present embodiment to be affixed to a horizontal strap (such as a belt, as in Figure 10) as opposed to a vertical strap (such as a backpack strap as in Figure 9). The belt buckle 108 is to be used in lieu of the strap buckle 103; they are not to be used together. Figure 5 also illustrates ridges on the rear of the chassis 101 which correspond to similar ridges on the strap buckle 103 and the belt buckle 108.

Figures 6-8 illustrate a camera mounting device 200 according to a further possible embodiment of the present disclosure. The camera mounting device 200 generally includes analogous features to the device 100 of Figures 1-5, but has a different lens support extension 205, in place of lens support extension 105 illustrated in the above figures. Lens support extension 205 has formed therein a pair of slots sized to receive one or more straps configured to encircle the lens of a camera and connect it to the extension 205. As best illustrated in Figures 7-8, a separate slot arrangement is included on a rear side of the lens

support extension 205, for connecting a further support band around a body part of a user (e.g., a leg in the case the mounting device 200 is attached to a belt, or a user's torso if the mounting device is attached to a backpack strap).

Figure 9 graphically demonstrates how a camera mounting device, such as device 100 will mount to a backpack strap. In this embodiment, a camera mounting device 100 connects to a strap of a backpack 20 via a strap buckle 103 as illustrated in Figure 3 to mount a camera l0 in a vertically aligned orientation, with the camera lens oriented downward. In alternative embodiments, other camera orientations are possible as well.

Figure 10 graphically demonstrates how a camera mounting device, such as device 100 will mount to a belt. In this embodiment, the camera mounting device 100 connects to a belt 30 via belt buckle 108, as illustrated in Figure 5, to mount the camera 10 in a vertically aligned orientation and with the camera lens oriented downward. As with the arrangement of Figure 6, alternative camera orientations are possible as well. For example, in certain embodiments, the camera orientation is adjustable (e.g., the vertical rotational position of the camera can be adjusted).

Although in Figures 9-10 camera mounting device 100 is illustrated, it is understood that additional embodiments are contemplated as having analogous attachment features, such as those shown in Figures 6-8 relating to camera mounting device 200.

Overall, it can be seen that the camera mounting device can be used to fasten a camera to a backpack or belt, allowing it to be securely maintained while allowing its user to quickly release the camera from the strap (using the quick release actuator 104) for access.

Figure 11 is an upper right isometric view of a camera mounting device 1100 showing all of the functional parts of the device. The components of the camera mounting device include a chassis 1101, a backplate 1102, a camera shoe 1103, a spring loaded quick release button 1104, a camera mounting screw 1106, two cinching screws 1107, and a secondary locking screw 1108.

Figure 12 is a bottom isometric view of the camera mounting device. Figure 12 depicts the same components listed in Figure 11, yet the shoe 1103 has been slid out of the chassis 1101.

Figure 13 is a rear isometric view of the camera mounting device 1100 intended to show how the backplate 1102 and the chassis 1101 separate so that a strap can be inserted. Figure 13 also shows a quick release button cover 1105.

A camera can be mounted to the shoe 1103 by threading the camera connection screw into the tripod receiver on the bottom of most cameras. This connection is obtained by using the standard ¼" diameter – 20 thread per inch screw found on the bottom of most cameras. Other fasteners could be used as well. In the embodiment shown, the camera connection screw 1106 is sized and selected to screw into the bottom of a camera, as is typically found in most tripod systems for cameras. This is shown on both Figures 11 and 12.

Separately from the shoe, the rest of the components of the camera mounting device 1100 are mountable to any strap, horizontal or vertical. This is accomplished by sandwiching the strap between the chassis 1101 and the backplate 1102, and tightening the cinching screws until the device is securely affixed to the strap. Gripping of any given strap is aided by the offset ridges which are on the backplate 1102 and the chassis 1101. In order to get the strap between the chassis 1101 and the backplate 1102, one of two methods can be employed. One method involves completely unscrewing both cinching screws from the backplate 1102 and then screwing them back in when the backplate 1102 has been correctly placed between the chassis 1101 and the backplate 1102. The other more common method of attaching the device 1100 to a strap is to unscrew the left cinching screw 1102 as depicted in Figures 11 and 12 enough turns to make the surface of the cinching screw 1107 head rise above the lip of its cutaway in the chassis 1101. When the left cinching screw 1107 is sufficiently elevated, the chassis 1101 can be swiveled and separated from the backplate, with the pivot point being the right cinching screw 1107 as depicted in Figures 11 and 12. Once the chassis 1101 is out of the way, the strap can be positioned in front of the backplate 1102 and the chassis 1101 can be swiveled back into place and cinched onto the strap with both cinching screws 1107.

Once the camera mounting device 1100 is mounted to the strap and the shoe 1103 is mounted to the camera, the device is ready for use and the user can now mount his or her camera to their device. This is accomplished by sliding the shoe 1103 (with camera attached) into the corresponding slot on the chassis 1101. Figure 12 shows the shoe 1103 (without camera attached) just above this slot. Upon entrance of the shoe 1103 into the slot in the chassis 1101, the spring loaded quick release button 1104 will be knocked out of the way by the interaction of

its inclined face being contacted by a rounded feature on the bottom of the shoe intended to knock the quick release button out of the way. When the shoe 1103 has fully entered the slot on the chassis 1101, a corresponding cutout on the bottom of the shoe 1103 allows the quick release button 1104 to slide back to its original position. This action locks the shoe 1103 into place, and prevents the shoe 1103 (and the attached camera) from being removed from the chassis 1101. The shoe 1103 is removed from the chassis 1101 by the user depressing the spring loaded quick release button 1104 until it is unobstructed by the corresponding cutout on the bottom of the shoe 1103, and the shoe 1103 can be removed from the device. This spring loaded locking mechanism could be accomplished by many configurations of spring mechanisms. The present disclosure depicts only one possible embodiment of the spring loaded locking mechanism.

A secondary locking screw 1108 has been included and functions as follows. When the shoe 1103 is engaged with the chassis 1101 and locked into place, the secondary locking screw 1108 can be turned clockwise so that it protrudes into the shoe 1103. The shoe 1103 has a small notch cut in it to receive the shape of the secondary locking screw 1108. The secondary locking screw 1108 is an additional measure to prevent the shoe 1103 from being removed from the chassis 1101. To disengage the secondary locking screw 1108, it is simply turned counterclockwise far enough to remove it from the slot in the chassis 1101 where it resides within the body of the chassis 1101.

The camera mounting device also includes additional features aside from the main purpose of mounting a camera to a strap. In both Figures 11 and 12 it is evident that the shoe 1103 has four slots protruding from its sides. The first purpose for one of these slots is to attach to a camera strap (such as that similarly found on a camcorder). The second purpose is to enable the shoe 1103 to be tethered to the chassis 1101. This would be accomplished by connecting the bottom slot on the shoe 1103 through the slot in the chassis 1101.

Although certain attachment systems are described herein, it is understood that any method of attaching a camera carrying device to a strap by means of cinching and/or compression (be it buckles, screws, etc.) are encompassed. Furthermore, other locking devices could be used, such as a screw turned and inserted into a groove in the shoe which prevents the shoe from being ejected.

It will be apparent to those skilled in the art that various modifications or variations may be made in the present disclosure without departing from the scope or spirit of the

invention. Other embodiments of the disclosure will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein.

