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(71) Applicant: **DKT A/S**
4060 Kirke Saby (DK)

(72) Inventors:
• **KRISTIANSEN, Michael Skjerning**
4140 Borup (DK)
• **HANSEN, Hardy C.**
4070 Kirke Hyllinge (DK)
• **MØLLER-LARSEN, Anders**
4000 Roskilde (DK)
(74) Representative: **Zacco Denmark A/S**
Arne Jacobsens Allé 15
2300 Copenhagen S (DK)

(54) **PUSH-IN OUTLET SYSTEM AND METHOD FOR CONFIGURING SUCH A PUSH-IN OUTLET SYSTEM**

(57) The present invention relates to a push-in outlet system for user connectivity to various types of accessible networks such as computer network, satellite, television and radio. In particular, the present invention relates to a push-in outlet 10 featuring an exchangeable functional module 12 arranged in an interface 11 and where various embodiments of the functional module 12 may

comprise various signal processing and determine the type and number of connections available to the user and more in particular the present invention relates to a push-in outlet system featuring an interface 11 and a functional module comprising corresponding mating connections in a central vertical plane A.

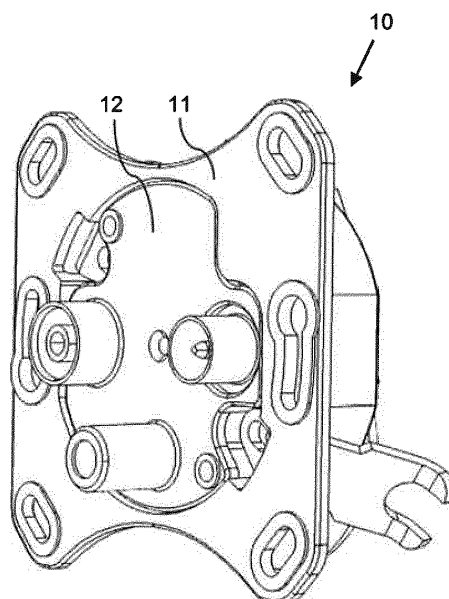


Figure 3

Description

[0001] The present invention relates to a push-in outlet system for user connectivity to various types of accessible networks such as computer network, satellite, television and radio networks. In particular, the present invention relates to a push-in outlet featuring an exchangeable functional module arranged or accommodated in an interface and where various embodiments of the functional module may comprise various signal processing means and determine the type and number of connections available to the user. More in particular, the present invention relates to a push-in outlet system featuring an interface and a functional module comprising corresponding mating connections disclosed in a central vertical plane.

Background of the invention

[0002] Ordinary users such as consumers and offices are continuously introduced to a variety of cable connection outlets providing access to new and current networks. The standards applied to these outlets in terms of frequency bands, the number of connecting networks available and the types of sockets may typically be subject to constant change as technology leaps forward. As of today, a common connection outlet may be configured to provide various supplies of services such as internet access, television or radio. Depending on the user's or the supplier's preference or range of services, the connection outlet may consequently feature different connections having different sockets or different means of signal processing.

[0003] In the changeable marketplace of suppliers and service ranges, a problem often encountered, when a supplier needs to exchange the equipment of such connection outlet, for example due to new standards or due to a new occupant of an office or apartment having different needs or preferences than the previous occupant is that the incoming cable may have been damaged by the previous connection to the connection outlet and therefor may be shortened to be connected to a new connection outlet. With time, the incoming cable may have been shortened so many times that it may not reach the connection outlet and the incoming cable needs to be replaced. Furthermore replacement of connection outlets presently installed and needing replacement for a suitable connection outlet, is a job per default carried out by a professional on behalf of the supplier.

[0004] DE3723987 C2 discloses a cable connection outlet assembly comprising mechanical holding means securing incoming cables mechanically and which further receives a functional block having corresponding connections. According to the teachings of DE3723987 C2, the mechanical holding means comprise incoming connections disposed in a horizontal plane and the functional block comprises outgoing user connections in a vertical plane. A further teaching of DE3723987 C2 is that it is advisable that at least the mechanical holding means and

preferably also the functional block are sealed in order to prevent users from arbitrary altering the functional block as such acts should be carried out by a professional supplier.

