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(72) Inventors:
• **PRAPLAN, Vincent**
2300 La Chaux-de-fonds (CH)
• **PIERRE, Christophe**
25120 Maiche (FR)

(74) Representative: **reuteler & cie SA**
Chemin de la Vuarpillière 29
1260 Nyon (CH)

(71) Applicant: **Geosatis SA**
2340 Le Noirmont (CH)

(54) **ELECTRONIC MONITORING BRACELET COMPRISED OF FIRST AND SECOND LOCKABLE AND SEPARABLE BRACELET PARTS**

(57) Electronic monitoring bracelet (2) comprising a rigid casing (4) and an electronic monitoring system mounted within the casing, the electronic monitoring bracelet comprised of first and second lockable and separable bracelet parts (2a, 2b) joinable together at first and second interfaces. The first interface comprises a locking interface coupling (8) having an electronically controlled release mechanism, and the second interface comprises a hinge interface coupling (6). The hinge interface coupling comprises a first part hinge coupling portion (6a) comprising a hinge pin receiving orifice (18) and a second part hinge coupling portion (6b) comprising a locking pin mechanism comprising at least one slidable

pin (24) slidably extendable into the hinge pin orifice (18). The slidable pin is slidably and rotatably mounted in a mounting tube (22) and connected to a cam follower (26) extending through a cam guide slot (30) in the mounting tube, the cam follower engaging a cam guide (17) disposed on the first part hinge coupling portion (6a) during rotation between an open and a closed position of the coupling portions (6a, 6b). The cam guide and cam follower are arranged to axially displace the slidable pin during rotation of the hinge coupling portions, such that the pin engages in the hinge pin receiving orifice to lock the first and second hinge part coupling portions together when they rotate into the closed position.

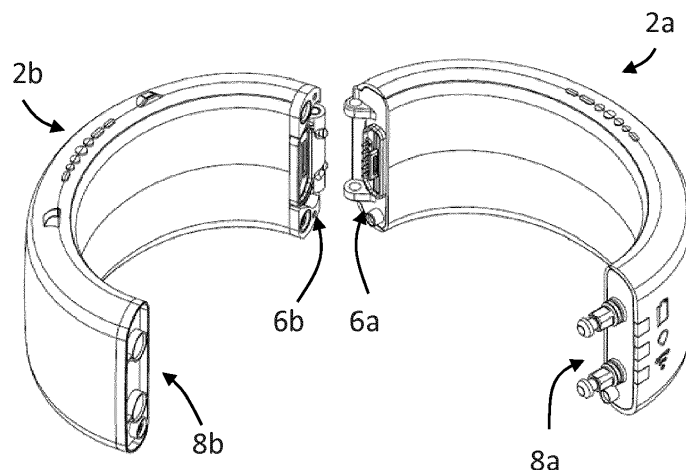


Fig 2

Description

[0001] The present invention relates to an electronic monitoring bracelet in particular for monitoring the displacements of a person, for example within the scope of judicial oversight.

[0002] Certain persons suspected of having committed an offence awaiting judgment, or having committed an offence and being on parole, may be forced to wear an electronic monitoring bracelet so that the monitoring authority may localize the person and monitor his/her displacements at any time. Such bracelets contain a satellite localization system (called "GNSS", acronym for Global Navigation Satellite System) such as for example GPS (Global Positioning System), a telecommunications system for transmitting data to a monitoring/control central unit and a system for detecting integrity of the bracelet in order to be able to detect whether the bracelet has been taken off or is faulty.

[0003] US 2015/0048939 discloses an electronic monitoring bracelet, comprising a ring-shaped body configured to be mounted around a person's limb or around an object, the ring-shaped body being in the form of a rigid shell containing components of the electronic monitoring system therein. The bracelet is made of two separate parts that may be locked together around the limb or object to fully encircle the limb or object in the locked position. In one version described in this publication, the locking mechanism is reversible by activation of an electronic key or code to allow the two parts to be unlocked, separated and removed from the person or object without destruction of the bracelet. The bracelet can then be re-used. The locking mechanism comprises, on both mating interfaces of the two bracelet parts, locking pins on one part that are received in complementary cavities in the other part, the locking pins being locked in the cavity by a spring mounted plunger engaging in a groove in the head of the locking pin, the plunger being coupled to an electromagnet that can be activated to retract the plunger from the pin head groove to unlock the mechanism.

[0004] There is an advantage in providing an electronic monitoring bracelet with a rigid body construction, as described in the aforementioned document, that comprises two separable parts that can be locked together around an object or limb. The separable bracelet parts provides a number of benefits. For instance one of the parts may have various shapes and sizes while the other part remains a standard part, or one of the parts is replaceable for example the part containing the battery. One can generate a standard part for one of the parts and a dedicated part for the other of the parts. There may be other advantages in being able to selectively replace or exchange one of the two parts of the electronic monitoring bracelet. These advantages are fulfilled in the electronic monitoring bracelet described in the aforementioned patent application document. However, locking mechanisms that are unlocked electronically are required on both locking interfaces which leads to relatively high costs and com-

plexity. The number of components required for the locking also adversely affects the size, weight and potentially also the reliability and robustness of the electronic monitoring bracelet.

[0005] In view of the foregoing, it is an object of the present invention to provide an electronic monitoring bracelet made of at least of two separable parts that may be locked around a limb or an object that is compact and cost effective yet robust and secure.

[0006] It is advantageous to provide an electronic monitoring bracelet that is easy to put in place and lock, respectively to unlock and remove by an authorised party.

[0007] It is advantageous to provide an electronic monitoring bracelet that is versatile and allows easy charging.

[0008] It is advantageous to provide an electronic monitoring bracelet made of two parts in which it is easy to change or replace one of the parts.

[0009] Objects of this invention have been achieved by providing the electronic monitoring bracelet according to claim 1.

[0010] Disclosed herein is an electronic monitoring bracelet comprising a rigid casing and an electronic monitoring system mounted within the casing. The electronic monitoring bracelet is comprised of first and second lockable and separable bracelet parts joinable together at first and second interfaces, the first interface comprising a locking interface coupling having an electronically controlled release mechanism, and the second interface comprising a hinge interface coupling. The hinge interface coupling comprises a first part hinge coupling portion on the first bracelet part comprising a hinge pin receiving orifice and a second part hinge coupling portion on the second bracelet part comprising a locking pin mechanism. The locking mechanism comprises at least one slidable pin slidably extendable into the hinge pin orifice. The slidable pin is slidably and rotatably mounted in a mounting tube and connected to a cam follower extending through a cam guide slot in the mounting tube. The cam follower engages a cam guide disposed on the first part hinge coupling portion during rotation between an open and a closed position of the coupling portions. The cam guide and cam follower are arranged to axially displace the slidable pin during rotation of the hinge coupling portions, such that the pin engages in the hinge pin receiving orifice to lock the first and second hinge part coupling portions together when they rotate into the closed position, respectively to disengage the pin from the hinge pin receiving orifice to unlock the first and second hinge part coupling portions when they rotate into the open position.

[0011] In an embodiment, the slidable pin comprises a friction ring mounted therearound frictionally engaging against a surface of a cavity in the mounting tube such that the slidable pins remain in a retracted position by frictional engagement in the open position.

[0012] In an embodiment, the friction ring is in the form of an elastic O-ring mounted in a circumferential groove in the slidable pin.

[0013] In an embodiment, the slidable pin is coupled to a traction spring to retract the pin into the mounting tube in the unlocked position.

[0014] In an embodiment, the cam follower of the slidable pin comprises a head with an outer engagement surface that engages in a groove forming the cam guide provided on the first part hinge coupling portion.

[0015] In an embodiment, the outer engagement surface of the head may have a rounded or tapered shape and the cam guide groove may comprise a substantially complementary profile to slidably receive the head thereagainst.