The above specification, examples and data provide a complete description of the manufacture and use of the composition of the invention. Since many embodiments can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

Claims:

1. A camera mounting device comprising:

a chassis having a front surface and a rear surface, the chassis including a hinged connection to a lens support extension;

a buckle arranged on a rear surface of the chassis and configured for connection to a strap of undetermined thickness;

a shoe mountable to the front surface of the chassis and including a fastener configured to securely fasten the shoe to a camera; and

a quick release actuator configured to release the shoe from the chassis.

2. The camera mounting device of claim 1, further comprising one or more straps connectable to the lens extension and configured to at least partially encircle a camera mounted to the device.

3. The camera mounting device of claim 2, wherein at least one of the one or more straps is sized to encircle a portion of a user's body.

4. The camera mounting device of claim 2, wherein the lens support extension includes one or more slots configured to receive one or more straps.

5. The camera mounting device of claim 1, wherein the buckle is a strap buckle configured to connect the chassis to a vertically-oriented strap.

6. The camera mounting device of claim 1, wherein the buckle is a belt buckle configured to connect the chassis to a horizontally-oriented strap.

7. The camera mounting device of claim 1, wherein the fastener includes a screw sized to be received into a tripod connector of a camera.

8. A method of attaching a camera to a strap, the method comprising:

affixing a shoe to a camera using a fastener associated with the shoe;

attaching a chassis of a camera mounting device to a strap using a buckle;

inserting the shoe into a shoe mounting location in the chassis to affix the shoe and camera to the chassis and strap.

9. The method of claim 8, further comprising actuating a quick release actuator to release the shoe and camera from the chassis of the camera mounting device.

10. The method of claim 8, further comprising attaching one or more straps over the camera and affixing the one or more straps to the camera mounting device.

11. The method of claim 10, wherein affixing the one or more straps to the camera mounting device includes inserting a strap into a slot of a lens support extension.

12. A camera mounting device comprising:

a chassis having a front surface and a rear surface;

a back plate which will serve to cinch a strap or belt of undetermined thickness between it and the chassis by means of two cinching screws on the horizontal extremities of the device;

a shoe mountable to the front surface of the chassis and including a fastener configured to securely fasten the shoe to a camera; and

a quick release actuator configured to lock and release the shoe from the chassis.

13. The camera mounting device of claim 12, wherein the fastener includes a screw sized to be received into a tripod connector of a camera.

14. A method of attaching a camera to a strap, the method comprising:

affixing a shoe to a camera using a fastener associated with the shoe;

attaching a chassis of a camera mounting device to a strap using a back plate and clamping screws which sandwich the strap;

inserting the shoe into a shoe mounting location in the chassis to affix the shoe and camera to the chassis and strap.

15. The method of claim 14, further comprising actuating a quick release actuator to release the shoe and camera from the chassis of the camera mounting device.

Figure 1

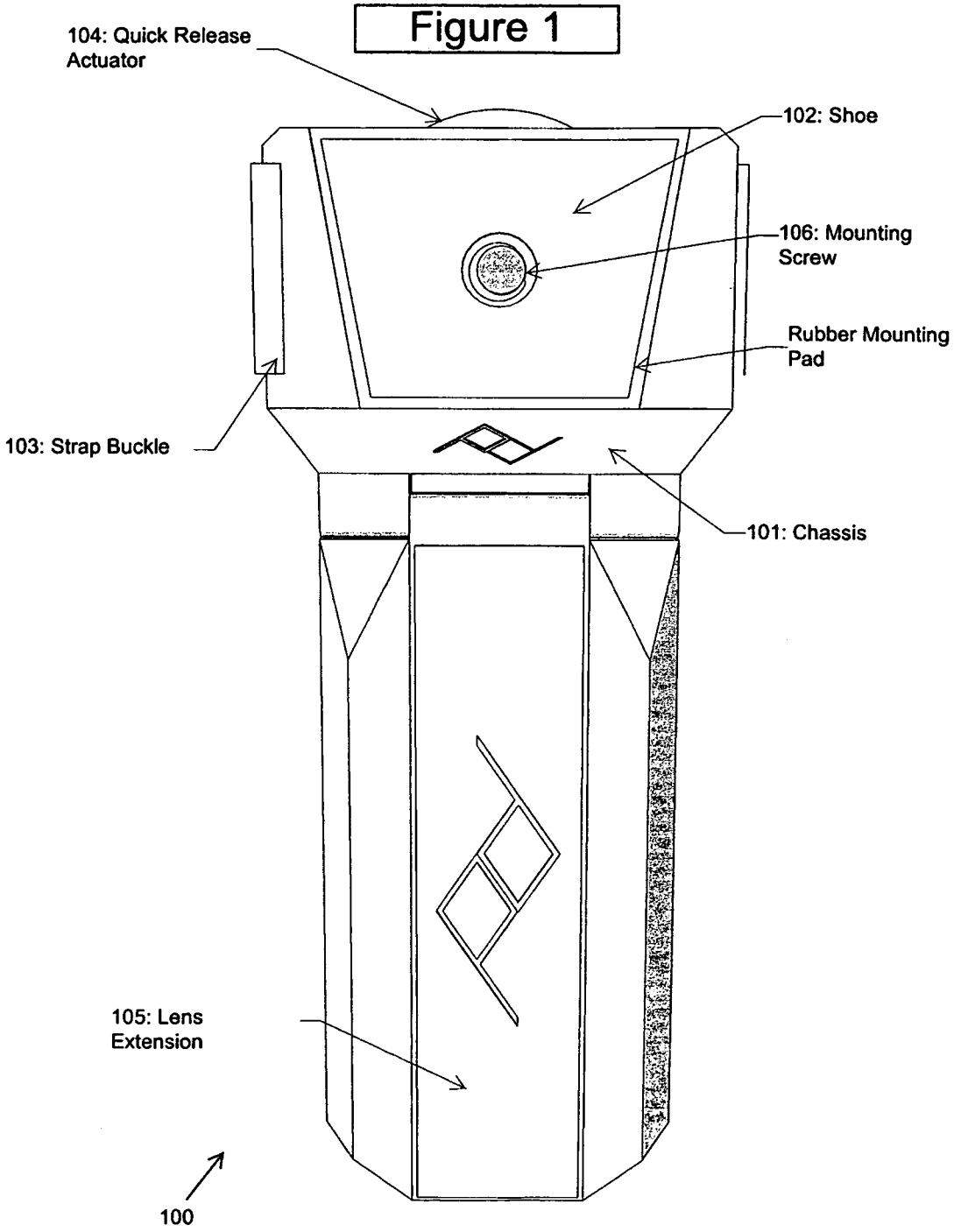

104: Quick Release Actuator
102: Shoe
106: Mounting Screw
Rubber Mounting Pad
103: Strap Buckle
101: Chassis
105: Lens Extension
100