[0005] EP2309605 A1 discloses a cable connection outlet comprising coaxial cable fasteners for securing incoming cables. According to the teachings of EP2309605 A1, the two coaxial cable fasteners are disposed in two non-central vertical planes and the functional block comprises outgoing user connections in a central horizontal plane.

Summary of the invention

[0006] On this background, it is an object of the invention to provide a push-in outlet system which enables ordinary users to change a functional module themselves without aid of a trained professional.

[0007] A further object of the invention is to provide a push-in outlet system where an interface and a functional module are configured to receive and/or comprise corresponding mating connections disclosed in a central and vertical plane and, optionally, outlet connections disclosed in a central and horizontal plane in relation to the interface.

[0008] A further object of the invention is to provide a push-in outlet system featuring more than two outlet connections and thereby further utilize the economy of space provided by the current standards of the outlet base. The outlet base typically constitutes a plastic box which encapsulates the outlet assembly and which comprises holes for the outlet user connections of the outlet.

[0009] The push-in outlet system according to the invention is suitable for providing connections to various types of networks. Once a push-in outlet has been installed, it enables simplified installation of a new functional module if required. To achieve this, the push-in outlet uses an interface arranged between a functional module and a substrate such as a wall, underlay or base. The interface may provide the stationary interface between the wall and the functional module whereas the functional module is interchangeable and features the electronic components such as filters as well as various types of outlet connections such as standard network sockets which are readily available to a user.

[0010] The interface may be attached to a conventional outlet base which may typically constitute a type of standard outlet base such as DIN45330, Fuga and Opus featuring outlets for TV, RADIO and DATA. The outlet base may typically facilitate attachment of the interface and encapsulate the push-in outlet. The outlet base may further be secured to the wall or in some embodiments it may be built into a wall. In further embodiments, the interface may be attached directly inside or outside a wall. An incoming network cable, typically a signal carrying coaxial cable is attached to the interface, preferably in a central vertical plane.

[0011] The geometry and shape of the interface may

be configured such as to mechanically guide the functional module such that the functional module may be slidably received by or within the interface in a manner such that it assumes a predetermined orientation and position in the interface.

[0012] The interface and the functional module may be configured to receive and/or comprise corresponding mating connections disposed in a central and vertical plane in relation to the functional module and the substrate. The mating connections mate as the functional module is inserted to the interface. Thus, the interface is configured for receiving and/or comprising a connection disposed in a central and vertical plane, which connection mate with a connection arranged on the functional module and which is also disposed in a central and vertical plane.

[0013] The functional module may be configured to carry out signal processing of the signals received from an incoming network cable. The functional module may also divide the incoming signals and pass them through to a plurality of outlet connections arranged on the functional module. The outlet connections may protrude out from the functional module as sockets, making the outlet connections readily available for the user to connect with the provided networks.

[0014] The push-in outlet system may comprise a plurality of functional modules which functional modules respectively provides different configurations of outlet connections and/or different filters such that a user may be provided with the specific functional module which corresponds to his or a supplier's preference. In this sense, the push-in outlet system may include a variety of functional module embodiments and which are interchangeable as all are compatible with the embodiments of the interface according to the invention. The functional module may be radio frequency tight, i.e. configured to maintain the shielding that the coaxial cable offers.

[0015] Due to the above mentioned disposition of the mating connections, an advantage of the present invention include that the push-in outlet system may comprise outlet connections disclosed in a central and horizontal plane. A further advantage of the present invention include that the push-in outlet system is not confined only to comprise outlet connections disclosed in a central and horizontal plane but may additionally comprise an outlet connection disclosed in a central and vertical plane and disposed below the two connections disposed in a central and horizontal plane. Thereby, the push-in outlet system according to the invention is capable of providing more than two outlet connections as the outlet connections may be arranged in both horizontal and vertical planes.

