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(54) **DOMESTIC COOLING APPLIANCE COMPRISING A REINFORCEMENT PART**

(57) The invention relates to a reinforcement part (13), comprising a tube (19) having a longitudinal axis (A), a first seat (26) for a plug (PUCb) of a first type located inside the tube (19), and a second seat (27) for a plug (PCCb) of a second type located inside the tube (19), wherein, if viewed along the longitudinal axis (A), the second seat is located beside the first seat, a free space (45) is located beside the second seat, the free space (45) having a cross-section allowing passage of the second plug (PCCb) along the longitudinal axis (A), and a gap (46) is present in the second seat (27) linking a seating space (47) for the plug (PCCb) of the second type to the free space (45). A domestic cooling device (1) comprises a cabinet (5) comprising at least one opening (12) into which the reinforcement part (13) is inserted.

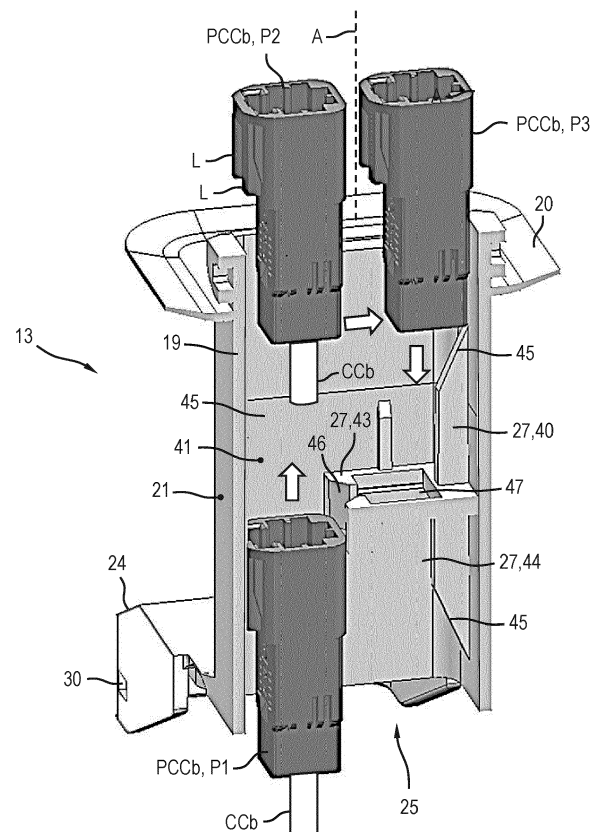


Fig.13

Description

[0001] The invention relates to a reinforcement part, comprising a tube having a longitudinal axis, a first seat for a plug of a first type), and a second seat for a plug of a second type, wherein, if viewed along the longitudinal axis, the second seat is located beside the first seat. The invention also relates to a domestic cooling device comprising a cabinet covering and being spaced apart from an innerliner acting as a wall for a cooling compartment, a load opening of which is coverable by a door, wherein the cabinet comprises at least one opening into which the reinforcement part is inserted. The invention further relates to a method of inserting a plug of a second type into a second seat of such a reinforcement part. The invention is particularly useful for domestic cooling appliances in form of refrigerators and/or freezers.

[0002] EP 2 021 708 B1 discloses a refrigeration appliance with an outer and an inner shell and a thermal insulation layer arranged therebetween, and with a device for the attachment of plug-in modules for the electrical installation of the refrigeration appliance in an opening in the outer shell and/or inner shell of the refrigeration appliance, characterised in that there is provision for an adapter box in the opening, in which the plug-in modules for the electrical installation are fastened via a snap-lock, that the plug-in modules are standard parts, and the adapter box is matched to their normal dimensions in the region in which the plug-in modules are mounted, and that the adapter box is locked in the opening in the outer shell and/or inner shell of the refrigeration appliance.

[0003] US 2006/0223351 A1 discloses a wire harness fixing device designed to enable convenient installation thereof within an inner liner of a refrigerator while effectively preventing leakage of a foam insulation material filled between the inner liner and an outer liner of the refrigerator. The wire harness fixing device comprises a housing including an insert part provided at one end of the housing and inserted through a fixing hole formed in the inner liner, and an interior part positioned at the other end within the inner liner. A latch is provided on the insert part that engages an outer surface of the innerliner at the fixing hole when the insert part is inserted into the fixing hole, and a cover of a flexible material integrally formed to the housing at the interior part side to cover the fixing hole, the cover being subjected to elastic deformation to closely contact an inner surface of the inner liner at the fixing hole side when the latch is latched to and supported by the inner liner.

[0004] It is the **object** of the present invention to at least partially overcome the problems associated with the prior art. It is a particular object of the present invention to provide a reinforcement part acting as a cable interface that has a compact design while providing seats for cable plugs of different types. It is also an object of the present invention to provide a reinforcement part acting as a cable interface that allows easy seating of a cable plug even under adverse installation conditions.

[0005] The object is achieved according to the features of the independent claims. Advantageous embodiments can be found, e.g., in the dependent claims and/or in the description.

[0006] The object is achieved by a reinforcement part, comprising a tube having a longitudinal axis, a first seat for a plug of a first type located inside the tube, and a second seat for a plug of a second type located inside the tube, wherein, if viewed along the longitudinal axis,

- the second seat is located beside the first seat,
- a free space is located beside the second seat, the free space having a cross-section allowing passage of the second plug along the longitudinal axis, and
- a gap is present in the second seat linking a seating space for the plug of the second type.

[0007] This reinforcement part achieves the advantage that it can be implemented having compact dimensions if viewed along the longitudinal axis. Furthermore, by having the particular arrangement of the seats and the free space, seating the plug of the second type can be realized in an easy fashion when a cable comprising this plug is already installed and thus not freely movable.

[0008] The reinforcement part is provided to be inserted into an opening of a shell of a domestic cooling device, e.g. an outer shell (housing or cabinet) and/or an inner shell (e.g. an innerliner). When inserted, it strengthens the material of the shell surrounding the opening

[0009] The tube is hollow and has a lateral wall with an outer ("lateral") surface and an inner ("lateral") surface. The end faces are open. The tube is thus open at both ends. In one embodiment, the tube is a straight tube, i.e., having a linear longitudinal axis. Alternatively, the tube may be slightly curved. The cross-sectional form of the lateral wall is generally not restricted and may, e.g., have a generally circular, oval, rectangular, etc. form. A general form may comprise the exact form as well as some minor deviations from it, e.g., rounded corners, additional notches and/or bulges, etc.

[0010] The tube may be made of plastic material. It may be made by moulding, in particular, injection moulding.

[0011] That the plugs are of a different type, may include that they have a different outer form or form factor. In particular, the plug of the first type may not fit into the second seat while the plug of the second type may not fit into the first seat. In particular, the plugs may be standardized plugs conforming to standards requiring different outer forms or form factors.

[0012] The plugs may be fixed, in particular removably fixed, in their respective seats by, e.g., press-fitting, snap-locking, etc.

[0013] That, if viewed along the longitudinal axis, the second seat is located beside the first seat, comprises that these seats are arranged side by side, and are not arranged behind each other along the longitudinal axis. This advantageously enables easy access to both seats

through the open end faces, in particular through an upper end face.

[0014] The gap advantageously enables moving a cable attached to the plug of the second type from the free space sideways into the second seat which, in turn, allows seating this plug by leading it first through the free space and then into the second seat.

[0015] It is an embodiment and a distinct solution to the object, that one method of inserting the plug of the second type into the second seat comprises the following steps:

- the plug of the second type with a cable attached to it is inserted into the free space through a lower end face of the tube into the tube with the plug first;
- the plug is moved in the free space along the direction of the longitudinal axis towards an upper end face of the tube at least until the plug has passed the gap. Now, a section of the cable is located beside the second seat and the gap;
- the plug is then moved sideways to be located above the second seat. With this movement, the cable moves through the gap into the second seat;
- the plug is then lowered into the second seat.

[0016] This is particularly advantageous if the cable of this plug is already preinstalled and cannot be lowered into the tube from the upper end face.

[0017] It is an embodiment that the second seat comprises a cylindrical sidewall surrounding the seating space for the second plug with the gap being an open section of the sidewall extending along the longitudinal axis. This advantageously enables a compact design and easy manufacturing, in particular by injection moulding. The second seat may also be regarded as an open-ended tube and may thus be regarded as a "tube-within-a-tube". The cross-sectional inner form of the sidewall may, in particular, confirm to the respective outer contour of the plug of the second type.

[0018] It is an embodiment that the sidewall is partly formed by the tube and partly formed by at least one protrusion extending from an inner lateral surface of the tube. This advantageously enables a particular compact design and easy removal of the plug, if so desired. The removal may be particularly easy if the protrusion is a mechanically elastic protrusion.

[0019] It is an embodiment that the protrusion is a locking arm being located opposite of a locking arm formed at the inner lateral surface of the tube. This advantageously enables a reliable fixation of the plug and enables an easy removal.