[0016] In an embodiment, the head of the cam follower may comprise an inner engagement surface engaging a chamfered surface along the cam guide slot.

[0017] In an embodiment, the first part hinge coupling portion may comprise at least one flange within which the hinge pin receiving orifice is provided.

[0018] In an advantageous embodiment, the locking pin mechanism may comprise a pair of slidable pins arranged in opposite directions in the mounting tube, configured to project beyond opposed axial ends of the mounting tube in the locked position for engagement in a corresponding pair of said hinge pin receiving orifices of the first part hinge coupling portion.

[0019] In an embodiment, the first part hinge coupling may comprise a pair of said flanges for receiving therebetween the mounting tube, the cam guide being provided on the first coupling portion between the flanges.

[0020] In an embodiment, the hinge interface coupling comprises a connector system comprising an electrical connector having a first connector mounted on the first bracelet part and a second connector portion mounted on the second bracelet part, and a fibre optic connector having a first connector portion on the first bracelet part and a second connector portion on the second bracelet part, the connector system configured to allow rotational engagement of the connectors from an uncoupled to a coupled and locked position.

[0021] In an embodiment, the first connector portion on the fibre optic connector comprises a ferrule mounted in a ferrule guide, and the second connector portion comprises a ferrule slidable into the ferrule guide, the ferrules mounting opposed optical fibre ends, whereby the ferrule guide has a non-circular entry mouth to allow rotation of the ferrule of the second connector portion into the ferrule guide on the first connector portion, the ferrules further comprising sealing rings elastically compressed between the ferrule and ferrule guide.

[0022] In an embodiment, a first connector portion may comprise contact pins that are spring biased and a second connector portion comprises contact pads against which the contact springs press in the closed position.

[0023] In an embodiment, a SIM card connection slot may advantageously be arranged in the connector system of the hinge interface coupling on one of the two bracelet parts.

[0024] In an embodiment, the first connector portion

may advantageously comprise a shroud surrounding the electrical contacts receivable in a complementary recess in the second connector portion, a seal being mounted between the recess and the shroud.

[0025] Further objects and advantageous features of the invention will be apparent from the claims and the following detailed description of embodiments of the invention in relation to the annexed drawings in which:

Figure 1 is a perspective view of an electronic monitoring bracelet according to an embodiment of the invention;

Figure 2 is a perspective view of an electronic monitoring bracelet according to an embodiment of the invention where the two bracelet parts are separated;

Figure 3 is a view similar to Figure 2 where the two bracelet parts are in an initial coupling position;

Figure 4 is a perspective view of one of the two bracelet parts and Figure 5 is a perspective view of the other of the bracelet parts;

Figure 6 is a perspective view of a hinge coupling interface of the electronic monitoring bracelet according to an embodiment of the invention, showing a first hinge coupling part and a second hinge coupling part that belong to respective first and second bracelet parts in an uncoupled position, the second part of the hinge coupling interface being shown in an unlocked position;

Figure 7 is a perspective exploded view of a second part of the hinge coupling interface;

Figure 8 is a perspective view of the second part of the hinge coupling interface in a locked position;

Figures 9a and 9b are cross-sectional views of the hinge coupling interface at a level of an electrical connector, in an open position (fig. 9a) and closed position (fig. 9b); and

Figures 10a and 10b are cross-sectional views of the hinge coupling interface at a level of a fibre optic connector, in an open position (fig. 10a) and closed position (fig. 10b).

[0026] Referring to the figures, an electronic monitoring bracelet 2 according to embodiments of the invention comprises a ring shaped rigid casing 4 configured for mounting around a limb of a person, such as a person's wrist or a person's ankle. Various sizes and shapes may be provided to adapt to ranges of morphology of humans. The bracelet may however also be used in other applications, for instance for the electronic monitoring of an-

imals and may have a shape accordingly adapted for a limb or other member of the animal. The electronic monitoring bracelet may also be configured for placement around an innate object for tracking and surveillance of the object.

[0027] The electronic monitoring bracelet 2 comprises two separable bracelet parts 2a, 2b which for convenience will be named hereinafter a first bracelet part 2a and a second bracelet part 2b. In the illustrated embodiments, the two bracelet parts 2a, 2b have essentially the same or similar general shape and dimensions, coupled together at interfaces that are arranged essentially in a plane of symmetry of the general outer shape of the bracelet 2. In variants however, it is possible that one of the bracelet parts extends around a shorter portion of the closed perimeter than the other bracelet part, the two parts having asymmetrical shapes. Also, the first and second bracelet parts may have different shapes and sizes. In a particular embodiment, one of the bracelet parts forms a standard component, while the other bracelet part is selected from a set of bracelet parts with different configurations for instance in order to adapt the size of the central passage around which the bracelet extends, or to integrate different functions and/or electrical components depending on the specific application intended for the monitoring bracelet or the particular conditions of use of the bracelet.

[0028] The electronic bracelet 2 further comprises an electronic monitoring system mounted within the rigid casing. The electronic monitoring system comprises a plurality of electrical circuit and electronic component distributed within the rigid casing 4 in both the first and second bracelet parts 2a, 2b. Certain components and electronic functions of the bracelet may be installed in only one of the two parts, or may be found in both of the parts. For instance, a power source for the electronic monitoring bracelet may be found in only one of the two bracelet parts 2a, 2b whereby this bracelet part may be replaced at a different intervals from the other bracelet part depending on the state of the battery, in particular if it loses the ability to charge sufficiently due to the number of cycles of discharge and recharge. Electrical components with relatively shorter life cycles that relate to the technologies employed for instance in wireless communications that may evolve quickly, can be placed in one of the bracelet parts such that this bracelet part can be replaced with an updated bracelet part in the case of new technology.

[0029] The electronic bracelet may have a useful lifespan of months or years, and be used and re-used on various persons such that the ability to replace one of the parts without replacing both parts provides cost advantages of the useful lifetime of monitoring bracelet.

[0030] The electronic monitoring system mounted within the rigid casing 4 includes an integrity detection system to detect whether the bracelet is in a secure locked and untampered state, or whether the bracelet is broken, opened, or has been tampered with in an illegit-

imate manner. The integrity detection system may comprise various sensors such as pressure sensors, material integrity sensors, electrical circuit sensors and one or more optical fibres. In the illustrated embodiment, the electronic monitoring bracelet 2 comprises an optical fibre mounted within the bracelet that forms a circuit along the closed ring perimeter of the bracelet to detect if the bracelet is open or has been severed at any position. The electronic monitoring system further comprises an energy source, in particular a rechargeable battery such as lithium ion battery, a localization system including a GNSS localization system and additional localization systems that may include mobile phone network localization systems and local wireless systems to determine the position, speed, and/or direction of displacement of the bracelet. The integrity detection system further comprises a communication system for transmitting monitoring data to a monitoring central unit and from receiving data from the monitoring central unit. The communication system may include a system for communicating with mobile phone networks via various mobile phone communication protocols and for communicating via wireless communications systems in local networks such as Wifi, Bluetooth, Zigbee or other communication systems for communicating for instance with a base station that may be placed in a person's domicile or place of work. Electronic monitoring systems for the surveillance of persons are *per se* well-known and various features and functions of such systems may be included in the electronic monitoring system of an electronic monitoring bracelet according to embodiments of this invention.