[0016] In a general embodiment of the invention, the push-in outlet system comprises a circuit board arranged inside the functional module. The circuit board may feature appropriate frequency filters and a number of connections. The circuit board may be configured inside the functional module between a front panel and a back panel of the functional module.

[0017] The circuit board has a rear side facing the back panel and a front side facing the front panel of the functional module. The circuit board comprises a back connection arranged on the rear side of the circuit board which is being configured to mate with the network connection arranged in the interface. The two connections may thereby mate in a central and vertical plane. The circuit board may further comprises one or more connections disposed on the front side of the circuit board and which are oriented in a central and vertical plane and/or a central horizontal plane in relation to the interface.

[0018] In one embodiment of the invention, the outlet connections comprise television, radio and data network connections.

[0019] In one embodiment of the invention the interface and the functional module of the push-in outlet system may have general cylindrical shapes. The circuit board may have a corresponding shape when arranged between a front and back panels of the functional module.

[0020] In further embodiments of the invention, the interface and the functional module of the push-in outlet system may attain various corresponding shapes such as rectangular shapes or cross-shapes.

[0021] In a general embodiment of the invention, the interface may have a general female configuration suitable for receiving the functional module having a corresponding general male configuration or vice versa such that the functional module may be inserted to the interface by a push-in action only when corresponding mating connections are arranged in a central and vertical plane.

Brief description of the drawings

[0022] In the following detailed portion of the present description, the invention will be explained in more detail with reference to the exemplary embodiments shown in the drawings, in which:

Fig. 1a is a plane view of the interface according to one embodiment of the invention.

Fig. 1b is a perspective view of the interface according to one embodiment of the invention.

Fig. 2a is a plane view of the functional module according to one embodiment of the invention.

Fig. 2b is a plane view of the functional module according to one embodiment of the invention.

Fig. 2c is a perspective view of the functional module according to one embodiment of the invention.

Fig. 2d is a perspective view of the circuit board in the functional module according to one embodiment of the invention.

Fig. 3 is a perspective view of an interface according to one embodiment of the invention.

Fig. 4 is a perspective view of a push-in outlet system according to the invention.

Detailed description of the invention

[0023] In the following detailed description of the invention will be described by the preferred embodiments. Referring to Fig. 1a-b, typically, a house, apartment or office is supplied with an incoming network cable 15 which typically constitute a coaxial cable. An end of such cable 15 may be arranged in a standard outlet base. Typically, the outlet base is a plastic housing which facilitates holes for sockets connecting to television, data and radio. The outlet base may be arranged on a wall surface or it may be arranged as an in-wall base being built in to a wall. Embodiments according to the invention may be designed such as to fit inside a standard outlet base and thereby provide compatibility with such outlet bases of different standards.

[0024] Typically, the incoming network cable 15 is led parallel along the wall substrate, hereafter referred to as the substrate 16. The incoming network cable may typically arrive at and/or enter the outlet base from below the outlet base. Typically, the incoming network cable 15 is oriented vertically as it enters the outlet housing but may also enter the outlet base in a horizontal plane in relation to the outlet housing and the push-in outlet system. As will be apparent, the push-in outlet system 10 may provide outlet connections disposed in a central and horizontal plane regardless the orientation of the incoming network cable 15.

[0025] Referring to Fig. 1a-b, according to the invention, the incoming network cable 15 is supplied with a socket such as a network connection 14 or a branch-off socket either at an end of the incoming network cable or at a point along the length of the incoming network cable 15. In one embodiment of the invention, the network connection 14 provides the incoming network cable 15 with a socket comprising a right angle such that the network connection 14 is protruding in a direction out from the substrate 16.

[0026] Referring again to Fig 1a, the interface 11 may feature a snap-lock hem 17 which receives the network connection 14 and provides a snap-lock function such that the network connection 14 attains a fixed position in the interface 11. The snap-lock hem 17 and the network connection 14 may be constructed such that the network connection 14 is secured in a horizontal and vertical position and being allowed still to pivot about a longitudinal axis of the snap-lock hem 17 and network connection 14 in a plane parallel the substrate 16.

