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(54) **RETENTION DEVICE**

(57) A system for mounting an item of emergency equipment (20) on a support (24), which support is a component of an item of equipment suitable for wearing on a person. The system comprises a base (10) that has fixing formations (34) that are suitable for fixing the base to the support (24), a clip (12) that can be fixed to an item of equipment. The clip (12) can be releasably connected to and removed from the base (10). The system further including fixings to enable the base to be fixed to the support, which fixings may include one or more of: a.

threaded fasteners (38) that cooperate with the fixing formations (34) and which can be passed through mounting holes in the support (24); b. threaded fasteners that can be passed through mounting holes in the support to cooperate with a threaded component of the base; c. threaded fasteners that cooperate with the fixing formations and which can be driven into the support; or d. an adapter that cooperates with the fixing formations and which can be connected to the support

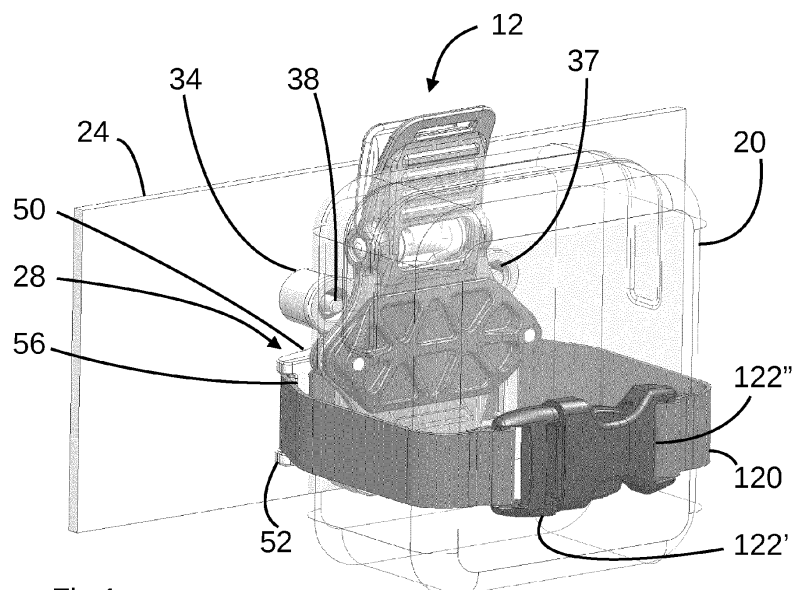


Fig 1

Description

[0001] This invention relates to a retention device. It has particular, but not exclusive, application to a quick-release retention device for carrying an item of emergency equipment such as a first-aid kit. The invention will be described in relation to a device for use by a person working at height, but it is not limited to such application.

[0002] A person working at height must often carry a large amount of equipment that will be used during their work. Emergency equipment, such as a first-aid kit, will also be carried. All of this equipment is typically carried by securing it directly or indirectly to a working harness.

[0003] Since the emergency equipment is used only rarely, it is often carried at a worker's back, with space at the front of the harness being reserved for equipment that is in more regular use. This positioning of the emergency equipment creates difficulties. Mistakes in handling must be avoided, yet by its nature, the equipment will be used in situations of stress which gives rise to an increased likelihood of error. Additionally, the worker is likely to be relatively unfamiliar with its operation, is disadvantaged by having restricted sight of the equipment as a consequence of its position, and may have reduced capacity due to injury.

[0004] An aim of this invention is to provide apparatus and methods for securely mounting equipment and in particular emergency equipment on a support such that it can be accessed and returned readily and reliably and most preferably using just one hand. The mounted equipment may also be attached to items other than a dedicated base and still be located securely.

[0005] To this end, from a first aspect, this invention provides a system for mounting an item of equipment on a support that is a component of an item suitable for wearing on a person, the system comprising a base that has fixing formations and cooperating fixings that are suitable for fixing the base to a support, a clip that is fixed to an item of equipment, wherein the clip can be releasably connected to and removed from the base while the base remains fixed to a support and while the clip (12) remains fixed to the item of equipment.

[0006] In a system embodying the invention the fixings may include:

threaded fasteners that cooperate with the fixing formations and which can be passed through mounting holes in the support;

threaded fasteners that can be passed through mounting holes in the support to cooperate with a threaded component of the base;

threaded fasteners that cooperate with the fixing formations and which can be driven into the support; or

an adapter that cooperates with the fixing formations and which can be connected to the support.

[0007] The system may include drop-prevention components that prevents the clip from becoming completely separate from the base when it has been removed from the base. For example, the drop-prevention components may include an elongate flexible element that is connected between the clip and to the base and remains so connected when the clip is removed from the base.

[0008] Typically, the base and/or the clip includes guide formations that guide the clip to the correct position on the base. For example, the guide formations may include one or both of guide surfaces that splay apart and guide surfaces that include convex curves.

[0009] The support may be a component of an item of personal protective equipment such as a harness, which is one or both of a fall-protection harness and a harness for supporting a person working at height. (It could, alternatively, be a belt worn for the specific purpose of mounting the base.) The support may have a plurality of spaced mounting holes through which fasteners can be passed to connect the base to the support, such as is disclosed in WO-A-2020/174221. The support may be an integral component of a harness through which mounting holes are formed, or it may be a component secured to the harness, which components include the spaced mounting holes.

[0010] The item of equipment is typically emergency equipment such as a first-aid kit.

[0011] From a second aspect, this invention provides a system according to the first aspect having an item of equipment fixed to the clip to form a clip subassembly. The item of equipment may be an enclosure for containing items. For example, the enclosure may be a first-aid kit

[0012] From a third aspect, this invention provides a harness or a belt upon which the base of a system embodying the first or second aspect of the invention is fixed.

[0013] The system is preferably fixed at a location on the harness that is not used to carry equipment that is in frequent use, for example, towards the back of a person using the harness.

[0014] The support is a semi-load-bearing substrate of the harness, such as a flexible sheet formed of, for example, a PVC/Polyester laminate.

[0015] From a fourth aspect, the invention provides a method of using a harness or a belt embodying the third aspect of the invention, comprising steps of opening the clip; removing the clip sub-assembly from the base; applying the clip to an item other than the base to support the clip sub-assembly for subsequent use.

[0016] The item to which the clip is applied may be an item or wearing apparel, another component of the harness. It might also be an unconnected object, such as a tree branch.

[0017] An embodiment of the invention will now be described in detail, by way of example, and with reference to the accompanying drawings, in which:

Figure 1 shows an item of equipment carried on a

retention device embodying the invention;

Figure 2 shows an outer face of a base of the retention device of Figure 1 mounted on a substrate of a harness;

Figure 3 is a view of the inner face of the base of Figure 3;

Figure 4 shows a clip subassembly of the retention device of Figure 1 comprising a clip having an item of equipment mounted on it;

Figure 5 is an exploded view of the clip of Figure 4;

Figures 6 and 7 are back and front views of a clip tongue of the clip of Figure 4;

Figure 8 is a front view of a clip bracket of the clip of Figure 4;

Figure 9 is a back view of a clip bracket and an attachment plate of the clip of Figure 4;

Figure 10 shows the item of equipment of Figure 1 and the attachment plate of Figure 9;

Figure 11 is an exploded view of the clip subassembly;

Figure 12 shows a securing strap arrangement deployed to enhance the security of attachment of the item of equipment of Figure 1;

Figures 13 to 16 are front, side, rear and exploded front views of a mounting adapter that can be used to connect an embodiment of the invention to a harness;

Figure 17 illustrates how an embodiment of the invention can be mounted on the mounting adapter of Figures 13 to 16;

Figure 18 shows an embodiment of the invention mounted on a fixed object; and

Figure 19 shows an embodiment of the invention equipped with a drop-prevention cord.

[0018] With reference to the drawings, a retention device embodying the invention comprises a base 10 and a clip 12. Its application in this example is to mount an enclosure 20 that may, for example, contain a first-aid kit (shown transparent in Figure 1) on a substrate 24 of a harness or other structure.

[0019] In this example, the substrate 24 is provided with a plurality of mounting holes of 5 mm diameter and with centres spaced by an integer multiple of 15 mm, as

disclosed in WO-A-2020/174221, the content of which is incorporated herein by reference. The substrate 24 is a semi-load bearing component formed from a flexible sheet of a PVC/Polyester laminate. It is semi-load bearing in that it is not one of the primary load-bearing components responsible for transferring the weight of a user of the harness to a support such as a climbing rope, but it does contribute to the strength of the harness and maintains the primary load-bearing components in their correct positions.

[0020] The base 10 is formed as a one-piece plastic moulding that is symmetrical about a median plane P. The base 10 includes a U-shaped frame that extends from an inner to an outer face of the base 10. In normal use, as shown in Figure 3, the frame has legs 30 disposed to opposite sides of the median plane P. The legs 30 are interconnected by a crossbar 32 and each end to two free end portions, the legs 30 and the crossbar 32 symmetrical about the median plane. The legs 30 and the crossbar 32 are approximately rectangular in cross-section, with a long dimension extending from the inner to the outer surfaces parallel to the median plane P.