[0031] In order to lock together the bracelet parts 2a, 2b and to unlock and separate the two bracelet parts 2a, 2b, the electronic monitoring bracelet is provided with interface couplings 6, 8 at ends of the bracelet parts 2a, 2b. One of the two coupling interfaces comprises a hinge interface coupling 6 and the other comprises a locking interface coupling 8. The locking interface coupling 8 may comprise similar locking features to the reversible locking system described in US 20150048939 which is incorporated herein by reference thereto. In particular, the locking interface coupling 8 may be provided with complementary mating projections 48 and cavities 50, a plunger system provided within the cavities engaging a locking groove 49 in the projection, the plunger being electrically or electromagnetically retractable to enable unlocking. Actuation of the electromagnetic or electrical system may be subject to a secret electronic code or electronic access system controlled by an authorised person. Other secure locking systems *per se* known in the art for electronic monitoring bracelets may be used in lieu of the aforementioned system for the locking interface coupling 8 which need not be described in more detail hereinafter.

[0032] The hinge interface coupling is configured to allow the two bracelet parts 2a, 2b to be hinged and securely held together at the hinge interface coupling 6 in a locked position when the locking interface coupling 8 is locked, and to be unhinged and separated when the

locking interface coupling 8 is released. In this manner, only the locking interface coupling 8 needs to be actuated to open the monitoring bracelet for removal or placement around a limb of a subject, while at the same time allowing the two bracelet parts to be completely separated from each other.

[0033] The hinge interface coupling 6 comprises a first part hinge coupling portion 6a on the first bracelet part 2a and a second part hinge coupling portion 6b on the second bracelet part.

[0034] The second part hinge coupling portion 6b comprises a locking pin mechanism that comprises at least one slidable pin 24, but preferably a pair of slidable pins 24, slidably and rotatably mounted within a cavity 28 of a mounting tube 22 that is fixed or integrally formed with a wall of the second part hinge coupling portion 6b.

[0035] The first part hinge coupling portion 6a comprises hinge orifices 18 that receive therein outer engagement ends 27 of slidable pins 24. The orifices 18 may be provided in flanges 16 or in another shaped parts integrated in the wall at the interface of the coupling portion 6b proximate top and bottom ends of the interface. Cam guide grooves 17 are further provided on the interface of the first part hinge coupling portion 6a, between the opposed flanges 16.

[0036] The one or more slidable pins 24 are each fixedly connected to a cam follower 26 extending through a cam guide slot 30 in the mounting tube 22. The cam guide slot forms a passage from the cavity 28 to an outside surface of the mounting tube 22 to allow the cam followers to extend from the slidable pin to a position outside of the mounting tube 22. The cam guide slots 30 guide the axial movement of the slidable pins 24 upon rotation of the cam followers 26 (and slidable pins 24 fixed thereto) from an unlocked position as illustrated in figure 6 to a locked position as illustrated in figure 8. Rotation from the unlocked to the locked position is effected by engaging the cam followers 26 to force them to rotate from the unlocked position to the locked position such that the cam followers follow the cam guide slots 30 to impose an axial movement of the slidable pins 24 such that the axial ends thereof go from a position that is below or flush with axial ends 23 of the mounting tube 22 to a position projecting beyond the axial ends 23 such that the outer engagement ends 27 of the slidable pins may engage in the orifices 18 on the complementary hinge coupling portion 6a. As may be easily understood with reference to figure 6, in the retracted position of the slidable pins 24, the mounting tube 22 may be inserted and positioned between the inner support faces 19 of the flanges 16 such that the slidable pins 24 may be substantially aligned with the corresponding orifices 18.

[0037] The cam followers 26 comprise a head 44 with an outer engagement surface 45 and an inner engagement surface 47. The inner engagement surface 47 faces inwardly and engages a chamfered surface 46 of the cam guide slots 30, whereas the outer engagement surface 45 faces outwardly towards the cam guide grooves 17.

The outer engagement surface 45 may advantageously have a tapered or rounded shaped. The cam guide grooves 17 in the first part hinge coupling portion 6a are configured to receive and engage the outer engagement surface 45 of the heads 44 of the respective cam followers 26 when the two bracelet parts are initially assembled together at the hinge interface coupling 6 as illustrated in figure 3.

[0038] Upon relative rotation of the two bracelet parts 2a, 2b towards each other, the cam followers 26 are forced to rotate because of the engagement of the outer engagement surface 45 of the head 44 in the cam guide grooves 17. Upon rotation of the cam followers 26, the cam followers, which are fixed to the slidable pins, are in addition to their rotation forced to displace axially due to the profile of the cam guide slots 30 such that the outer engagement ends 27 of the slidable pins 24 project outwardly and engage in the corresponding orifices 18. Upon full rotation, the locking interface coupling 8 is closed and the hinge coupling interface 6 is locked by engagement of the slidable pins in the corresponding flange orifices to form the closed and locked position illustrated in figure 1.

[0039] In an embodiment, each slidable pin comprises a friction ring 33 mounted therearound configured to frictionally engageable against a surface of the cavity 28 of the mounting tube 22 such that the slidable pins remain in a retracted position by frictional engagement when the hinge is in the open position. The friction rings may for instance be in the form of substantially elastic O rings mounted in a circumferential groove 31 in the slidable pin.

[0040] In a variant the slidable pins are coupled to a traction spring (not shown) configured to pull the pins into the retracted position in the mounting tube when the hinge is in the unlocked position.

[0041] In variants of the hinge interface coupling, locking pin mechanisms may be provided on both the first and second hinge part coupling portions that engage with cam guide grooves and orifices also provided on both the first and second hinge part coupling portions. The mounting tubes on each part are positioned to extend over complementary portions (interleaving or non-overlapping) along the hinge rotation axis.

[0042] The hinge interface coupling 6 advantageously comprises a connector assembly that may include an electrical connector 12 and a fibre optic connector 14. As mentioned previously, the optical fibre may serve to detect whether the bracelet is in a fully closed, locked and unsevered state. The optical fibre may also serve to allow transmission of optical signals between the two bracelet parts 2a, 2b for purposes other than integrity detection, for instance for transmission of a data. In a variant, it is possible to omit the electrical connector whereby in such case each of the bracelet parts may be provided with their own power supply.

[0043] As best illustrated in figures 10a and 10b, the fibre optic connector 14 comprises a first and second connector portions 14a, 14b mounted in respective first

and second bracelet parts 2a, 2b, each of the connector portions comprising a ferrule 38 housing an end of an optical fibre 40, one of the connector portions comprising a ferrule guide 42 configured to slide over the ferrule of the opposite connector portion to align ends of the optical fibres. In order to allow the rotational movement during closing of the hinge interface coupling, the ferrule guide 42 is provided with a slightly oval entry mouth 43. The ferrules 38 may be provided with outer sealing rings 41 for instance in the form of O-rings that engage with the ferrule guide 42 whereby the sealing rings also act to provide some play to allow the rotational movement of the mating ferrule guide and ferrule yet provide an elastic force to center the ferrules within the ferrule guide.

[0044] It may be noted that the locking interface coupling 8 may also be provided with an optical fibre connector and/or an electrical fibre connector.

[0045] The electrical connector 12 comprises first and second connector portions 12a, 12b that are complementary and mounted on respective bracelet parts 2a, 2b such that when the hinge interface coupling is closed electrical connection between the two bracelet parts 2a, 2b is ensured. The electrical connector comprises a seal 32 that surrounds the electrical contacts and that provides a hermetic seal round the electrical contacts when the hinge interface coupling 6 is closed. It may be noted in variants that the seal 32 could be provided in different forms and configurations provided that it surrounds electrical contacts and moreover it may also be used to encompass the fibre optic connector or alternatively separate seals may be provided for the fibre optic connector and the electrical connector.

[0046] The electrical connector may comprise spring biased contact pins 34a on one of the connector portions 12a that engage against contacts 34b of the other connector portion 12b, for instance be in the form of contact pads 34b. The electrical connector may further comprise other forms of mating electrical contacts.