[0020] It is an embodiment that an upper surface of the second seat is adapted to act as an end stop for the second plug. This advantageously prevents the plug from passing through the second seat.

[0021] It is an embodiment that the reinforcement part comprises a cover part connected to the tube via a hinge, wherein the cover part is adapted to cover an open lower

end face of the tube when having been rotated around the hinge. This gives the advantage that the tube can be protected against intrusion of unwanted material, e.g., liquid or foam-like thermal insulation material. However, the cover part and the lower end section are formed such that they allow passage of cables, in particular cables attached to the seated plugs.

[0022] In an embodiment, the hinge is a film-like hinge ("film-hinge") connecting the tube, in particular a lower edge or rim of it, with the cover part. Such a film-hinge is lightweight and easy to produce in one piece with the tube and the cover part, in particular by injection moulding.

[0023] In an embodiment, the cover part may can be snap-fitted to the tube. This advantageously enables a reliable and easy fixation of the cover part. To this effect, the cover part may, e.g., comprise holes which, when the cover part is put on the lower end section of the tube, engage with respective locking protrusions such that the cover part is snap-fitted with the tube, preferably detachably snap-fitted.

[0024] It is an embodiment that

- the cover part has a bowl-shaped form with a sidewall that extends from one end of the hinge along / around the side of the cover part to the other end of the hinge;
- on the side opposite to the hinge, the sidewall comprises an outward-protruding jut;
- on the side opposite to the hinge, the tube comprises a cut-out extending from its lower rim, wherein the cut-out is located opposite and spaced apart from the jut when the cover part covers the open lower end face of the tube; and
- a rib is located at an inner side of a bottom side of the cover part spaced apart from the sidewall, the rib being continuously closed with the exception of a gap facing the jut.

[0025] This embodiment gives the advantage that a convoluted passage or "labyrinth" for the cables is created when the cover is put on the tube that avoids leakages of, e.g., thermal insulation material into the tube, in particular a flow of thermally insulating material still in its liquid condition. Also, positioning of the cable(s) is easy and does not require additional inserts.

[0026] In an embodiment, a support flange surrounds an outer lateral surface of the tube in circumferential direction around the longitudinal axis and extends generally perpendicular from the outer lateral surface. The support flange may in particular have a slightly bowl-shaped or cupped form and may be elastic. In an embodiment, the support flange may be attached to a cabinet of a domestic cooling appliance, in particular a top panel thereof, by snap-fitting. To this effect, the part of the tube extending above the support flange may be equipped with laterally extending locking ribs on opposite sides.

[0027] The object is also achieved by a household or domestic cooling device comprising a cabinet covering

and being spaced apart from an innerliner acting as a wall for a cooling compartment, a load opening of the cooling compartment being coverable by a door, wherein the cabinet and/or the innerliner comprises at least one opening into which the reinforcement part as described is inserted. The domestic cooling device may be embodied in analogy to the reinforcement part and achieves the same advantages.

[0028] In an embodiment reinforcement part is inserted into an opening of the cabinet.

[0029] Typically, a thermal insulation layer is arranged there between the cabinet and the innerliner.

[0030] It is an embodiment that a control unit is located between the cabinet and the innerliner. The control unit may also act as a power module.

[0031] In an embodiment, a cable leads from the control unit to the reinforcement part, a plug of which of the first type being seated in the first seat. Thus, this cable comprises a plug of the first type seated in the first seat. On the other end, the cable may be connected to the control unit directly or via another plug of the first type.

[0032] In an embodiment, another cable leads from the control unit to the reinforcement part, a plug of which of the second type being seated in the second seat. Thus, this cable comprises a plug of the second type seated in the second seat. On the other end, the cable may be connected to the control unit directly or via another plug of the second type.

[0033] In an embodiment, a cable leads from the reinforcement part to a user interface module located in the door, a plug of which of the first type is connected to the plug being seated in the first seat. Thus, the plug of the first type of this cable and the plug of the first type seated in the first seat form a plug connection. Therefore, the two plugs of the first type are a fitting pair, e.g., comprising a male plug and a female plug. The corresponding cables form a respective cable connection between the control unit and the user interface module.

[0034] In analogy, yet another cable leads from the reinforcement part to a camera and camera module, respectively, located in the door, a plug of which of the second type is connected to the plug being seated in the second seat. Thus, the plug of the second type of this cable and the plug of the second type seated in the second seat form a plug connection. Therefore, the two plugs of the second type are a fitting pair, e.g., comprising a male plug and a female plug. The corresponding cables form a respective cable connection between the control unit and camera. The camera is provided to take pictures of the cooling compartment such that cooling goods can be identified. To this effect, picture data may be transferred from the camera to the control unit for analysis.

[0035] In an embodiment, the plugs of the first type or the second type are RAST ("Raster-Anschluss-Steck-Technik") plugs, in particular RAST 2.5 plugs. RAST 2.5 plugs are specially designed for signal currents. The cables attached to this kind of plugs may be several wires, in particular up to eight wires.

[0036] In an embodiment, the plugs of the first type or the second type are FAKRA ("Fachkreis Automobil" (Automobile Expert Group) plugs, in particular Mini-FAKRA plugs. The cables attached to this kind of plugs may be coaxial cables. This allows transfer of high data rates using a particular easy installation and compact design.

[0037] In an embodiment, the plugs of the first type or the second type are USB plugs, in particular USB-C plugs. The cables attached to the USB plugs are USB cables.

[0038] It is an embodiment that the at least one opening has a contour that is filled out by the tube. Thus, the minimal cross-sectional area of the tube may be design particularly large which, in turn, leaves

[0039] The above-described features and advantages of the invention as well as their kind of implementation will now be schematically described in more detail by at least one embodiment in the context of one or more figures.

Fig.1 shows a sketch of a refrigerator comprising a camera-in-fridge;

Fig.2 shows an oblique view of a top panel of an outer housing of the refrigerator;

Fig.3 shows a top view of the top panel around an opening;

Fig.4 shows a side view of a reinforcement part;

Fig.5 shows a top view of a tube and a support flange of the reinforcement part;

Fig.6 shows a top view of the tube inserted into the top panel and with plugs seated in respective seats;

Fig.7 shows an oblique view from above of the tube inserted into the top panel and with the plugs seated in their seats;

Fig.8 shows a bottom view of the reinforcement part without plugs;

Fig.9 shows an oblique view from below of the reinforcement part without plugs;

Fig.10 shows a cross-sectional side view of the reinforcement part on the I-I view plane depicted in Fig.5;

Fig.11 shows a cross-sectional side view of the refrigerator through the reinforcement part on the I-I view plane depicted in Fig.5,

Fig.12 shows a cross-sectional oblique view of the reinforcement part through the II-II view plane depicted in Fig.5 with a plug inserted; and

Fig.13 shows a cross-sectional oblique view of the reinforcement part through the II-II view plane depicted in Fig.5 with a series of positions of the plug when to be inserted into its seat.

[0040] Fig.1 shows a sketch of domestic cooling appliance in form of a refrigerator 1. The refrigerator 1 comprises an inner housing typically called an innerliner 2 that acts as a wall for a cooling compartment 3. The innerliner 2 may be made of metal or plastics. The innerliner

2 is outwardly covered by a thermal insulation layer 4 (e.g. a self-hardening foam). The thermal insulation layer 4, in turn, is outwardly covered by an outer housing / cabinet 5, e.g. made of metal. The outer side of the cabinet 5 may be covered by plastic or metal covers (not shown). Below a top side of the cabinet 5 (in the following called a top panel 6) and between the top panel 6 and the innerliner 2 is positioned a control unit 7.

[0041] A frontal load opening of the cooling compartment 3 is coverable by a door 8 which comprises a user interface module 9 at its outer side. The user interface module 9 may comprise a display (e.g., to display the temperature in the cooling compartment 3) and is adapted to receive user settings like a target temperature of the cooling compartment 3, certain cooling modes, etc. In particular, the user interface module 9 may comprise a touchscreen.

[0042] The user interface module 9 is connected for power and data exchange to the control unit 7 via a cable connection UCa, UCb. In one variant, the cable connection UCa, UCb runs through the door 8, out of a door hinge of the door 8, through a door hinge cover 11 to the top panel 6, though an opening 12 of the top panel 6 into the space between the top panel 6 and the innerliner 2, and to the control unit 7.

[0043] Inserted into the opening 12 is a reinforcement part 13 that also acts a cable duct or cable interface support for the cable connection UCa, UCb. To facilitate assembly and repair, the cable connection UCa, UCb is made up of two cables UCa and UCb. In particular, the first cable UCa is connected to the user interface module 9 and comprises a plug PUCa at its end opposite the user interface module 9. The second cable UCb comprises a plug PUCb seated in the reinforcement part 13 and another plug (not shown) inserted into the control unit 7. The plug PUCa and the (counter) plug PUCb are a fitting pair and form a plug connection, PUCa, PUCb, in particular located within the reinforcement part 13.

