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US 4702447 A

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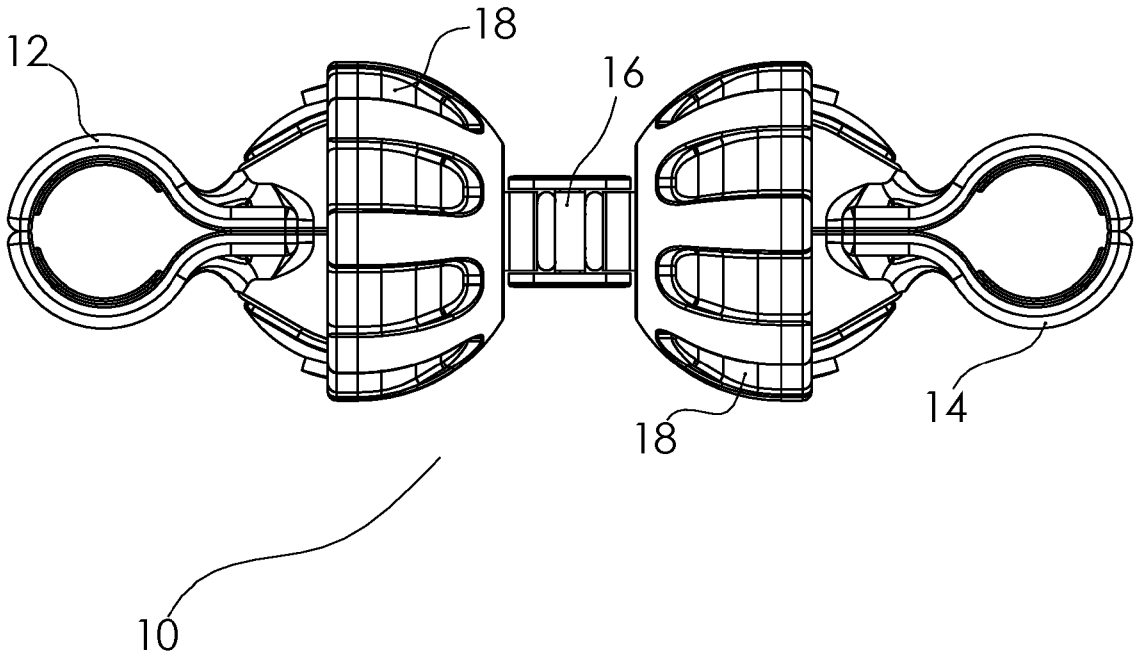


Fig 1

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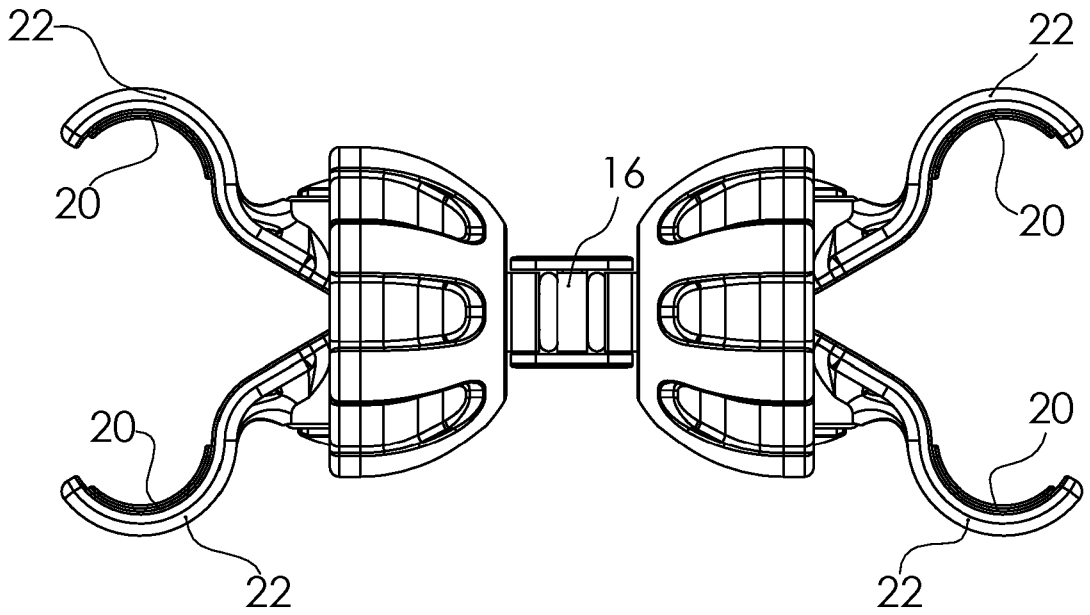


Fig 2

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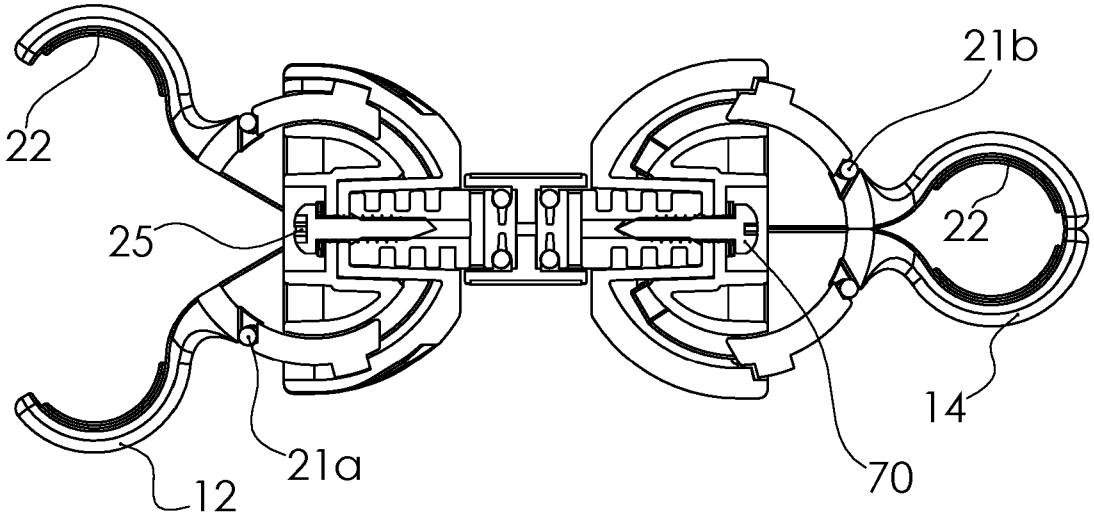