[0047] The electrical connector may further include a slot for a SIM (Subscriber Identity Module) card, in which a tray 36a for mounting the card is inserted, the tray comprising a handle that projects out of the slot. The SIM card tray handle 36a engages in a complementary slot 36b in the other connector part to allow closing of the hinge.

List of references

Electronic monitoring bracelet 2

Rigid Casing 4

Electronic monitoring system

[0048]

integrity detection system

sensors (pressure, rupture)
optical fibre

energy source e.g. rechargeable lithium battery
localization system (GNSS, GPRS, WiFi)
communications system

First and second lockable and separable bracelet parts 2a, 2b

Hinge interface coupling 6

[0049]

First part Hinge coupling portion 6a (on first part)

Flange 16

Hinge pin receiving orifice 18

Cam guide 17

Cam guide groove

Second part Hinge coupling portion 6b (on second part)

Locking pin mechanism

Slidable Pin 24

outer engagement end 27

inner end 29

friction ring mounting groove 31

friction ring 33

cam follower 26

head 44

outer engagement surface 45

inner engagement surface 47

traction spring

Mounting tube 22

Axial bearing end 23 Cavity 28

Cam guide slots 30

Chamfered surface 46

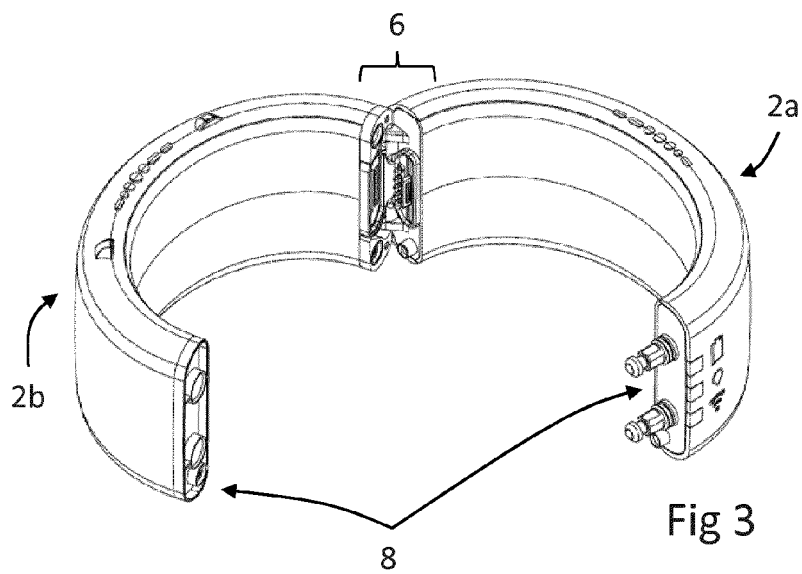
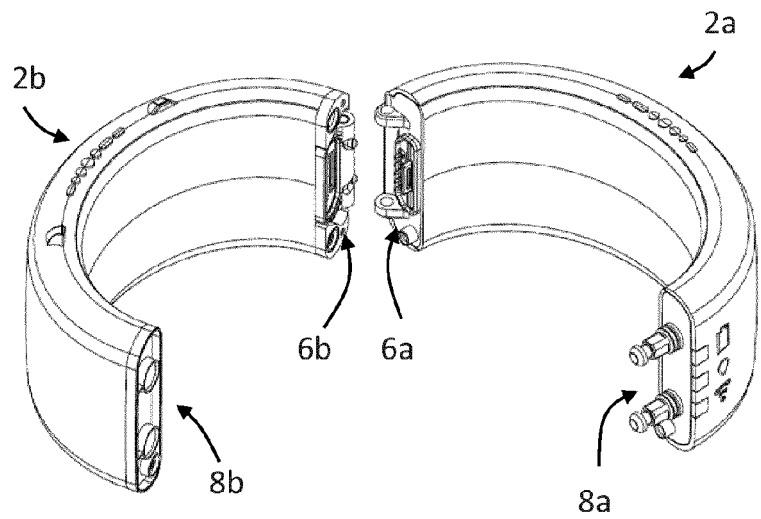
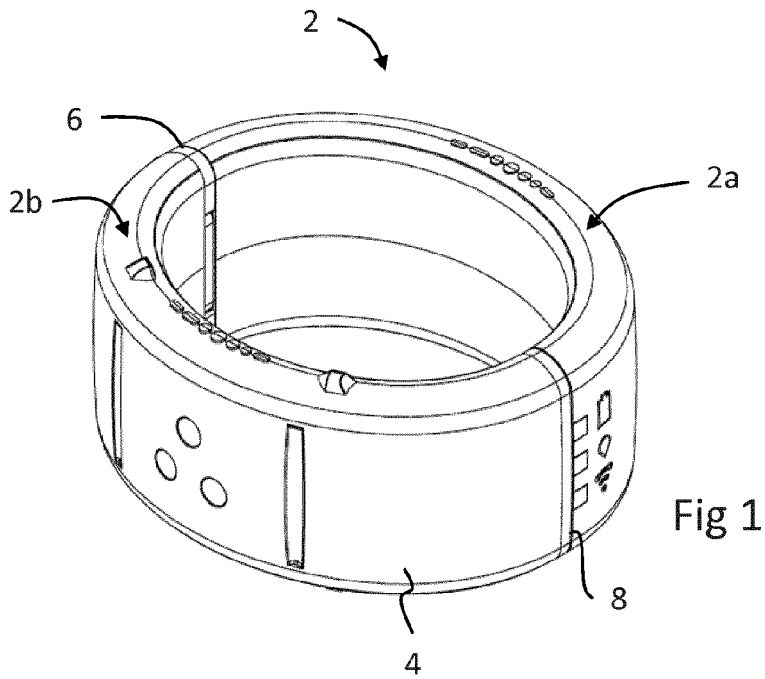
Connector

