

(19)



(11)

EP 4 826 918 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

21.10.2026 Bulletin 2026/43

(51) International Patent Classification (IPC):

H01R 13/52 ^(2006.01) **H01R 24/78** ^(2011.01)
H01R 43/00 ^(2006.01)

(21) Application number: **25171300.4**

(52) Cooperative Patent Classification (CPC):

H01R 13/5219; H01R 24/78; H01R 43/005;
H01R 13/5216

(22) Date of filing: **17.04.2025**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA

Designated Validation States:

GE KH LA MA MD TN

(72) Inventors:

- **SCHWEDT, Alexander**
58515 Lüdenscheid (DE)
- **HUJER, Vlastimil**
46801 Jablonec nad Nisou (CZ)

(74) Representative: **Zimmermann & Partner**

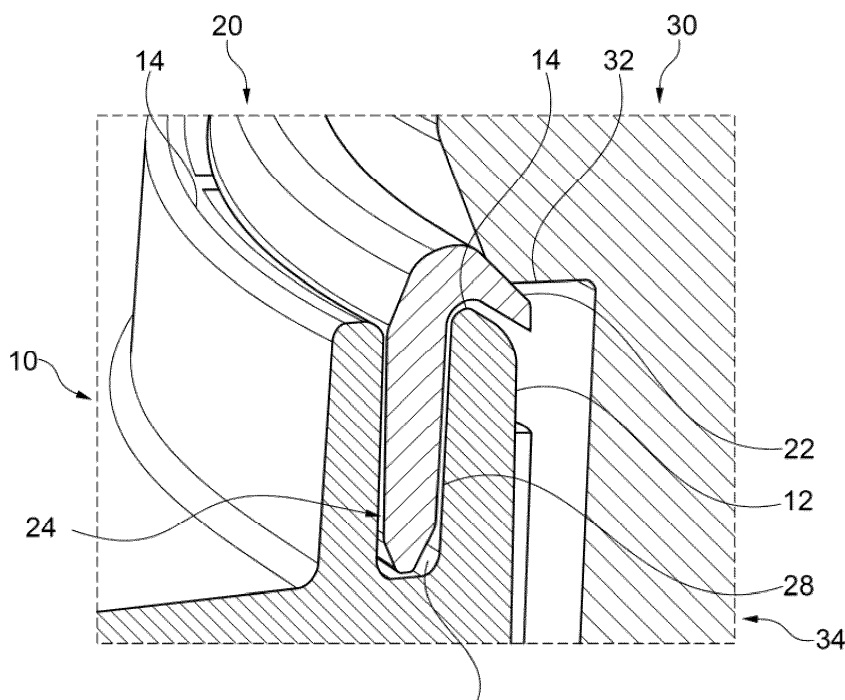
Patentanwälte mbB
Postfach 330 920
80069 München (DE)

(71) Applicant: **ABB Schweiz AG**
5400 Baden (CH)

(54) SEALING UNIT FOR SEALING A POWER SOCKET

(57) A sealing unit (20) for sealing a power socket (10). The sealing unit (20) is configured to be mounted on the power socket (10). The power socket (10) comprises a pot wall (12) surrounding a socket pot (16). The socket pot (16) is configured to receive a power plug (30). The sealing unit (20) comprises a sealing

element (22). When the sealing unit (20) is mounted on the power socket (10) and the power plug (30) is plugged in the power socket (10), the sealing element (22) is in contact with a plug flange (32) of the power plug (30) and a pot flange (14) of the pot wall (12) to seal the socket pot (16).



EP 4 826 918 A1

Description

Technical field

[0001] Embodiments of the present disclosure relate to a sealing unit for sealing a power socket, a power socket comprising a sealing unit and a method of sealing a socket pot of a power socket.

Technical Background

[0002] Power sockets are commonly used to supply an electric device with electric power. A power plug of the electric device may be plugged-in the power socket to supply electric power to the electric device. The power plug of the electric device may also be unplugged from the power socket, terminating the supply of electric power from the power socket to the electric device. To transfer electric power from the power socket to the power plug an electrical connection may be established between the power socket and the power plug. The electrical connection may be susceptible to environmental hazards. Such environmental hazards include e.g. fluid, water, dust and/or dirt.