Fig 3

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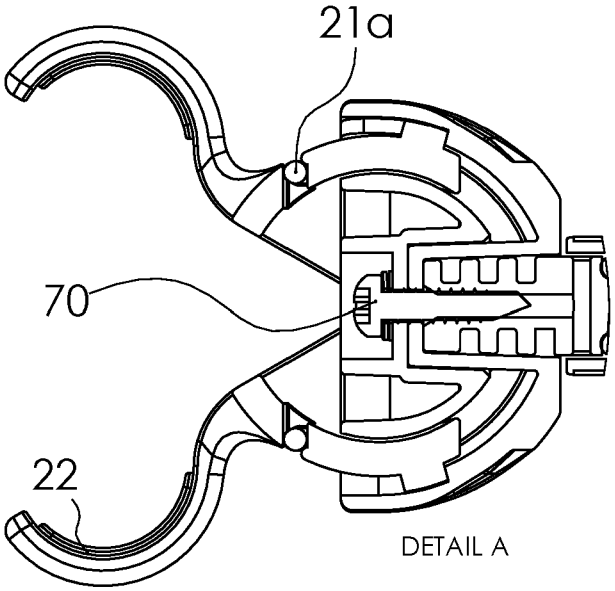


Fig 4a

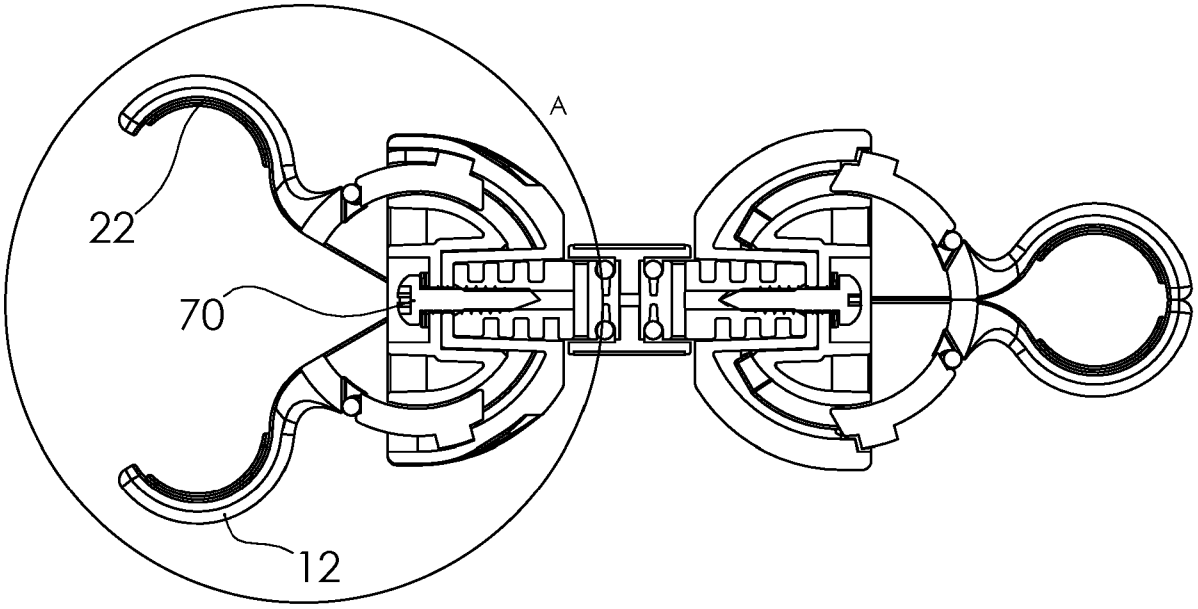


Fig 4b

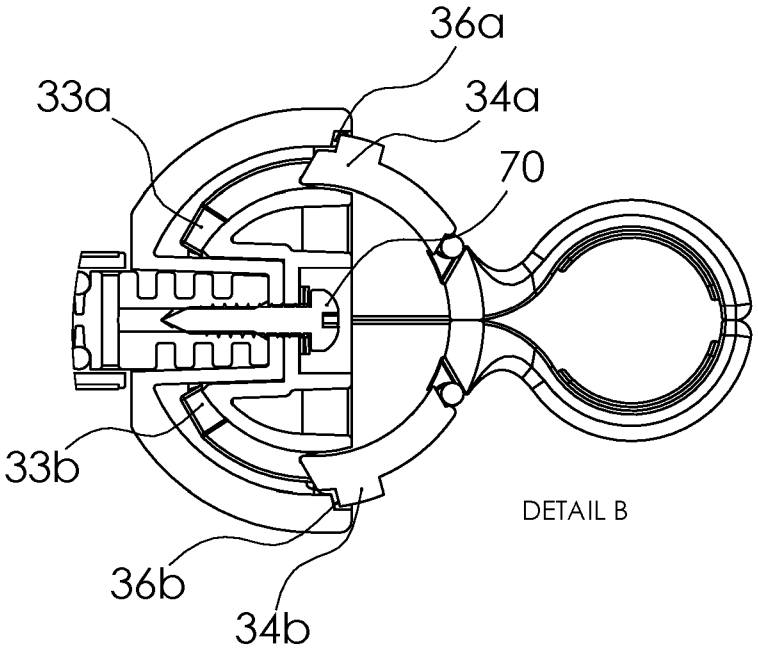


Fig 5a

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