Figure 2

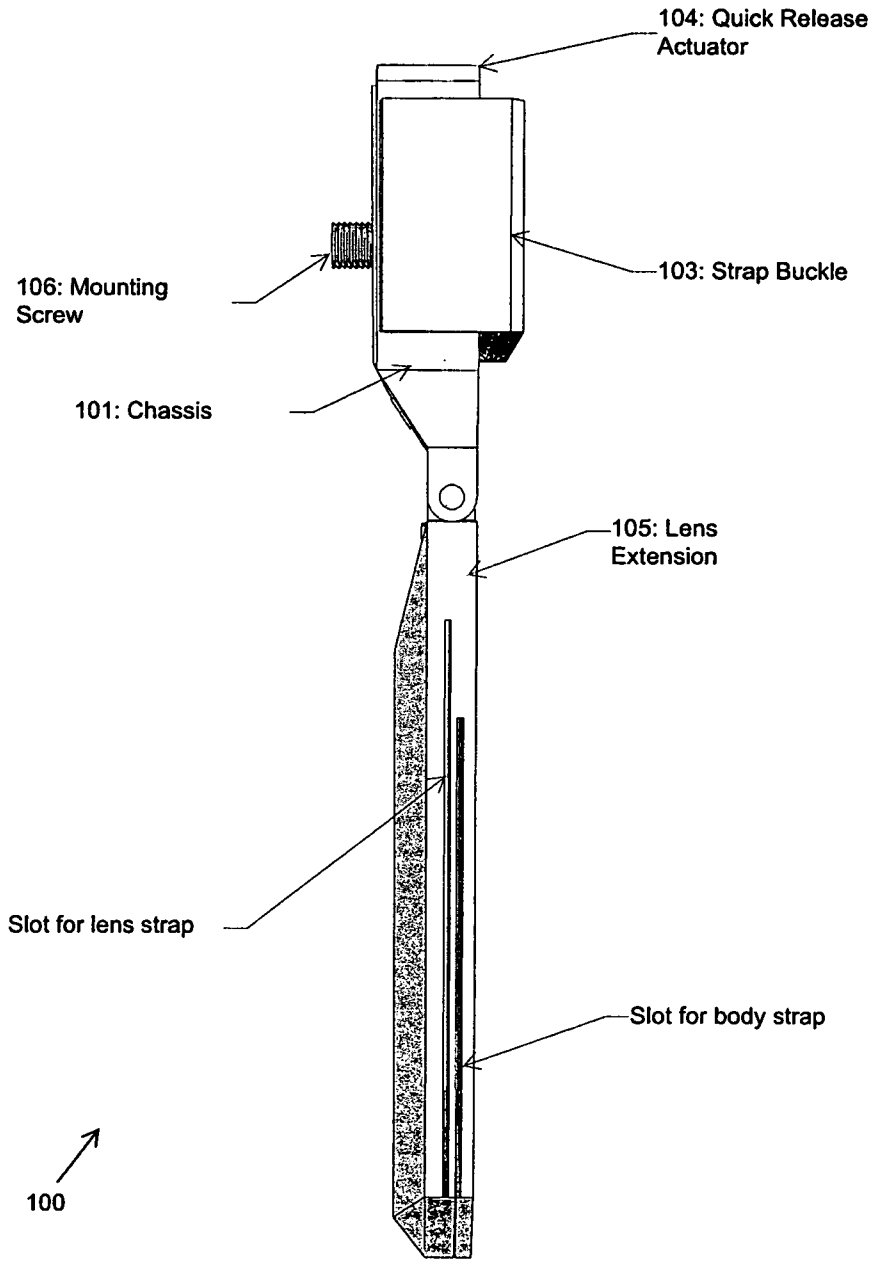

104: Quick Release Actuator
103: Strap Buckle
106: Mounting Screw
101: Chassis
105: Lens Extension
Slot for lens strap
Slot for body strap
100

Figure 3

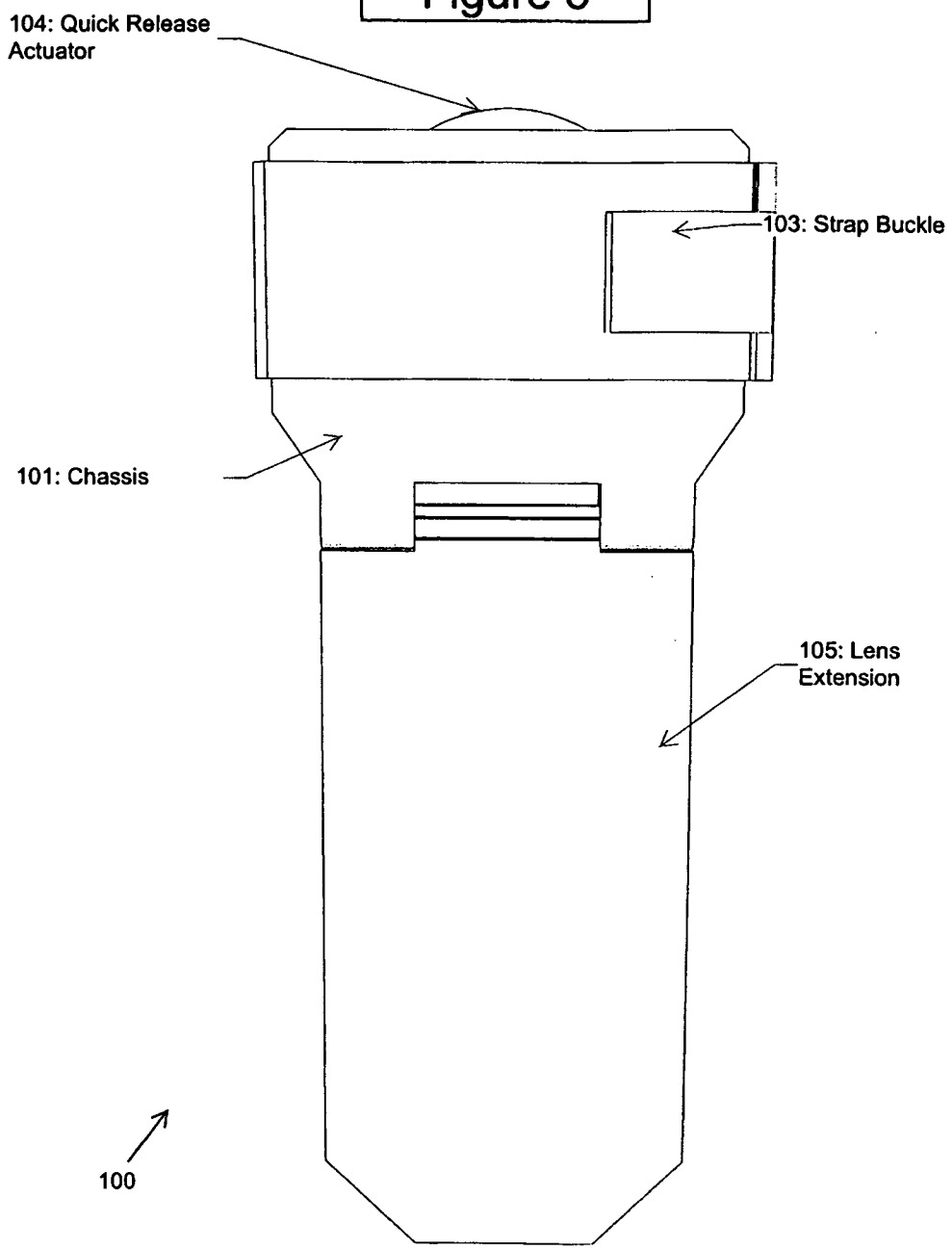

104: Quick Release Actuator
103: Strap Buckle
101: Chassis
105: Lens Extension
100