[0044] The door 8 further comprises at least one camera 10 (often called Camera-in-Fridge, CiF) or camera module comprising the camera 10. The camera 10 is arranged and operated to take pictures of the cooling compartment 3. These pictures may be used, e.g., to identify objects stored in the refrigerator 1, e.g., food, medication, etc. The picture(s) may be displayed in the display of the user interface module 9 and/or on a mobile user terminal like a smartphone, tablet, etc.

[0045] The camera 10 and camera module, respectively, is also connected for power and data exchange to the control unit 7, this time via a cable connection CCa, CCb which also runs through the door 8, out of the door hinge, through the door hinge cover 11, though the reinforcement part 13, and to the control unit 7. To facilitate assembly and repair, the cable connection CCa, CCb, too, is made up of two cables UCa and UCb. In particular, the first cable CCa is connected to the camera 10 and camera module, respectively, and comprises a plug PC-

Ca at its end opposite the camera 10 and camera module, respectively. The second cable CCb comprises a plug PCCb seated in the reinforcement part 13 and another plug (not shown) inserted into the control unit 7. The plug PCCa and the (counter) plug PCCb form a plug connection, PCCa, PCCb, in particular located within the reinforcement part 13. In the present case, the first cable CCa and the second cable CCb may be coaxial cables.

[0046] Fig.2 shows an oblique view of the top panel 6 of the cabinet 5 of the refrigerator 1 from above. Without loss of generality, the top panel 6 comprises two identical openings 12 on its left side and right, respectively, if viewed from the front. Depending on the side of the door hinge, one of the openings 12 is used to connect the camera 10 and the user interface module 9 to the control unit 7. In particular, each of the identical openings 12 may be fitted with respective reinforcement parts 13 and cables UCa and CCb to facilitate changing the side of the door hinge by a user.

[0047] The top panel 6 also comprises a frontal flange 14, in which a cut-out 15 for the control unit 7 is present. For example, the control unit 7 may be inserted into the cut-out 15 from the back side.

[0048] Fig.3 shows a top view of the top panel 6 around an opening 12. The opening 12 has a generally square form with two rounded corners 16, two bulges 17 on opposite sides, and a triangle-shaped notch 18. This, inter alia, ensures correct orientation of the reinforcement part 13.

[0049] Fig.4 shows a side view of the reinforcement part 13. The reinforcement part 13 comprises a hollow tube 19 as a kind of main body part having a linear longitudinal axis A. A support flange 20 surrounds an outer lateral surface 21 of the tube 19 in circumferential direction around the longitudinal axis A and extends generally perpendicular from the outer lateral surface 21. When inserting the reinforcement part 13 into the opening from inside / lower side, as indicated by the broad arrows, an upper side 22 of the support flange 20 is used to contact an inner / lower side of the top panel 6 around the opening 12 to act as an end stop and / or as a sealing. The support flange 20 may in particular have a slightly bowl-shaped or cupped form and may be elastic. The support flange 20 enables a positioning of the tube 19 perpendicular to the top panel 6.

[0050] In an embodiment, the support flange 20 may be attached to the top panel 6 by snap-fitting. To this effect, the part of the tube 19 extending above the support flange 20 may be equipped with laterally extending locking ribs (not shown) on opposite sides.

[0051] At its lower rim 35, the hollow tube 19 is connected to a cover part 24 via an integral film-hinge 23. The cover part 24 may be rotated around the film-hinge 23 - as indicated by the curved arrow P - to cover an open lower end face 25 of the hollow tube 19 at least partly. The cover part 24 comprises holes 30 which, when the cover part 24 is put on the lower end section of the tube 19, engage with respective locking protrusions 31 such that the cover part 24 is snap-fitted with the tube 19, pref-

erably detachably snap-fitted.

[0052] Fig.5 shows a top view of the tube 19 and the support flange 20, i.e., the reinforcement part 13 without the cover part 24. The outer lateral surface 21 of the tube 19 around and immediately above the support flange 20 corresponds to the form of the opening 12 and thus completely fills the opening 12. For example, its cross-sectional form with respect to its longitudinal axis A shows a notch-shaped protrusion 42 fitting into the notch 18, etc.

[0053] Inside the tube 19 is formed a first seat 26 for seating plug PUCb and a second seat 27 for seating a plug PCCb. The seats 26 and 27 are arranged next to each other. In particular, the plugs PUCb and PCCb can be snap-fitted into the respective seats 26 and 27, respectively. Exemplarily, the first seat 26 is a seat for a RAST 2.5 plug, and plug PUCb is a male or female RAST 2.5 plug.

[0054] Furthermore, a free space 45 is located beside the second seat 27, the free space 45 having a cross-section allowing passage of the second plug (PCCb) along the longitudinal axis A. Additionally, a gap 46 is present in the second seat 27 linking a seating space 47 for the second plug PCCb to the free space 45. Exemplarily, the second seat 27 is a seat for a Mini-FAKRA plug, and plug PCCb is a male or female Mini-FAKRA plug.

[0055] Fig.6 shows a top view of the tube 19 inserted into an opening 12 of the top panel 6 with plugs PUCb and PCCb seated in seats 26 and 27, respectively. Fig.7 shows an oblique view from above of the tube 19 inserted into the top panel 6 and the plugs PUCb and PCCb seated in their seats 26, 27. The seats 26 and 27 are positioned such that the plugs PUCb and PCCb, if seated, are surrounded by the tube 19 and fully immersed into the tube 19.

[0056] Plug PUCb may be inserted into its seat 26 by inserting it from below and is then held in its seat 26 by means of a locking catch 128 located on the own PUCb. Furthermore, plug PUCa is plugged into plug PUCb from above and is then held in its position by means of a locking catch 28. The locking catch 28 protrudes from a flexible flap 29 so that the plug PUCa may be released by pushing the flap 29 outward.

[0057] Fig.8 shows a bottom view of the reinforcement part 13 without the plugs PUCb and PCCb. Fig.9 shows an oblique view from below of the reinforcement part 13 without the plugs PUCb and PCCb. Fig.10 shows a cross-sectional side view of the reinforcement part 13 on the I-I view plane depicted in Fig.5.

[0058] The cover part 24 has a bowl-shaped form with a sidewall 32 that extends from one end of the film-hinge 23 around the side to the other end of the film-hinge 23. Thus, the sidewall 32 has a gap only at the side adjacent to the film-hinge 23. On the side opposite the film-hinge, the sidewall 32 has a jut 33. On the corresponding side opposite the film-hinge 23, the tube 19 comprises a cut-out 34 extending from the lower rim 35.

[0059] Additionally, a rib 36 is located at the inner side

of a bottom of the cover part 24 within and spaced apart from the sidewall 32. The rib 36 is continuously closed with the exception of a gap 37 facing the jut 33. Thus, when the cover 24 is put on the tube 19, there exists a passage or "labyrinth" 38 from the inside of the tube 19 to the outside via gap 37, the cut-out 34, and the jut 33 (see fig.11).

[0060] Fig.11 shows a cross-sectional side view of the refrigerator 1 through the reinforcement part 13 on the I-I view plane depicted in Fig.5. Plug PUCb is fixed in its seat 26, and plug PCCb is fixed in its seat 27. Plug PCCa is inserted into plug PCCb, thus forming a plug connection PCCa, PCCb. Plug PCCa is connected to coaxial cable CCa while Plug PCCb is connected to coaxial cable CCb. Plug PUCb is connected cable UCb (not shown).

[0061] Coaxial cable CCb runs from the plug PCCb through the labyrinth 38 to the control unit 7. The provision of the labyrinth 38 avoids leakages of thermally insulating material into the tube 19 when the thermally insulating layer 4 is created, in particular a flow of thermally insulating material still in its liquid condition. The thermally insulating material may, e.g., be or based on polyurethane / PUR.

[0062] Fig.12 shows a cross-sectional oblique view of the reinforcement part 13 through the II-II view plane depicted in Fig.5 with the plug PCCb inserted into its seat 27. The seat 27 comprises a rib 40 protruding from an inner lateral surface 41 of the tube 19. The rib 40 is aligned parallel to the longitudinal axis A (see also fig.10).

[0063] The plug PCCb is held on the rib 40 by two locking arms 43 and 44 extending from the inner lateral surface 41 on both sides of the rib 40. The locking arms 43, 44 prevent movement of the plug PCCb out of contact with the rib 40. While locking arm 43 may be fixed at the inner lateral surface 41 while the locking arm 44 may be an elastically deformable arm.

[0064] Fig.13 shows a cross-sectional oblique view of the reinforcement part 13 through the II-II view plane depicted in Fig.5 with a series of consecutive positions of the plug PCCb when to be inserted into its seat 27, as indicated by the broad arrows. The positions of the plug PCCb may be achieved by movement of the plug and/or the reinforcement part 13. This kind of assembly is particularly useful if the cable CCb attached to the plug PCCb is part of a cable harness pre-connected to the control unit 7 and/or the cables UCa and CCa are part of a cable harness coming from the door 8.