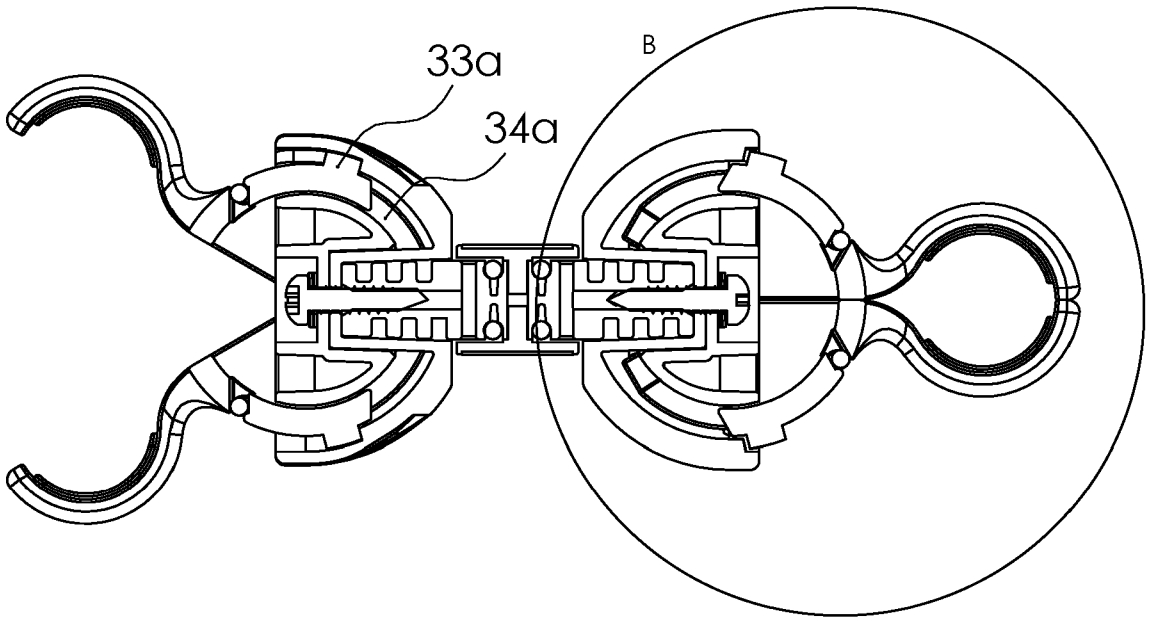


Fig 5b

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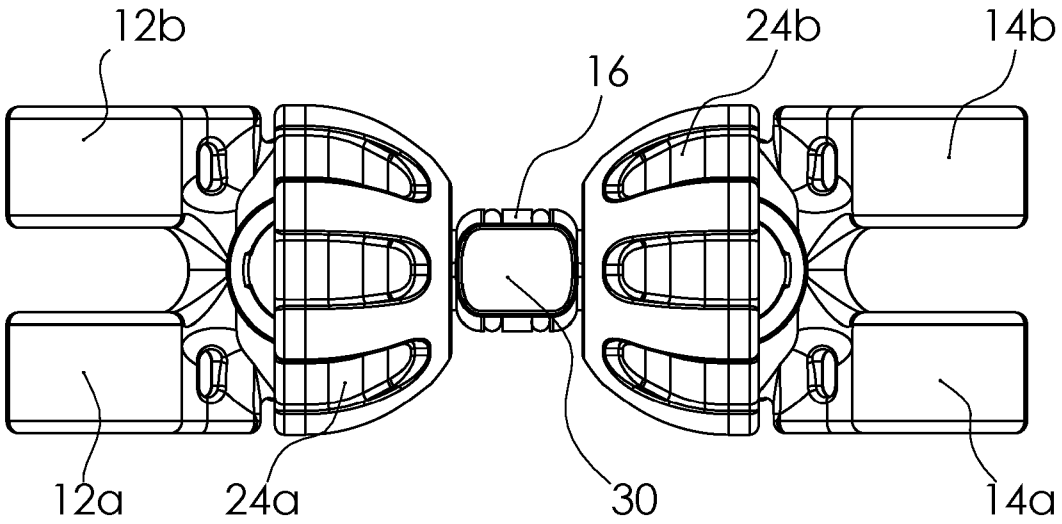


Fig 6

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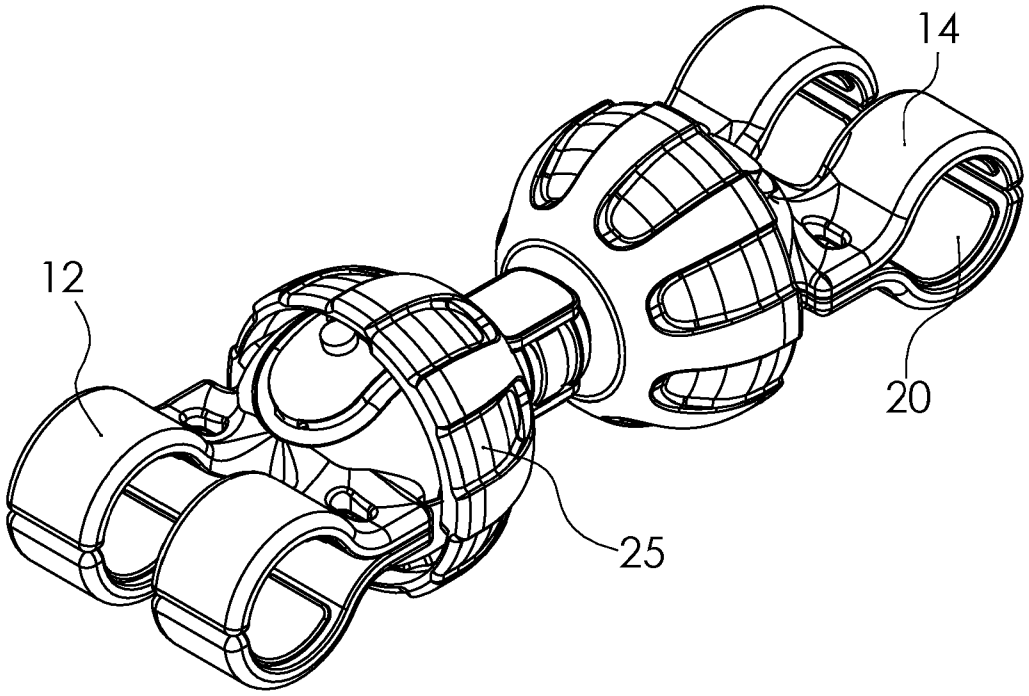