[0003] Environmental hazards may decrease a resistance of the electric connection, thus already lower voltages may cause arcing. Environmental hazards, particularly fluids, may cause short circuits. Thus, it is desired to avoid exposure of the electrical connection to environmental hazards.

Description of invention

[0004] In view of the above, embodiments of the present disclosure aim to seal an electrical connection between a power socket and a power plug from the environment. Thus, environmental hazards may be prevented from causing short circuits and/or impair with the electrical connection between the power socket and the power plug. When the power plug is plugged in the power socket, environmental hazards may be sealed from the electrical connection, particularly from the inside of a socket pot of the power socket.

[0005] According to an aspect of the disclosure, a sealing unit for sealing a power socket is disclosed. The sealing unit is configured to be mounted on the power socket. The power socket includes a pot wall surrounding a socket pot. The socket pot being configured to receive a power plug. The sealing unit includes a sealing element. When the sealing unit is mounted on the power socket and the power plug is plugged in the power socket, the sealing element is in contact with a plug flange of the power plug and a pot flange surrounding the socket pot to seal the socket pot.

[0006] According to an aspect of the disclosure, a power socket includes a socket pot configured to receive a power plug and a sealing unit mounted on the socket pot. The socket pot is surrounded by a pot wall.

The pot wall has a pot flange. The sealing unit is a sealing unit according to any embodiment described herein.

[0007] According to an aspect of the disclosure, a method of sealing a socket pot of a power socket is disclosed. The method includes: (a) providing a sealing unit, the sealing unit comprising a sealing element; (b) contacting the sealing element with a pot flange of a pot wall, the pot wall surrounding the socket pot; (c) plugging a power plug in the power socket; (d) contacting the sealing element with a plug flange of the power plug.

[0008] A socket pot of a power socket may be a recess in the power socket surrounded by a pot wall. In an example, a power plug may include at least two pins. The socket pot may provide at least two female socket headers, particularly the socket pot may provide two female socket headers. A female socket header may be configured to receive a pin of the power plug.

[0009] For example, the female socket headers may be provided in a bottom surface of the socket pot. The pot wall may extend essentially perpendicular to the bottom surface of the socket pot. Particularly, the female socket headers and the pot wall may extend in opposite directions from the bottom surface of the socket pot.

[0010] The pot wall may have a pot flange. The pot flange may extend along a direction deviating from the extension direction of the pot wall. Particularly, the pot flange may extend parallel to the bottom surface of the socket pot. In an example, the pot flange may have a rounding and/or a bevel. Particularly, the pot wall may have an inner surface facing the socket pot. The rounding and/or the bevel may be located at a transition from the inner surface of the pot wall to the pot flange.

[0011] A power plug may include a plug body. At least two pins may extend from a top surface of the plug body. When a socket pot receives the power plug, particularly the plug body, the pins of the power plug may be received by the female socket headers of the socket pot. Particularly, the top surface of the plug body and the bottom surface of the socket pot may be in contact.

[0012] The socket pot may have the same shape as the plug body. The socket pot may be larger than the plug body to account for tolerances of the socket pot shape and the plug body shape. The power plug may include a plug flange. The plug flange may extend essentially parallel to the top surface of the plug body.

[0013] The plug flange may have a rounding and/or a bevel. The plug body may have an outer surface extending perpendicular to the top surface. When the power plug is plugged in a power socket, the outer surface of the plug body may face the inner surface of the pot wall. The rounding and/or the bevel may be located at the transition from the outer surface of the plug body to the plug flange.

[0014] According to an aspect of the disclosure, the sealing element may contact the plug flange around the

whole periphery of the plug flange. Contacting the plug flange around the whole periphery may be understood as: the area of contact between the plug flange and the sealing element may be a closed loop surround the socket pot and/or the power plug. By contacting the sealing element and the plug flange around the whole periphery of the plug flange, environmental hazards may be prevented from passing between the plug flange and the sealing element.