[0021] The crossbar has a several functions. It contributes significantly to strength and rigidity of the frame of the base 10. It also provides protection to the lower end of the clip 12 such that it is highly unlikely that an external force can be applied to the lips 76, 88 by an object such as a tree branch which could cause the clip 12 to become disengaged and pushed of the plate 40. The crossbar 32 therefore has security function that helps reduce the probability of inadvertent release of the clip 12.

[0022] At their end remote from the crossbar 32, a mounting boss 34 is formed on each leg 30 to serve as a fixing formation for the base 10. Each mounting boss 34 extends from the respective leg 30 away from the median plane P and has a bolt hole 36 extending through it in a direction parallel to the median plane P between the inner and the outer faces to the base 10. An internally-threaded metal ferrule 37 is disposed within each bolt hole 36. At the inner face, the boss 34 has an annular mating surface surrounding the bolt hole 36. The centres of the bolt holes 36 are spaced by a distance equal to the spacing between the centres of two of the mounting holes in the substrate 24. Remote from the crossbar 32, mutually facing guide surfaces of the legs 30 splay apart from one another and curve around the mounting bosses 34.

[0023] At the outer surface, the legs 30 are interconnected by a plate 40 which extends normal to the median plane P. The plate 40 extends from the mounting bosses 34 towards but not to the crossbar 32, leaving a slot 42 between the crossbar 32 and a straight bottom edge of the plate 40. The plate 40 can be considered to perform the function of a short length of 45mm webbing. As compared with webbing, the plate 40 is rigid hence has the benefit that it is in a predictable location and condition for connection. The thickness of the plate 40 is tapered (by approximately 50% on its upper edge portion to pro-

vide a thinner face to facilitate installation if the clip 12 and is thicker and not tapered close to its lower edge to provide more reliable engagement for the transverse lip 88.

[0024] The inside of the plate 40 is offset from the outer surface of the substrate 24 by the thickness of the clip tongue 62, including the transverse lip 76, plus a small margin (approximately 0.6mm or 7% in this embodiment). This serves to facilitate connection of the clip 12 but minimises overall volume and limits the build-up of unwanted debris.

[0025] A webbing guide 28 projects from each leg 30 symmetrically away from the median plane P. Each webbing guide has an upper and a lower arm 50, 52 that project away from the median plane. Parallel inner and outer guide bars 54, 56 extend between the arms 50, 52.

[0026] The clip 12 comprises three main components, each formed as one-piece mouldings: a clip bracket 60, a clip tongue 62 and an attachment plate 64. It also includes a metal pivot pin 102 and a closing spring 104.

[0027] The clip tongue 62 has a plate portion of generally rectangular peripheral shape and is symmetrical about a long axis that extends vertically in the figures. It has a shallow U-shape cross-section to provide it with beam stiffness. At approximately one third of the length of the clip tongue 62 from an upper end, and to opposite sides of the long axis, a pair of lugs 66 project from the plate portion parallel to one another. A circular pivot hole 68 passes through each lug 66, the pivot holes 68 being coaxial with one another. A plurality of transverse ribs 70 of rounded triangular cross-section are formed on a first surface 72 of the plate portion in a region that extends, approximately, from the lugs 66 to the upper end. A transverse lip 76 extends across and projects from a second surface 74 of the plate portion. The transverse lip 76 has a chamfered lower surface and an upper surface that is approximately at right angles to the second surface.

[0028] The clip bracket 60 is symmetrical about a long axis that extends vertically in the figures. Below a line X-X in Figures 8 and 9, the clip bracket 60 has a mounting region. A first surface 80 of the mounting region is flat and planar. Two lugs 82 project from the mounting region 80 symmetrically away from the long axis, a circular mounting hole 84 passing through each lug 82, the mounting holes 84 having parallel axes. An opposite, second surface of the mounting region 80 is formed with strengthening ribs 86 that stiffen the mounting region 80. A transverse lip 88 extends across and projects from the second surface of the mounting region 80 of the plate portion. The transverse lip 88 has a chamfered outer surface and an inner surface that is approximately at right angles to the second surface.

[0029] Above the line X-X in Figures 8 and 9, the clip bracket 60 has an operating region. The operating region has a peripheral flange 90, end portions of which extend from the mounting region in a U-shape. Close to the line X-X, a boss 92 projects outwardly from leg portions of the flange 90, a pivot hole 94 extending through each

boss 92, the pivot holes 94 being coaxial. Inwardly of the bosses 92, the flange 90 has flat surfaces that face one another across the long axis of the clip bracket 60. A web 96 extends between the leg portions of the flange 90, a plurality of ribs 98 being formed on a surface of the web 96 above the mounting region 80. A loop 100 extends outwardly from the operating region.

[0030] The pivot pin 102 has an elongate shaft of circular cross-section at one end of which is a head. The closing spring 104 has a central coiled portion from which two arms project. The arms can be pivoted with respect to one another about the coiled portion against spring force.

[0031] The clip 12 is assembled by passing the lugs 66 of the clip tongue 62 between the leg portions of the flange 90 on the clip bracket 60 such that the pivot holes 68 of the lugs 66 align with the pivot holes 94 in the bosses 92. The closing spring 104 is located with its coiled portion aligned with the holes 68, 94 and its arms bearing against the second surface 74 of the clip tongue 66 and the web 96 of the clip bracket 60. The shaft of the pivot pin 102 is then inserted through a first pair of the holes 94, 68 the coiled portion of the closing spring 104, and the second pair of holes 68, 94, until the head makes contact with the boss 92 surrounding the first pivot hole 94. The pivot pin 102 is secured by applying a fastener to or riveting the end portion of the shaft opposite the head. The arms of the closing spring 104 urge apart the portions of the clip base 60 and clip tongue 62, causing the transverse lip 88 of the clip base 60 against the clip tongue 62 immediately adjacent to its transverse lip 76.

[0032] A user can apply manual squeezing force to the clip base 60 and the clip tongue 62 in the region of their transverse ribs 70, 98 (arrows F in Figure 4) to pivot the clip base 60 and clip tongue 62 about the pivot pin 102, thereby separating the transverse lips 76, 88 so opening the clip 12.

[0033] The clip 12 can be attached to a piece of equipment such as an enclosure 20 using the attachment plate 64 to form a clip sub-assembly. The clip sub-assembly is not disassembled during normal use but can be disassembled to replace the enclosure or the clip if required. The attachment plate 64 is passed behind a securing loop 22 and then secured to the clip base 60 by passing a screw 112 through each of the mounting holes 84 of the clip bracket 60 into two internally threaded fastening holes 110 in the attachment plate 64 located to opposite sides of the securing loop 22.

[0034] Use of this retention device with a harness will now be described.

[0035] First, the base 10 is connected to the harness. This connection is not intended to be disconnected during use of the harness. In this example, this is done by passing a shank of a respective M5 bolt 38 through two of the mounting hole in the substrate 24. Each shank passes into a corresponding bolt hole 36 of the base 10, wherein it is threaded into the ferule 37, and tightened to pull the base into contact with an outer surface of the substrate

24, as shown in Figures 1 and 2. A head of the bolt 38 makes contact with an inner surface of the substrate 24. The bolts 38 have low-profile heads - in this case metric socket flanged button screws - so that they do not cause discomfort to a wearer of the harness. In cases where the enclosure 20 is expected to be used rarely, such as with emergency equipment, this will typically be done at a part of the harness that will be towards the back of a user wearing the harness. For example, this may be approximately centrally at the back of the harness and towards its top, to enable it to be accessed equally easily by either of a user's hands.

[0036] The enclosure 20 is then mounted on the harness by sliding the clip 12 down onto the base with the clip base 60 and the clip tongue 62 to opposite sides of the plate 40 of the base 10, with the clip base 60 closely approaching the legs 30. The curved facing surfaces of the legs 30 and their splay in the region of the mounting guide the clip 12 into the correct position on the base 10, which helps a user to perform this operation with one hand. The plate 40 makes contact with the chamfered surfaces of the lips 76, 88 which urges them apart and so opens the clip 12 to the extent necessary to allow it to be mounted on the base 10. The clip 12 is allowed to close under the action of the spring force. The transverse lips 76, 88 slide in contact with the plate 40 and, when the clip reaches a locking position, enter the slot 42 whereupon the clip 12 can close fully. The transverse surfaces of the lip 88 is in contact with the edge of the plate 40 thereby preventing removal of the clip 12 from the base 10 until the clip is opened, whereby the enclosure 20 is reliably and securely connected to the harness. It will be seen that the lip 88 makes contact with the plate 40 along its length, and not just at a single point, to further enhance security of connection. Interaction between the clip tongue 62 and the legs 30 restrict transverse and rotational movement of the clip 12 on the base 10. The edge of the plate 40 opposite from the slot 42 makes contact with or closely approaches the bosses 92 on the base 10 to prevent further downward movement of the clip 12.

[0037] Although the enclosure 20 when mounted as described above is secure against accidental removal, it can be accessed by a user of the harness readily when required. Opening the clip 12, as described above, allows it to be removed whereby the clip subassembly can be detached from the harness for use. However, if the user loses grip of the clip 12 during removal, the transverse lips 76, 88 will come into contact with the plate 40 to resist it moving back into the locking position or falling from the base 10 under gravity.