Figure 4

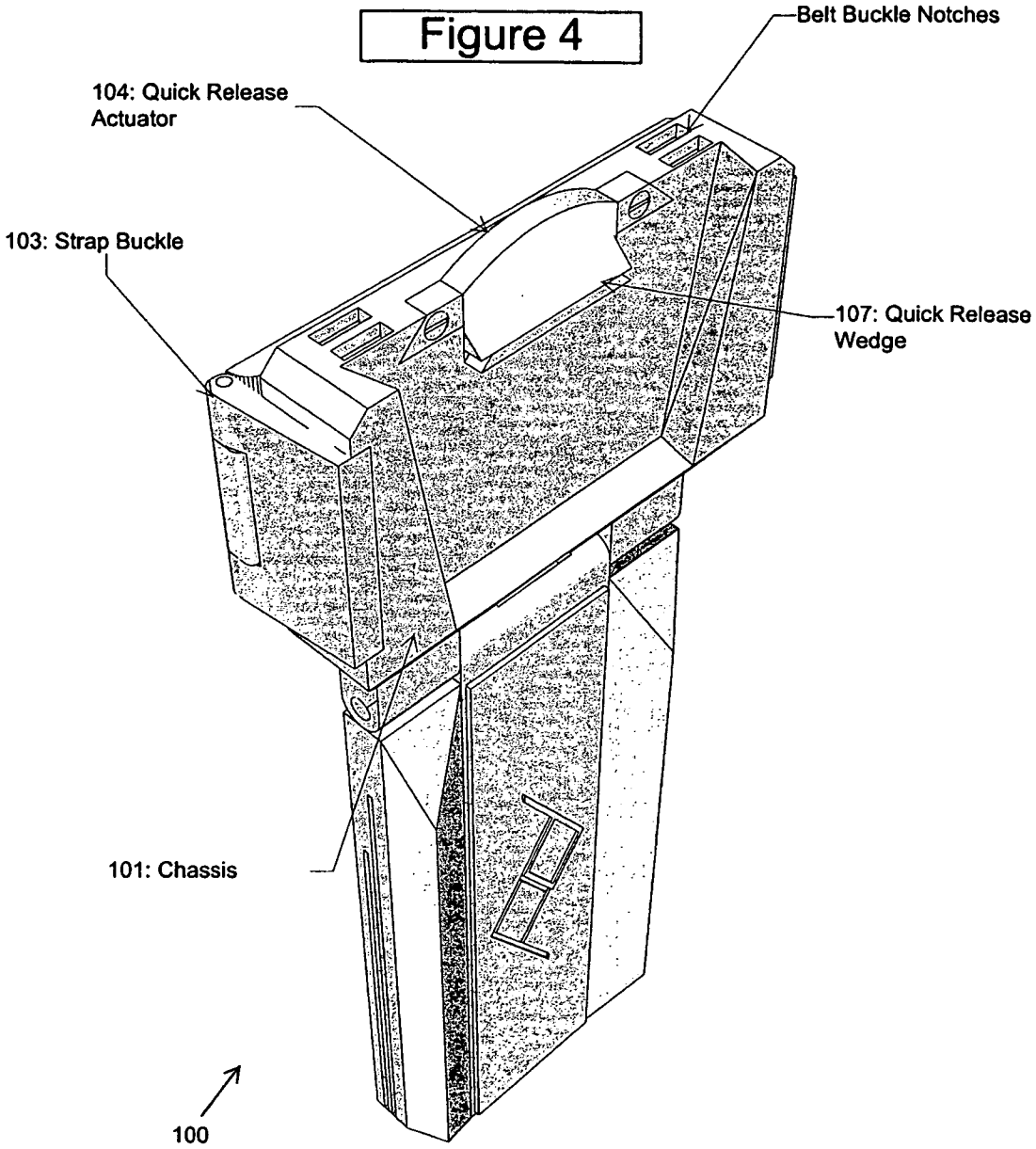

Belt Buckle Notches
104: Quick Release Actuator
103: Strap Buckle
107: Quick Release Wedge
101: Chassis
100

Figure 5

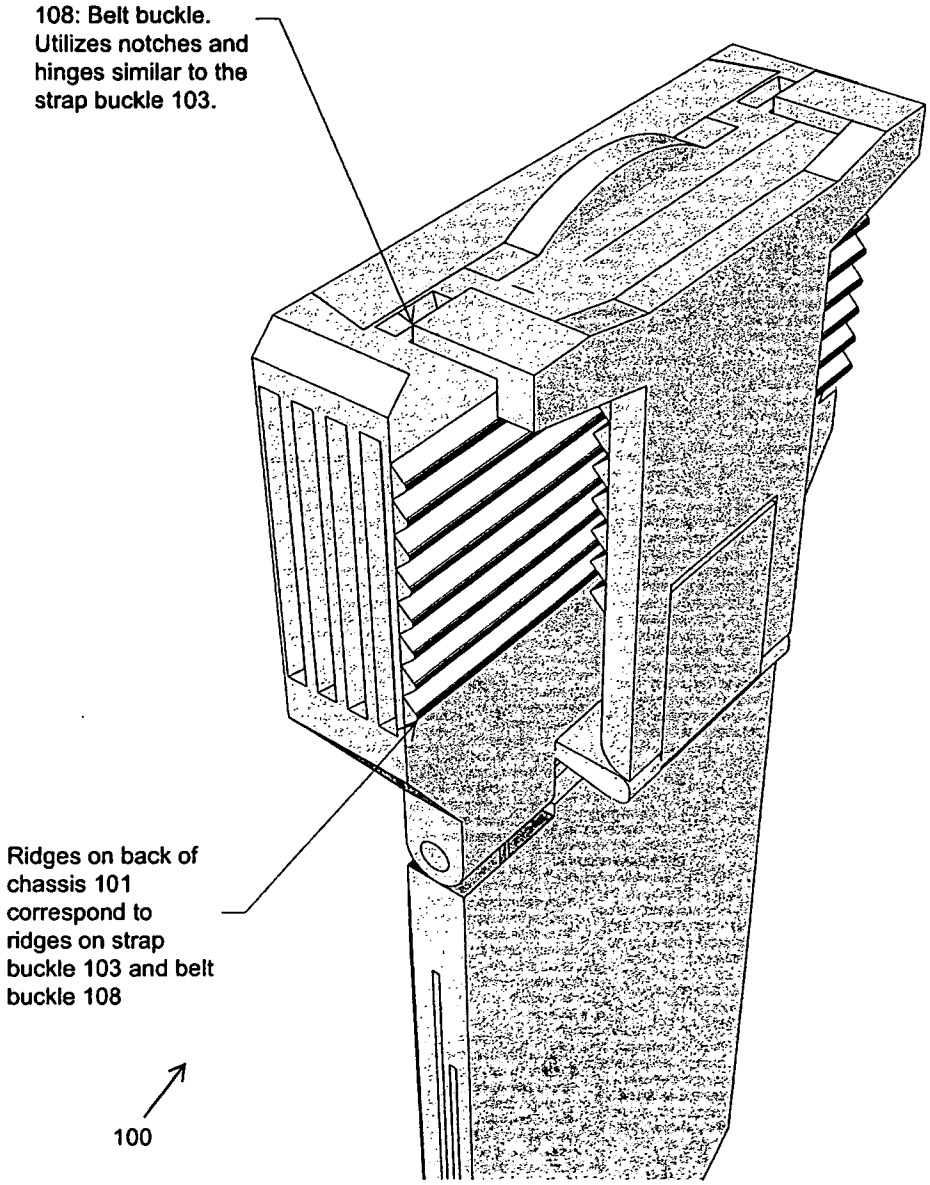

108: Belt buckle. Utilizes notches and hinges similar to the strap buckle 103.
Ridges on back of chassis 101 correspond to ridges on strap buckle 103 and belt buckle 108
100