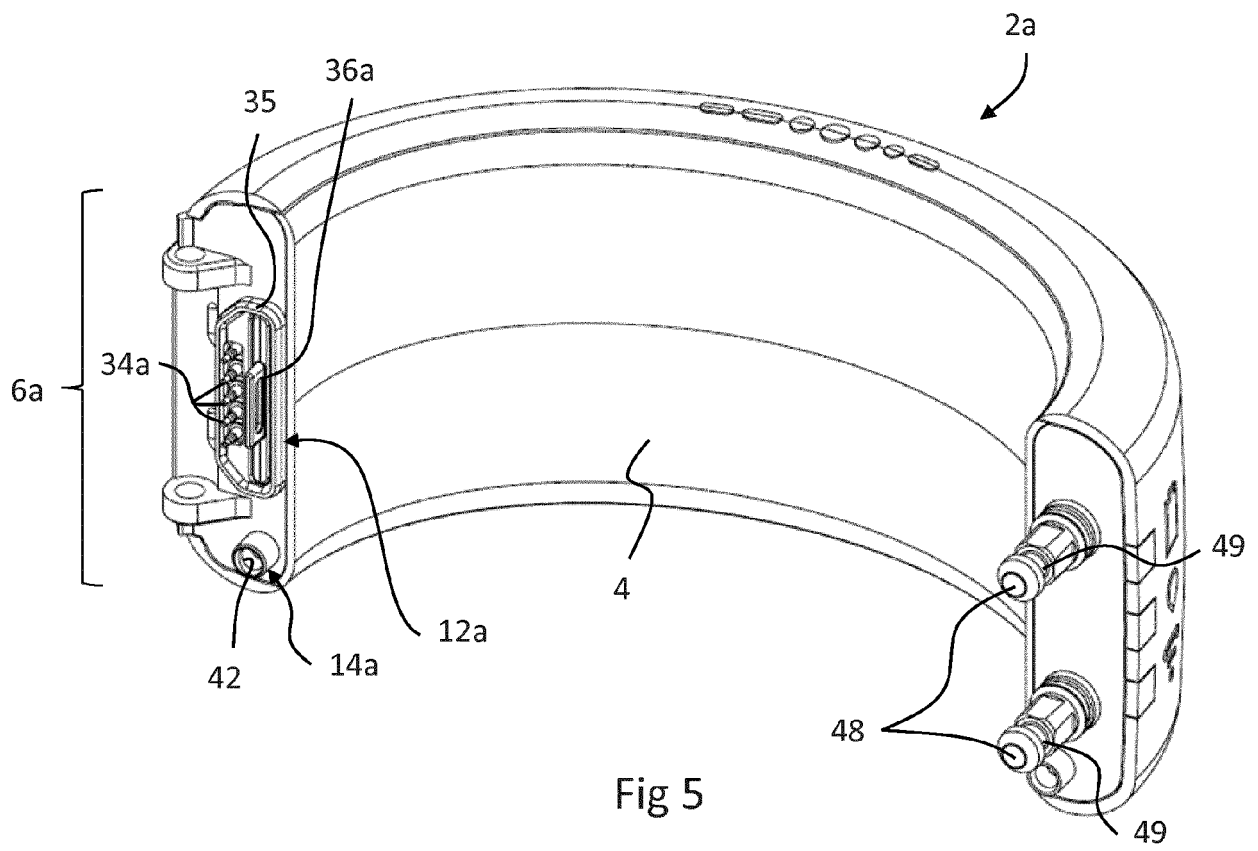
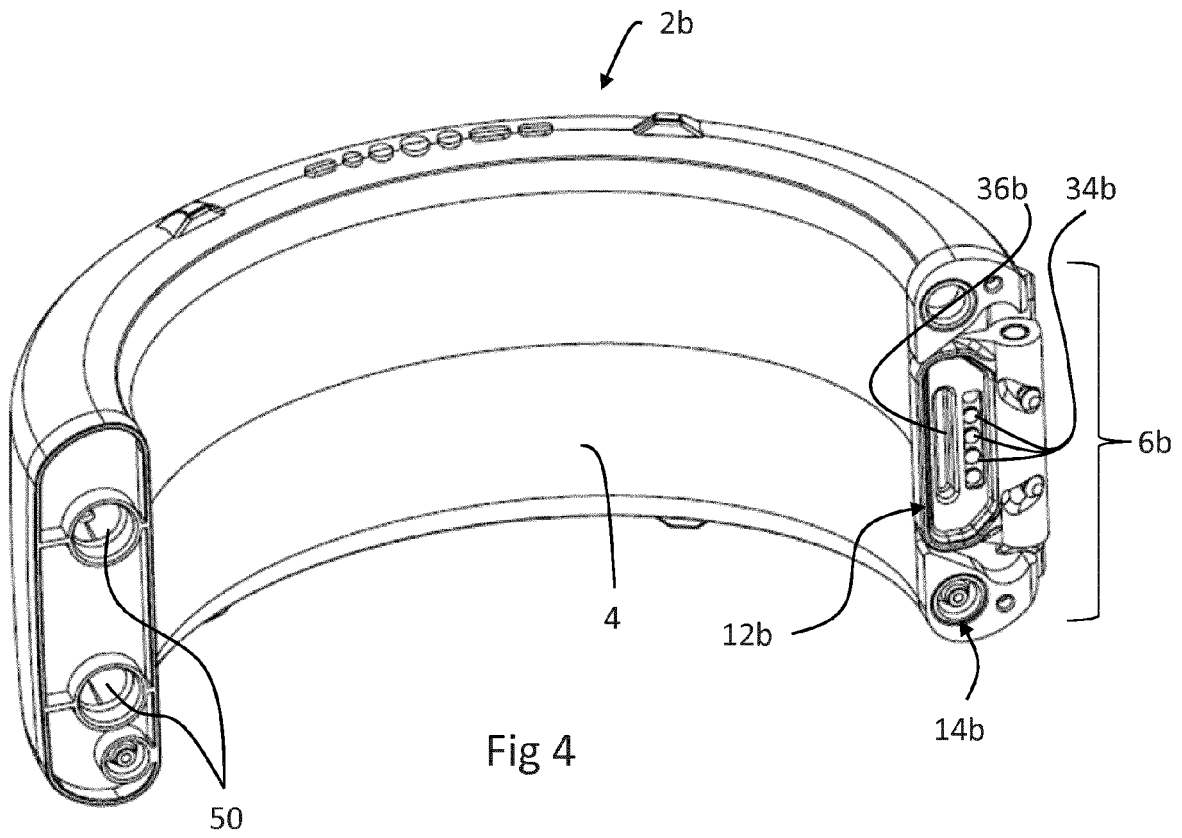
[0048] Electrical connector 12

[0050]

First connector portion 12a		
Contacts		
contact pins (spring biased) 34a	5	
SIM card tray handle 36a		
Shroud 35		
Second connector portion 12b		
Contacts	10	
contact pads 34b		
slot 36b		
recess 37	15	
Seal 32		
Fibre optic connector 14	20	
[0051]		
First connector portion 14a	25	
Ferrule 38		
Optical fiber 40		
Ferrule guide 42		
Oval entry mouth 43	30	
Second connector portion 14b		
Ferrule 38		
Optical fiber 40	35	
Sealing ring 41		
Locking interface coupling 8		
[0052]	40	
projection 48		
locking groove 49		
cavity 50	45	
Claims	50	
1. Electronic monitoring bracelet (2) comprising a rigid casing (4) and an electronic monitoring system mounted within the casing, the electronic monitoring bracelet comprised of first and second lockable and separable bracelet parts (2a, 2b), the bracelet parts joinable together at first and second interfaces, the first interface comprising a locking interface coupling (8) having an electronically controlled release mechanism, and the second interface comprising a hinge interface coupling (6), wherein the hinge interface coupling comprises a first part hinge coupling portion (6a) on the first bracelet part comprising a hinge pin receiving orifice (18) and a second part hinge coupling portion (6b) on the second bracelet part comprising a locking pin mechanism comprising at least one slidable pin (24) slidably extendable into the hinge pin orifice (18), the slidable pin slidably and rotatably mounted in a mounting tube (22) and connected to a cam follower (26) extending through a cam guide slot (30) in the mounting tube, the cam follower engaging a cam guide (17) disposed on the first part hinge coupling portion (6a) during rotation between an open and a closed position of the coupling portions (6a, 6b), the cam guide and cam follower arranged to axially displace the slidable pin during rotation of the hinge coupling portions, such that the pin engages in the hinge pin receiving orifice to lock the first and second hinge part coupling portions together when they rotate into the closed position, respectively to disengage the pin from the hinge pin receiving orifice to unlock the first and second hinge part coupling portions when they rotate into the open position.	55	
		2. Electronic monitoring bracelet according to any of the preceding claims wherein the slidable pin comprises a friction ring (33) mounted therearound frictionally engaging against a surface of a cavity (28) in the mounting tube (22) such that the slidable pins remain in a retracted position by frictional engagement in the open position.
		3. Electronic monitoring bracelet according to the preceding claim wherein the friction ring is in the form of an elastic O-ring mounted in a circumferential groove in the slidable pin.
		4. Electronic monitoring bracelet according to claim 1 wherein the slidable pin is coupled to a traction spring to retract the pin into the mounting tube in the unlocked position.
		5. Electronic monitoring bracelet according to any of the preceding claim wherein the cam follower of the slidable pin comprises a head (44) with an outer engagement surface (45) that engages in a groove forming the cam guide (17) provided on the first part hinge coupling portion (6a).
		6. Electronic monitoring bracelet according to the preceding claim wherein the outer engagement surface (45) of the head has a rounded or tapered shape and the cam guide groove (17) comprises a substantially complementary profile to slidably receive the head thereagainst.

