

"Connector, Housing and Belt"

Field of the Invention

The present invention relates to a connector, a housing and a belt.

The connector of the present invention may be used in a belt having individual compartments, or housings, for retaining personal items of a wearer. Examples of such personal items include a mobile telephone, a personal music player, other personal electronic devices, money and keys. However, the connector of the present invention is not limited to use in such a belt and housing, and may be used in any applications for which it is suitable.

Disclosure of the Invention

The connector of the present invention has first connector means, second connector means, and engagement means, wherein a first connector means of a first said connector and a second connector means of a second said connector are releasably engageable, and a second connector means of the first said connector and a first connector means of the second said connector are releasably engageable such that the first said connector and the second said connector are releasably connectable.

Accordingly, the connector of the present invention is releasably connectable with another like connector.

The engagement means comprises a first engagement means and a second engagement means, wherein the first engagement means of a first said connector and the second engagement means of a second said connector are releasably engageable, and the second engagement means of the first said connector and the first engagement means of the second said connector are releasably engageable.

The first connector means is provided with the first engagement means and the second connector means is provided with the second engagement means.

The first and second connector means are arranged such that the first connector means of a first said connector is receivable in the second connector means of a second said connector and the first connector means of the second said connector is receivable in the second connector means of the first said connector.

The second connector means has an opening at the distal region thereof to receive the first connector means of another said connector.

In accordance with a first aspect of the present invention, there is provided a connector characterised in that it comprises:

first connector means provided with first engagement means;

second connector means provided with second engagement means;

said first engagement means is located substantially at a leading or distal region of said first connector means;

said second engagement means is located substantially at a trailing or proximal region of the second connector means and internally of said second connector means;

a grip provided integral with the first connector means and separate from the first engagement means;

an opening provided at a distal region of the second connector means arranged to receive the first connector means of another said connector;

the first connector means and the second connector means are arranged such that

the first connector means of a first said connector is receivable in the second connector means of a second said connector, and

the first connector means of the second said connector is receivable in the second connector means of the first said connector,

whereby the first engagement means of the first said connector and the second engagement means of the second said connector are releasably engageable and the second engagement means of the first said connector and the first engagement means of the second said connector are releasably engageable,

such that the first said connector and the second said connector are releasably connectable, and

the grip of each first connector means of the respective first and second said connectors is usable to effect release of the engagement between the first and second engagement means of the first and second connectors.

Preferably, said first connector means is flexibly resilient such that it is able to flex, such that the first engagement means of said first connector means of a first said connector is able to engage with the second engagement means of the second connector means of a second said connector.

Preferably, guide means is provided to assist in the alignment of the first and second said connectors.

In one embodiment, the first engagement means comprises a recess provided at the leading (or distal) region of the first connector means and the second engagement means comprises a lug provided at the trailing (or proximal) region of the second connector means, such that the respective recess of first and second said connectors is engageable with the respective lugs of the second and first said connectors, respectively.

In another embodiment, the first engagement means comprises a first stepped surface provided at the leading (or distal) region of the first connector means and

the second engagement means comprises a complimentary second stepped surface provided at the trailing (or proximal) region of the second connector means, such that the respective first stepped surfaces of first and second said connectors are engageable with the respective second stepped surface of the second and first said connectors, respectively.

In accordance with a second aspect of the present invention there is provided a belt comprising:

at least a first housing to retain an object, each said housing having an opening for insertion of an object into, and removal of the object from, the housing, and

a strap having connection means,

each said housing has connection means to detachably engage with said connection means of said strap to thereby releasably connect said housing with said strap,

wherein said connection means comprises at least one connector as hereinbefore described.

Preferably, the belt further comprises a second said housing that is releasably connectable to said first housing and said strap by said connection means of said strap and the respective connection means of said first housing and said second housing.

Preferably, the belt further comprises a third housing that is releasably connectable to said first housing and said second housing by respective said connection means of said first housing, said second housing and said third housing.

In accordance with a third aspect of the present invention there is provided a belt comprising:

a plurality of housings, each of said housings having an opening for insertion of an object into, and removal of an object from, the housing,

each said housing having connection means to detachably engage with connection means of another housing to thereby releasably connect one said housing with another said housing,

wherein said connection means comprises at least one connector as hereinbefore described.

The belt of the third aspect of the present invention is similar to the belt of the second aspect of the present invention except that the strap is omitted such that the belt of the third aspect of the present invention comprises housings that are releasably connectable to one another to thereby form the belt.

Preferably, said connection means of said strap comprises a first connector and a second connector provided at respective ends of said strap.

Preferably, said connection means of each said housing comprises two connectors provided at respective spaced apart locations of each said housing.

Preferably, the opening of each said housing extends substantially in the direction of the width of the belt.

Preferably, closure means is provided to close off the opening of each said housing.

Preferably, each said housing comprises a front wall and support means such that said front wall is attached to the support means.

Preferably, end members are provided at respective ends of each said housing and said connectors of each said housing are supported by said respective end members.