[0038] Security of the fastening can be enhanced by a securing strap arrangement. This includes a length of webbing 120 that is passed through the webbing guides 28 of the base 10. The webbing 120 is terminated at opposite ends by releasable and interconnectable components 122', 122" of an adjustable webbing buckle 122. Upon installation, the webbing 120 is wrapped around

the enclosure 20 and tightened using the buckle, as shown in Figures 1 and 2. The buckle 122 must be released (as shown in Figure 3) to allow the webbing 120 to fall away from the enclosure 20 before attempting to disconnect the enclosure 20 from the harness. Security is further enhanced because when the webbing 120 is tensioned around the enclosure 20 it is not possible to fully open the clip 12. The tongue 62 is able to pivot between the legs 30, but the clip bracket 60 is held firmly against the plate 40 such that the transverse lip 88 remains located on the lower edge of the plate 40 such that the clip 12 cannot be removed from the base 10. To detach the enclosure 20 from its designated storage position, a sequence of actions must be performed:

- tension must be removed from the webbing 120, normally and most easily by releasing the buckle 122;
- the clip 12 must be opened sufficiently far as to allow the transverse lip 76 on the tongue 62 clears both the transverse lip 88 on the bracket 60 and the plate 40;
- the transverse lip 88 on the bracket 60 must be manoeuvred clear of the plate 40; and
- the clip assembly 12 must be withdrawn from the base 10.

[0039] These actions have been designed to provide a secure attachment yet can be carried out with one hand (either left or right since the mechanism is symmetrical).

[0040] Once the enclosure 20 has been disconnected from the harness, it is preferable that steps are taken to minimise the chance of it being dropped and lost and to enable it to be used conveniently, for example, using one hand. The clip 12 may be attached to a convenient retention item, such as a readily-accessible component of the harness or of a user's clothing or other equipment (such as a webbing indicated diagrammatically at 26 in Figure 19, a belt, an edge of a piece of fabric, a sling or a pocket) or to a fixed item such as a building component or a tree branch. This allows a user to access the contents of the enclosure 20 without having to hold onto it at the same time, whereby its contents can be accessed by a user using one hand. When installed on thin fabric such as a shirt or trouser pocket, the transverse lips 76 and 88 overlap to pinch the fabric when helps to hold the clip 12 in the desired location.

[0041] The clip 12 may be connected to the base 10 for example by a flexible cord tied through the loop 100 and also tied to a component of the clip. The cord is sufficiently long and flexible so as not to inhibit use of the enclosure 20 or any other item connected to the clip, but serves to prevent loss in the event that the item is dropped.

[0042] As will be understood from the above description, the clip 12 (and therefore the enclosure 20 carried

on it) is installed and removed from the base 10 within the limits defined by the legs 30 and the plate 40. As such, the clip 12 and enclosure follow a linear path that is typically vertical when the base 10 is installed on a belt or harness that is being worn by a person standing upright. A harness used for work at height is often used to carry numerous items that aid the movement and position of the climber and also many tools to enable the work task to be carried out. This often results in a harness waist belt on which space is limited so it is preferable for a seldom-used item such as a first-aid kit to be located where it doesn't get in the way of day-to-day activities. Therefore, the upper centre rear of the waist is often the preferred location. As well as being out of the way, this position has the added advantage that the first-aid kit can be accessed using both left and right hands. The linear, vertical installation path has been chosen because it allows the item of stored equipment to be removed into the clear space above the waist belt and therefore does not conflict with neighbouring items. This is in contrast to mounting arrangements that require rotation to mount or dismount an item. Due to the proximity of other items stored on the harness waist belt, rotational would often not be possible.

[0043] The mounting apparatus can be used with a harness other than the type disclosed in WO-A-2020/174221, and thus lacking mounting holes, if suitable alternative mounting arrangements are made. For example, a mounting adapter as shown in Figures 13 to 16 may be used.

[0044] With reference to Figures 13 to 16, a mounting adapter that comprises a moulded plastic mounting plate 160 and a moulded plastic back 162.

[0045] The mounting plate 160 extends in a plane and is formed with a multiplicity of holes that extend through the plate normal to the plane between front and rear surfaces. In this embodiment, two of these holes are bolt holes 164. (Other embodiments may include more than two bolt holes for additional connection strength.) At the front surface, the bolt holes 164 are countersunk. At the rear surface, the bolt holes 164 are surrounded by an annular mating surface that extends parallel to the plane of the mounting plate 160.

[0046] The remaining holes in the mounting plate 160 are mounting holes 172. In this embodiment, there are two groups of mounting holes, shown generally by dotted lines at 170, and arranged symmetrically about a line interconnecting the bolt holes 164. To be compatible with existing systems, each mounting hole 172 is 5mm in diameter and they are centred on a 15mm square grid. The mounting holes 172 open at the rear surface of the mounting plate 160 in a plurality of recesses 174, each recess having a flat base surrounding the mounting holes 172.

[0047] The back 162 includes an elongate bar portion 176 at each end of which is a mounting region 178. Each mounting region 178 has a through hole 180 within which a threaded insert 182 is located. At each mounting region 178, a boss 184 surrounds the through hole 180, each

boss having an annular mating surface 186. The centres of the through holes 180 are at the same distance apart as the centres of the bolt holes 164 in the mounting plate 160.

[0048] The bar portion 176 has a flat gripping surface 190 that faces in the same direction as the annular mating surfaces 186. The gripping surface has a rounded projection 192 located centrally by width and approximately one-third of the length from one end.

[0049] Assembly of the mounting adapter takes place upon a suitable webbing component of a harness for a person working at height. The back 162 is positioned with its gripping surface 190 against and extending across the webbing component, in contact with a face of the webbing component that faces generally towards a user's body when the harness is in use. The particular mounting adapter chosen is of a size that the mounting regions project from opposite edges of the webbing component. The mounting plate 160 is then placed onto the back 162 across the webbing component such that the annular mating surface that surrounds each bolt hole 164 comes into contact with a respective one of the mating surfaces 186 that surround the through holes of the back 162.

[0050] The shank of a respective countersink headed machine screw 202 is then inserted through each of the bolt holes 164 to become engaged with the adjacent threaded insert 182 of the back 162, the head of each machine screw 202 being received within the countersink of the bolt holes so as not to project from the front surface of the mounting plate 160. The machine screws 202 are tightened to clamp the mating surfaces of the mounting plate 160 and the back 162 together. In this configuration, a slot is defined between the mounting plate 160 and the gripping surface 192 of the back, the webbing component passing through the slot, the slot being approximately the thickness of the webbing component and of length approximately the width of the webbing component. Tightening the screws 202 causes the rounded projection 192 to be pressed against the webbing component with the effect that the webbing component is clamped between the gripping surface 190 of the back 162 and the rear surface of the mounting plate 160. (It is possible to omit the projection 192 or remove it, for example, by filing if desired.)

[0051] The base 10 can then be connected to the harness by passing a threaded fastener 38 through each bolt hole 36 of the base 10 and a corresponding mounting hole 172 in the mounting plate, as shown in Figure 17.

[0052] The retention device embodying the invention can also be used to releasably carry an item on a fixed support, such as a wall 200. Screws 204 can be driven through the bolt holes 36 of the base 10 into the wall 200, and the clip 12 and attached enclosure 20 can then be connected to it.

[0053] As shown in Figure 19, the clip 12 may be connected to the base 10 by a flexible cord 14. This serves to tether the clip sub-assembly to the base 10, thereby