[0015] According to an aspect of the disclosure, the sealing element may contact the pot flange around the whole periphery of the pot flange. Contacting the pot flange around the whole periphery may be understood as: the area of contact between the pot flange and the sealing element may be a closed loop surround the socket pot and/or the power plug. By contacting the sealing element and the pot flange around the whole periphery of the pot flange, environmental hazards may be prevented from passing between the pot flange and the sealing element.

[0016] According to an aspect of the disclosure, the sealing element comprises an elastic material. An elastic material may be understood as a material that regains its original shape after being subjected to an external force. For example, the sealing element may comprise or even consist of at least one of: rubber-based sealing materials, foam-based sealing materials, polysulfide, polyurethane or silicon.

[0017] Rubber-based sealing materials may include silicon rubber, polyurethane, ethylene propylene diene monomer, neoprene rubber, nitrile rubber, butyl rubber and/or liquid silicon rubber. Foam-based sealing materials may include polyurethane foam and/or polyvinylchloride foam. An elastic material may be beneficial to contact the sealing element with the plug flange and/or the pot flange around the whole periphery. In an example, the sealing element may be deformed by the plug flange and the pot flange when a power plug is plugged in the power socket to improve the sealing properties of the sealing element.

[0018] According to an aspect of the disclosure, the sealing element may comprise of a UV-resistant material. A UV-resistant material may be understood as a material that does not change its inherent and/or mechanical properties, e.g. elasticity, due to long-term exposure by UV light. Long-term exposure may be more than 3 years, particularly more than 5 years. UV light may be light with a wavelength between 100 nm and 400 nm. For example, the sealing element may comprise of at least one of: ethylene propylene diene monomer, silicon rubber, neoprene rubber, polyurethane, butyl rubber or a combination thereof. A UV-resistant material may be beneficial for long-term use of the sealing unit, particularly in an outdoor environment.

[0019] According to an aspect of the disclosure, the sealing unit may further include a mounting portion. The mounting portion may be configured to contact,

particularly hold, the pot wall of the socket pot.

[0020] In an example, the mounting portion may be elastically deformed by the pot wall. Particularly, the mounting portion may be in contact with an opposite site of the pot wall. The opposite site may be opposite to the inner surface of the pot wall. In an example, when the sealing unit is mounted to a power socket, the mounting portion may extend from the sealing element essentially perpendicular to the bottom surface of the socket pot.

[0021] The sealing unit may be configured to be mounted on the socket pot in any reversible manner. For example, a reversible manner may be form fitting, elastic deformation and/or a frictional connection. Mounting the sealing unit on the socket pot may prevent an unintended dislocation of the sealing unit, particularly when unplugging a power plug from the power socket.

[0022] According to an aspect of the disclosure, the mounting portion may include at least one retaining structure to increase friction between the mounting portion and the pot wall. For example, the pot wall may include at least one extrusion such as a barb, a pillar and/or a lamella.

[0023] In an example, the mounting portion may include a main body and at least one retaining structure. In a mounted state, the main body may extend essentially perpendicular to the bottom surface of the socket pot. The retaining structures may extrude from the main body in a direction deviating from the surface normal of the bottom surface of the socket pot. The base area of the extrusion may be elliptical, circular, polygonal and/or a combination thereof. The base area of the extrusion may form a closed loop around the main body of the mounting portion.

[0024] According to an aspect of the disclosure, when the sealing unit is mounted on the power socket, the mounting portion may be elastically deformed by the pot wall. Particularly, predominantly the at least one retaining structure may be elastically deformed by the pot wall. Thus, friction between the mounting portion, particularly the at least one retaining structure, and the pot wall may be increased.

[0025] According to an aspect of the disclosure, when the sealing unit is mounted on the power socket, the mounting portion may extend around the whole periphery of the pot wall. Particularly, the mounting portion forms a closed loop around the pot wall. Thus, friction between the mounting portion and the pot wall may be increased.

[0026] According to an aspect of the disclosure, in a mounted state, the main body of the mounting portion may extend essentially parallel to the bottom surface of the socket pot. The at least one retaining structure may extend essentially perpendicular from the main body. The retaining structure may be configured to be mounted in a mounting recess of the power socket. Particularly, the power socket may have a mounting

recess for receiving a retaining structure of the sealing unit.