Preferably, said front wall is made of resiliently stretchable material.

The resiliently stretchable material may be of a type that permits objects contained in the housing to be at least partially visible from outside a said housing. The resiliently stretchable material may, alternatively or additionally, be of a type that permits objects contained in a said housing to be accessible through the material.

Preferably, the resiliently stretchable material is a mesh-like fabric.

Alternatively, the resiliently stretchable material may be of a type that is substantially opaque.

Preferably, the width of a said housing is substantially the same as the width of the strap.

In accordance with a fourth aspect of the present invention there is provided a housing to retain an object comprising an opening for insertion of the object therein, and removal of the object from, the housing, and a connector, as hereinbefore described, at respective spaced apart locations of the housing such that one of the connectors of the housing may be connected to another connector.

Brief Description of the Drawings

The present invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a top view of two connectors in accordance with a first embodiment of the present invention in position to be connected;

Figure 2 is a first side view of one of the connectors shown in Figure 1;

Figure 3 is a cross sectional view of a connector shown in Figure 1;

Figure 4 is a second side view of one of the connectors shown in Figure 1;

Figure 5 is an exploded view partially showing the first and second engagement means of two connectors;

Figure 6 shows a sequence of positions of the first connector component of a first connector as it moves into engagement with the second connector component of a second connector;

Figure 7 is a detailed partial view of first and second connector components of respective connectors in engagement;

Figure 8 is a partly internal plan view of the two connectors shown in Figure 1 connected together;

Figure 9 is a first perspective view of a connector in accordance with a second embodiment of the present invention;

Figure 10 is a second perspective view of the connector shown in Figure 9;

Figure 11 is a third perspective view of the connector shown in Figure 9;

Figure 12 is a plan view of two connectors, shown in Figure 9, orientated to be connected together;

Figure 13 is an end view of the connector shown in Figure 9;

Figure 14 is a plan view of two connectors, shown in Figure 9, in a connected together condition;

Figure 15 is a partly internal plan view of the connectors shown in Figure 12 in a connected together condition;

Figure 16 is an end view of the connectors shown in Figure 14;

Figure 17 is a top plan view of two connectors in accordance with an embodiment of a connector that has some of the features of the present invention;

Figure 18 is a side view of one of the connectors shown in Figure 17;

Figure 19 is an exploded view of portions of two connectors of the type shown in Figure 17, showing the engagement means;

Figure 20 is an exploded perspective view of a portion of one of the connectors shown in Figure 17;

Figures 21, 22, 23 and 24 are sequential views showing consecutive positions of the first connector component of a first connector and the second connector component of a second connector, of the type shown in Figure 17, as they move into engagement;

Figure 25 is a partly internal plan view of the connectors shown in Figure 17 in a connected together condition;

Figure 26 is a top plan view of a pair of connectors in accordance with another embodiment of a connector that has some of the features of the present invention;

Figure 27 shows two end views of the connectors shown in Figure 26;

Figure 28 is a plan view of one of the connector components of one of the connectors shown in Figure 26;

Figure 29 is a set of views of one of the engagement members of a connector shown in Figure 26;

Figures 30 and 31 are plan and end views, respectively, of a locking pin holder of a connector shown in Figure 26;

Figure 32 is a bottom plan view of the connectors shown in Figure 26 when connected together;

Figure 33 is a cross sectional view through the connectors shown in Figure 32;

Figure 34 is an end view of one of the connectors shown in Figure 26;

Figure 35 is a top plan view of two connectors shown in Figure 26 when connected together;

Figure 36 shows a pair of housings with a connector, of the type shown in Figure 26, at each end thereof;

Figure 37 is a perspective view of an embodiment of a belt in accordance with second aspect of the present invention;

Figure 38 is a frontal view of one of the housings of the belt shown in Figure 37;

Figure 39 is an embodiment of an alternative housing for the belt shown in Figure 37 with the connectors omitted;

Figure 40 is a perspective view of a portion of an embodiment of a belt in accordance with the second aspect of the present invention showing an alternative embodiment of a housing and a cover;

Figure 41 is a plan view of the cover of the belt shown in Figure 40;

Figure 42 is an end view of the cover shown in Figure 41;

Figure 43 shows the belt shown in Figure 37 being worn by a wearer in a first arrangement; and

Figure 44 shows the belt shown in Figure 37 worn by a wearer in a second arrangement.

Best Mode(s) for Carrying Out the Invention

In Figure 1, there are shown two connectors 50a and 50b (also referred to as connector/s 50). Each connector 50 comprises a first connector component, or member, 52, a second connector component, or member, 54, and engagement means to releasably engage the first connector component 52 and the second connector component 54 of respective connectors 50a and 50b. The two connectors 50 are identical. The reference numerals 50a and 50b have been used only to distinguish between the two connectors 50 in the drawings to assist with identifying the connectors 50 being described in the description of the manner of use and operation of the connector 50.

The engagement means comprises a first engagement means 56 and a second engagement means 58. The first connector component 52 is provided with the first engagement means 56 and the second connector component 54 is provided with the second engagement means 58.