Fig 7

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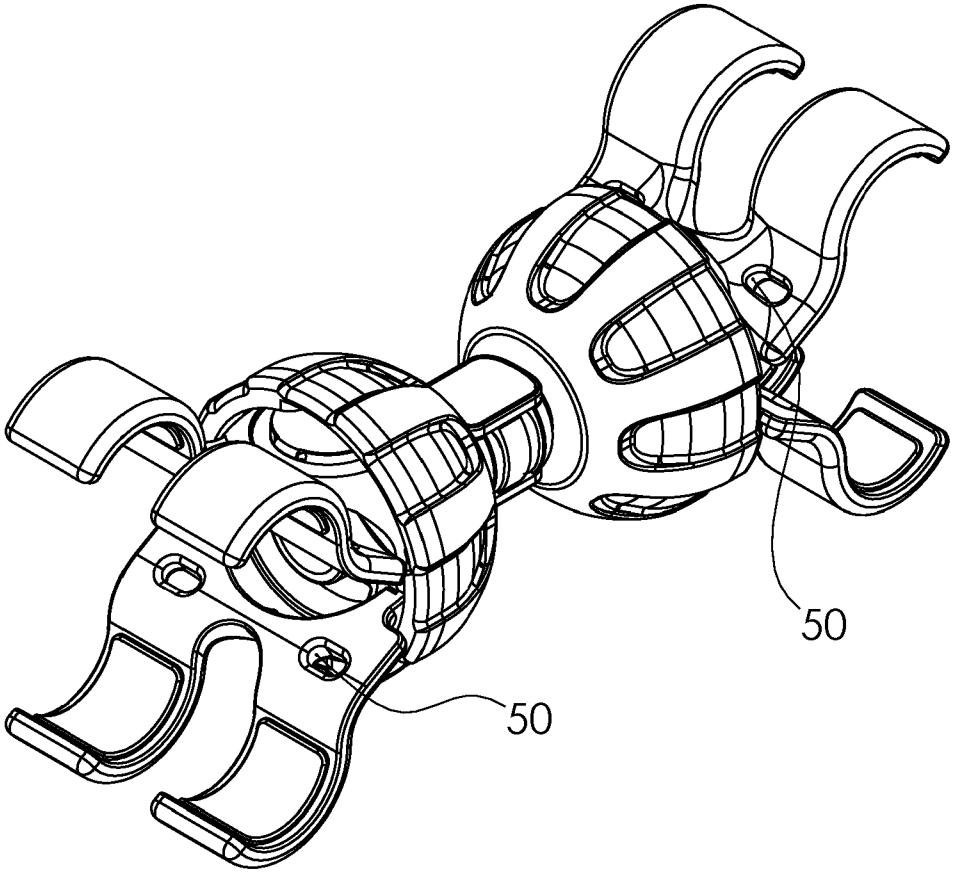


Fig 8

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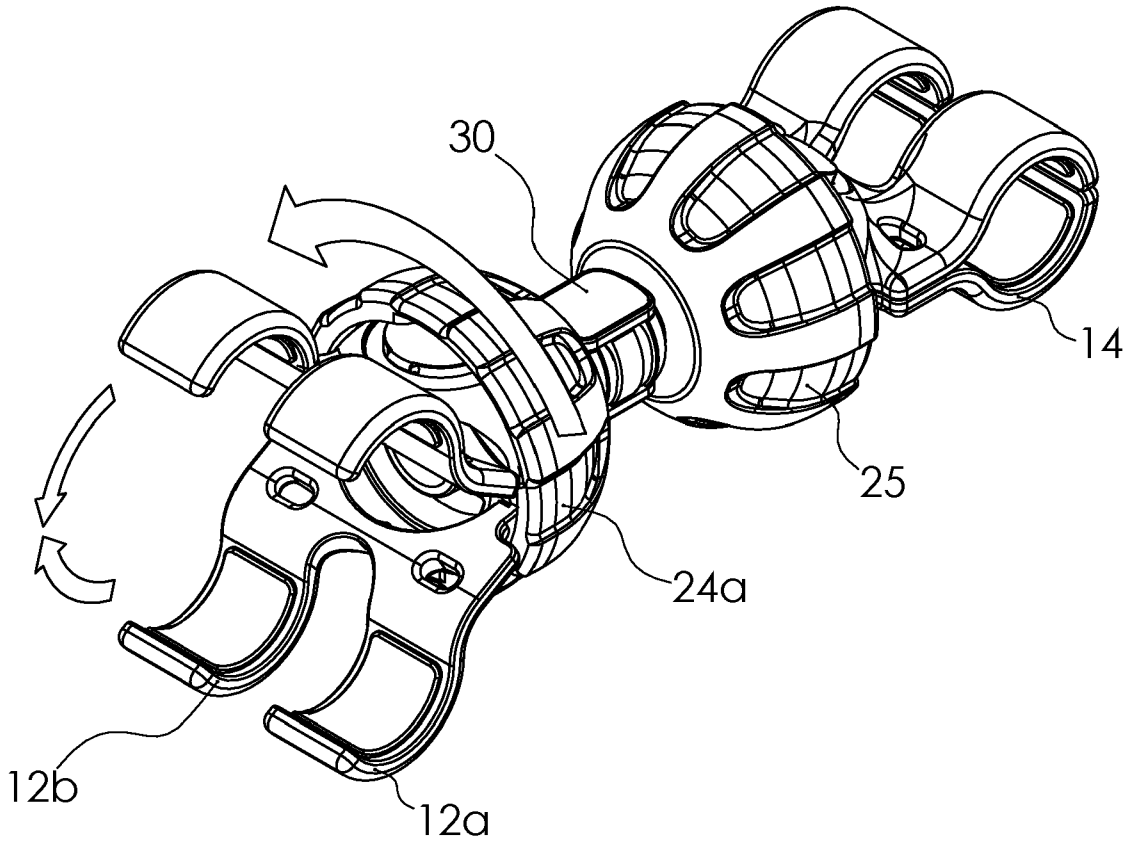


Fig 9

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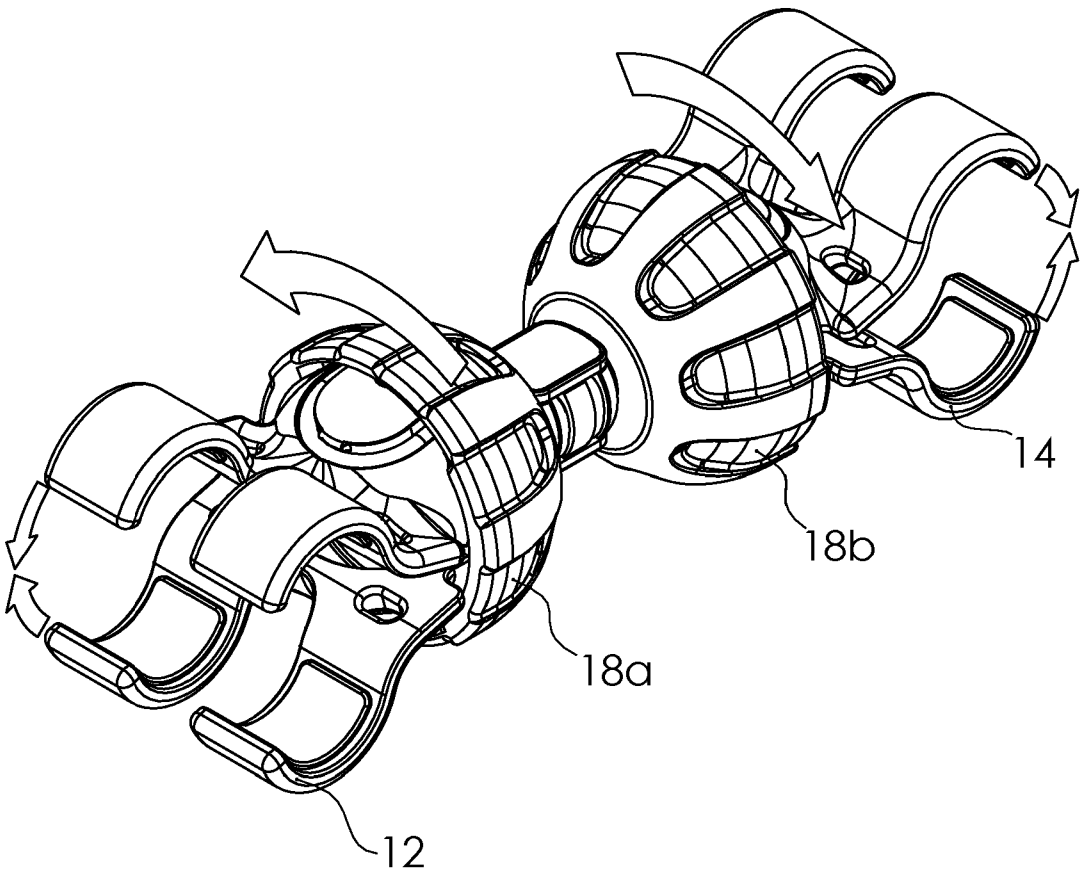