7. Electronic monitoring bracelet according to either of the two directly preceding claims wherein the head (44) of the cam follower (26) comprises an inner engagement surface (47) engaging a chamfered surface (46) along the cam guide slot (30). 5
8. Electronic monitoring bracelet according to any of the preceding claims wherein the first part hinge coupling portion (6a) comprises at least one flange (16) within which the hinge pin receiving orifice (18) is provided. 10
9. Electronic monitoring bracelet according to any preceding claim wherein the locking pin mechanism comprises a pair of slidable pins (24) arranged in opposite directions in the mounting tube (22), configured to project beyond opposed axial ends (23) of the mounting tube in the locked position for engagement in a corresponding pair of said hinge pin receiving orifices (18) of the first part hinge coupling portion (6a). 15 20
10. Electronic monitoring bracelet according to the preceding claim wherein the first part hinge coupling (6a) comprises a pair of said flanges (16) for receiving therebetween the mounting tube (22), the cam guide (17) being provided on the first coupling portion between the flanges. 25
11. Electronic monitoring bracelet according to any of the preceding claims wherein the hinge interface coupling comprises a connector system comprising an electrical connector (12) having a first connector (12a) mounted on the first bracelet part (2a) and a second connector portion (12b) mounted on the second bracelet part (2b), and a fibre optic connector (14) having a first connector portion (14a) on the first bracelet part and a second connector portion (14b) on the second bracelet part, the connector system configured to allow rotational engagement of the connectors from an uncoupled to a coupled and locked position. 30 35 40
12. Electronic monitoring bracelet according to the preceding claim wherein the first connector portion on the fibre optic connector comprises a ferrule (38) mounted in a ferrule guide (42), and the second connector portion comprises a ferrule (38) slidable into the ferrule guide (42), the ferrules mounting opposed optical fibre ends, whereby the ferrule guide (42) has a non-circular entry mouth (43) to allow rotation of the ferrule of the second connector portion into the ferrule guide (42) on the first connector portion, the ferrules further comprising sealing rings elastically compressed between the ferrule and ferrule guide. 45 50 55
13. Electronic monitoring bracelet according to any of the preceding claims wherein a first connector portion (12a) comprises contact pins that are spring biased (34a) and a second connector portion comprises contact pads (34b) against which the contact springs press in the closed position.
14. Electronic monitoring bracelet according to the preceding claim wherein the first connector portion comprises a shroud (35) surrounding the electrical contacts receivable in a complementary recess (37) in the second connector portion, a seal (32) being mounted between the recess and the shroud.
15. Electronic monitoring bracelet according to any of the four directly preceding claims wherein a SIM card connection slot is arranged in the connector system of the hinge interface coupling on one of the bracelet parts.