[0027] An embodiment comprising the pivotable configuration of the network connection 14 in snap-lock hem 17 thereby permits for the orientation of mounting of the push-in outlet system 10 to be independent the angle of which the incoming network cable 15 approaches the push-in outlet system 10.

[0028] When the network connection 14 is secured in its position in the interface 11, the interface 11 is subsequently arranged in the outlet base 13 (not shown) and fastened by first means of attachment 18 to the outlet

base where the outlet base is attached to the substrate 16 or arranged in a wall or like. It is thereby achieved, a network connection 14 in a central and vertical plane A in relation to the interface 11 and the substrate 16 as depicted in Fig.1a.

[0029] The resulting arrangement is then configured to receive a functional module 12 according to a user's preference or as required by a service supplier. The functional module may typically comprise at least a TV-outlet. One embodiment of the functional module 12 according to the invention is depicted in Fig. 2a-d.

[0030] In a general embodiment of the invention, the interface 11 provides a female shape such that a corresponding male shaped functional module 12 may be inserted to the interface 11 by the user exerting a pushing action towards the functional module 12 and the interface 11. In one embodiment of the invention, the corresponding shapes of the interface 11 and the functional module 12 may allow for such insertion only when in a specific orientation in relation to each other, making the proper insertion fail-safe to users.

[0031] Referring to Fig. 2, in a general embodiment of the invention, the functional module 12 comprises a generally cylindrical shape having a front panel 20 and a back panel 21. The functional module 12 may comprise cavities 24 providing space for second means of attachment 19 shown in Fig 1a-b. At least parts of the front panel 20 and/or back panel 21 of the functional module 12 may be removably attached to the functional module 12 for purposes of assembly. However, when the functional module 12 is delivered to the user, it may constitute an ingress protected module. The back panel 21 comprises a back opening 26 for a back connection 25 connecting to the network connection 14. The front panel 20 features front openings 27 for outlet connections such as network, satellite, television and radio connections.

[0032] When connecting the network connection 14 to the back connection 25 a flange 40 (see Fig. 1a), encircling the distal end of the network connection 14, may be arranged in-between the snap-lock hem 17 and the back connection 25 and/or the back panel 21. The flange 40 may either be a separate part, such as a nut, or an integrated part of the network connection 14. The flange 40 may improve the shielding of the signal in the connection between the incoming network cable 15 and the functional module 12. This in particular when the functional module 12 is attached to the interface 11 through the second means of attachment 19, urging the the back connection 25 and/or the back panel 21 towards the flange 40.

[0033] The socket in the network connection 14 may comprise a guiding cone for guiding the connection of the back connection 25 with the network connection 14 without damaging the socket elements within the network connection 14. The guiding cone may be relatively large, i.e. approximately as large as allowed by the design of the socket.

[0034] In case of the incoming network cable 15 being

too rigid or too short to reach the position of the snap-lock hem 17 an extension cable may be provided, wherein the extension cable may comprise a female connection in one end and a male connection in the other end.

[0035] In case of the need of a loop or loop through network connection an extension cable comprising two extension cables may be used, wherein each extension cable may be configured to be connected with an incoming network cable 15 in one end and gathered in a connection configured to be connected to the bag connection 15 in the other end.

[0036] According to alternative embodiments of the invention, the interface 11 and the functional module 12 may attain other general shapes such as quadratic or rectangular shapes. The design of the interface may be adjusted to comply with various appliances and/or outlet bases if applicable. The interface 11 shown in Fig. 3 may be used together with an Opus outlet cover and/or base. An alternative embodiment of such designs is illustrated in Fig. 4, which interface 11 may be used together with a Fuga cover and/or base.