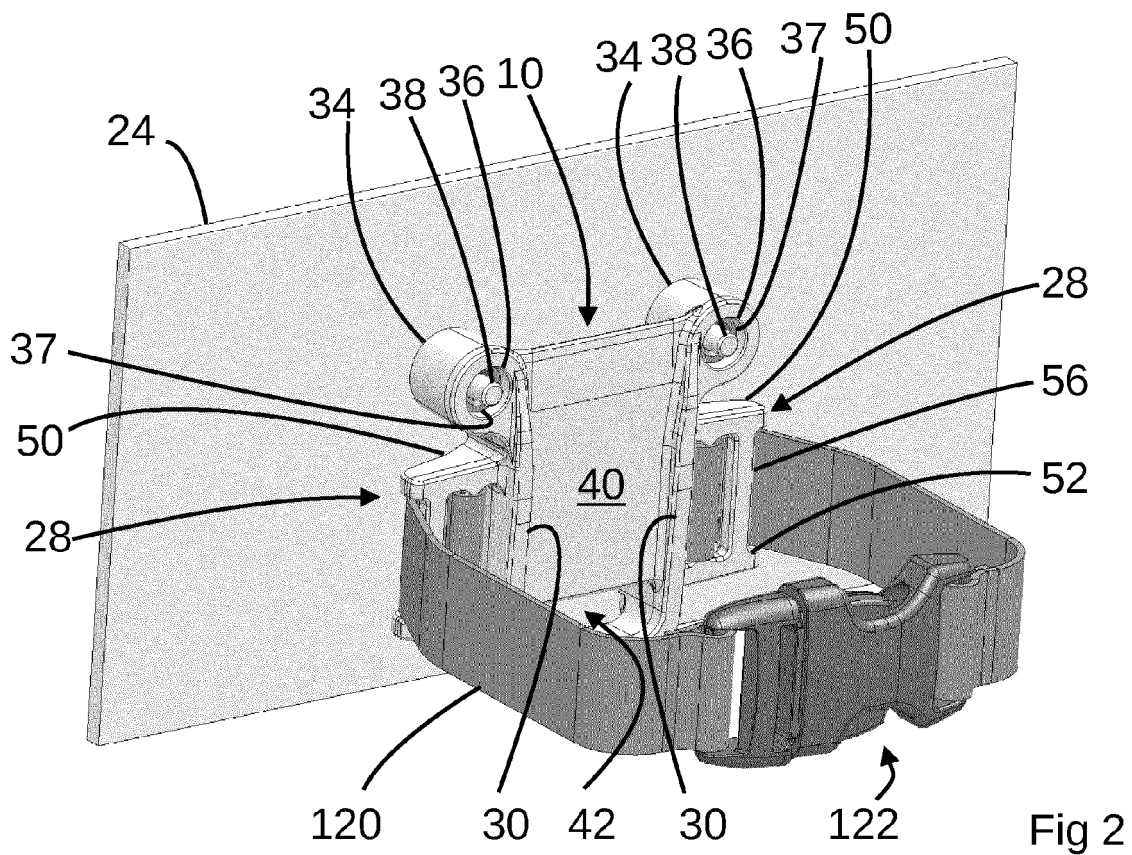
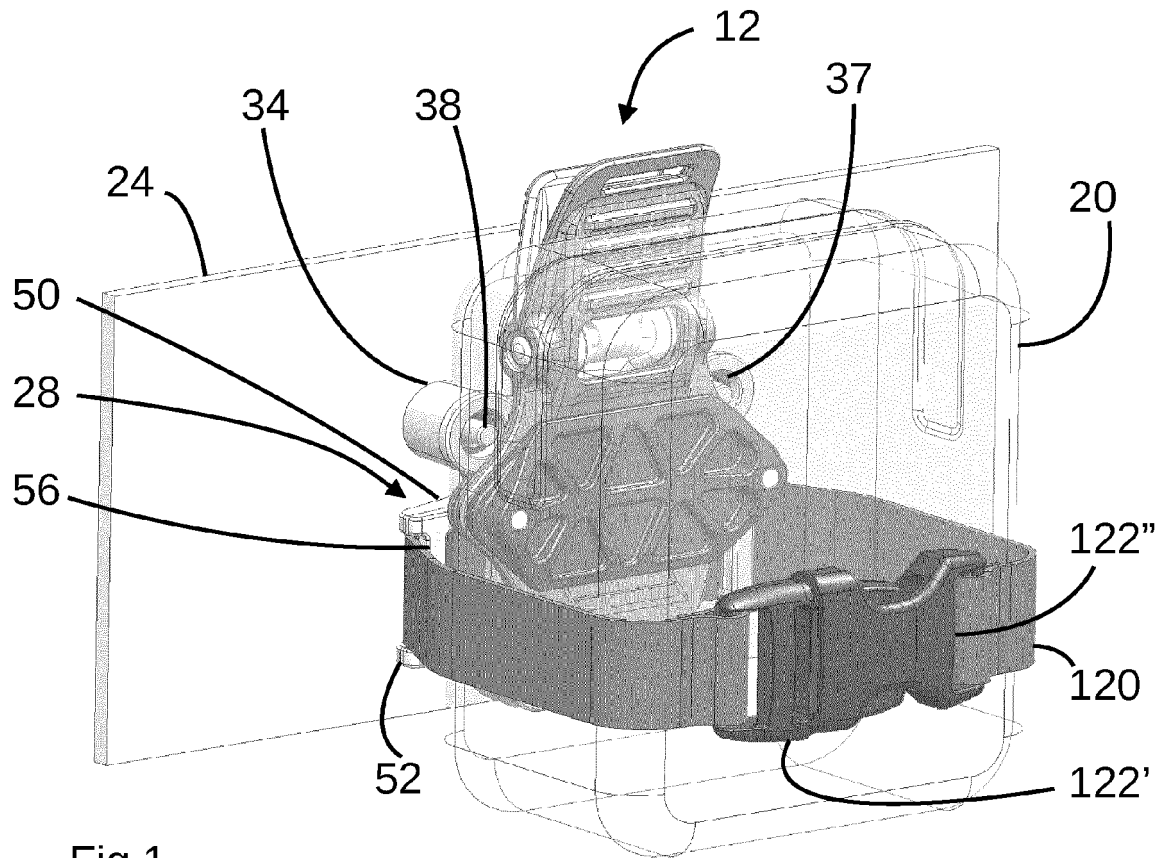
preventing loss of those components in the event that they are dropped during use. The cord 14 has sufficient length to enable the enclosure to be used with a minimum of obstruction.

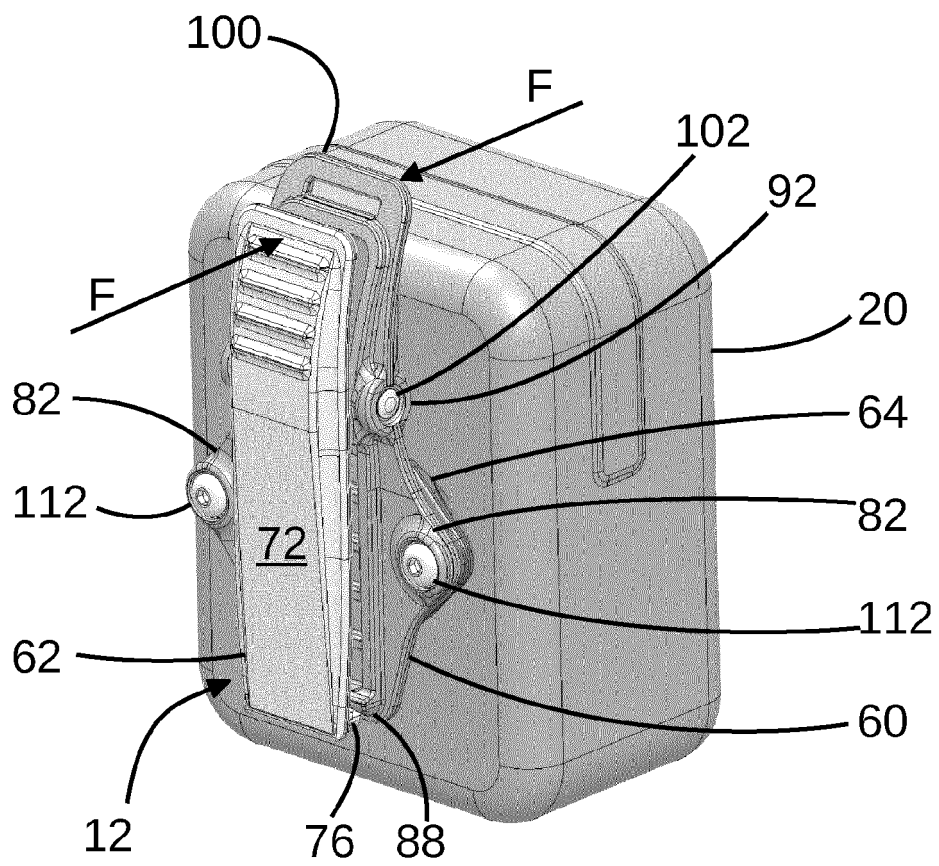
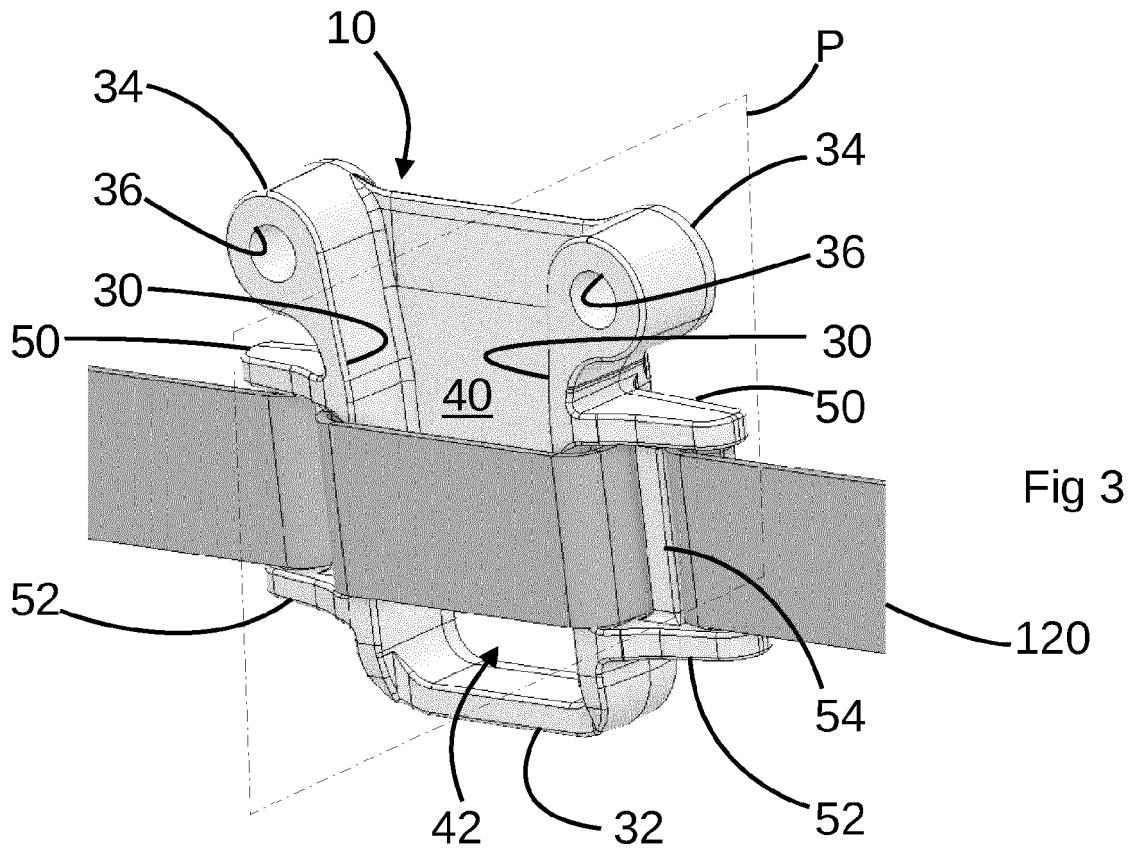
Claims