The first engagement means 56 is provided near the end region of the first connector component 52 that is remote from the end portion 60. This is the leading, or distal, end of the first connector component 52. The first engagement

means 56 is provided as a recess 85 near the end region of the first connector component 52.

The second engagement means 58 is provided near the end region of the second connector component 54 that is proximate to the end portion 60. This is the trailing, or proximal, region of the second connector component 54. The second engagement means 58 is provided as a lug 87 near the end region of the second connector component 54.

The first and second connector components 52 and 54 extend from an end portion 60 of the connector 50. The first and second connector components 52 and 54 are adjacent each other. The first connector component 52 extends from the end portion 60 as a finger-like member.

The first connector component 52 has a cut-out section 62. The cut-out section 62 provides the first connector component 52 with an enhanced flexible resilience such that it is able to flex at its proximal region adjacent the end portion 60. The first connector component 52 is also provided with a grip 64 that can be manipulated by a user as will be later herein described. The grip 64 is provided at a side of the connector 50. The grip 64 may be provided with serrations 66 to provide a frictional gripping surface for the user.

The second connector component 54 comprises walls 67 and is provided with an opening 68 at its end opposed to the end portion 60. The walls 67 and end portion 60 enclose a space which is accessible via the opening 68. The second connector component 54 is provided with a second opening 70 at one side thereof. The opening 70 is provided in a wall 67 of the second connector component 54 at the side of the connector 50 opposite to the side having the grip 64.

A guide member 72 is provided between the first and second connector components 52 and 54. The second connector component 54 is provided with a pair of internal ledges 74. An internal ledge 74 is provided on the respective opposed walls 67, neither of which is provided with the second opening 70. The

internal ledges 74 and an internal wall surface 76 of the second connector component 54 define a guide space 78.

The end portion 60 is provided with apertures 80. The end portion 60 comprises three narrow plate members 82, 84 and 86. The intermediate plate 86 is slightly longer than the other plates 82 and 84. The apertures 80 extend through the plates 82, 84 and 86.

The second connector component 54 is provided with a sloped internal surface 88 adjacent the opening 70. The sloped internal surface 88 slopes inwardly of the second connector component 54 in the general direction from the opening 68 to the end portion 60.

The leading end of the first connector component 52 is provided with a recess 85. The second connector component 54 is provided with a lug 87 near the end portion 60 and adjacent an edge of the opening 70.

The manner of use and operation of a connector 50 will now be described.

A connector 50 can be connected to another identical connector 50. Figure 8 shows two connectors 50a and 50b that are connected together.

To connect together two connectors 50, the connectors 50 are first aligned with one another as shown in Figure 1. In this arrangement the leading, or distal, end of the first connector component 52 of a first connector 50a is aligned with the opening 68 of the second connector component 54 of a second connector 50b; similarly, the leading, or distal end, of the first connector component 52 of the second connector 50b is aligned with the opening 68 of the second connector component 54 of the first connector component 50a. The leading end of the first connector component 52 is the end that is first received into the opening 68 of the second connector component 54 of another connector 50.

The first and second connectors 50a and 50b are then moved toward each other such that the first connector components 52 of the respective connectors 50a and

50b are received into the openings 68 of the respective second connector components 54 of the connectors 50b and 50a. As the first connector components 52 are inserted into the second connector components 54, the guide members 72 of the respective connectors 50a and 50b are received in the guide spaces 78 of the respective connectors 50b and 50a. As the first connector components 52 are inserted into the second connector components 54, the respective distal ends of the first connector components 52 bear against the sloped internal surface 88 of the second connector components 54 adjacent the opening 70. Due to the first connector components 52 being flexibly resilient, they are able to flex in the direction toward the guide members 72 as the first connector components 52 are inserted into the second connector components 54. The ends of the first connector components 52 bear against the sloped internal surfaces 88 of the second connector components 54 adjacent the openings 70.

Sequential positions of the distal end of a first connector component 52 as it flexes as it is inserted into a second connector 54 are shown in Figure 6. As the first connector component 52 is continued to be inserted into the second connector component 54, the distal end of the first connector component 52 will pass the lug 87 of the second connector component 54 and the lug 87 will be received in the recess 85 of the first connector component 52. This occurs as the first connector component 52 snaps back to its unflexed condition whereby the recess 85 and the lug 87 engage. In this condition the first connector components 52 of the respective connectors 50a and 50b are engaged with the second connector components 54 of the connectors 50b and 50a, respectively. This condition is shown in Figure 8. The first connector components 52 are thereby retained within the second connector components 54.