Fig 10

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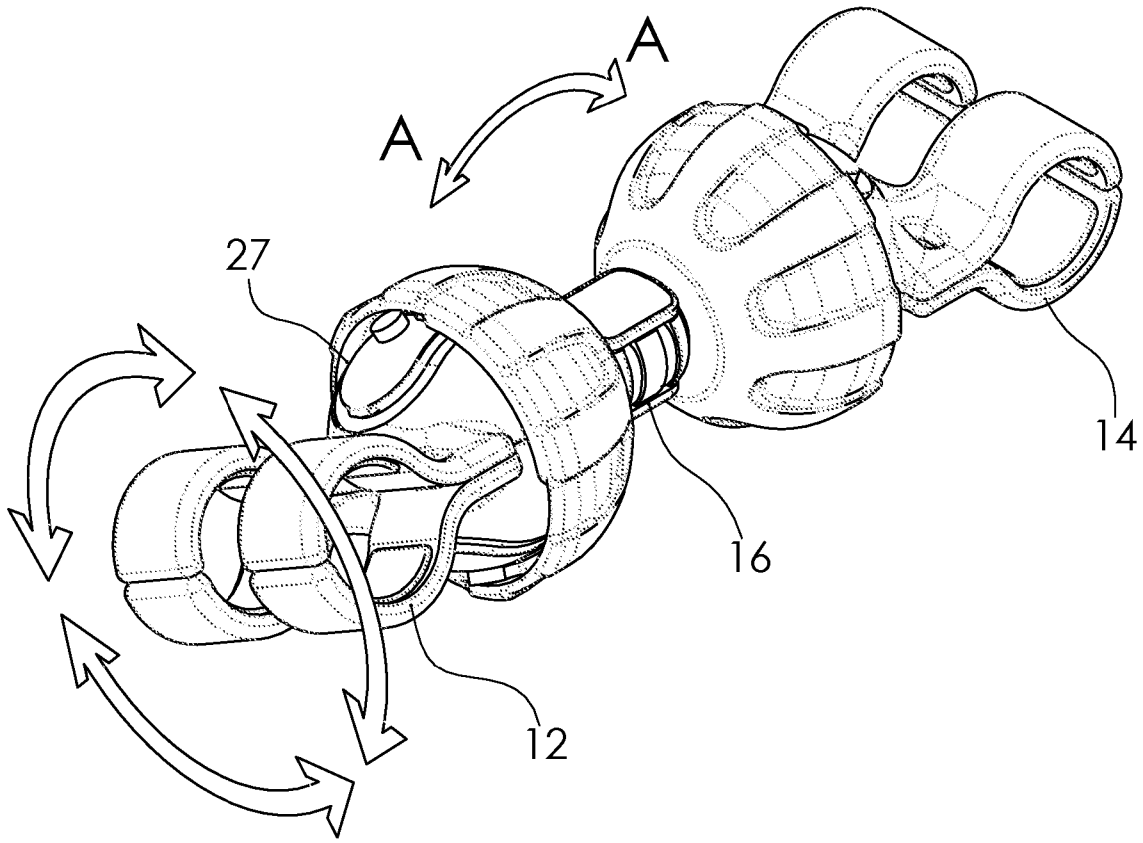


Fig 11

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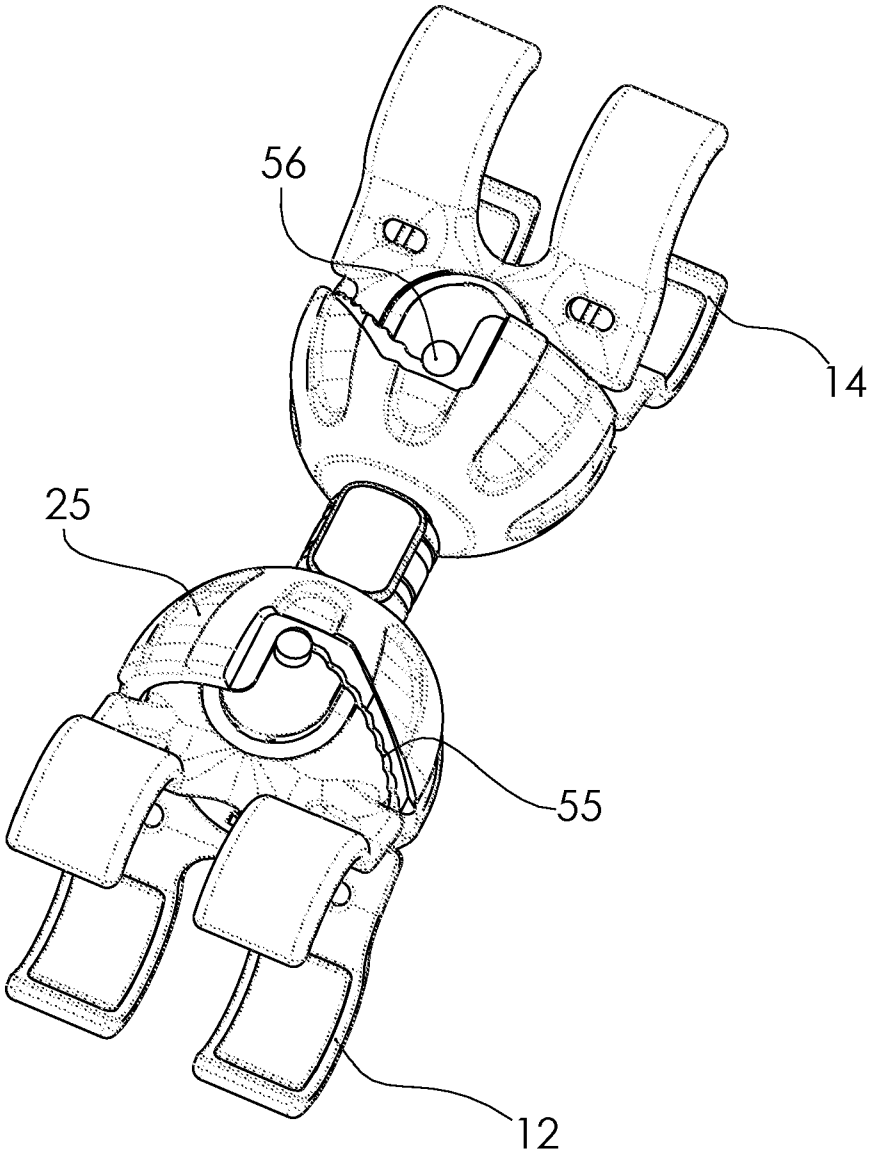