[0065] In its first position P1, the plug PCCb has been inserted into the tube 19 through the open lower end face 25 into its free space 45 alongside the ends of the locking arms 43 and 44 with the plug PCCb before its cable CCb. In this case, the cable CCb hangs down the free space 45 alongside the gap 46.

[0066] The plug PCCb is then moved upwards within the free space 45 in the direction of the longitudinal axis A along the ends of the locking arms 43 and 44 to a second position P2 above the seat 27, in particular above the rib 40.

[0067] The plug PCCb is then moved sideways to a third position P3 above the seat 27, in particular above the rib 40. The cable CCB connected to the plug PCCb (not shown) is at the same time moved into the seating space 47 between the locking arms 43, 44 through the gap 46 between the locking arms 43, 44.

[0068] The plug PCCb may then be lowered in the direction of the longitudinal axis A into the seating space 47 defined by the locking arms 43, 44. To facilitate this movement, rib 40 may have a sloped section 45 at its upper end, here: also at its lower end. This downward movement is stopped when lateral protrusions L of the plug PCCb contact the upper sides of the arms 43, 44 that thus act as end stops.

[0069] Of course, the invention is not restricted to the described embodiments.

List of Reference Signs

[0070]

1	Refrigerator
2	Innerliner
3	Cooling compartment
4	Thermally insulating layer
5	Cabinet
6	Top panel
7	Control unit
8	Door
9	User interface module
10	Camera
11	Door hinge cover
12	Opening
13	Reinforcement part
14	Frontal flange
15	Cut-out
16	Rounded corners
17	Bulge
18	Notch
19	Tube
20	Support flange
21	Outer lateral surface
22	Upper side of the support flange
23	Film-hinge
24	Cover part
25	Lower end face of the tube
26	First seat
27	Second seat
28	Locking catch
29	Flap
30	Hole
31	Locking protrusion
32	Sidewall
33	Jut
34	Cut-out
35	Lower rim
36	Rib
37	Gap

38	Labyrinth
39	Upper end face of the tube
40	Rib
41	Inner lateral surface of the tube
5 42	Notch-shaped protrusion of the tube
43	Locking arm
44	Locking arm
45	Free space
46	Gap
10 47	Seating space
128	Locking catch
A	Longitudinal axis
CCa	First coaxial cable
CCb	Second coaxial cable
15 P	Arrow
PCCa	Plug of first coaxial cable
PCCb	Plug of second coaxial cable
PUCa	Plug of first cable of cable connection UCa, UCb
20 PUCb	Plug of second cable of cable connection UCa, UCb
L	Lateral protrusions
UCa	First cable of cable connection UCa, UCb
UCb	Second cable of cable connection UCa, UCb
25	

Claims

1. A reinforcement part (13), comprising
 - a tube (19) having a longitudinal axis (A),
 - a first seat (26) for a plug (PUCb) of a first type located inside the tube (19), and
 - a second seat (27) for a plug (PCCb) of a second type located inside the tube (19), wherein, if viewed along the longitudinal axis (A),
 - the second seat (27) is located beside the first seat (26),
 - a free space (45) is located beside the second seat (27), the free space (45) having a cross-section allowing passage of the second plug (PCCb) along the longitudinal axis (A), and
 - a gap (46) is present in the second seat (27) linking a seating space (47) for the plug (PCCb) of the second type to the free space (45).
2. The reinforcement part (13) according to claim 1, wherein the second seat (27) comprises a cylindrical sidewall surrounding the seating space (47) for the second plug (PCCb) with the gap (46) being an open section of the sidewall extending along the longitudinal axis (A).
3. The reinforcement part (13) according to claim 2, wherein the sidewall is partly formed by the tube (19) and partly formed by at least one protrusion (43, 44) extending from an inner lateral surface (41) of the tube (19).

4. The reinforcement part (13) according to claim 3, wherein the protrusion is a locking arm (44) being located opposite of a locking arm (43) formed at the inner lateral surface (41) of the tube (19). 5
5. The reinforcement part (13) according to any of the preceding claims, wherein an upper surface of the second seat (27) is adapted to act as an end stop for the second plug (PCCb). 10
6. The reinforcement part (13) according to any of the preceding claims, comprising a cover part (24) connected to the tube (19) via a hinge (23), in particular film-hinge, wherein the cover part (24) is adapted to cover an open lower end face (25) of the tube (19) when having been rotated around the hinge (23). 15
7. The reinforcement part (13) according to claim 6, wherein 20
- the cover part (24) has a bowl-shaped form with a sidewall (32) that extends from one end of the hinge (23) around the side to the other end of the hinge (23);
 - on the side opposite to the hinge (23), the sidewall (32) comprises a jut (33); 25
 - on the side opposite the hinge (23), the tube (19) comprises a cut-out (34) extending from its lower rim (35) which cut-out (34) is located opposite and spaced apart from the jut (33) when the cover part (24) covers the open lower end face (25) of the tube (19); and 30
 - a rib (36) is located at an inner side of a bottom of the cover part (24) spaced apart from the sidewall (32), the rib (36) being continuously closed with the exception of a gap (37) facing the jut (33). 35
8. A domestic cooling device (1), comprising a cabinet (5) covering and being spaced apart from an innerliner (2) acting as a wall for a cooling compartment (3), a load opening of which is coverable by a door (8), wherein the cabinet (5) comprises at least one opening (12) into which the reinforcement part (13) according to any of the preceding claims is inserted. 40 45
9. The domestic cooling device (1) according to claim 8, wherein 50
- a control unit (7) is located between the cabinet (6) and the innerliner (2),
 - a cable (UCb) leads from control unit (7) to the reinforcement part (13), a plug (PUCb) of which of the first type being seated in the first seat (26); 55
 - another cable (CCb) leads from the control unit (7) to the reinforcement part (13), a plug (PCCb) of which of the second type being seated in the second seat (27);
- a cable (UCa) leads from the reinforcement part (13) to a user interface module (9) located in the door (8), a plug (PUCa) of which of the first type is connected to the plug (PUCb) being seated in the first seat (26);
 - another cable (CCb) leads from the reinforcement part (13) to a camera (10) located in the door, a plug (PCCa) of which of the second type is connected to the plug (PCCb) being seated in the second seat (27).
10. The domestic cooling device (1) according to claim 8, wherein the at least one opening (12) has a contour that is filled out by the tube (19).
11. Method of inserting a plug (PCCb) of a second type into a second seat (27) of a reinforcement part (13) according to any of the preceding claims, comprising the following steps:
- inserting the plug (PCCb) with a cable (UCCb) attached to it is into the free space through a lower end face (25) of the tube (19) into the tube (19) with the plug (PCCb) first;
 - moving the plug (PCCb) in the free space (45) along the direction of the longitudinal axis (A) towards an upper end face (39) of the tube (19) at least until the plug (PCCb) has passed the gap (46);
 - moving the plug (PCCb) sideways to be located above the second seat (27); and
 - lowering the plug (PCCb) into the second seat (27).