The connected together condition of the first and second connectors 50a and 50b is shown in Figure 8. In this condition, the grips 64 of the respective first connector components 52 protrude through the openings 70 of the respective second connector components 54. The grips 64 slope away from the sides of the connectors 50a and 50b in the direction of the respective end portions 60 of the connectors 50a and 50b. The first and second connectors 50a and 50b can be disconnected by disengaging the respective first and second connector

components 52 and 54 of the first and second connectors 50a and 50b. This can be done by a user gripping the grips 64 of the respective first connector components 52 between his/her thumb and forefinger and simultaneously squeezing in the directions shown by the dual arrows A and B in Figure 8. This causes the first connector components 52 to flex at their proximal regions such that the lugs 87 and recesses 85 disengage. The connectors 50a and 50b can then move away from one another with the first connector components 52 sliding out of the second connector components 54 and out through the respective openings 68.

Figures 9 to 16 show a connector 90 in accordance with a second embodiment of the present invention. The connector 90 of the second embodiment is substantially similar to the connector 50 of the first embodiment and the same reference numerals are used to identify features in the second embodiment as were used for the same or analogous features in the first embodiment.

The major differences between the connector 90 of the second embodiment and the connector 50 of the first embodiment are the first engagement means 56 and the second engagement means 58. Another difference between the connector 90 of the second embodiment and the connector 50 of the first embodiment is the end portion 60.

The first engagement means 56 comprises a lug 92 having a first stepped surface and the second engagement means 58 comprises a lug 94 having second stepped surface. The lugs 92 and 94 are complimentary in shape. The lug 92 is provided at the leading, or distal, end of the first engagement component 52. The lug 94 is provided at the proximal end of the second engagement component 54, i.e. near the end portion 60.

The portion 60 is provided in the form of a D ring, or loop, 96 that extends the width of the connector 90. The D ring 96 extends from the first connector component 52 to the second connector component 54 and defines an opening 98.

End portion 60 of the type in the connector 90 may alternatively be used in any embodiment of the connector of the present invention. Correspondingly, the connector 90 of the second embodiment may alternatively be provided with an end portion of the type used in other embodiments of the connector of the present invention.

The connector 90 is provided with openings 99a, 99b and 99c in the second connector component 54. These openings 99a, 99b and 99c are provided as they are required in the manufacturing and assembly process for the connector 90.

In other respects, the connector 90 of the second embodiment is similar to the connector 50 of the first embodiment.

In use, two connectors like 90a and 90b are aligned and the first connector components 52 are inserted into the second connector components 54 of respective connectors 90a and 90b. As the first connector components 52 are inserted into the second connector components 54, the leading ends of the first connector components 52 bear against the sloped internal surfaces 88 of the second connector components 54, and the first connector components 52 flex in a similar manner as previously described with reference to the connectors 50 of the first embodiment. With further insertion of the first connector components 52 into the second connector components 54, the lugs 92 and 94 engage due to the complimentary shape of the stepped surfaces of the lugs 92 and 94. In this way, the first and second connector components 52 and 54 of the respective connectors 90a and 90b engage to thereby connect the connectors 90a and 90b. The guides 72 are received in the guide spaces 78 in similar manner as previously hereinbefore described with reference to the connector 50 of the first embodiment.

The connectors 90a and 90b are disconnected in similar manner to the connectors 50a and 50b. Thus, a user presses against the grips 64 to disengage the lugs 92 and 94 to allow the first connector components 52 to be removed from the second connector components 54.

Figures 17 to 25 illustrate a connector 100 in accordance with an embodiment of a connector that has some of the features of the present invention. Similar reference numerals are used for the features of the connector 100 as are used for the same and analogous features in the connectors 50 and 90 of the first and second embodiments.

The main differences between the connector 100 and the connectors 50 and 90 of the first and second embodiments are the first connector component 52 and the first and second engagement means 56 and 58.

In Figures 17 to 25, the first connector component has been identified with reference numeral 102. The first connector component 102 has a leading, or distal, first portion 104 and a second portion 106 that extends toward the end portion 60.

The first portion 104 extends from the leading, or distal, end of the guide member 72.

The first connector component 102 is thus different from the first connector components 52 of the first and second embodiments in that its proximal region is not located adjacent the end portion 60. Instead, its proximal region is spaced from the end portion 60 and is located at the leading end of the first connector component 102. In this sense, the orientation of the first connector component 102 has been reversed compared with the first connector components 52 of the first and second embodiments.

The end of the second portion 106, that carries the first engagement means 56, is provided at the trailing end (and not the leading end) of the first connector component 102. The first engagement means 56 comprises a finger-like lug 108 extending from a wedge-like lug 110. The wedge-like lug 110 has a tapered surface 123. A space 112 is formed between the lugs 108 and 110.

The second engagement means 58 of the second connector component 54 comprises first and second lugs 114 and 116. A space, or recess, 118 is provided between the lugs 114 and 116.

As can be seen from the drawings of the embodiments of the connectors 50, 90 and 100, the first engagement means 56 of the first and second embodiments of the connectors 50 and 90 are located at the distal region (or leading region) of the first connector components 52, whilst in the embodiment of the connector 100, the first engagement means 56 is located at the end of the second portion 106 so that it is proximate the end portion 60. Correspondingly, the second engagement means 58 of the first and second embodiments of the connectors 50 and 90 are located proximate the end portions 60, whilst in the embodiment of the connector 100, they are located at the region of the second connector component 54 that is spaced from the end portion 60, i.e. near the openings 68.