[0027] According to an aspect of the disclosure, the mounting portion may provide a mounting hole. Particularly, in a mounted state, the mounting portion may extend from the sealing element essentially parallel to the bottom surface of the socket pot. The mounting hole may be configured such that a mounting element, e.g. a screw and/or a rivet, may penetrate the mounting hole. By mounting the mounting element to the power socket, the sealing unit may be mounted to the power socket.

[0028] According to an aspect of the disclosure, the power socket may be a stationary power socket. For example, the power socket may be mounted to a wall. Particularly, the power socket may be mounted to an inner side or an outer side of the wall. The inner side of the wall being in a closed room. The outer side being outside a closed room, particularly being exposed to natural phenomena such as rain, wind, and/or direct sun light. Alternatively, the power socket may be a mobile power socket. For example, the power socket may be connected to an extension cable, particularly to a multi socket outlet. Typically, the power socket may be a two-pole power socket. Typically, the power socket may be configured to provide a voltage of less than 500 V, particularly less than 300 V, more particularly 230 V and/or 110 V.

[0029] According to an aspect of the disclosure, the pot flange may comprise a mounting recess. The mounting portion of the sealing unit may be mounted in the mounting recess. The mounting recess may extend from the pot flange essentially perpendicular to the bottom surface of the socket pot. Particularly, the mounting recess may provide an opposite surface of the pot wall. The opposite surface being opposite to the inner surface of the pot wall.

[0030] According to an aspect of the disclosure, the mounting recess may extend along the whole periphery of the pot flange. Thus, the mounting portion may extend around the whole periphery of the opposite surface.

[0031] According to an aspect of the disclosure, the power socket may be an IPX4 socket, an IPX5 socket, DIN 49440-1 conform, DIN 49440-7 conform, DIN 49406-2 conform and/or DIN 49441-2 conform.

[0032] In a plugged-in state, the plug flange and the pot flange may not be in contact with each other. Thus, when a power plug is plugged in a power socket, space between the plug flange and the pot flange may allow environmental hazards to enter the socket pot. Mounting a sealing unit according to embodiments herein on the power socket may prevent environmental hazards from entering the socket pot.

[0033] According to an aspect of the disclosure, the sealing element may have a thickness of more than 0.5 mm and/or less than 1 mm. The thickness may be measured along an axis that is, in a mounted state,

parallel to the surface normal of the bottom surface of the socket pot. In an example, the sealing element may have a circular hole. In a mounted state, the circular hole may be aligned with the socket pot of the power socket. The circular hole may have a diameter of more than 38 mm and/or less than 40 mm, particularly essentially 39 mm. In an embodiment, in a mounted state, the mounting portion extends from the sealing element more than 10 mm parallel to the surface normal of the bottom surface and/or less than 18 mm, particularly essentially 17.5 mm.

[0034] According to an aspect of the disclosure, the socket pot may have an essentially cylindrical shape. The socket pot may have a depth of essentially 17.5 mm. The depth being measured along the surface normal of the bottom surface. The diameter of the essentially cylindrical shape may be essentially 39 mm.

[0035] According to an aspect of the disclosure, the power socket may be a cover-free power socket. A cover is understood to cover the power socket when no power plug is plugged in the power socket.

[0036] According to an aspect of the disclosure, the sealing unit is permanently mounted to the pot flange. For example, the sealing unit is glued and/or molded to the pot flange. Particularly, the sealing unit may be mounted to the pot flange by injection molding, two-component injection molding and/or multi-component injection molding.

[0037] According to an aspect of the disclosure, the method for sealing a socket pot of a power socket may further include: mounting, particularly permanently mounting, the sealing unit on the power socket, particularly the pot flange.

[0038] The term "mounted", if not otherwise stated, may refer to the sealing unit being mounted to the socket pot. The term "plugged-in", if not otherwise stated, may refer to the power plug being plugged-in the power socket. The term "essentially" may be understood as a variation of $\pm 5\%$ of the given value. If the term "essentially" is used in combination with the term "perpendicular" and/or "parallel", it may be understood as a variation of $\pm 5^\circ$. "Perpendicular to the bottom surface of the socket pot" may be understood as "parallel to the surface normal of the bottom surface of the socket pot".