Fig 12

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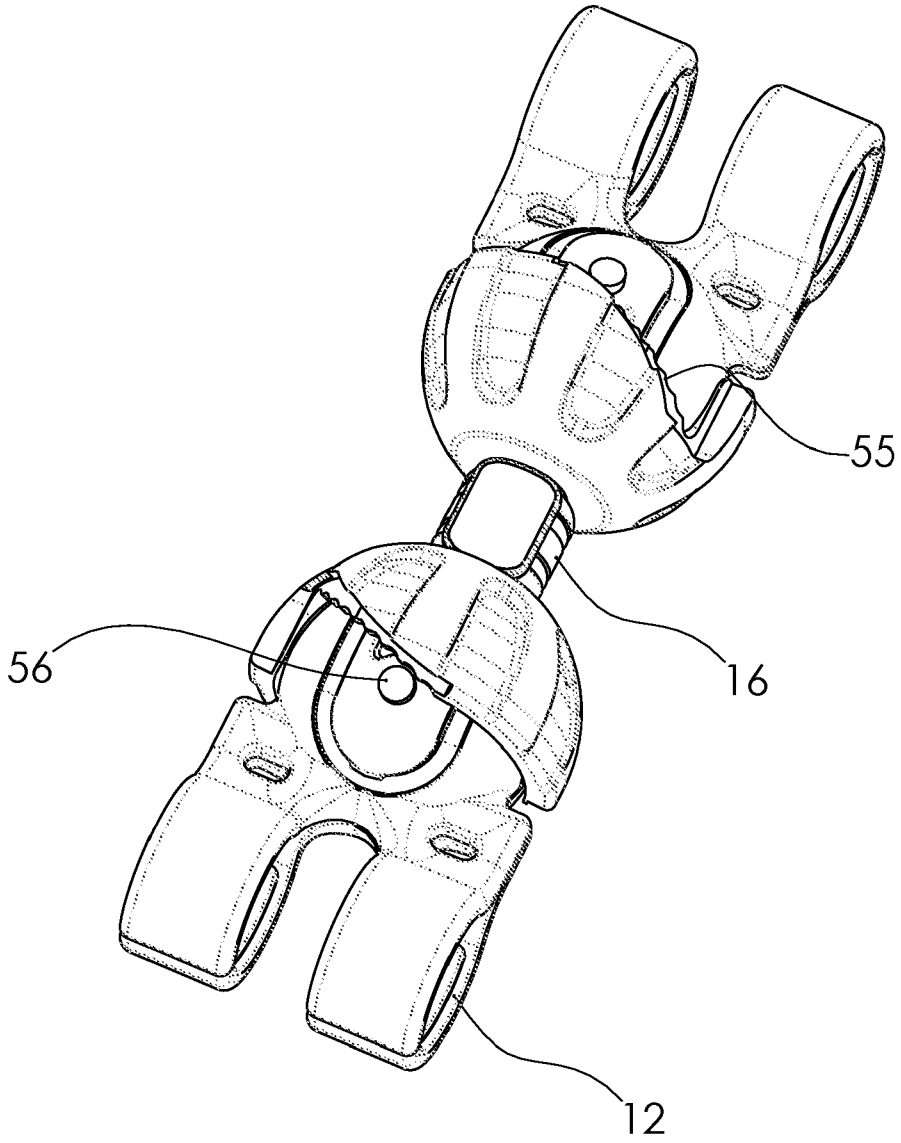


Fig 13

A Connector

Field

The present invention relates to a connector for connecting together similar items or units, for example pushchairs or prams or buggies.

Background

It is often desirable to connect items together on a temporary manner so that they can subsequently be disconnected one from another but whilst connected, may be moved or placed together for convenience.

Often conventional connectors were complex or required machines.

Prior Art

An example of an existing connector is shown in international patent application WO-A1-2006/056795 (Jennifer LAKE). The connector shows a connector with two gripping members for gripping together two perambulators.

Although successful, there were some drawbacks with the aforementioned connector. For example there was a risk that when connecting delicate or fragile items, that the connector crushed or damaged them.

The present invention seeks to overcome those drawbacks by providing an improved connector.

Summary of the Invention

According to a first aspect of the invention, there is provided connector which has first and second closable jaws, each jaw is adapted to close around an item or unit, the jaws are connected together by way of a bar, at least one of the jaws is rotatable with respect to the bar and has a twist lock closure means which comprises two relatively rotatable parts which when rotated in a first direction engages a lock means and prevents the jaws from opening by arresting a ratchet and pinion in place, and when rotated in an opposite direction unlocks the jaws; wherein the jaws are sprung apart by a resilient

09 08 22

means which includes at least one O-ring which, when in a relaxed (unstretched) state retains the jaws in an open configuration.

Ideally at least one of the jaws is adapted to rotate through at least 180°, and preferably to rotate through 360°.

A connector according to any preceding claim wherein the jaws have resiliently deformable pads located on inner surfaces thereof which compress to grip the item or unit.

The twist lock closure means is provided for locking at least one of the jaws in a closed, or in an open, configuration. The twist lock closure means includes a rotatable means, which when rotated in a first direction, locks the jaws, and when rotated in a second direction, unlocks the jaws.