Figure 6

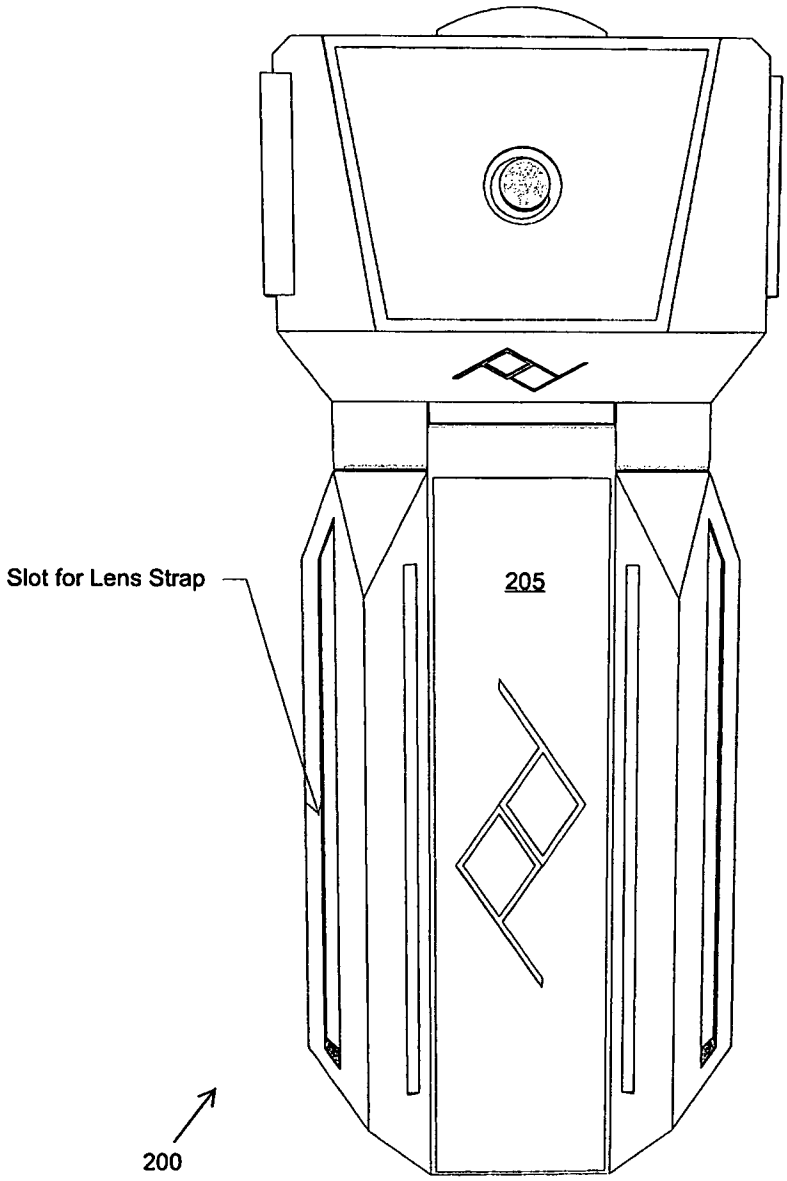
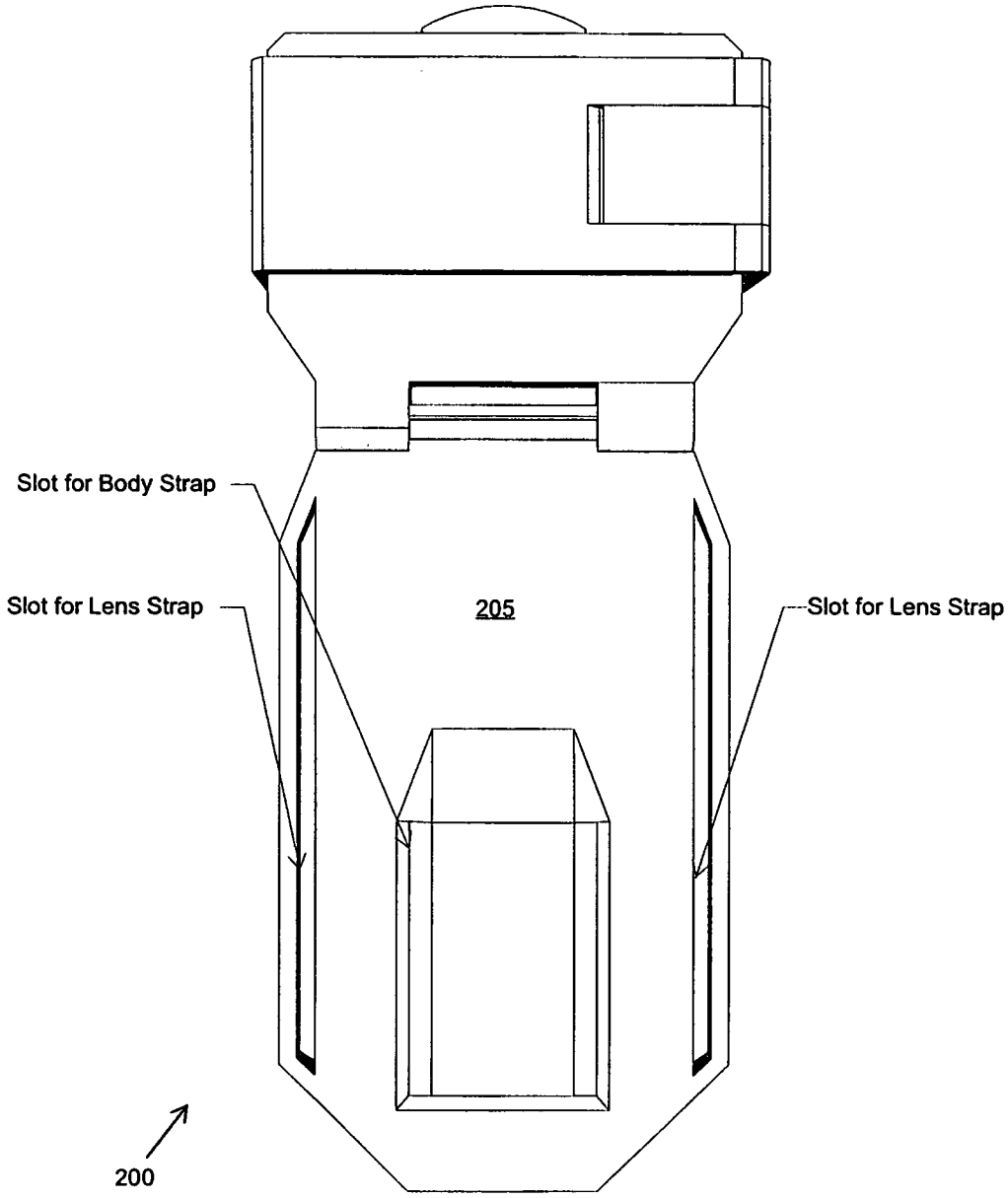