[0037] Now referring to Fig. 2 and in particular to Fig. 2d where certain elements of the functional module 12 have been left out for illustrative purposes. In a general embodiment of the invention the functional module 12 comprises a circuit board 28 arranged between the front panel 20 and the back panel 21 of the functional module 12. The circuit board 28 comprises a rear side 23 facing the interface 11 and a front side 22 facing from the interface 11.

[0038] The circuit board 28 may comprise a plurality of components not being limited to components such as connection sockets and components constituting means for signal processing such as frequency filters. The means for signal processing may comprise any such components found in the art and will not be further discussed in this disclosure.

[0039] Components arranged on the rear side 23 of the circuit board 28 may be in electrical communication with components arranged on the front side 22. The circuit board 28 inter alia has the function of dividing and forwarding the back connection 25 into one or more user connections 29, 30, 31. On the circuit board rear side 23 there is arranged a back connection 25 capable of mating with the network connection 14 as the functional module 12 is inserted into the interface 11.

[0040] In Fig. 2d there is illustrated a circuit board 28 comprising two outlet connections 29, 30 arranged in a central and horizontal plane B. However, in other embodiments of the invention, circuit board 28 may also comprise at least one additional outlet connection 31 arranged on the front side 22 of the circuit board 28 and disposed in a central and vertical plane A and disposed below the two outlet connections 29, 30, as depicted in Fig. 2a and 2c.

[0041] It is thereby achieved, that the interface 11 and the functional module 12 comprises corresponding mating connections; back connection 25 and network con-

nection 14, which mate when arranged in a central and vertical plane A in relation to the interface 11 and the substrate 16.

[0042] The electrical signals received from the network connection 14 by the back connection 25 may be further processed and forwarded to outlet connections 29, 30, 31 arranged on the front side 22 of the circuit board 28.

[0043] In a further embodiment of the invention, the circuit board 28 comprises only two outlet connections 29, 30 on the front side of the circuit board 28. The outlet connections 29, 30 may then be oriented in a central and horizontal plane B.

[0044] It is thereby achieved, a push-in outlet system 10 comprising a functional module 12 capable of providing at least two user connections.

[0045] When the functional module 12 has been inserted into the interface 11, the outlet connections 29, 30, 31 protruding from the functional module front panel 20 may be fitted into a cover of the outlet base 13 which is subsequently attached to the functional module 12, interface 11 and/or outlet base 13 and the outlet connections 29, 30, 31 are accessible to be connected with the users equipment.

[0046] The push-in outlet system 10 may preferably be manufactured from a material suitable for providing electrical insulation, durability and ingress protection. The push-in outlet system 10 may further feature colour coding and/or markings to facilitate simple installation procedure of a functional module 12.

[0047] Consequently, the invention provides a great variety of possible designs and adaptation of a network connection system.

[0048] The teaching of this invention has numerous advantages. Different embodiments or implementations may yield one or more of the following advantages. It should be noted that this is not an exhaustive list and there may be other advantages which are not described herein. One advantage of the teaching of this application is that it provides a great flexibility in designing and operating a connection outlet system.

[0049] Moreover, due to its flexibility and limited space requirement the invention may be utilized in already existing outlet bases already installed.

[0050] Although the teaching of this application has been described in detail for purpose of illustration, it is understood that such detail is solely for that purpose, and variations can be made therein by those skilled in the art without departing from the scope of the teaching of this application.

[0051] The terms "comprising" or "including" as used in the claims does not exclude other elements or steps. The term "a" or "an" as used in the claims does not exclude a plurality.