In some embodiments of the connector an outer portion of the twist lock closure means is in the form of a protective shell which surrounds at least part of the jaws.

Preferably the protective shell is in the form of a pair of scallops. Ideally the pair of scallops have helical pathways formed on inner surfaces thereof, along which guide pins pass when the rotatable means is rotated.

An adjuster permits a spacing between the first and the second closable jaws to be varied, for example by way of a threaded shaft portion.

In a preferred embodiment at least one resilient metal spring, configured to separate the jaws from a closed configuration, by pivoting the jaws around a pair of hinge pins.

An adjustment means may have an adjustable catch mechanism which ideally also includes a haptic and/or audible click device to indicate closing and/or opening of the jaws.

Components are preferably provided in a modular and are adapted to inter-connect one with another by way of push-fit connection means thereby enabling disassembly for repair or cleaning.

09 08 22

Jaws are shaped and dimensioned to grip a tube or pipe which is substantially round in cross section with a diameter of between 20 mm to 50 mm.

Ideally jaws are dimensioned so that the jaws can close without revealing any finger traps or areas for significant foreign body ingress.

Components are preferably formed from a single type of polymer for contamination free single polymer recycling.

A flat area is defined on the rod which connects the jaws for receiving a branding or a retro reflective panel. An aperture may be arranged to receive a flexible cord or tie for semi-permanent attaching the connector to the unit. For the purpose of theft prevention

Novelty features, such as faces or names or cartoon images, may be applied to the first and second protective shells so as to decorate them, for example adhesive eyeball stickers may be applied so as to decorate the connector.

09 08 22

It is appreciated that the connector may be fitted and removed without use of tools. The connector may include an attachment member that is sufficiently firm and stable, in use in order, for the attachment of at least two units one to another.

A resiliently deformable pad member is preferably provided wherein the attachment member is adapted to provide increased grip, to the connecter, by compliance, in use, to a surface of the unit and the connector, and increased friction is achieved therebetween.

The invention enables a jaw member to apply a clamping force to a curved surface via the connector.

In some embodiments, the unit is a pushchair or a scooter.

In some embodiments, the connector further includes a first and a second recess member which comprises a bias member and/or a groove member for connecting a first pushchair to a second pushchair at respective locations at the first pushchair and the second pushchair.

In some embodiments, the first pushchair is connected to the second pushchair in at least: a matrix configuration; and a series configuration.

In some embodiments, the jaws comprises one or more jaw liners to prevent damage to an aesthetic finish of the item to which the connector is attached. The jaw liners ideally include a resiliently deformable material, such as a synthetic foam or similar material, such as **Neoprene** (RTM).

Therefore in some embodiments, the jaw liners prevent damage to a paint coating, polish or surface finish of the connector.

In some embodiments, the connector further comprises haptic feedback means for a soft feedback to indicate when the connecter is deployed.

In some embodiments, the haptic feedback means comprises a regulatory haptic click to provide feedback to the user that the connector is secured to the at least two units.

In some embodiments, the connector further comprises an audible click feedback unit to give feedback that the connector is secured to the at least two units.

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

09 08 22

Brief Description of the Drawings

Figure 1 shows an overall view of the connector with its jaws closed;

Figure 2 shows an overall view of the connector with its jaws open;

Figure 3 shows a sectional view through the connector with its jaws closed;

Figures 4a and 4b shows a sectional view through a left hand end of the connector with its jaws open;

Figures 5a and 5b shows a sectional view through a right hand end of the connector with its jaws open;

Figure 6 shows an overall plan view of the connector from above;

Figure 7 shows an overall isometric view of the connector from above with its jaws closed;

Figure 8 shows an overall isometric view of the connector from above with its jaws open;

Figure 9 shows an overall isometric view of the connector from above with one jaw open and indicates how the open jaw is capable of twisting with respect to the closed jaw;

Figure 10 shows an overall isometric view of the connector from above with both jaws open and indicates how the jaws twist with respect one to another;

Figure 11 shows an overall isometric view of the connector from above with both jaws closed and indicates how an interconnecting bar flexes and permits twisting of the jaws;

Figure 12 shows an overall isometric view of the connector from above with both jaws open and indicates how a ratchet and pinion operates to close the jaws close; and

Figure 13 shows an overall isometric view of the connector from above and indicates how the ratchet and pinion has operated to close the jaws.

09 08 22

Detailed Description of Preferred Embodiments of the Invention

Referring to the Figures there is shown a connector 10 which has a first closable jaw 12 and a second closable jaw 14, each of which is adapted to close around an item or unit (not shown). The jaws 12, 14 are connected together by way of a bar 16. At least one of the jaws 12, 14 is rotatable with respect to a longitudinal axis of the bar 16 (shown for example in Figure 9) and twist lock closure means 18a, 18b are provided to lock each of the jaws 12, 14, as shown for example in Figure 10.

Resiliently deformable pad members 20 are fitted to inner surfaces of each of attachment members 22, as shown in Figure 2. Each attachment member 22 is adapted to provide increased grip, to an item (not shown) being gripped by the connecter, by compliance and because each attachment member 22 is resiliently deformable. The attachment members 22 increases friction between the item being gripped and the jaws 12 of the connecter.

As shown in Figure 11, the jaws 12, 14 are adapted to rotate through at least 180°. In one preferred embodiment the jaws 12. 14 are able to rotate through 360°.

Referring to Figure 3 the jaws 12, 14 are sprung by a resilient means 21 which is operative to open the jaws 12, 14. The resilient means 21a, 21b includes at least one O-ring which when in a relaxed (unstretched) state, retains the jaws 12, 14 in an open configuration.

Referring to Figures 4 and 5 which show in detail the jaws 12, 14 with the resiliently deformable pads 22 located on their inner surfaces. The resiliently deformable pads 22 are formed from a synthetic sponges and are adapted to grip the item or unit (not shown).

In Figure 6 a twist lock closure means 24a is provided for locking the jaw 12 in a closed, or in an open, configuration. The twist lock closure means 24 includes a rotatable housing 27 which when rotated in a first direction (Figure 9), locks the jaw 12, and when rotated in a second direction (Figure 10), unlocks the jaws 12. An outer portion of the twist lock closure means 24 is in the form of a protective shell which surrounds at least part of the jaws. The protective shell 25 is in the form of a pair of scallops.

09 08 22

The pair of scallops have helical pathways 28 (Figure 11) formed on inner surfaces thereof, along which guide pins 28 pass when the rotatable housing 27 is rotated. Bending along the rod 16 is permitted as indicated by the double-headed arrow A-A.