The end of the first engagement component 102 adjacent the end portion 60 is provided with a groove 120 to accommodate the lug 108. The groove 120 restricts the degree of lateral movement available to the lug 108, but allows the lug 108 to move in its axial direction. The axial direction of the lug 108 is the direction in which the first engagement component 102 is able to flex.

In use, two like connectors 100a and 100b can be aligned as shown in Figure 17. The end portions 104 are the first parts of the first connector components 102 that are inserted into the openings 68 of the connector components 54.

With continued insertion of the first connector components 102 into the second connector components 54, the lug 114 will bear against the portion 106 of the first connector component 102. This is shown in Figures 21 and 22. Continued insertion of the first connector components 102 into the second connector components 54 will result in the lugs 110 and 114 approaching contact with one another, as shown in Figure 23. The tapered surface 123 of the lug 110 bears against the lug 114. This causes the first connector component 102 to flex at the junction of the guide member 72 and the portion 104. Once the lug 110 passes

the lug 114, the lug 114 is received in the space 112 between the lugs 108 and 110 and the lug 108 is received in the space 118 between the lugs 114 and 116, as the first connector component 102 snaps back into its unflexed condition. This is shown in Figure 24. In this condition, the first and second engagement means 56 and 58 of the respective connectors 100a and 100b are engaged. This is shown in Figure 25.

As can also be seen from Figure 25, the grips 64 protrude through the openings 70 in the second connector components 54. As with the connectors 50 and 90 of the previous embodiments, depressing the grips 64, in the manner previously herein described with reference to the first embodiment, disengages the first and second engagement means 56 and 58 and the connectors 100a and 100b can be disconnected.

The connector 100 is provided with apertures 124 extending through walls 67 of the second connector component 54. When two connectors 100 are connected together, a padlock can be passed through the apertures 124 of the second connector component 54 of each connector 100. Each padlock passes through a void in the first connector component 102. The use of one or two padlocks in this way ensures that the connectors 100 cannot be disconnected without first unlocking the padlocks. This provides security to the user of the connectors 100. Similar apertures 124 can be used in any embodiment of the connector of the present invention, even though they are not shown.

Figures 26 to 36 show a connector 130 in accordance with another embodiment of a connector that has some of the features of the present invention. Similar reference numerals are used for the features of the connector 130 as are used for the same and analogous features of the connectors 50, 90 and 100.

The main differences between the connector 130 of the fourth embodiment and the connectors 50, 90 and 100 are the structure of the first and second connector components 52 and 54 and the first and second engagement means 56 and 58. In Figures 26 to 36, the first

connector component has been identified with reference numeral 132 and the second connector component has been identified with reference numeral 134.

The first connector component 132 comprises two portions 136 and 138 that extend from the end portion 60 of the connector 130.

The first engagement means 56 is provided as a cut-out section 140 in the portion 136. The portion 136 is also provided with guide spaces 142. The portion 136 is substantially square in cross section as best seen in Figure 27.

The portion 138 is provided with a cut-out guide 144.

The second connector component 134 is provided with an opening 146 having guide members 148.

The second connector component 134 further comprises a rotatable member 150 with a hollow core 152. A guide vane 154 projects into the hollow core 152. The second engagement means 58 is provided as a latch member 156 extending from the rotatable member 150, outside the hollow core 152.

The rotatable member 150 is provided with a lever 158 having locking pins 160. The locking pins 160 are receivable in housings 162.

A cover plate 164 is provided to cover an opening 166 in the second connector component 134. The cover plates 164 have cut-outs 168. The opening 166 is provided for insertion of the rotatable member 150 into the second connector component 134 during assembly of the connector 130.

Openings 80 are provided in the end portions 60. The openings 80 permit the connector 130 to be attached to another item as will be later herein described. The connector 130 can be retained with the item by way of plugs 170 passing through the apertures 80 and corresponding apertures in the item. Similar plugs 170 are also shown in some figures of some of the other embodiments of the

connectors of the present invention. Caps 172 may be provided to close the open ends of the apertures 80.

In use, two connectors 130a and 130b are aligned as shown in Figure 26. The connectors 130a and 130b are then moved toward one another in the respective directions shown by arrows C and D. The first connector components 132 of the respective connectors 130a and 130b are received in the second connector components 134 of the connectors 130b and 130a, respectively. The first portion 136 of each first connector component 132 is received in the opening 146 of the second connector component 134 of the respective connectors 130a and 130b. The guide members 148 of the second connector components 134 are received in the guide spaces 142 of the first connector components 132. Simultaneously, the second portion 138 of each first connector components 132 is received in the hollow core 152 of the rotatable members 150. The guide vane 154 is received in the cut-out guide 144.