Figure 7


Slot for Body Strap
Slot for Lens Strap
205
Slot for Lens Strap
200

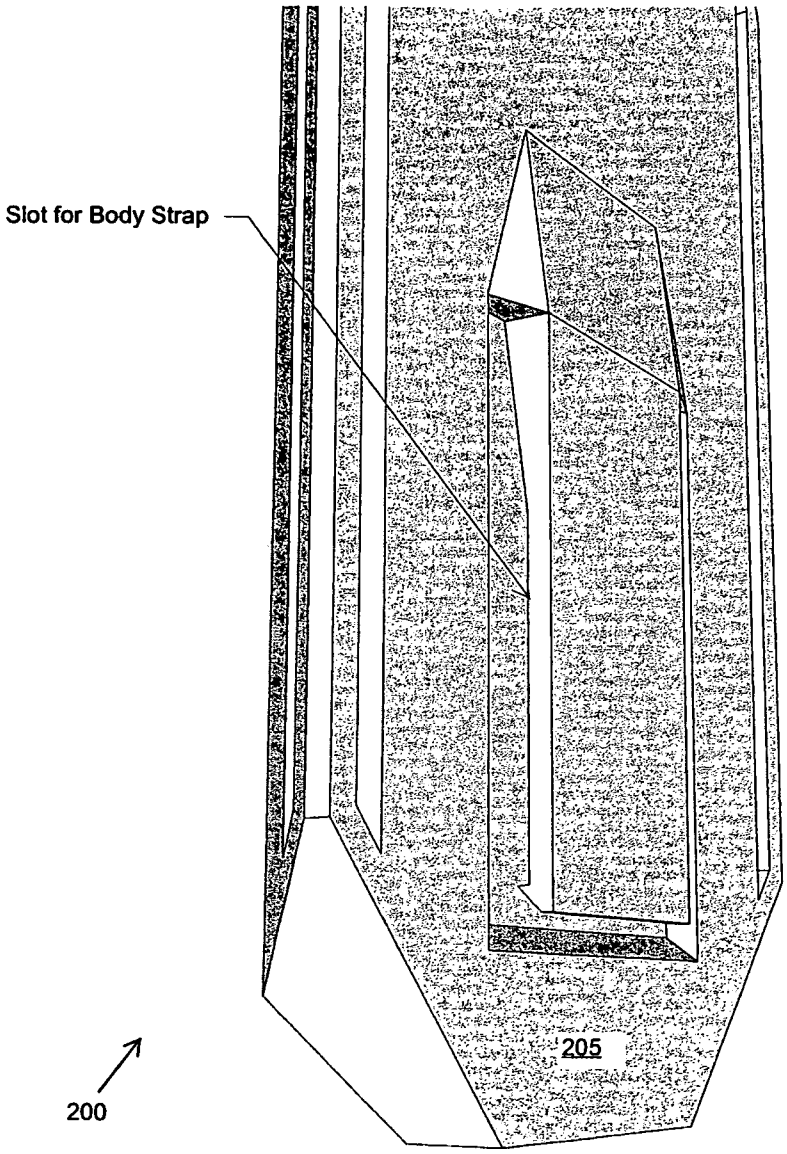


Figure 8