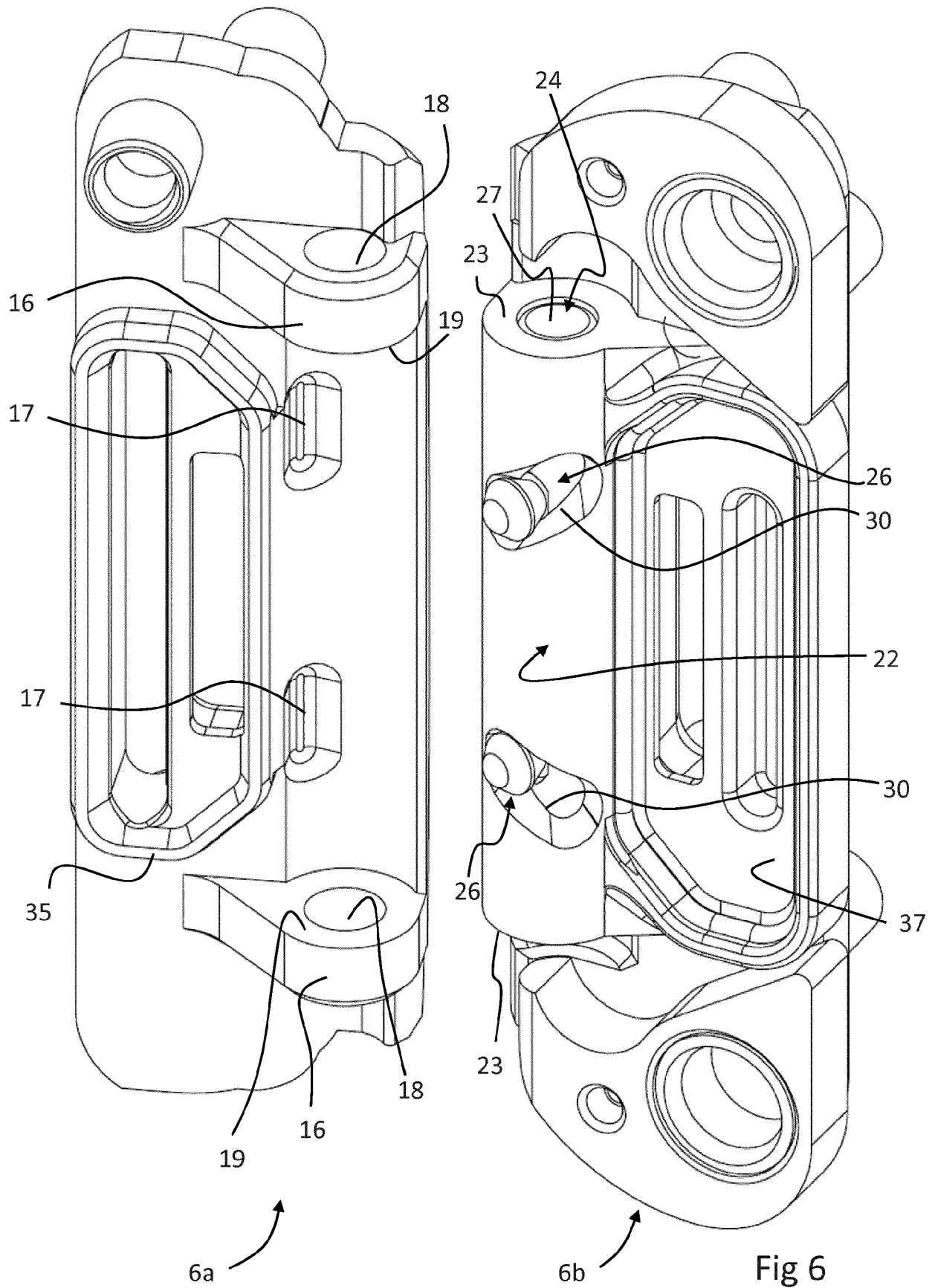


Fig 6

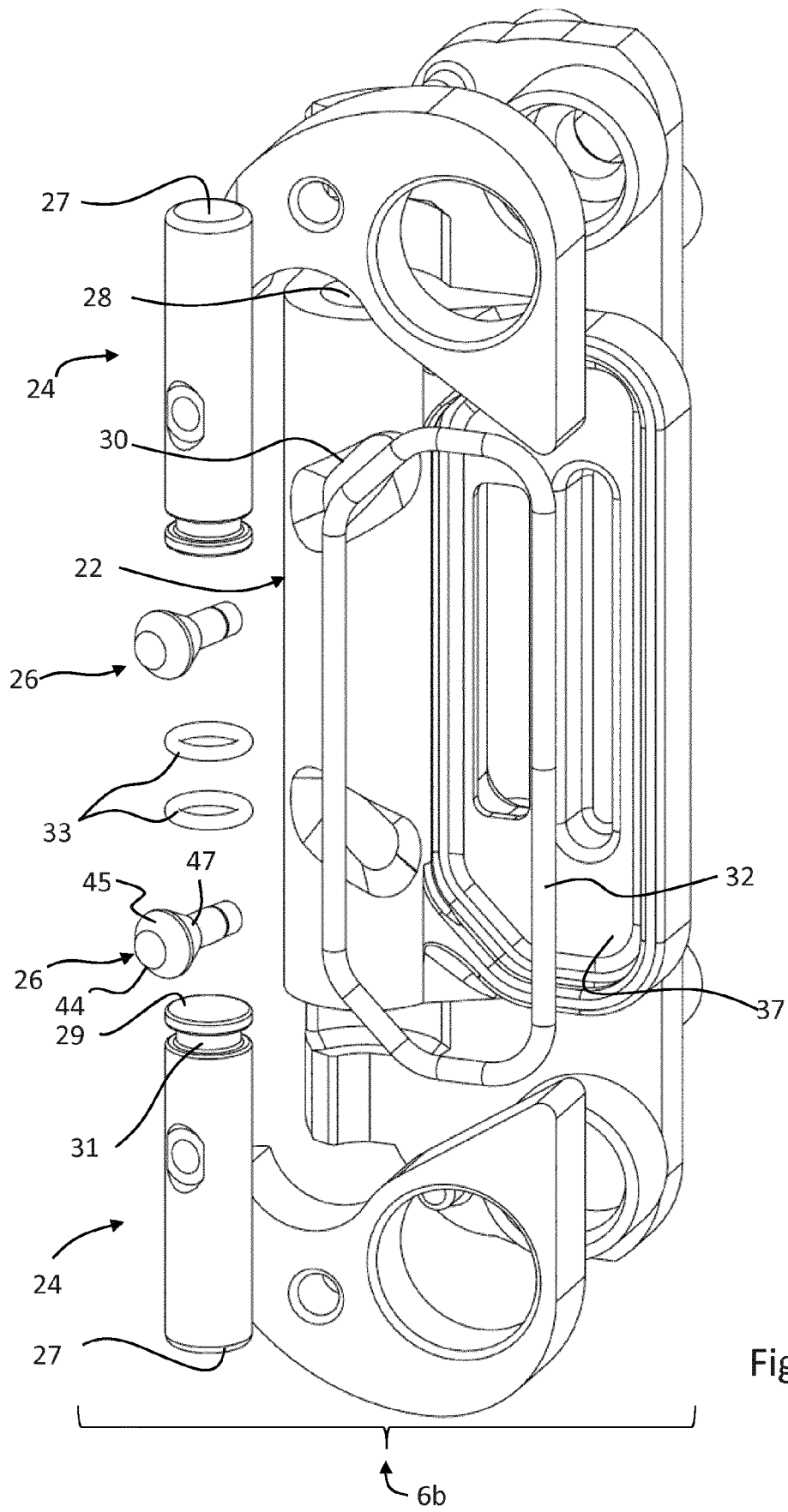


Fig 7

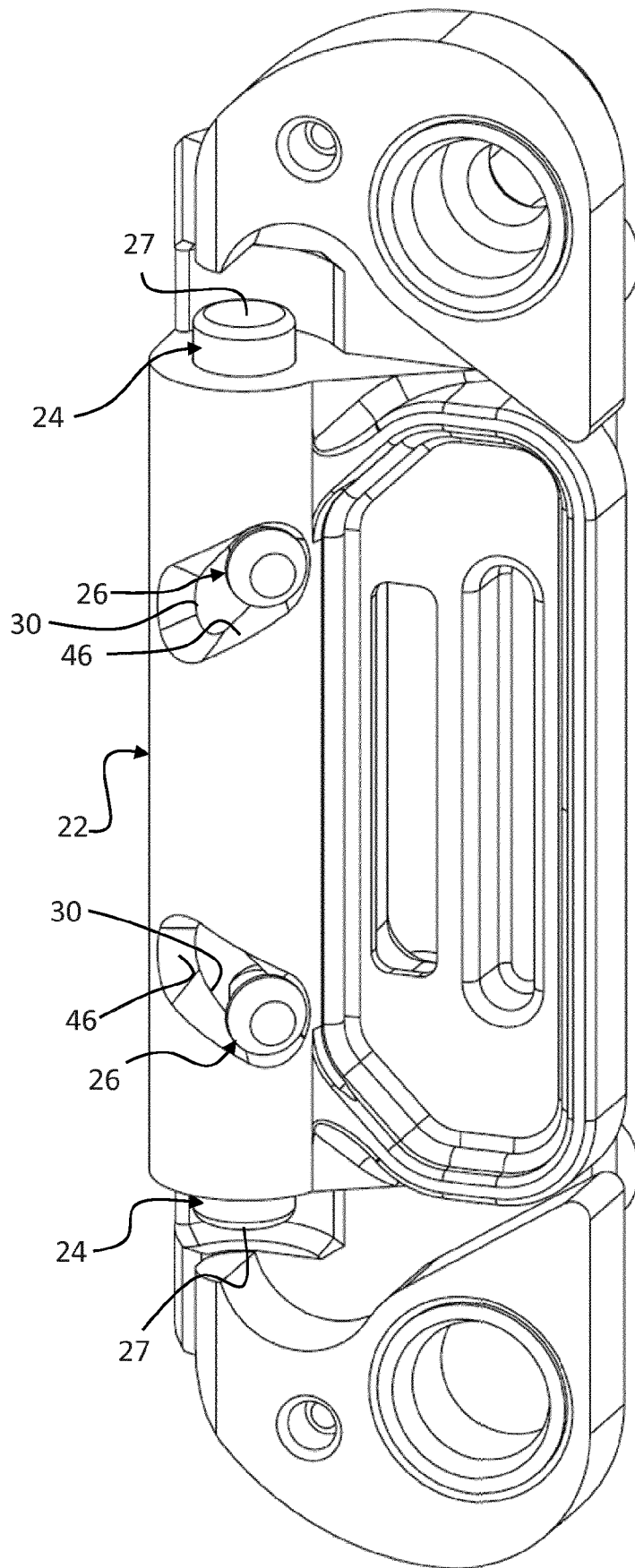


Fig 8

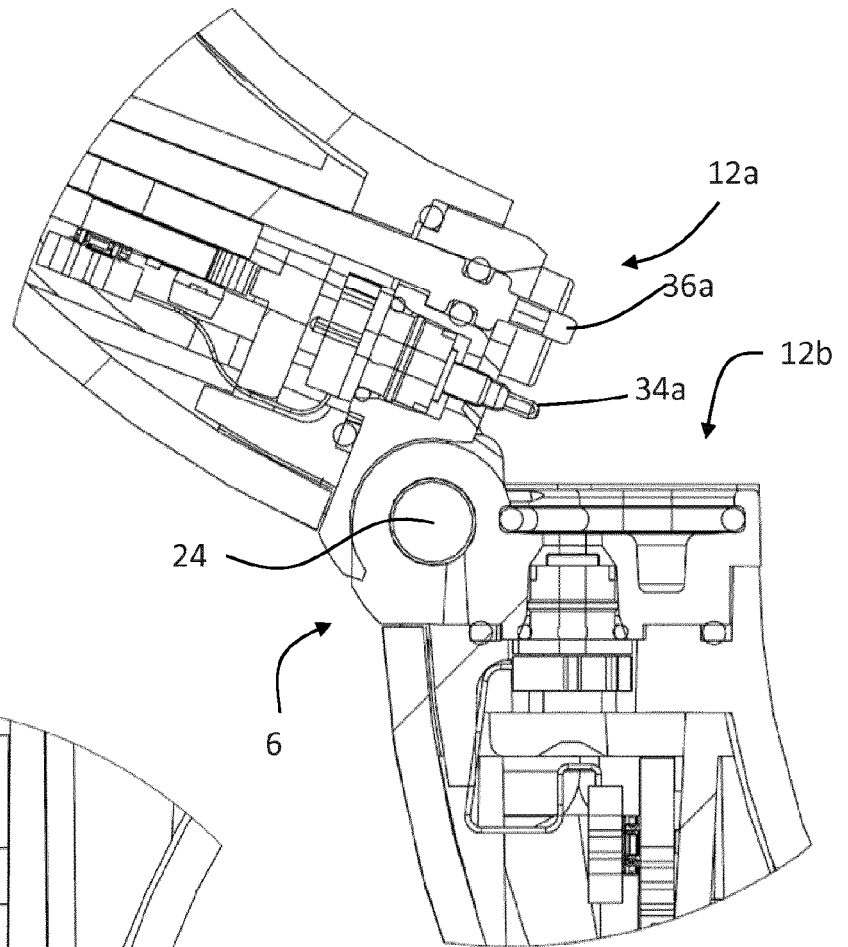


Fig 9a

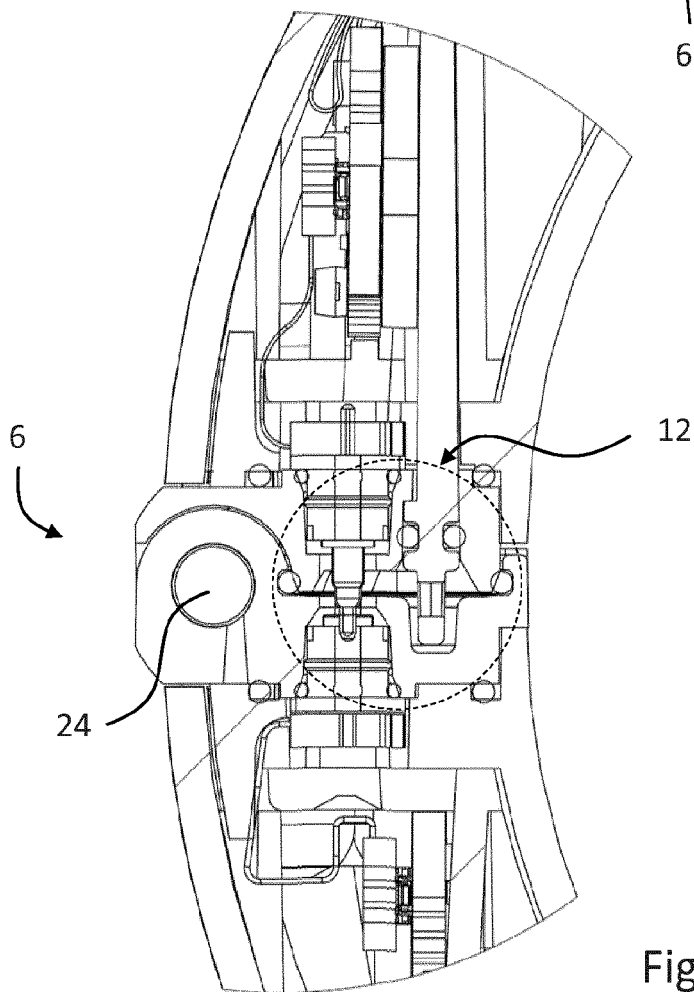


Fig 9b

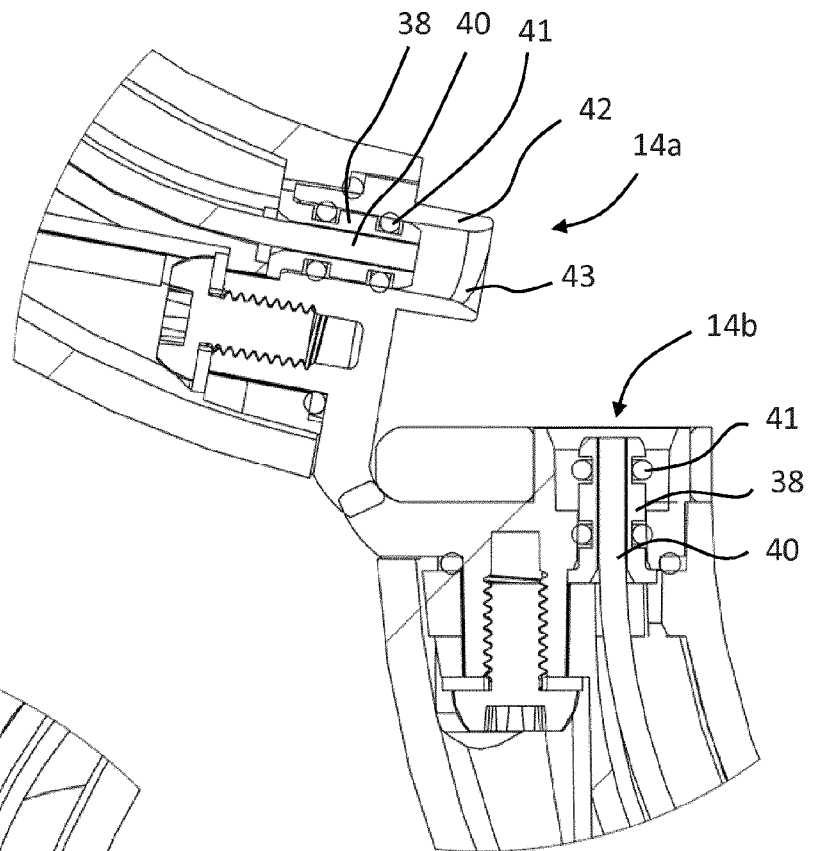


Fig 10a