1. A system for mounting an item of equipment on a support (40), which support is a component of an item suitable for wearing on a person, the system comprising a base (10) that has fixing formations (34) and cooperating fixings (38) that are suitable for fixing the base to the support, a clip (12) that is fixed to an item of equipment (20), wherein the clip (12) can be releasably connected to and removed from the base (10) while the base (10) remains fixed to a support (24) and while the clip (12) remains fixed to the item of equipment (20).
2. A system according to claim 1 in which the fixings include one or more of:
 - a. threaded fasteners that cooperate with the fixing formations and which can be passed through mounting holes in the support;
 - b. threaded fasteners that can be passed through mounting holes in the support to cooperate with a threaded component of the base;
 - c. threaded fasteners that cooperate with the fixing formations and which can be driven into the support; or
 - d. an adapter that cooperates with the fixing formations and which can be connected to the support
3. A system according to claim 1 or claim 2 further including drop-prevention components operative to prevent the clip (12) from becoming completely separate from the base (10) when it has been removed from the base, the drop-protection components including an elongate flexible element (14) that is connected between the clip and to the base and remains so connected when the clip is removed from the base.
4. A system according to any preceding claim in which the base includes guide formations (30) that guide the clip to the correct position on the base.
5. A system according to claim 4 in which the guide formations (30) include one or both of guide surfaces that splay apart and guide surfaces that include convex curves.
6. A system according to any preceding claim in which the support (24) is a component of a harness, which is one or both of a fall-protection harness and a har-

ness for supporting a person working at height

7. A system according to any preceding claim in which the support (24, 160) has a plurality of spaced mounting holes through which fasteners can be passed to connect the base to the support.
8. A system according to claim 7 in which the support is an integral component (24) of a harness through which mounting holes are formed.
9. A system according to claim 7 in which the support is a component (160) secured to the harness, which component include the spaced mounting holes.
10. A system according to any preceding claim having an item of equipment (20) fixed to the clip (12) to form a clip subassembly.
11. A system according to claim 10 in which the item of equipment (20) is emergency equipment such as a first-aid kit.
12. A harness upon which the base of a system according to any preceding claim is fixed.
13. A harness according to claim 12 in which the base is fixed at a location on the harness that is not used to carry equipment that is in frequent use towards the back of a person using the harness.
14. A harness according to claim 12 or claim 13 in which the support is a semi-load-bearing substrate of the harness.
15. A method of using a harness according to any one of claims 12 to 14, comprising steps of opening the clip (12); removing the clip sub-assembly from the base (10); applying the clip (12) to an item (19) other than the base to support the clip sub-assembly for subsequent use.
16. A method of using a harness according to claims 15 in which the item to which the clip is applied is an item or wearing apparel, another component of the harness or an unconnected object, such as a tree branch.





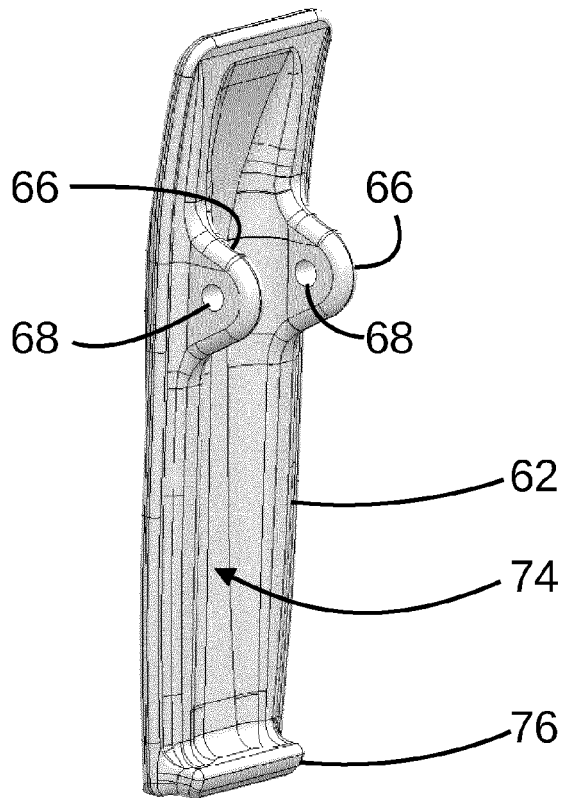
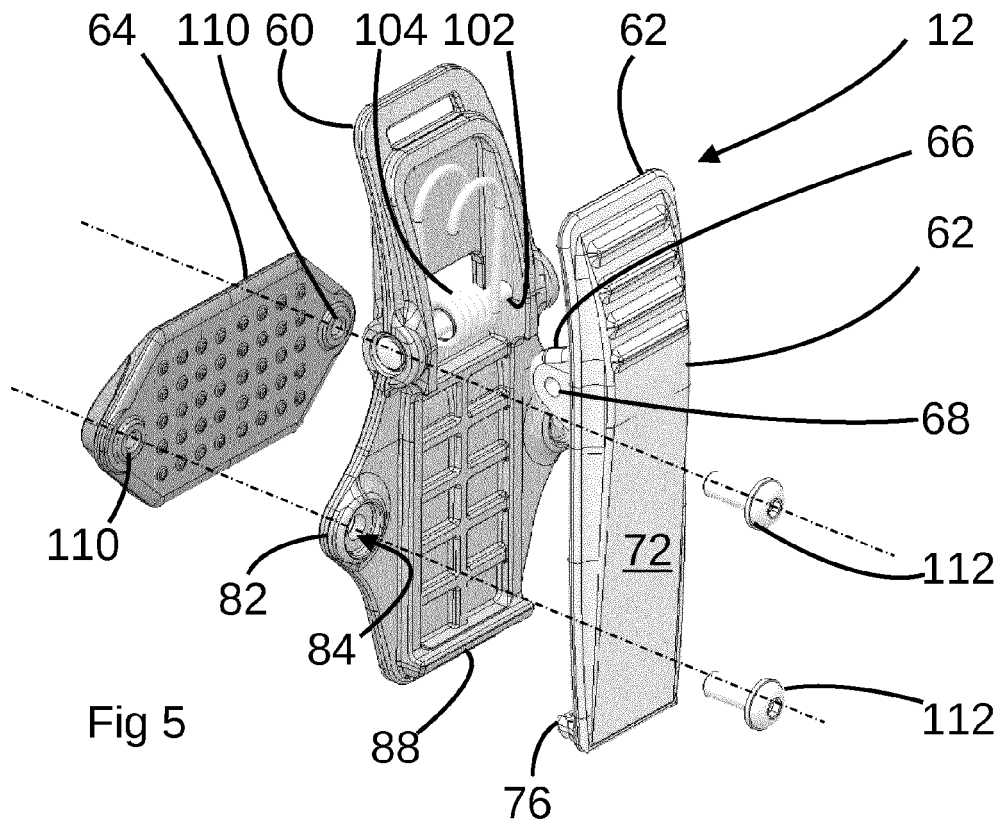