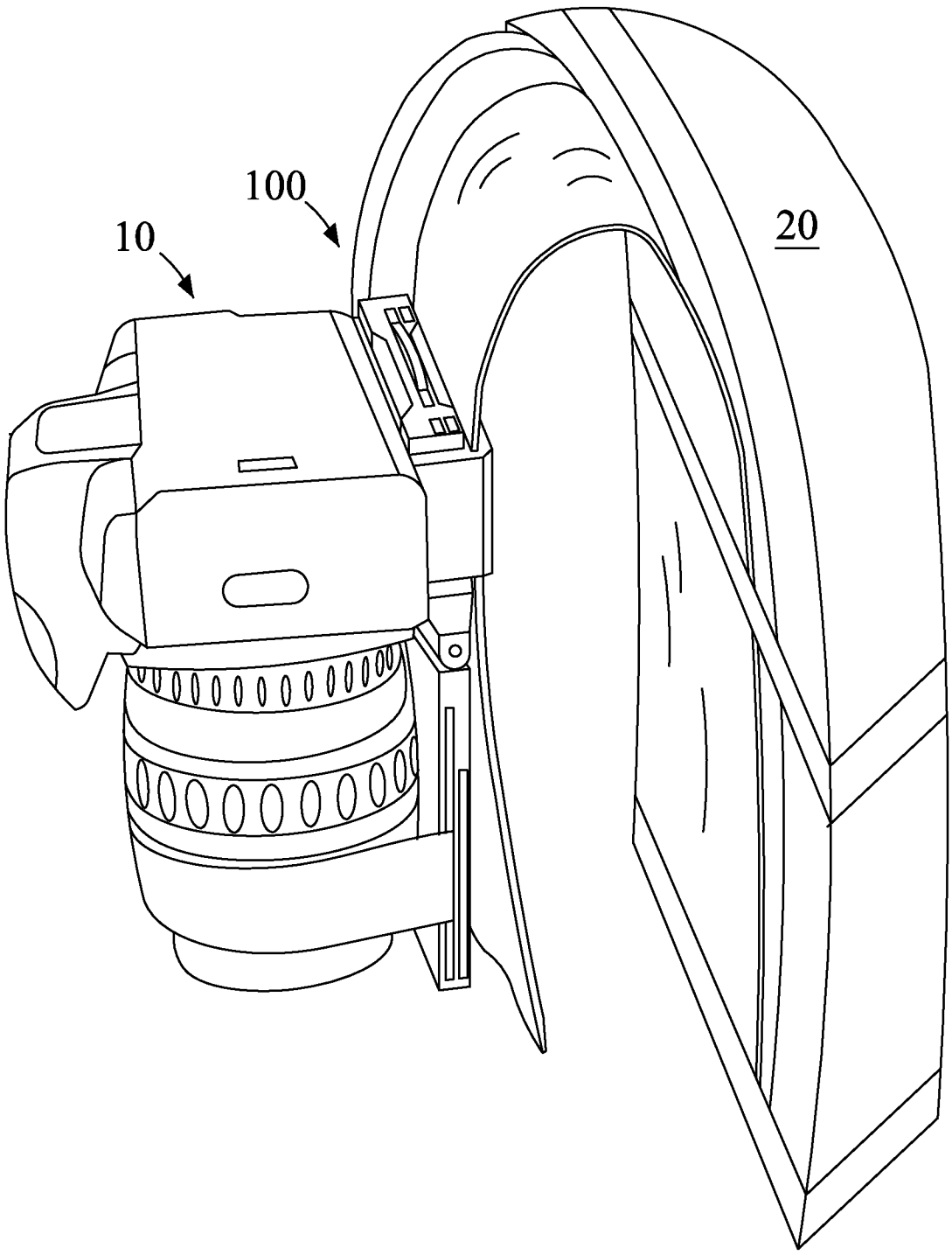


Figure 9

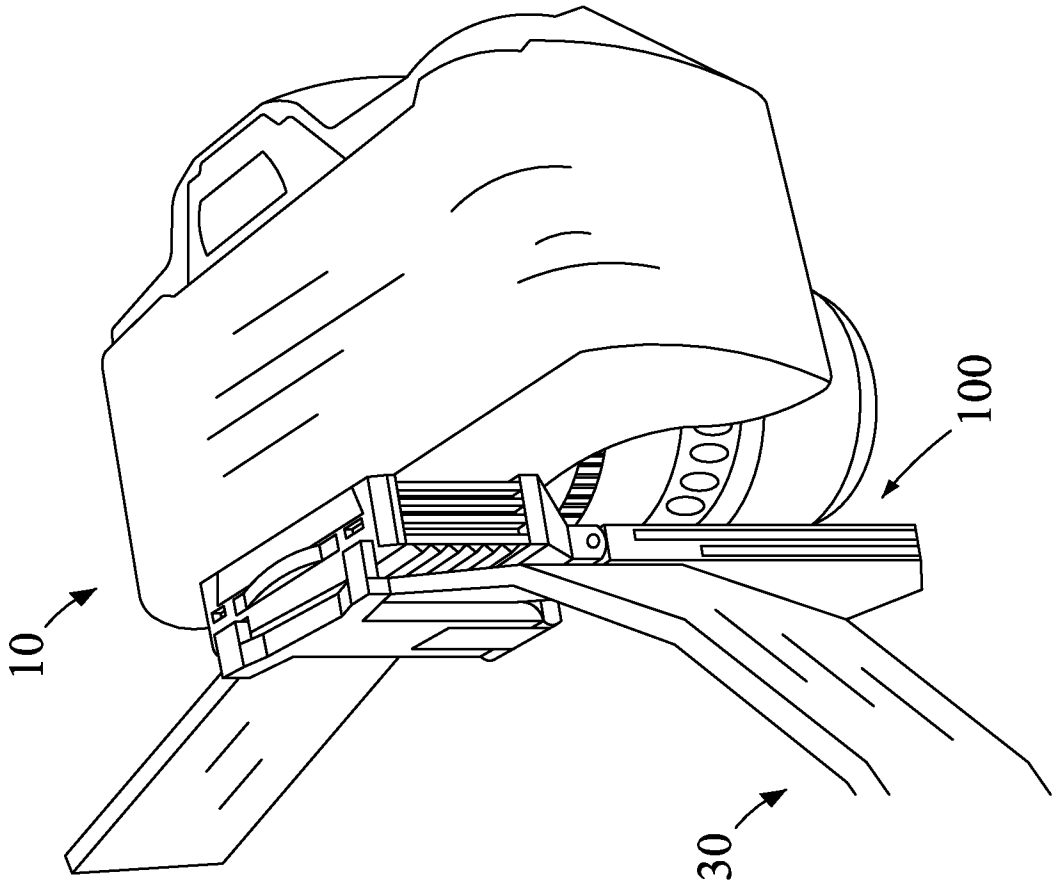


Figure 10

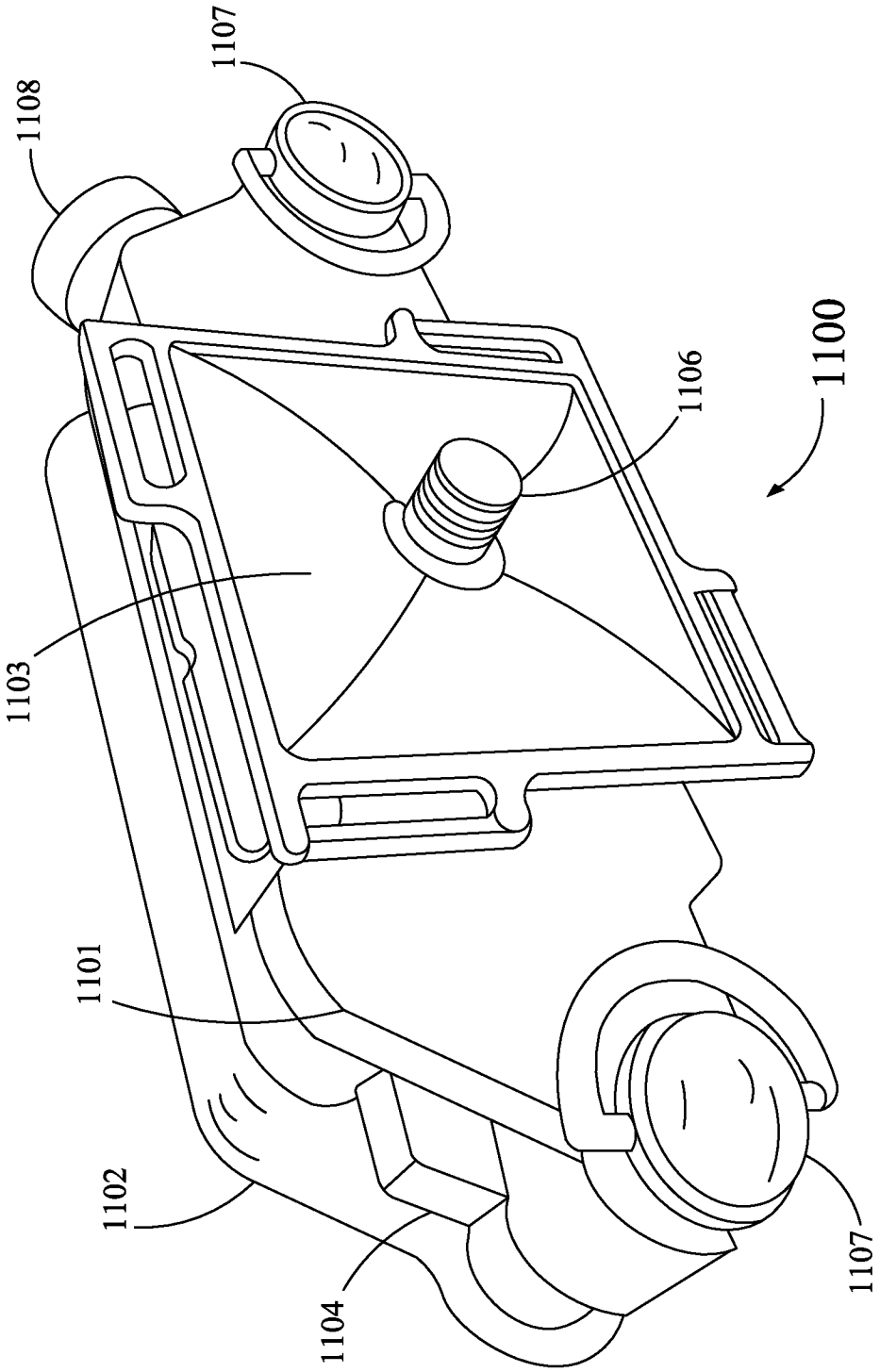