Claims

1. A push-in outlet system (10) suitable for connecting

- a user to networks, said outlet system comprising an interface (11) arranged between a functional module (12) and a substrate (16), **characterized in that** the interface (11) and the functional module (12) are configured to receive and/or comprise corresponding mating connections (14, 25) arranged in a central and vertical plane (A) in relation to said functional module (12) and said substrate (16).
2. A push-in outlet system (10) according to claim 1 wherein said functional module (12) comprises outlet connections (29, 30) arranged in a central horizontal plane (B) in relation to said functional module (12) and said substrate (16).
 3. A push-in outlet system (10) according to claim 1 or 2 wherein said functional module (12) comprises a circuit board (28) arranged inside said functional module (12) wherein said circuit board (28) may divide and pass through a back connection (25) into a plurality of outlet connections (29, 30, 31).
 4. A push-in outlet system (10) according to claim 3, further **characterized in that** said circuit board (28) comprises means for signal processing (32).
 5. A push-in outlet system (10) according to any preceding claim wherein said outlet connections (29, 30, 31) comprises TV, satellite, Radio or data connections.
 6. A push-in outlet system (10) according to any preceding claim wherein said interface (11) and said functional module (12) has corresponding general cylindrical shapes.
 7. A push-in outlet system (10) according to any preceding claim wherein the incoming network cable (15) constitutes a coaxial-cable.
 8. A push-in outlet system (10) according to any preceding claim, further **characterized in that** an incoming network cable (15) is provided with a right angled network connection (14) being attached to said interface such that said network connection (14) is pivotable in a plane parallel said substrate (16).
 9. A push-in outlet system (10) according to any preceding claim wherein said interface (11) has a general female shape suitable for receiving said functional module (12) having a corresponding general male shape such that said functional module (12) may be inserted to said interface (11) only when corresponding mating connections (14, 25) are arranged in a central vertical plane (A).
 10. A push-in outlet system (10) according to any preceding claim wherein the interface (11) and functional module (12) are fitted into a pass-through module being embedded in a wall and being substantially flush with said substrate (16).
 11. A method for configuring a push-in outlet system (10) according to any preceding claim, said method comprising the following steps:
 - providing an incoming network cable (15) with a network connection (14);
 - attaching said network connection (14) to an interface (11);
 - selecting a functional module (12) according to a user or supplier preference;
 - providing said user with said functional module (12);
 - orienting said functional module (12) such that said network connection (14) and a back connection (25) are opposed;
 - inserting said functional module (12) into said interface (11) such that said connections (14, 25) mate in a central and vertical plane (A);