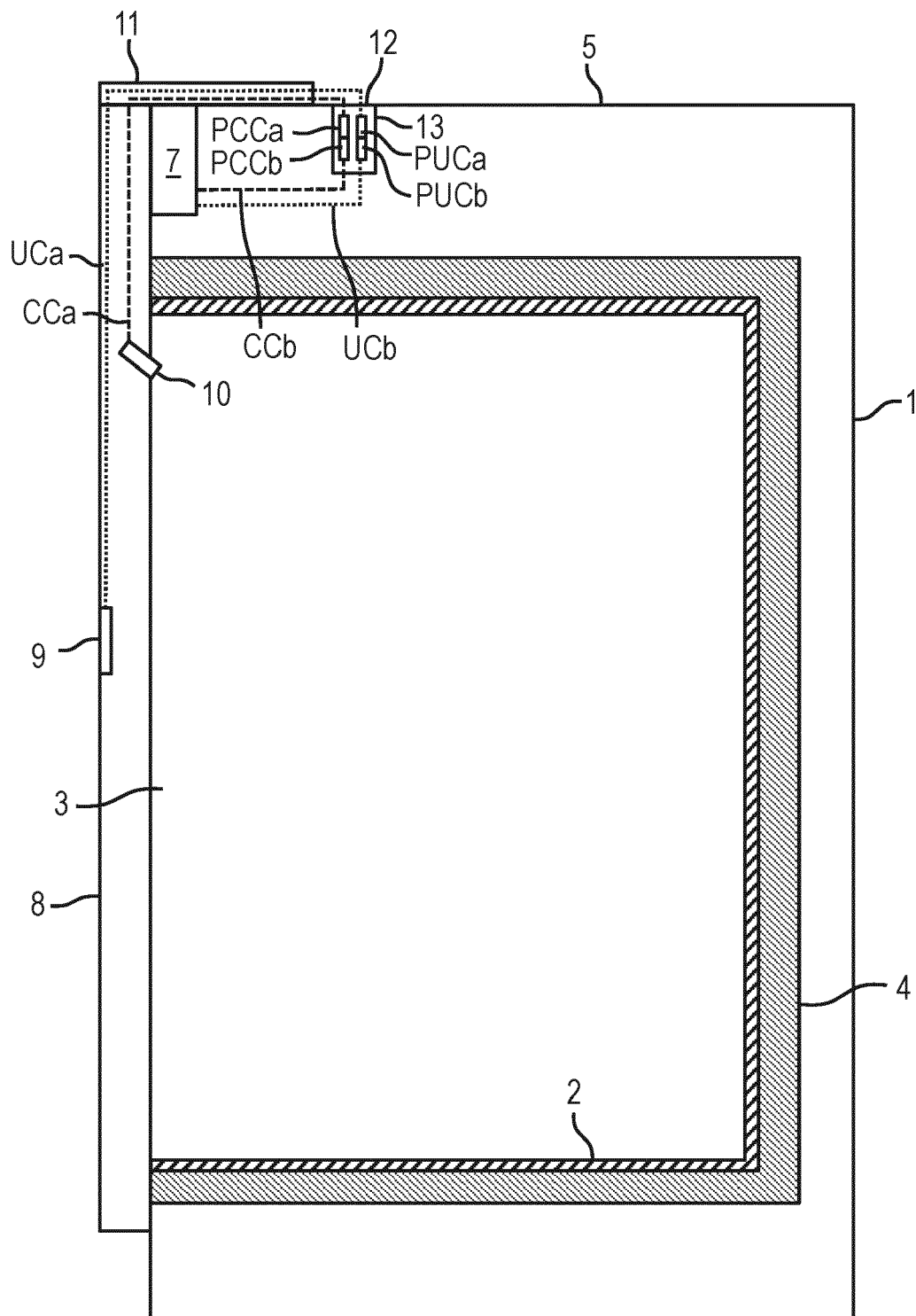


Fig.1

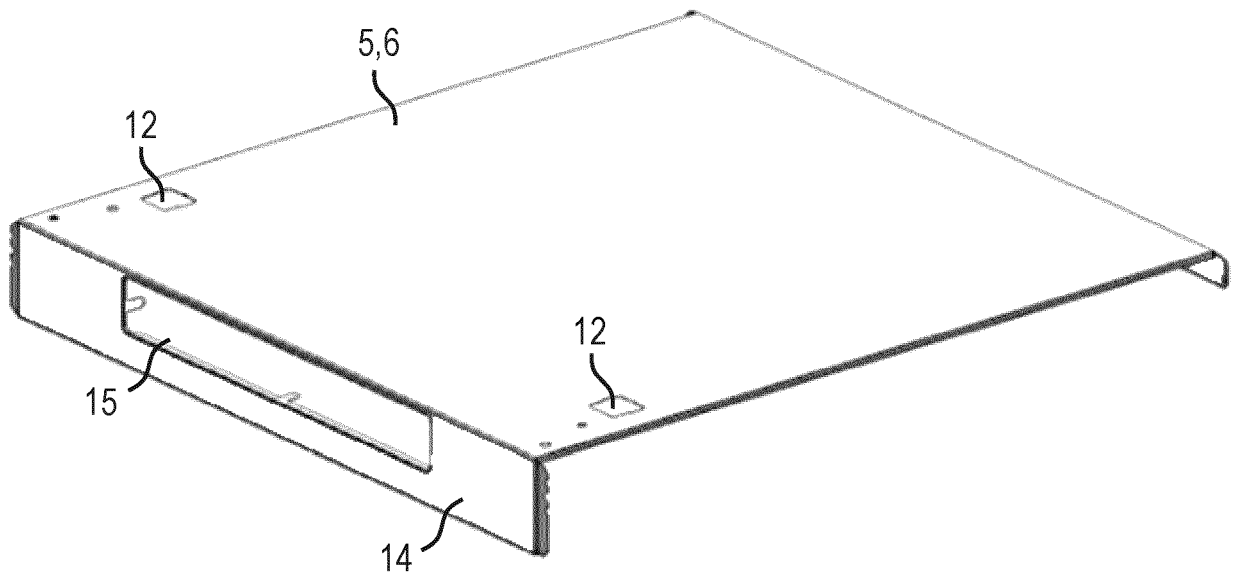


Fig.2

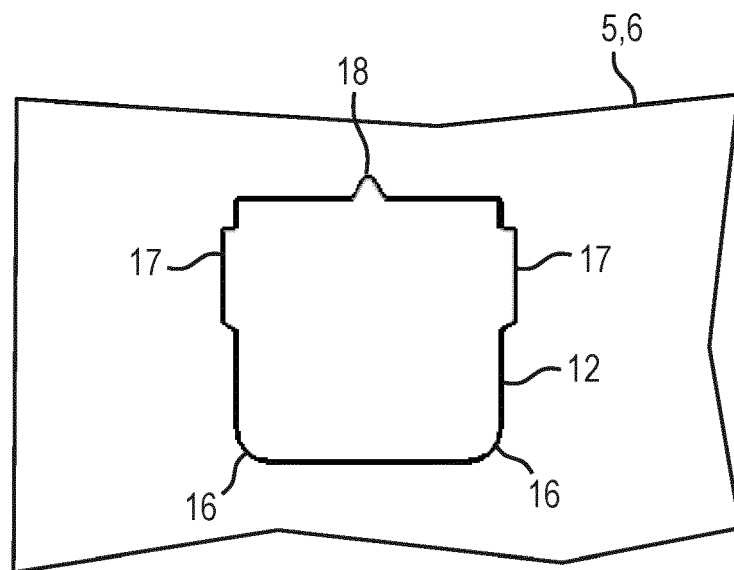


Fig.3

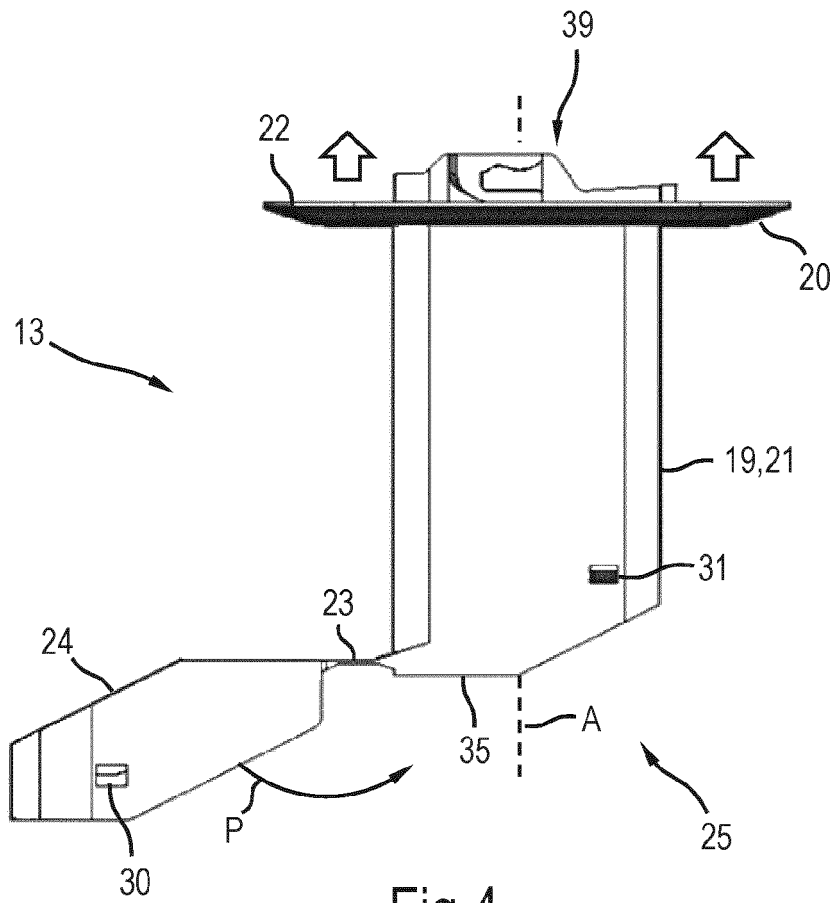


Fig.4