Fig 6

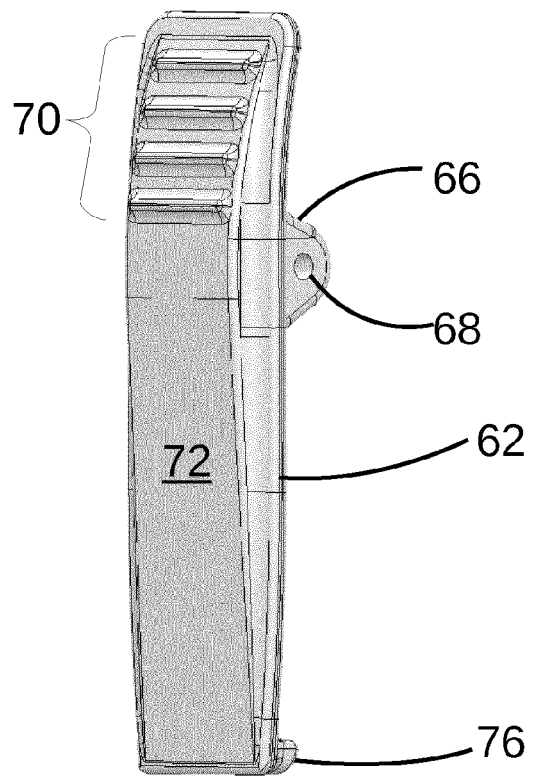


Fig 7

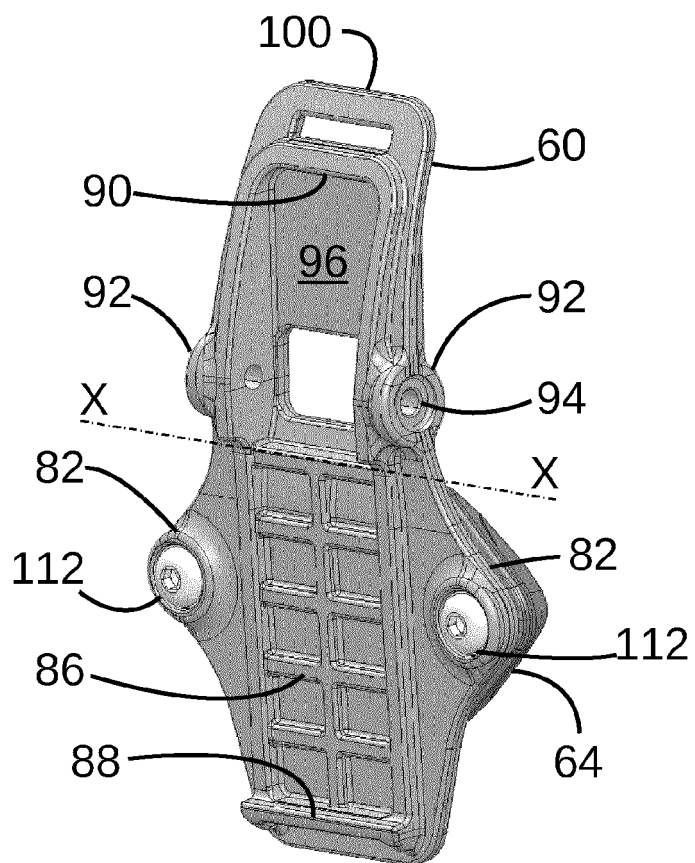


Fig 8

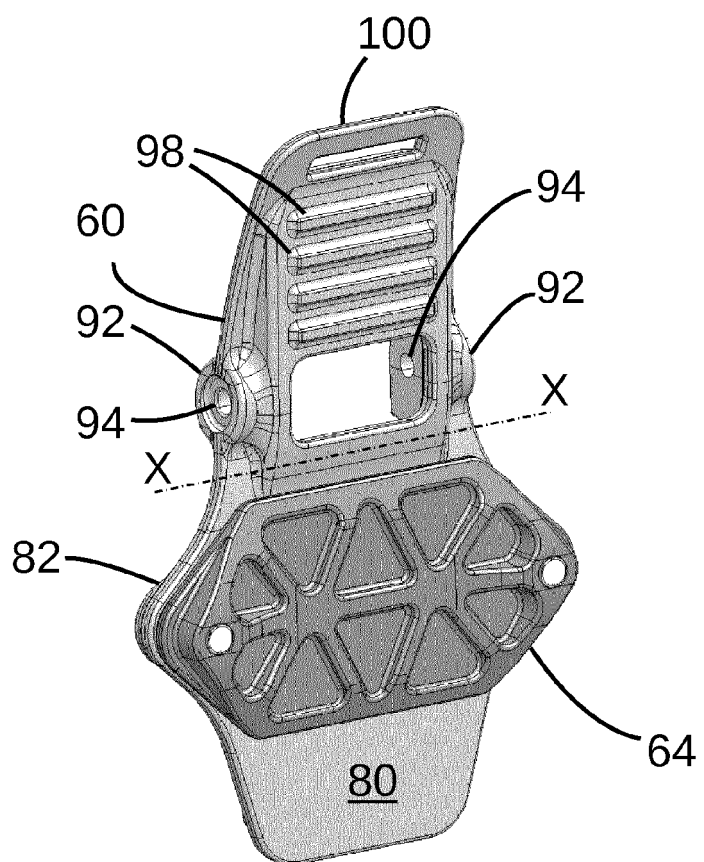


Fig 9