Figure 11

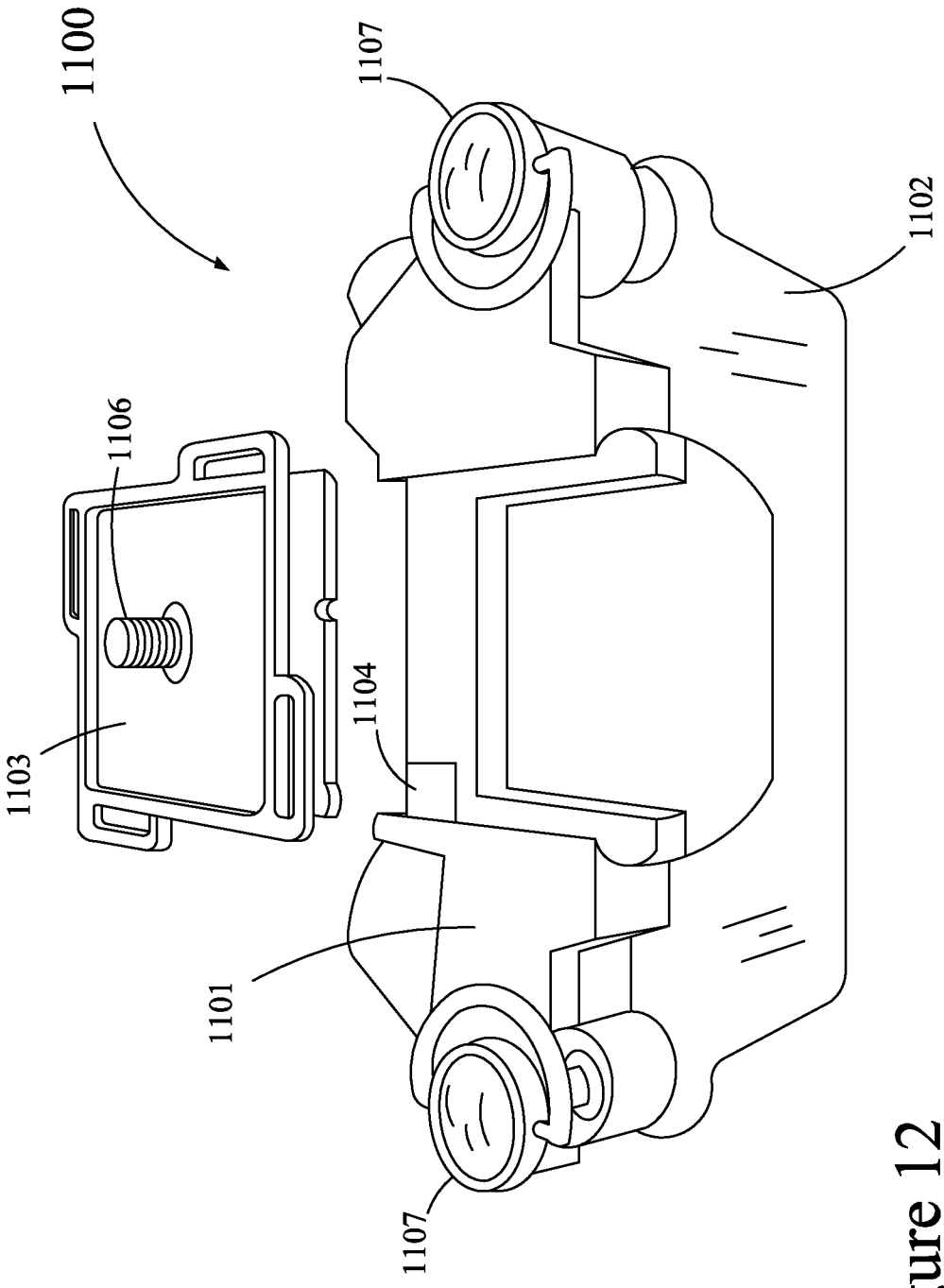


Figure 12

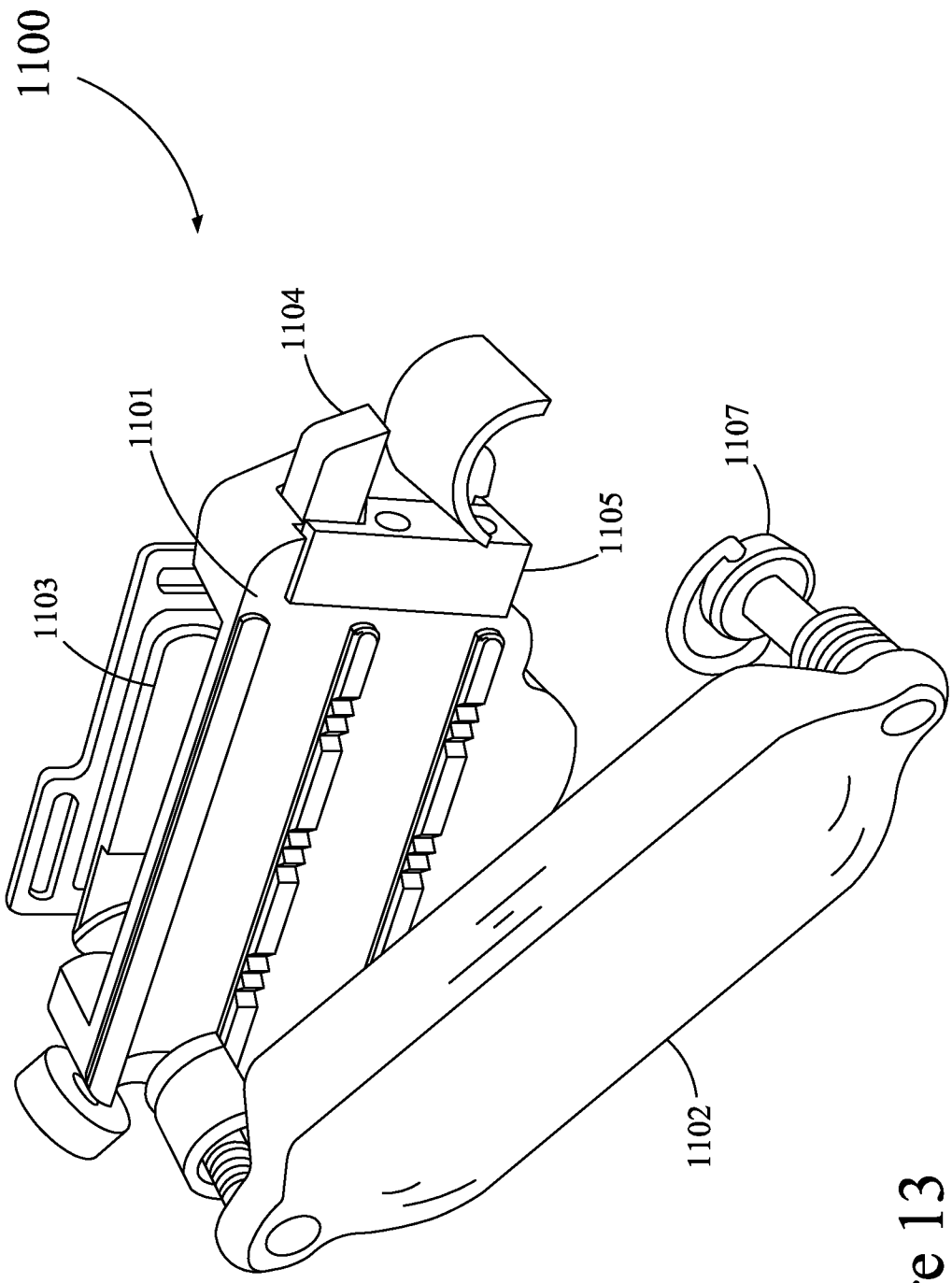


Figure 13