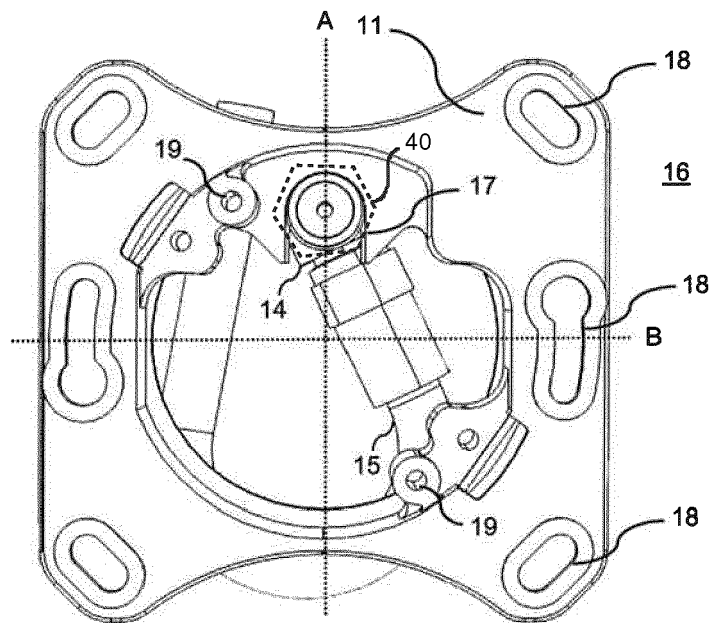


Figure 1a

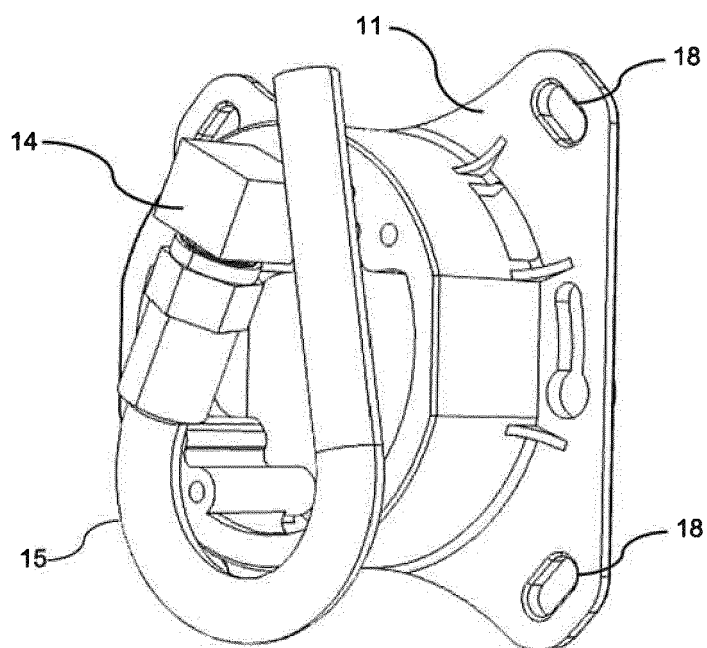


Figure 1b

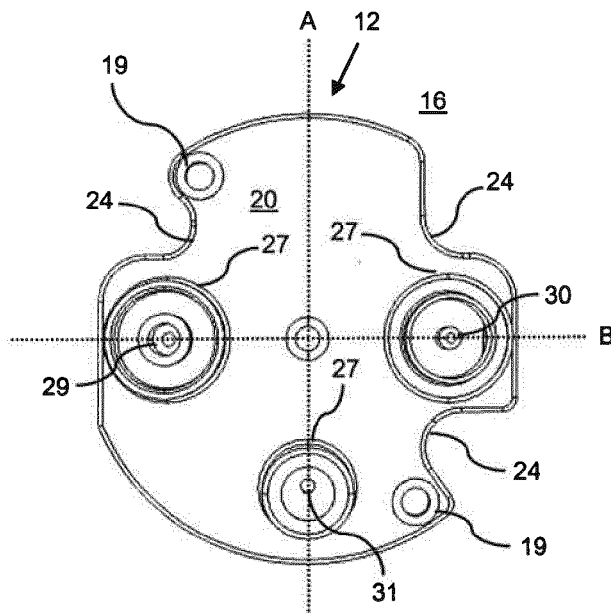


Figure 2a

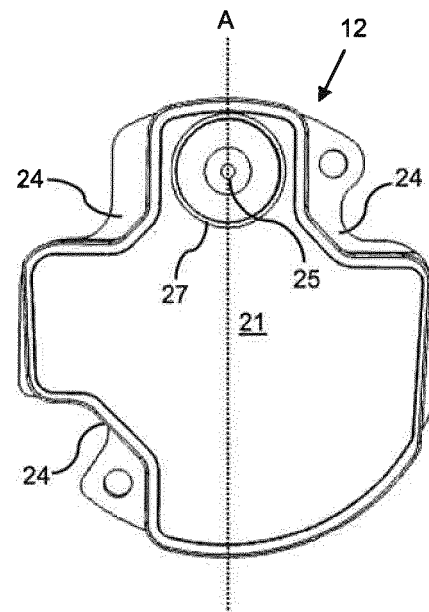


Figure 2b

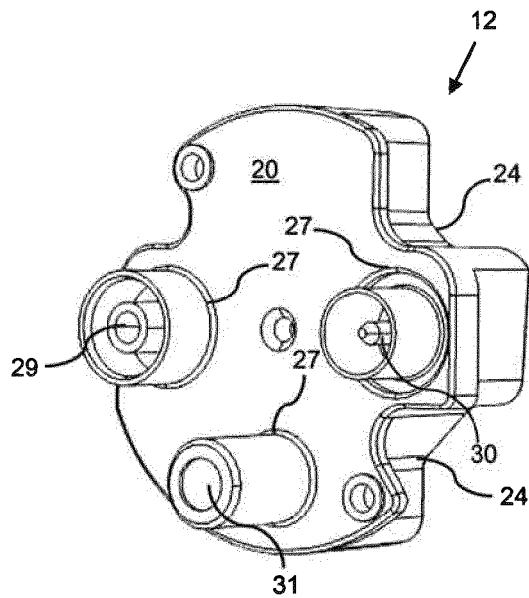


Figure 2c

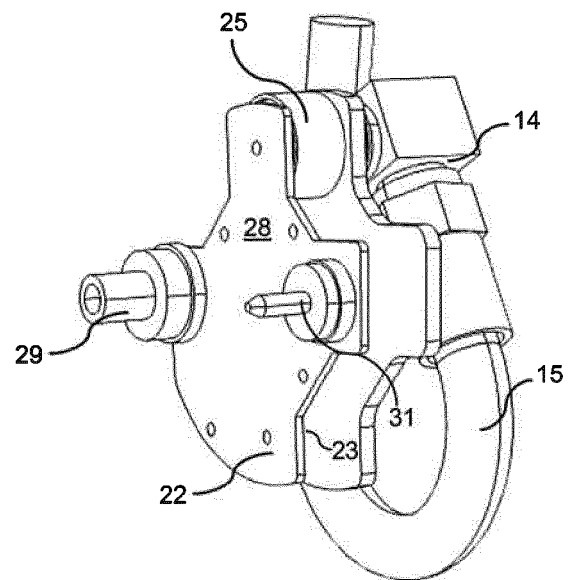


Figure 2d

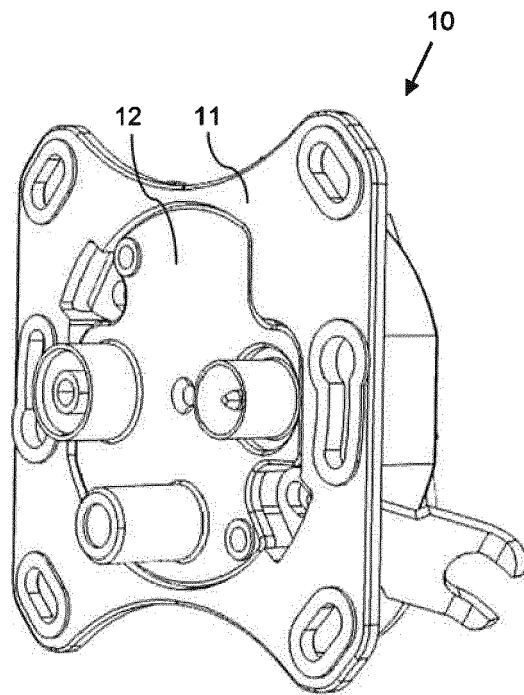


Figure 3

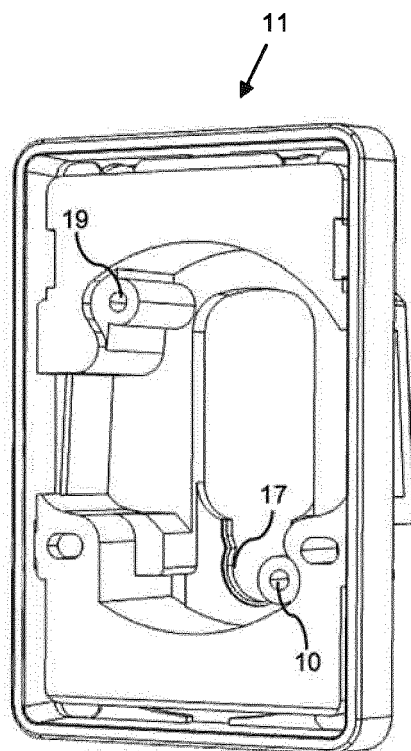


Figure 4



EUROPEAN SEARCH REPORT

 Application Number
 EP 16 17 1246

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
The Hague		22 September 2016	Esmiol, Marc-Olivier
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 16 17 1246

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-09-2016

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