Referring to Figure 12 an adjuster comprises a rack or ratchet 55 is located around an inner peripheral portion of the protective shell 25. A pinion 56 works with the rack or ratchet 55 to permit a spacing between the first and the second parts of each closable jaw 12, 14 to be varied. At least one resilient metal spring (not shown) is configured to separate the jaws from a closed configuration, by pivoting them around a pair of hinge pins. The adjuster ideally has a haptic catch mechanism which is defined by the ratchet 55 and pinion 56 with an audible click to indicate closing and/or opening of the jaws 12, 14. Twisting of the shell 25 causes the jaws to lock by arresting the ratchet 55 and pinion 56 in place and thereby prevents the jaws 12, 14 from opening.

Components are modular and are adapted to inter-connect one with another by way of push-fit connection means thereby enabling disassembly for repair or cleaning. A lock screw 70 is shown which connects the integers together.

Figures 4a and 4b and Figures 5a and 5b show how jaws 12 are shaped and dimensioned to grip a tube or pipe (not shown) which is typically round or oval in cross section with a diameter of between 20 mm to 50 mm. Catches 34 slide and engage with recesses 33 when the jaws are unlocked and engage with pawls 36 when the jaws 12 are locked, as shown in Figure 5a. It is understood that the closable jaw 12 is also capable of applying a clamping force to a flat surface via the connector.

Figure 6 shows a flat area 30 that is defined on the rod 16 for receiving a branding (not shown) or a retro reflective panel.

Figures 8 shows apertures 50 which are arranged to receive a flexible cord or tie (not shown) for semi-permanent attaching the connector 10 to a buggy or other device for the purposes of deterring theft. The first and second protective shells are decorated to resemble eyeballs or other novelty features, such as a face or logo or name.

09 08 22

The components are formed from a single polymer for contamination free single polymer recycling.

In some embodiments, the connector further includes a first and a second recess member, a bias member and a groove member for connecting a first pushchair (not shown) to a second pushchair (not shown) at respective locations at the first pushchair and the second pushchair.

In some embodiments, the first pushchair is connected to the second pushchair in a matrix configuration or as a series configuration.

In some embodiments, the connector further comprises a haptic feedback means for a soft feedback regarding a connecting capability of the connecter.

Once the connecter is fitted to a pushchair the attachment point must be sufficiently firm and stable for the attachment of a second pushchair or scooter

While various embodiments of the present invention have been described above, they have been presented by way of example only, and not limitation. It should be apparent that adaptations and modifications are intended to be within the meaning and range of equivalents of the disclosed embodiments, based on the teaching and guidance presented herein.

The elements of the embodiments presented above are not necessarily mutually exclusive, but items may be interchanged to meet various needs as would be appreciated by a person skilled in the art. For example, one or more light emitting diodes (LEDs) (not shown) may be incorporated in the connector with a power supply, such as a battery (not shown). Optionally a flasher unit (not shown) may be provided which enables a user to switch on the LEDs so as to enable the connector to be seen more easily in low light or in the dark.

Although the invention has been described in considerable detail in language specific to structural features, it is to be understood that the invention defined in the appended claims is not necessarily limited to the specific features herein described. Rather, the specific features are disclosed as exemplary preferred forms of implementing the claimed invention.

It is to be understood that the phraseology or terminology used herein is for the purpose of description and is not limiting and the scope of protection is defined by the claims.

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List of Parts

12	closable jaw
14	closable jaw
16	bar
18	twist lock closure means
20	deformable pad member
21	O-ring
22	pad member
24	twist lock closure means
25	protective shell
26	attachment member
27	rotatable housing
28	helical pathway
33	recess
34	catch
36	pawl
50	aperture
55	ratchet
56	pinion
70	lock screw

09 08 22

Claims

1. A connector has first and second closable jaws, each jaw is adapted to close around an item or unit, the jaws are connected together by way of a bar, at least one of the jaws is rotatable with respect to the bar and has a twist lock closure means which comprises two relatively rotatable parts which when rotated in a first direction engages a lock means and prevents the jaws from opening by arresting a ratchet and pinion in place, and when rotated in an opposite direction unlocks the jaws; wherein the jaws are sprung apart by a resilient means which includes at least one O-ring which, when in a relaxed (unstretched) state retains the jaws in an open configuration.

2. A connector according to claim 1 wherein at least one of the jaws is adapted to rotate through at least 180°, and preferably to rotate through 360°.

3. A connector according to claim 1 or 2 wherein the jaws have resiliently deformable pads located on inner surfaces thereof which compress to grip the item or unit.

4. A connector according to any preceding claim wherein a lock means, comprises catches that slide and engage with recesses when the jaws are unlocked and engage with pawls to lock the jaws in a closed, or in an open, configuration.

5. A connector according to any preceding claim wherein an outer portion of the twist lock closure means is in the form of a protective shell which surrounds at least part of the jaws.

6. A connector according to claim 5 wherein the protective shell is in the form of a pair of scallops.

7. A connector according to claim 6 wherein the pair of scallops have helical pathways formed on inner surfaces thereof, along which guide pins pass when the rotatable means is rotated.

8. A connector according to any preceding claim includes an adjuster which permits a spacing between the first and the second closable jaws to be varied.

09 08 22

9. A connector according to any preceding claim includes at least one resilient metal spring, configured to separate the jaws from a closed configuration, by pivoting the jaws around a pair of hinge pins.

10. A connector according to any preceding claim includes an adjustment means which has a haptic catch mechanism and/or audible click to indicate closing and/or opening of the jaws.

11. A connector according to any preceding claim wherein components are modular and are adapted to inter-connect one with another by way of push-fit connection means..

12. A connector according to any preceding claim wherein the jaws are shaped and dimensioned to grip a tube or pipe which is substantially round in cross section with a diameter of between 20 mm to 50 mm.

09 08 22

13. A connector according to any preceding claim wherein components are formed from a single polymer for contamination free single polymer recycling.

14. A connector according to any preceding claim wherein a flat area is defined on a rod for receiving a branding or a retro-reflective panel.

15. A connector according to any preceding claim includes an aperture arranged to receive a flexible cord or tie for semi-permanent attaching the connector to the unit.

16. A connector according to any of claims 5 to 15 wherein the first and second protective shells are decorated to resemble eyeballs.

17. A connector according to any preceding claim includes a light emitting diode (LED).

18. A connector according to claim 17 includes a flasher unit and power supply for the light emitting diode (LED).