Once the first connector components 132 have been fully inserted into the second connector components 134, the end portions 60 of the respective connectors 130a and 130b will abut. The rotatable members 150 of each connector 130a and 130b can then be rotated in the direction of arrow E shown in Figure 27 such that the latch members 156 of connectors 130a and 130b engage in the cut-out sections 140 of connectors 130b and 130a, respectively. In this way, the first and second engagement means 56 and 58 are engaged such that the first connector components 132 are releasably engaged with the respective second connector components 134. The pins 160 are receivable in the housings 162 in a snap-fit engagement to releasably lock the rotatable member 150 in position whereby the latch members 156 are retained in the cut-out sections 140.

The connectors 130a and 130b can be disconnected by rotating the rotatable members 150 in a direction opposed to arrow E such that the pins 160 are first disengaged from the housings 162. The rotatable members 150 are then further rotated such that the latch members 156 are disengaged from the cut-out sections 140 and are received in the cut-outs 168 in the plates 164. The connectors 130a

and 130b can then be moved away from each other with the first connector components 132 being removed from the second connector components 134.

The connector of the present invention may be used as a connector for a belt made up of modular housings.

In Figure 37 there is shown a belt 1 comprising housings 3a, 3b and 3c (referred to generally as housings 3) to hold respective objects, and a strap 4.

The belt 1 extends in a substantially longitudinal direction and has a width substantially transverse to this longitudinal direction. The housings 3a, 3b and 3c have respective openings 11a, 11b and 11c (also referred to generally as the openings 11) for insertion of an object into, and for removal of the object from, the respective housing 3a, 3b and 3c.

The strap 4 has first and second connectors 5 at respective ends thereof. Each housing 3 has first and second connectors 5 provided at spaced apart locations thereof, e.g. at respective ends of each housing 3.

The connectors 5, are shown "schematically", and designate a connector as hereinbefore described in the embodiments in relation to the connectors 50, 90, 100 and 130. The following description of the belt 1 is with reference to the connectors 5 being a connector of any one of the embodiments previously hereinbefore described.

The housings 3 are provided with end members 9 that support and retain the first and second connectors 5. The end members 9 are preferably made of a more rigid material than the material of the remainder of the housings 3.

The end members 9 may be accommodated in the end portions 60 of the connectors 5.

These end members 9 may be received between the plates 82 and 86 and the plates 84 and 86, for example, of the connector 50 of the first embodiment.

Alternatively, when the end portion 60 is of the form of a D ring 96, as is the case in the connector 90 of the second embodiment, the end members 9 loop through the openings 98. These end members 9 may be provided as short straps that are attached at respective ends of the housings 3. The end members 9 may be attached to the housings 3 by stitching.

The housings 3a, 3b and 3c have front, or outer, walls 13a, 13b and 13c, respectively, (also referred to generally as the front walls 13).

The front walls 13a, 13b and 13c may be made of a resiliently stretchable material. The resiliently stretchable material may be of a type that permits the objects contained in the housings 3a, 3b and 3c to be visible from outside the housings 3a, 3b and 3c and/or accessible through the material, e.g. for operation thereof. The resiliently stretchable material may, for example, be a mesh-like fabric.

Alternatively, the resiliently stretchable material may be of a type that is substantially opaque.

In a further alternative, the front walls, 13a, 13b and 13c may be made of a waterproof material, e.g. plastics.

The housings 3, each further comprise an underlying backing support 15 (visible in Figure 39) to which the respective front walls 13 are attached, either directly or by side walls – as shown in Figure 39. The sides of the housings 3 extend in the longitudinal direction of the belt 1. The other end of each respective front wall 13 is left unattached to a backing support 15 to thereby form the openings 11. The housings 3 thus have a pocket-like or bag-like structure. The backing supports 15 form the rear, or inner, walls of the housings 3.

The housings 3 have a respective closure for closing the openings 11. The closure may, for example, comprise drawstrings 16 to close the respective openings 11.

As an example of an alternative form for the closure, the closure may be provided as a zipper or as releasable tongue and groove closure strips. The releasable tongue and groove closure strips are particularly suitable when the front walls 13 of the housings 3 are made of a waterproof material.

The strap 4 may be made of a woven synthetic material that is flexibly resilient, yet light and resistant to tearing and fraying. The backing support 15 is made of a more rigid material, that preferably still has at least a degree of flexibility or resilience.

The openings 11a and 11b of the housings 3a and 3b extend substantially in the direction of the width of the belt 1. In this way, objects are inserted into and withdrawn from, the housings 3 in the longitudinal direction of the belt 1. Furthermore, the housings 3 extend substantially in-line with the longitudinal direction of the belt 1 and are substantially the same width as the strap 4.

The belt 1 may be provided with fasteners (not shown) which are releasably engageable to connect together the respective ends of the belt 1 together so that the belt 1 can be worn by a wearer. The fasteners may also be in the form of connectors 5. The strap 4 is provided with adjustment means to adjust the length of the belt 1. The adjustment means may, for example, comprise an adjustment buckle 25 so that the length of the belt 1 can be adjusted.