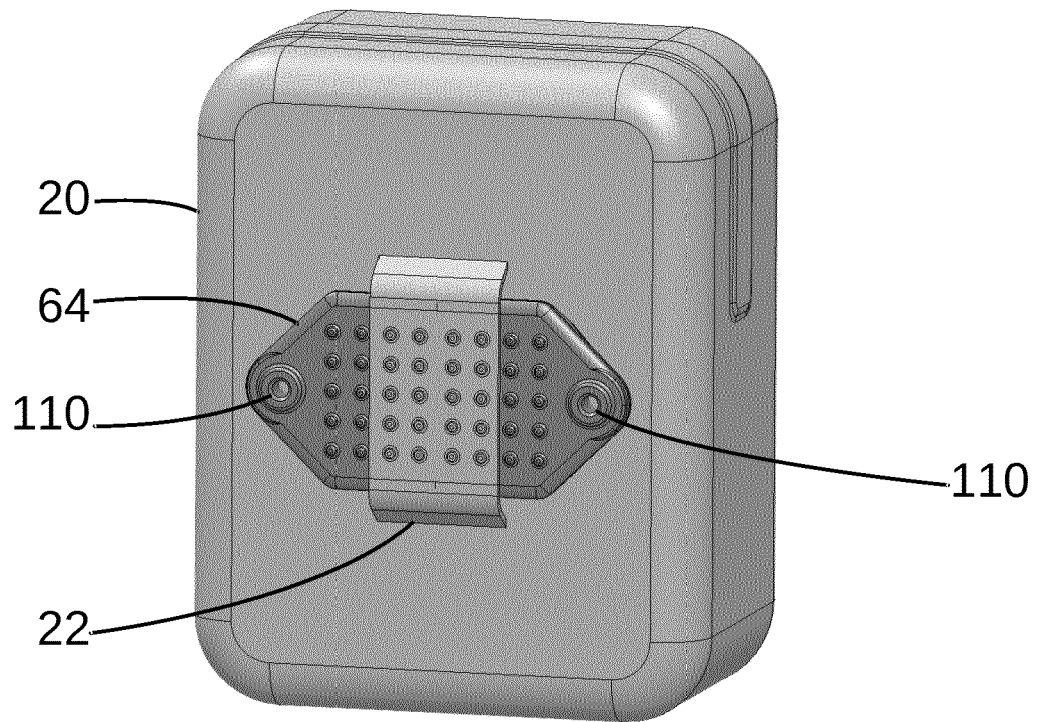


Fig 10

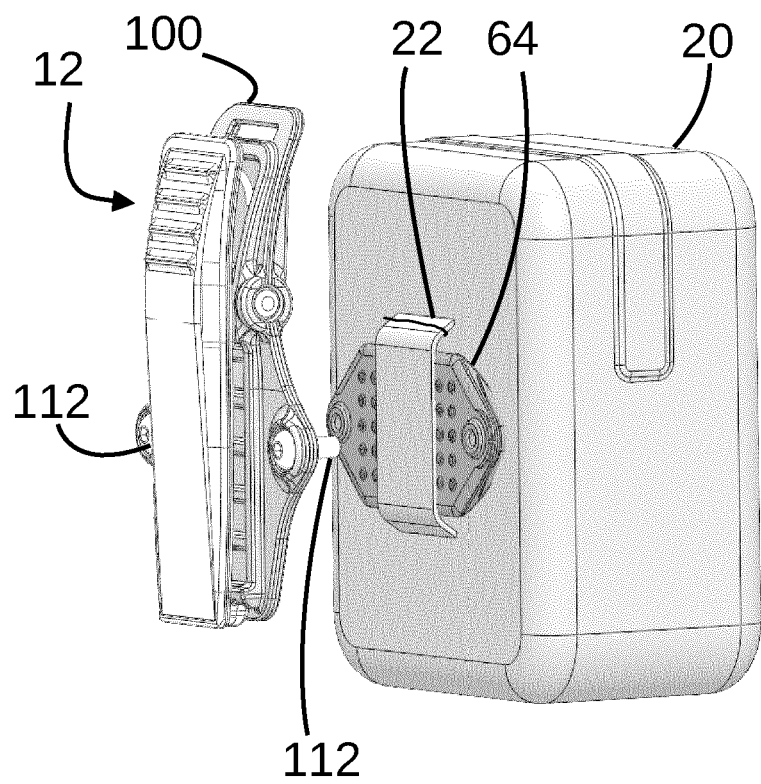
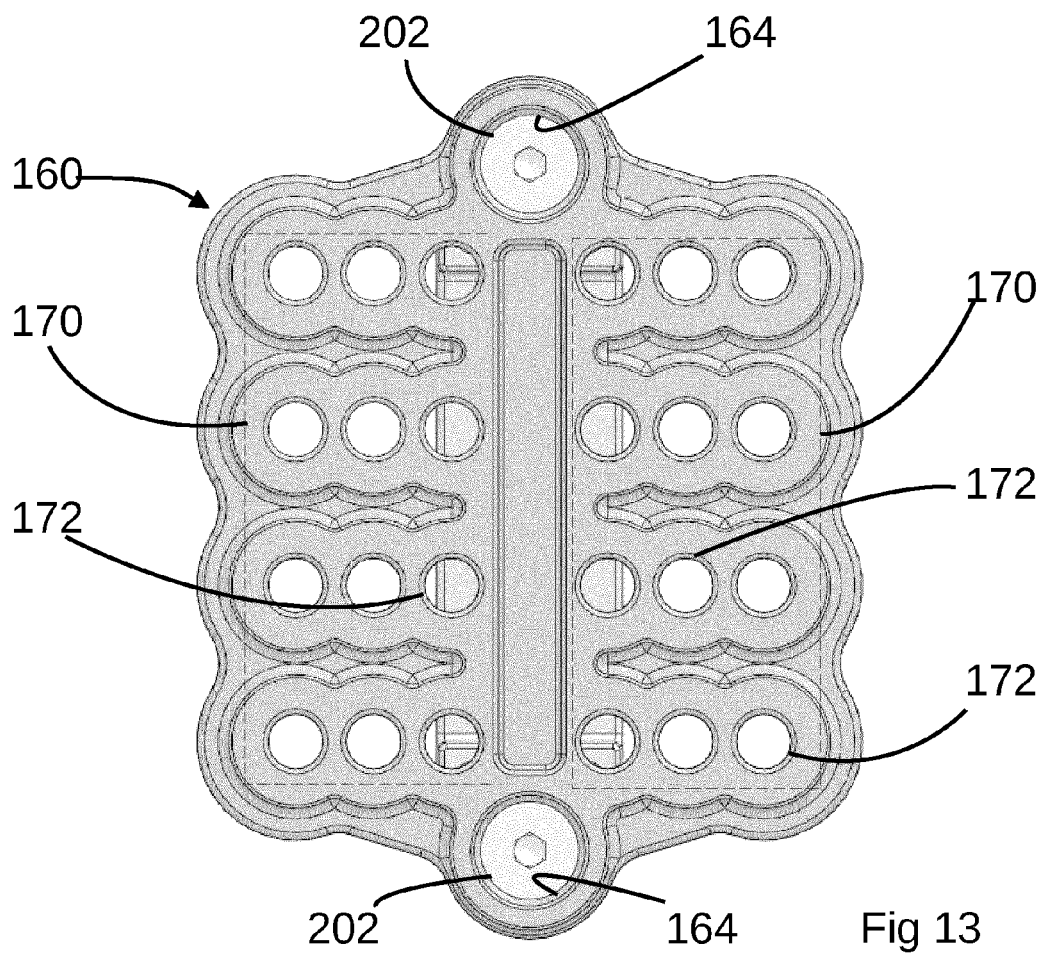
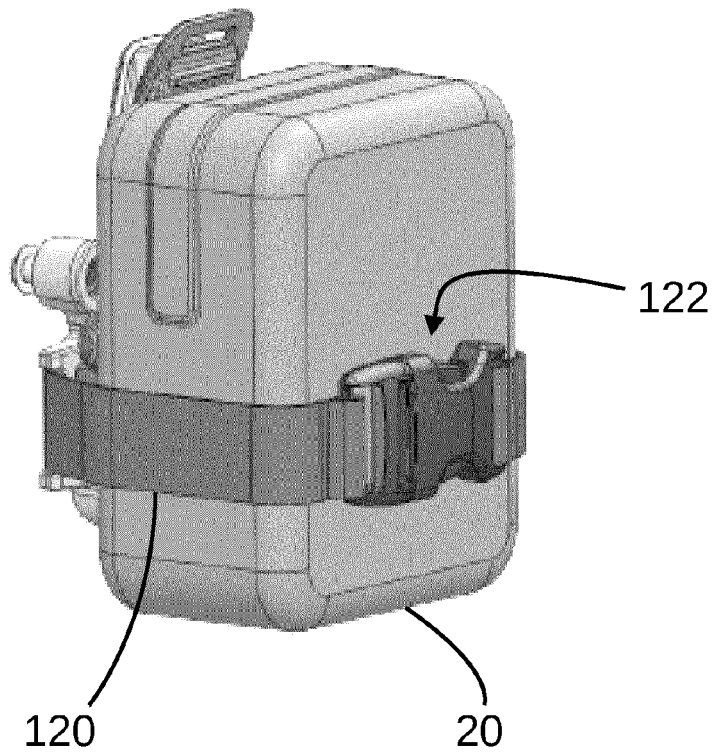