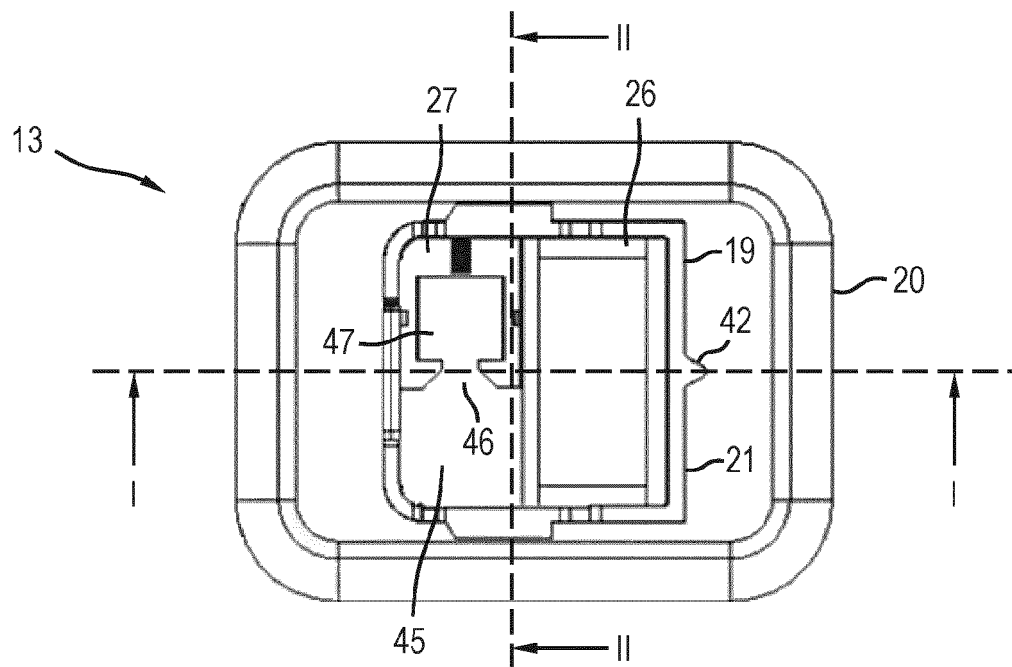


Fig.5

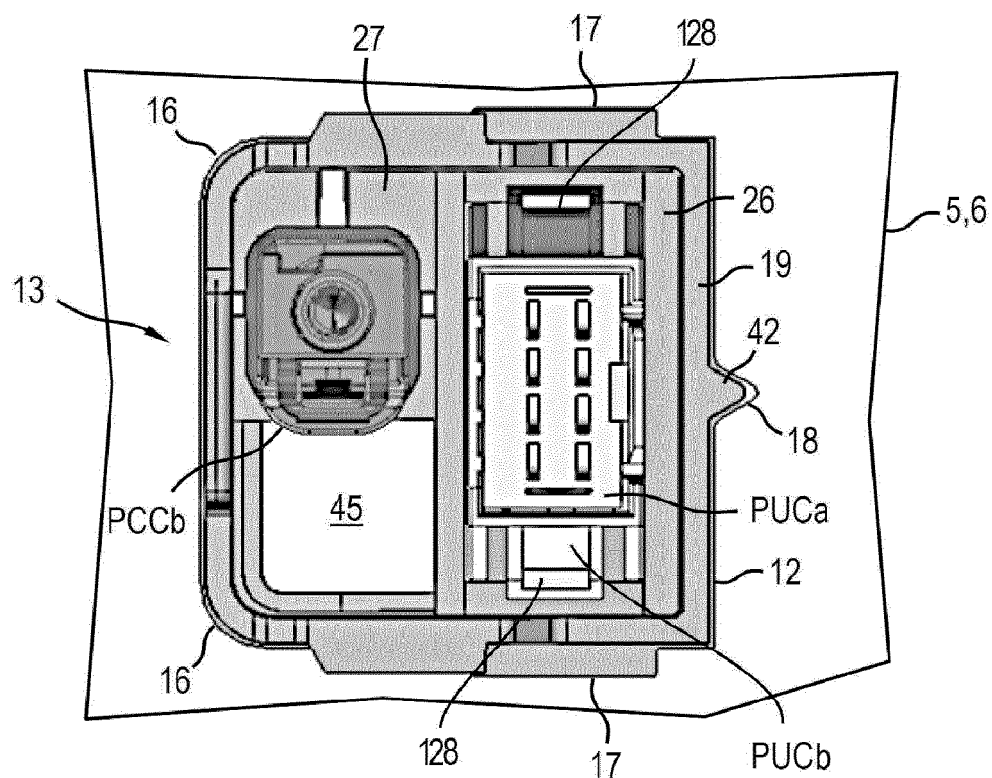


Fig.6

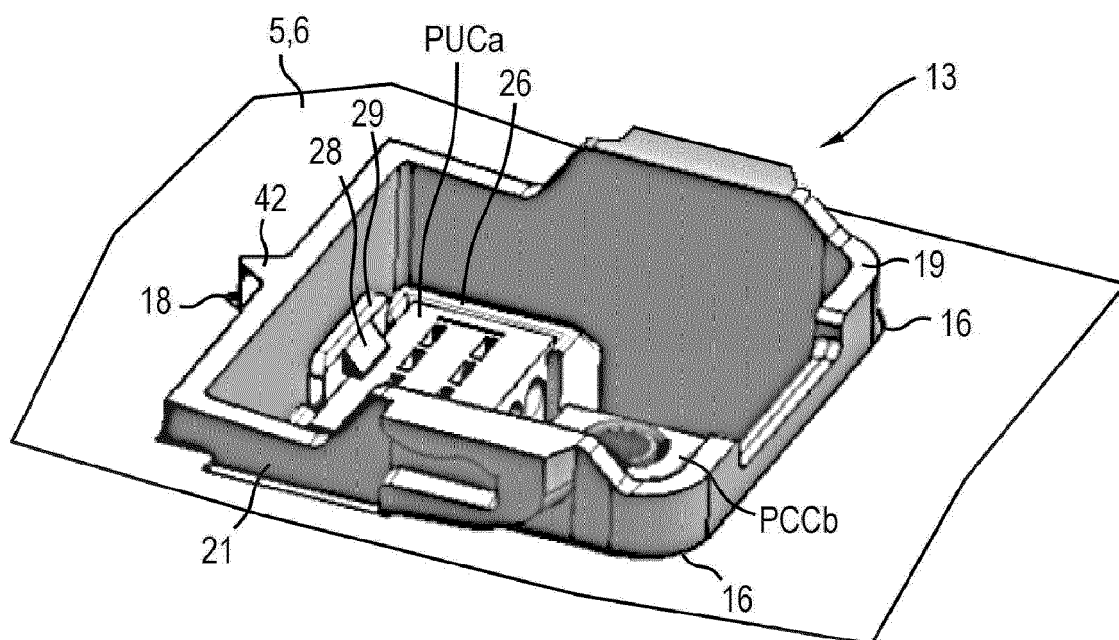


Fig.7

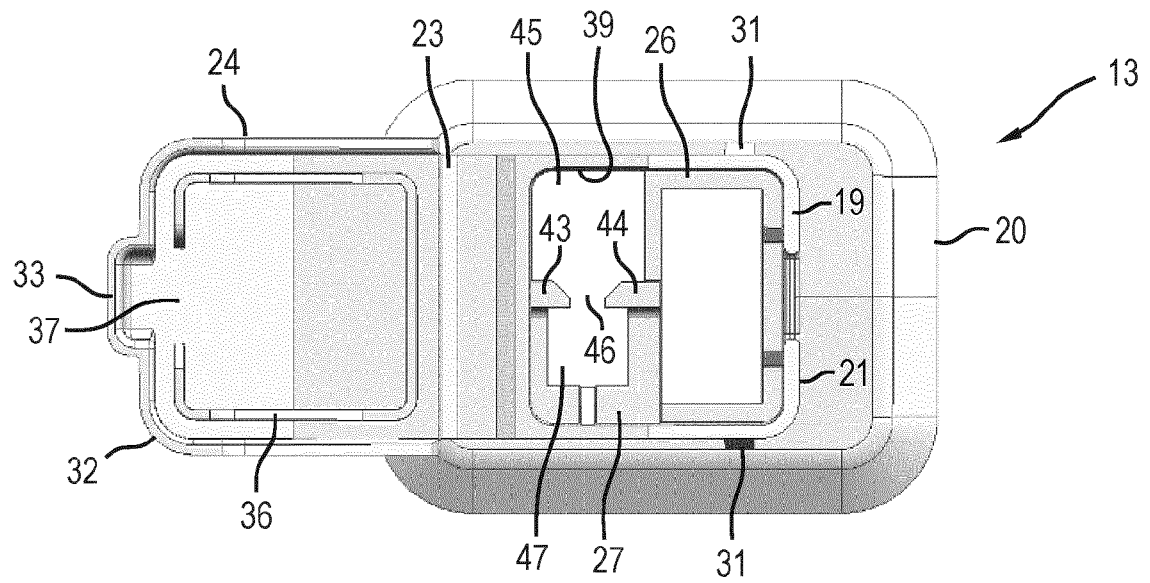


Fig.8

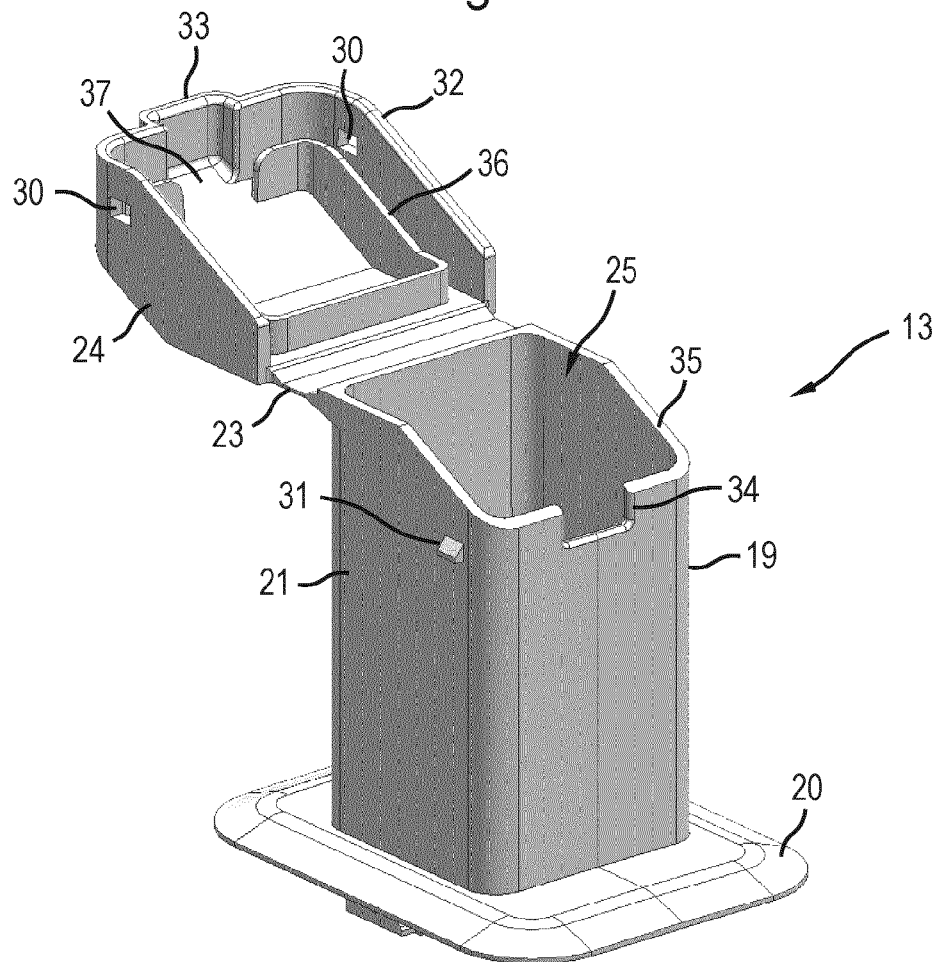