Figure 38 shows an embodiment of a housing 3d which is provided with connectors in the form of the connectors 90 of the second embodiment. The connectors 90 are connected at respective ends of the housing 3d.

Figure 39 shows an embodiment of a housing 3e in which the front wall 13 is attached to the backing support 15 by side wall 20. The front wall 13 of the housing 3e may be made of a more rigid material than the front walls of the

embodiments previously hereinbefore described. The side walls 20 may be made of an elasticated material. In addition to the side walls 20, an end wall (obscured in Figure 39) is provided. The end wall may also be elasticated. Providing the side walls 20 and the end wall 20 of an elasticated material means that the housing 3e expands when an item is inserted into it thereby retained the item. The housing 3e may further be provided with a rib 21 at the opening 11 to assist in retaining the item in the housing 3e. The connectors 5 have been omitted from the housing 3e for clarity. However, it is to be understood that connectors 5 would be attached to the backing support 15 at respective ends thereof.

The housing 3f (shown in Figure 40) has a different structure from that of the housings 3a, 3b, 3c, 3d and 3e and is particularly intended to store valuable items such as money and keys. For that reason, the housing 3f is provided with a front wall 13f made of an opaque material. The housing 3f may, however, also have a mesh-like material cover over the front wall 13f. This is primarily to provide a similar visual appearance, if desired, to the housing 3f as may be possessed by the housings 3a, 3b, 3c, 3d, 3e and 3f when the housings 3a, 3b, 3c, 3d, 3e and 3f have front walls 13, 13a, 13b and 13c that are made of a mesh-like material.

The opening 11f of the housing 3f may be provided along a side, rather than an end, of the housing 3f as shown in Figure 40. A zipper 25a may be provided to close off the opening 11f. As an alternative, however, the opening 11f may be provided at an end of the housing 3f in a similar position to the openings 11a, 11b and 11c of the housings 3a, 3b and 3c, respectively. However, the opening 11f would nevertheless retain a zipper 25a to close the opening 11f rather than a drawstring as used in the housings 3a, 3b and 3c.

The belt 1 may be provided with a sleeve 27. The sleeve 27 is able to slide along the belt 1. The purpose of the sleeve 27 is that it can be slid into position so as to cover the housings 3a, 3b, 3c, 3d, 3e and 3f. The sleeve 27 thus further protects the contents of the housings 3a, 3b, 3c, 3d, 3e and 3f, e.g. from rain. For this reason, it is preferable that the sleeve 27 is made from a substantially waterproof material.

The backing supports 15 of one or more housings 3 may be provided with loops (obscured) on the reverse face thereof. The loops are provided so that the electrical wires leading from a device, such as personal music player that is retained in one of the housings 3 can be fed through the loops. Another loop may be provided on the front face 32b of the strap 4 for a similar purpose. In this way, the electrical wires do not inconvenience the wearer.

The belt 1 may be provided with one or more loops (not shown). Such loops are provided at the front face 32b of the strap 4. Items such as keys may be suspended from these loops.

The belt 1 may be made of material in colours and patterns as required, making the belt suitable as a fashion accessory.

The use and operation of the belt 1 will now be described with particular reference to the drawings.

In use, the belt 1 is worn by a wearer as depicted in Figures 43 and 44. The belt 1 may be worn around the waist of the wearer or cross shoulder (as shown in Figure 44). The belt fasteners, when provided, provide a secure yet releasable, fastening of the belt 1 so that it is retained in place on the wearer. The buckle 25 enables the length of the belt 1 to be adjusted to suit individual wearers.

The first and second connectors 5 of the strap 4 and the housings 3 allows a wearer to attach together the required number of housings 3 and the strap 4. In the alternative, where a strap 4 is not used, the belt would consist entirely of connected housings 3.

The housings 3 may vary in shape and size to accommodate different sizes and types of items. However, the use of the first and second connectors 5 of the housings 3 permits the various housings 3 to be connected together.

Since the housings 3 and strap 4 of the belt all use the same type of connector 5, the housings 3 are completely interchangeable so that a user can select

whichever housings are required and connect them together to form the belt. The use of a single type of connector 5 at both ends of each housing 3 and at each end of the strap 4 means that the belt 1 of the present invention may be oriented in any desired manner, e.g. around the waist of a user, or over the left or right shoulder of the user, with whichever housings the user requires. This interchangeability is illustrated in Figure 36 by way of the broken lines signifying that each of the housings 3 illustrated in Figure 36 can be connected at any end, as required by the user. The connector of the present invention thus overcomes the problem that would be encountered if conventional connectors, which consist of a pair of different connectors that are able to engage to connect together, were used as such conventional connectors would not allow the interchangeability of the housings 3 in a belt 1 as previously hereinbefore described.

With the belt 1 being worn by the wearer, the contents of the housings 3 are readily accessible via the openings 11. In the embodiment in which the front walls 13 are made of a material that permits the objects in the housings 3 to be visible from outside the housings 3 and accessible through the material of the front walls 13 of the housings 3, devices, such as a mobile telephone, are readily accessible through the material of the front walls 13. For example, it permits the screen of the mobile telephone to be viewed and keys/buttons to be pressed. That is, the devices do not need to be removed from the housings 3 to be accessible for operation.

Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

Modifications and variations such as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

Claims

1. A connector characterised in that it comprises:

first connector means provided with first engagement means;

second connector means provided with second engagement means;

said first engagement means is located substantially at a leading or distal region of said first connector means;

said second engagement means is located substantially at a trailing or proximal region of the second connector means and internally of said second connector means;

a grip provided integral with the first connector means and separate from the first engagement means;

an opening provided at a distal region of the second connector means arranged to receive the first connector means of another said connector;

the first connector means and the second connector means are arranged such that

the first connector means of a first said connector is receivable in the second connector means of a second said connector, and

the first connector means of the second said connector is receivable in the second connector means of the first said connector,

whereby the first engagement means of the first said connector and the second engagement means of the second said connector are releasably engageable and the second engagement means of the first said connector and the first engagement means of the second said connector are releasably engageable,

such that the first said connector and the second said connector are releasably connectable, and

the grip of each first connector means of the respective first and second said connectors is usable to effect release of the engagement between the first and second engagement means of the first and second connectors.

2. A connector according to claim 1, characterised in that said first connector means is flexibly resilient such that it is able to flex, such that the first engagement means of said first connector means of a first said connector is able to engage with the second engagement means of the second connector means of a second said connector.
3. A connector according to any one of the preceding claims, characterised in that guide means is provided to assist in alignment of the first and second said connectors.
4. A connector according to any one of claims 1 to 3, characterised in that the first engagement means comprises a recess provided at the leading or distal region of the first connector means and the second engagement means comprises a lug provided at the trailing or proximal region of the second connector means, such that the respective recess of first and second said connectors is engageable with the respective lug of second and first said connectors, respectively.
5. A connector according to any one of claims 1 to 3, characterised in that the first engagement means comprises a first stepped surface provided at the leading or distal region of the first connector means and the second engagement means comprises a complimentary second stepped surface provided at the trailing or proximal region of the second connector means, such that the respective first stepped surface of first and second said connectors is engageable with the respective second stepped surface of the second and first said connectors, respectively.
6. A belt comprising:
 - at least a first housing to retain an object, each said housing having an opening for insertion of an object into, and removal of the object from, the housing, and
 - a strap having connection means,

each said housing has connection means to detachably engage with said connection means of said strap to thereby releasably connect said housing with said strap,

wherein said connection means comprises at least one connector according to any one of claims 1 to 5.

7. A belt according to claim 6, characterised in that it further comprises a second said housing that is releasably connectable to said first housing and said strap by said connection means of said strap and the respective connection means of said first housing and said second housing.
8. A belt according to claim 7, characterised in that it further comprises a third housing that is releasably connectable to said first housing and said second housing by respective said connection means of said first housing, said second housing and said third housing.
9. A belt comprising:

a plurality of housings, each of said housings having an opening for insertion of an object into, and removal of an object from, the housing,

each said housing having connection means to detachably engage with connection means of another housing to thereby releasably connect one said housing with another said housing,

wherein said connection means comprises at least one connector according to any one of claims 1 to 5.
10. A belt according to any one of claims 6 to 8, characterised in that said connection means of said strap comprises a first said connector and a second said connector provided at respective ends of said strap.
11. A belt according to any one of claims 6 to 10, characterised in that said connection means of each said housing comprises two connectors provided at respective spaced apart locations of each said housing.

12. A belt according to any one of claims 6 to 11, characterised in that the opening of each said housing extends substantially in the direction of the width of the belt.
13. A belt according to any one of claims 6 to 12, characterised in that closure means is provided to close off the opening of each said housing.
14. A belt according to any one of claims 6 to 13, characterised in that each said housing comprises a front wall and support means such that said front wall is attached to the support means.
15. A belt according to claim 14, characterised in that said front wall is made of resiliently stretchable material.
16. A belt according to any one of claims 6 to 15, characterised in that end members are provided at respective ends of each said housing and said connectors of each said housing are supported by said respective end members.
17. A belt according to claim 15 or 16, characterised in that the resiliently stretchable material is of a type that permits objects contained in each said housing to be at least partially visible from outside said housing.
18. A belt according to any one of claims 15 to 17, characterised in that the resiliently stretchable material is of a type that permits objects contained in a said housing to be accessible to through said material.
19. A belt according to any one of claims 15 to 18, characterised in that the resiliently stretchable material is a mesh-like fabric.
20. A belt according to any one of claims 15 to 18, characterised in that the resiliently stretchable material may be of a type that is substantially opaque.
21. A belt according to any one of claims 9 to 20, characterised in that the width of a said housing is substantially the same as the width of the strap.
22. A housing to retain an object comprising an opening for insertion of the object therein, and removal of the object from, the housing, and a

connector, according to any one of claims 1 to 5, at respective spaced apart locations of the housing such that one of the connectors of the housing may be connected to a another connector.