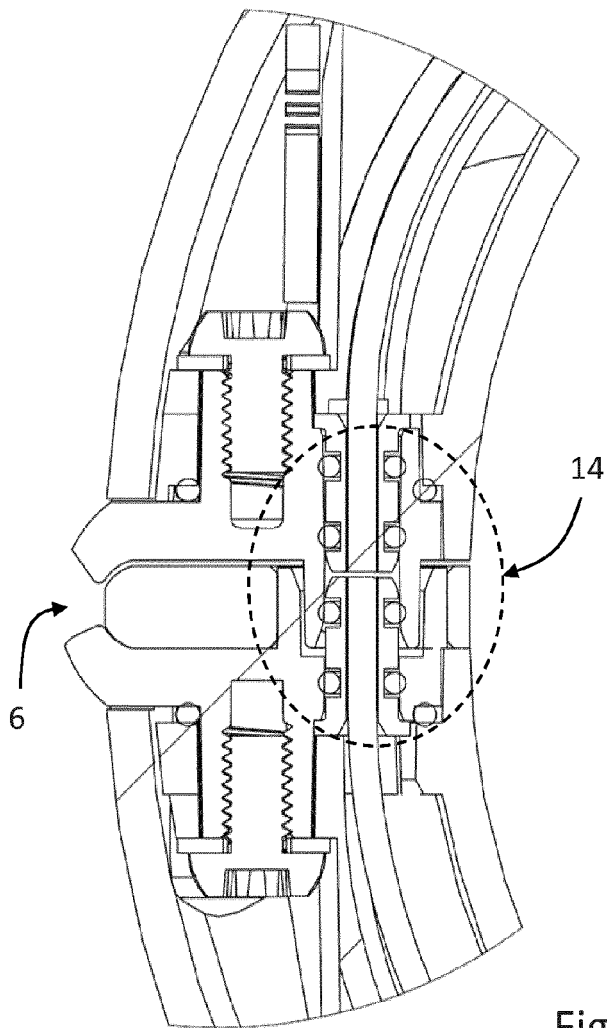


Fig 10b



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			G08B A61B
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Place of search Munich		Date of completion of the search 8 February 2018	Examiner Bourdier, Renaud
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