Fig 11



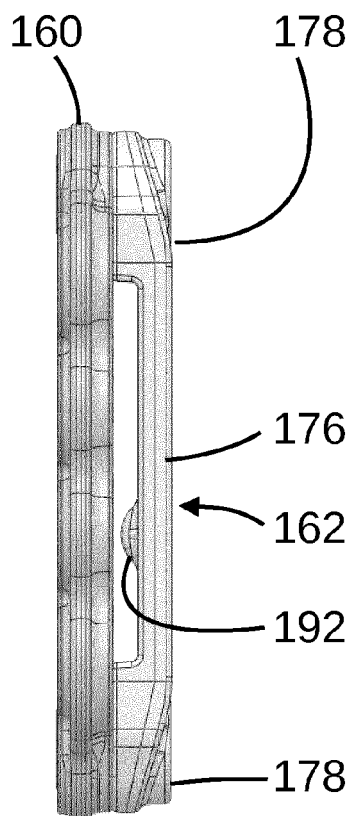


Fig 14

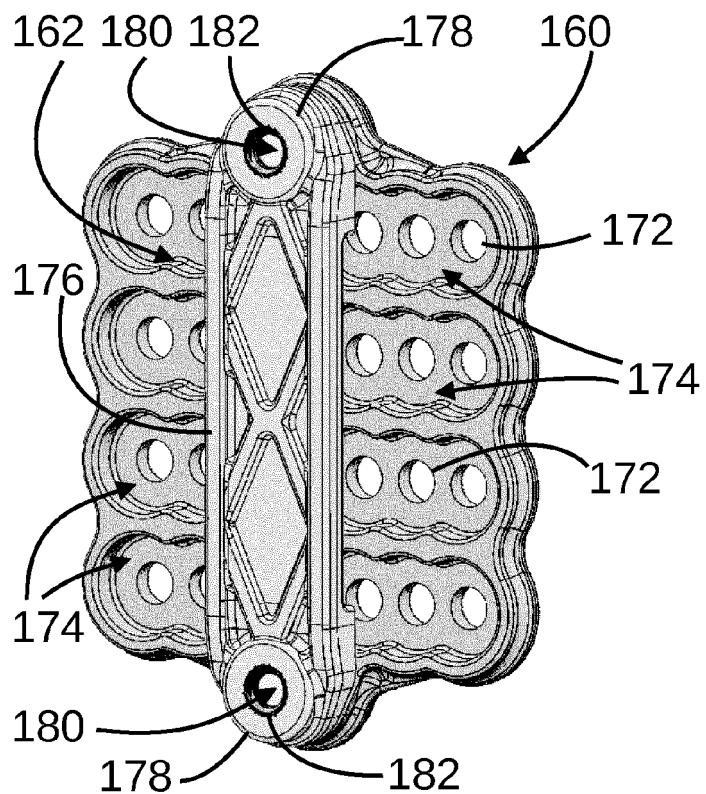


Fig 15

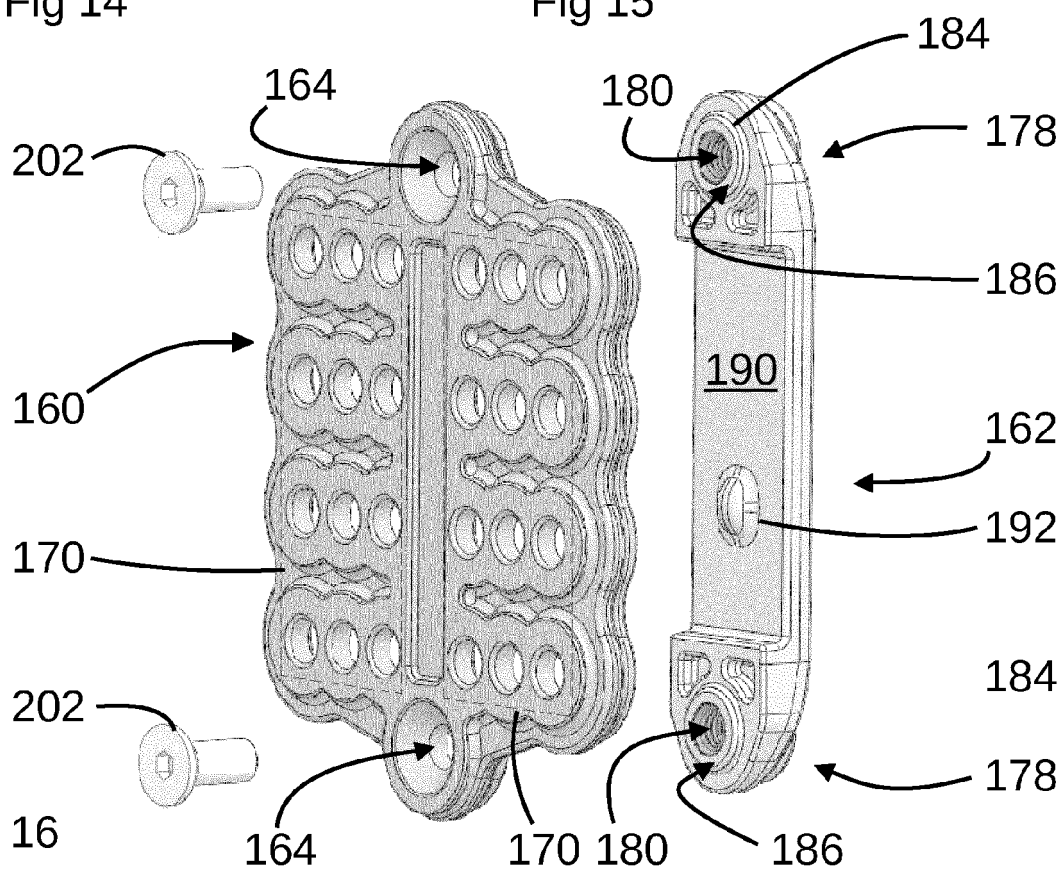
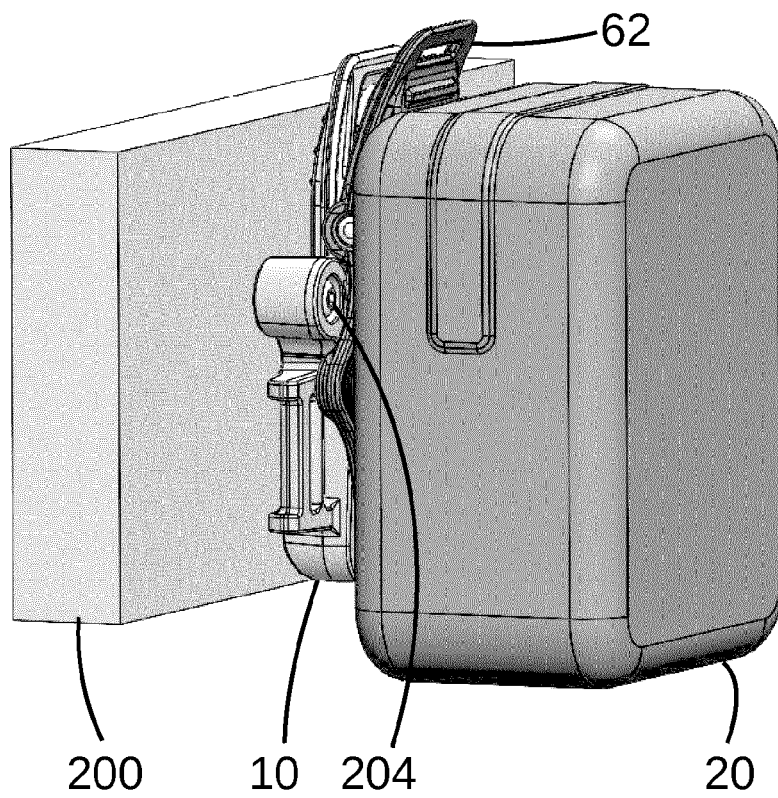
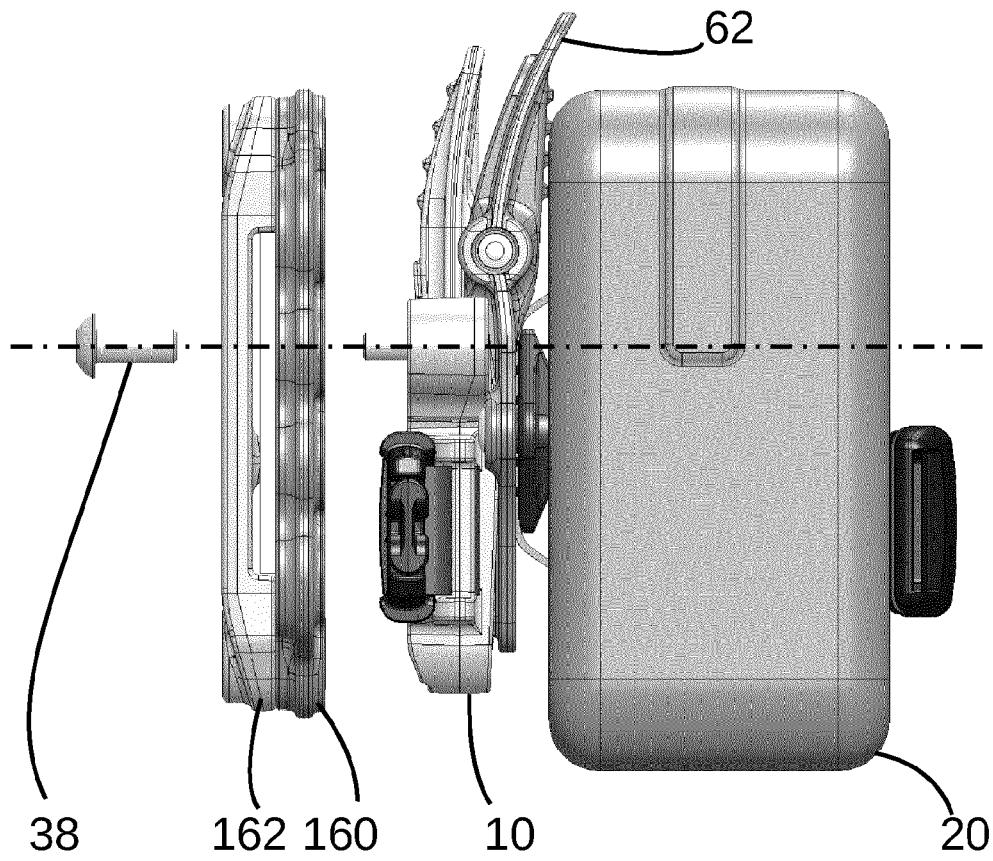


Fig 16



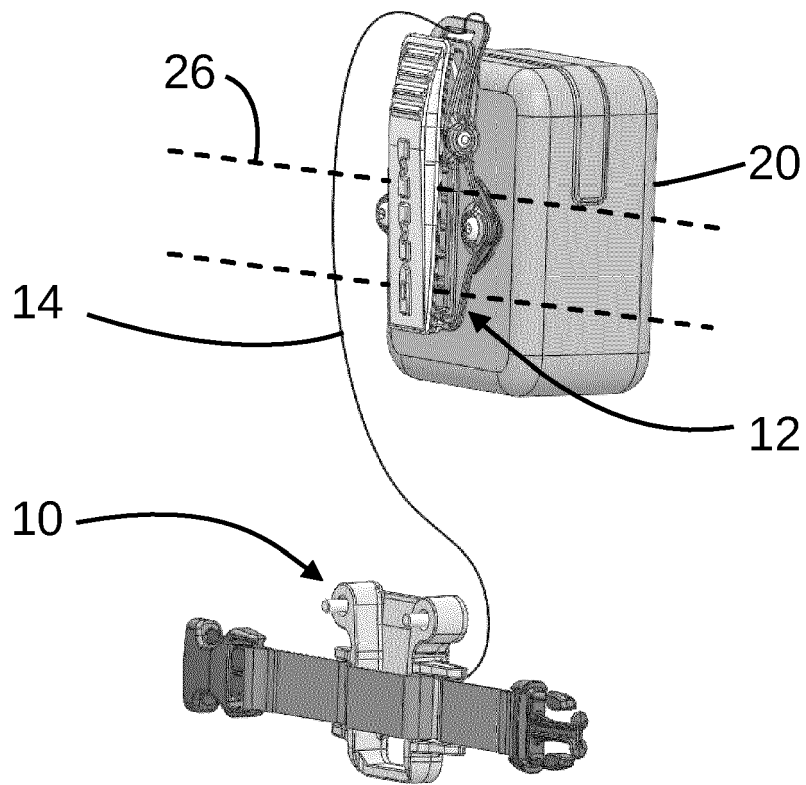


Fig 19



EUROPEAN SEARCH REPORT

Application Number

EP 21 21 6431

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2019/206441 A1 (INDUSTRIAL TOOL SUPPLIES LONDON LTD [GB]) 31 October 2019 (2019-10-31)	1, 2, 7, 10, 11	INV. A45F3/14 A45F5/02
Y	* page 39, line 10 - page 41, line 14; figures *	4	

X	US 2019/231054 A1 (WALTER THOMAS A [US]) 1 August 2019 (2019-08-01)	1-9, 12-14	
Y	* paragraph [0024] - paragraph [0032]; figures *	15, 16	

Y	DE 203 06 596 U1 (GERICK KLAUS [DE]) 14 August 2003 (2003-08-14)	4, 15, 16	
	* paragraph [0022] - paragraph [0037]; figures *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A45F
Place of search		Date of completion of the search	Examiner
The Hague		10 May 2022	van de Beek-Duijker
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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10-05-2022

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WO 2019206441 A1	31-10-2019	NONE	
US 2019231054 A1	01-08-2019	NONE	
DE 20306596 U1	14-08-2003	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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