Fig.9

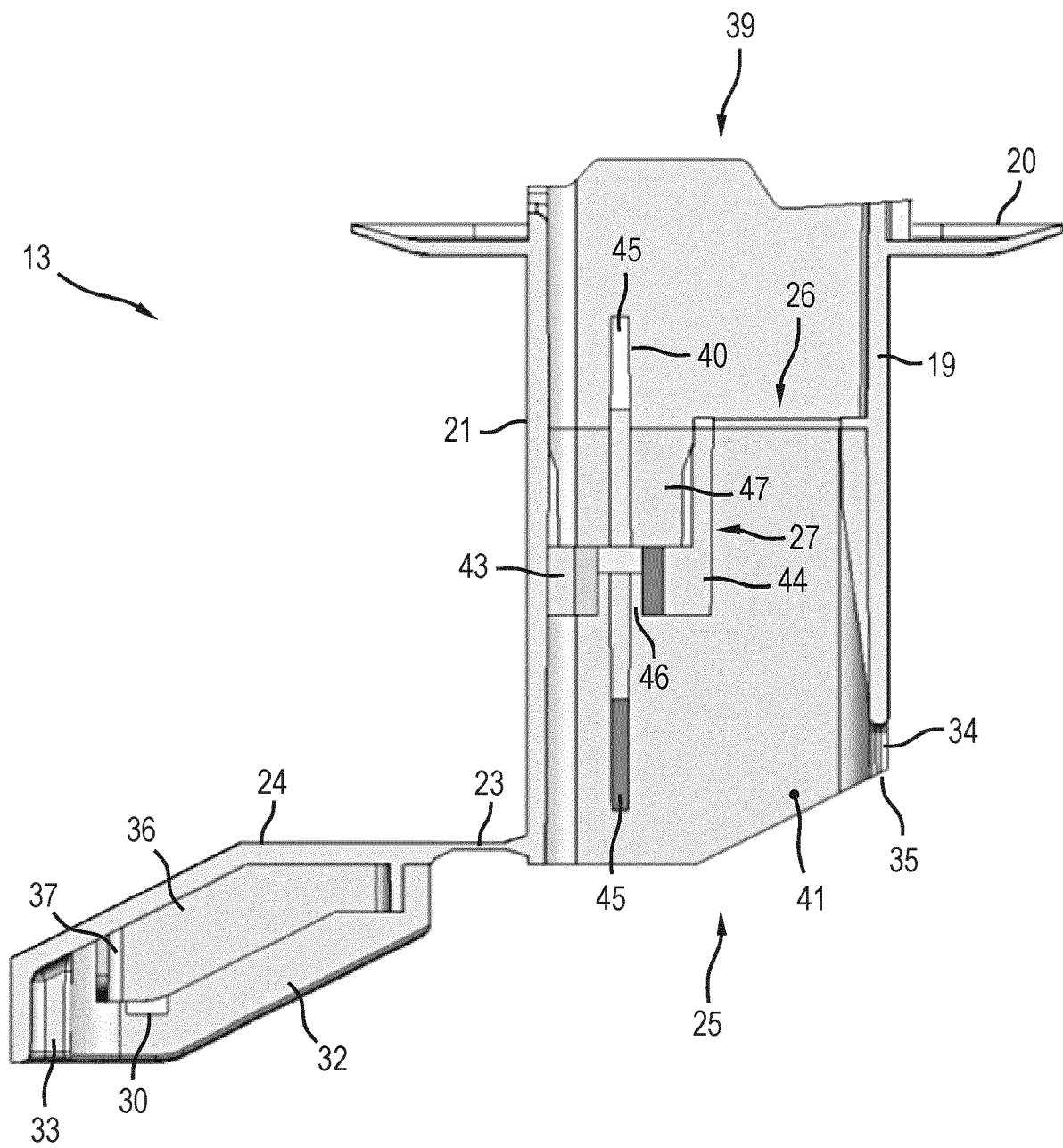


Fig.10

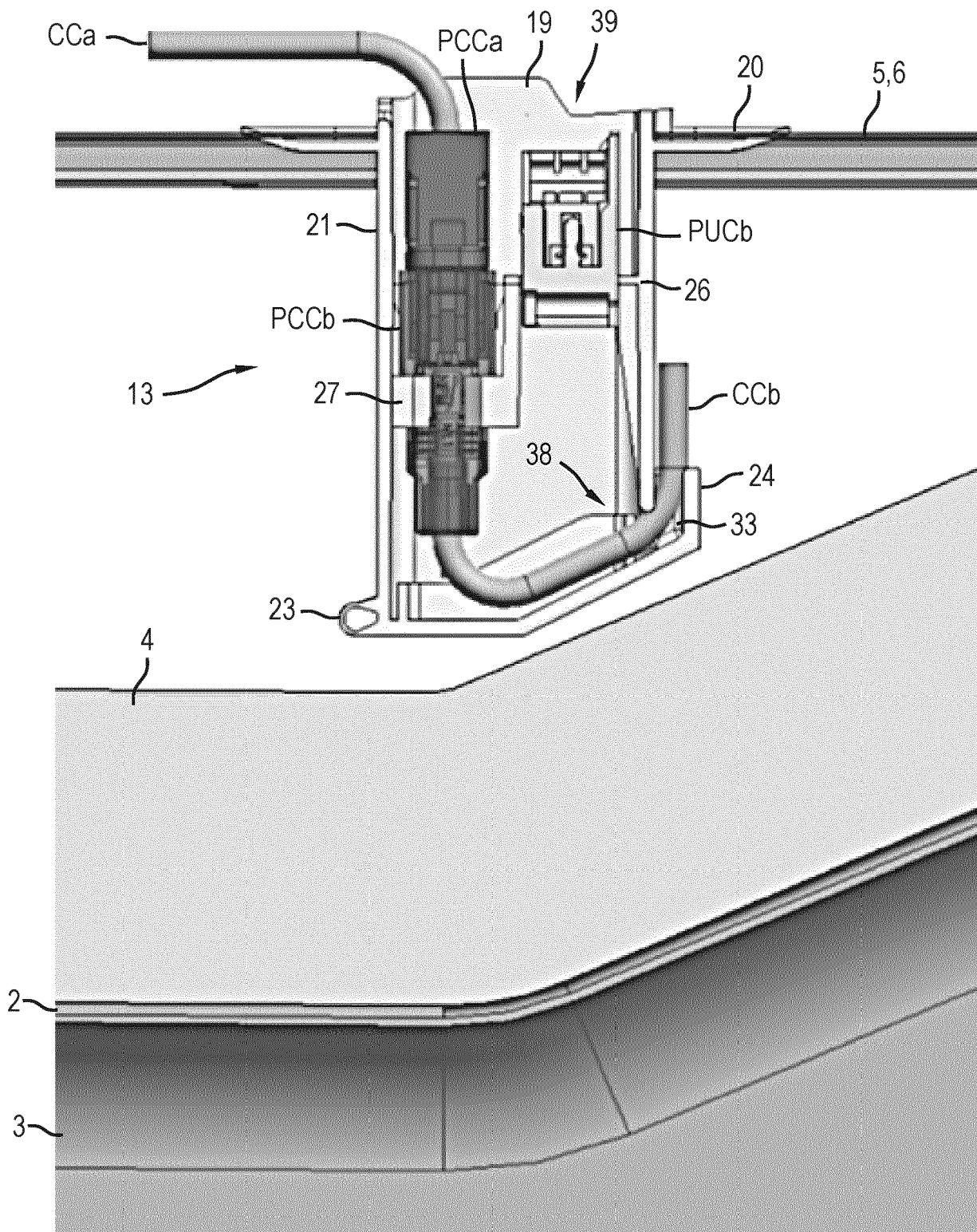


Fig.11

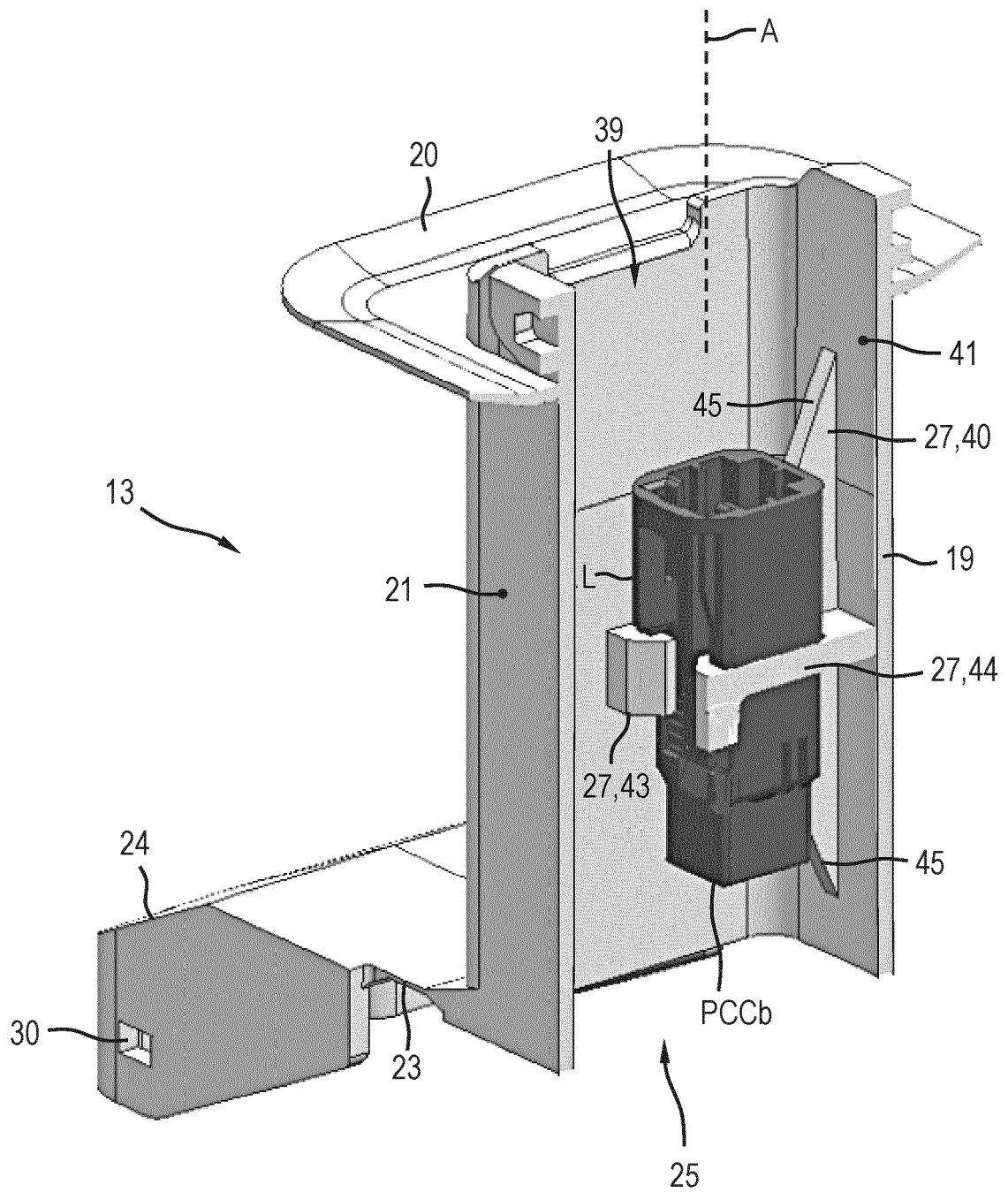


Fig.12

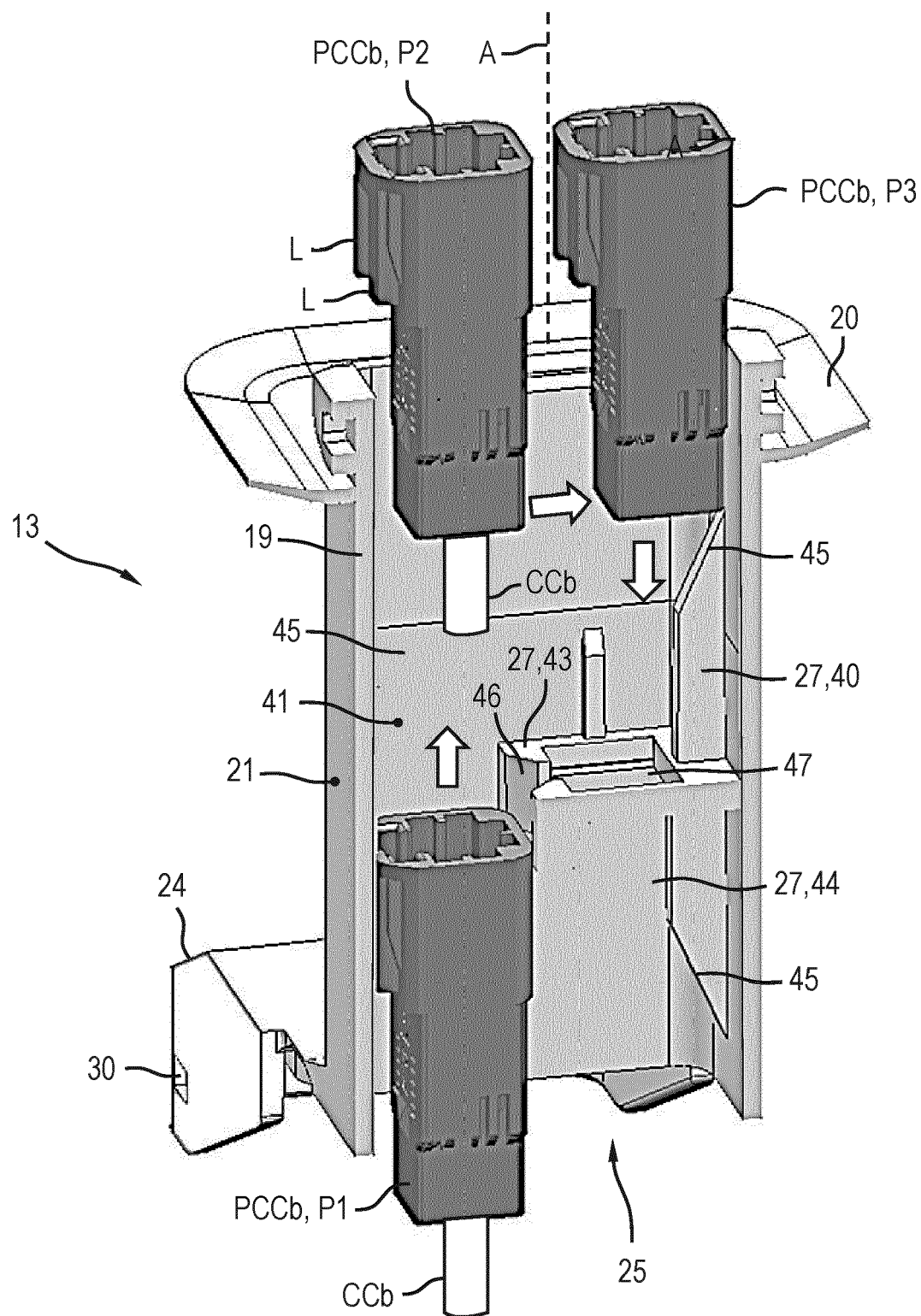


Fig.13



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Place of search The Hague		Date of completion of the search 31 October 2022	Examiner Bejaoui, Amin
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