Brief description of the figures

[0039] In the following, examples for the disclosure are described in more detail with reference to the drawings. Therein:

Fig 1a illustrates a schematic drawing of a sealing unit mounted on a power socket according to an embodiment of the disclosure;

Fig 1b illustrates a section view through the axis S of Fig. 1a according to an embodiment of the disclosure;

- Fig 2a illustrates a schematic drawing of a sealing unit mounted on a power socket with a power plug plugged-in according to an embodiment of the disclosure;
- Fig 2b illustrates a schematic drawing of a sealing unit according to an embodiment of the disclosure;
- Fig 2c illustrates a schematic drawing of a sealing unit mounted on a power socket with a power plug plugged-in according to an embodiment of the disclosure;
- Fig 2d illustrates a schematic drawing of a sealing unit mounted on a power socket with a power plug plugged-in according to an embodiment of the disclosure;
- Fig 2e illustrates a schematic drawing of a sealing unit mounted on a power socket with a power plug plugged-in according to an embodiment of the disclosure;
- Fig 3a illustrates a schematic drawing of a power socket according to an embodiment of the disclosure;
- Fig 3b illustrates a schematic drawing of a power socket according to an embodiment of the disclosure;
- Fig 4a illustrates a schematic drawing of a sealing unit according to an embodiment of the disclosure; and
- Fig 4b illustrates a schematic drawing of a sealing unit according to an embodiment of the disclosure;
- Fig 5 illustrates a flow diagram representing a method of sealing a socket pot according to an embodiment of the disclosure.

Detailed description of the figures

[0040] Reference will now be made in detail to the various embodiments of the disclosure, one or more examples of which are illustrated in the figures. Generally, only the differences with respect to individual embodiments are described. Each example is provided by way of explanation of the disclosure and is not meant as a limitation of the disclosure. Further, features illustrated or described as part of one embodiment can be used on or in conjunction with other embodiments to yield a further embodiment. It is intended that the description includes such modifications and variations. In the figures, elements may be depicted with exagger-

ated dimensions to improve the comprehensibility of the detailed description of embodiments. In particular, relations of lengths and widths of components shown may be distorted. Further, some elements may be depicted with enlarged dimensions while other elements in the same figure are depicted, relatively, with reduced dimensions.

[0041] Fig 1a schematically illustrates a sealing unit 20 mounted on a power socket 10. Fig 1b schematically illustrates a cross-section view of Fig 1a cut through the axis S. The power socket 10 includes a socket pot 16. The socket pot 16 is surrounded by a pot wall 12. The pot wall 12 has a pot flange 14. The socket pot 16 is configured to receive a power plug 30. The sealing unit 20 includes a sealing element 22. When the sealing unit 20 is mounted on the power socket 10 and the power plug 30 is plugged in the power socket 10, the sealing element 22 is in contact with a plug flange 32 of the power plug 30 and the pot flange 14 to seal the socket pot 16.

[0042] The socket pot 16 may have a shape similar to the shape of a plug body 34 of the power plug 30. The socket pot 16 may have an essentially cylindrical shape. The cylindrical shape may be interrupted by guiding elements 17. The socket pot 16 is surrounded by the pot wall 12. The pot wall 12 may form the lateral limitation of the socket pot 16. A bottom surface 11 of the socket pot 16 may be defined by the power socket 10. The guiding elements 17 may extend essentially perpendicular to the bottom surface 11. At least two female socket headers 13 may extend essentially perpendicular to the bottom surface 11 from the bottom surface 11 in the power socket 10. The pot wall 12 may extend essentially perpendicular to the bottom surface 11 from the bottom surface 11 in an opposite direction as the female socket headers 13.

[0043] The pot wall 12 has a pot flange 14. The pot flange 14 may extend essentially in a direction parallel to the bottom surface 11 of the socket pot 16. The pot flange 14 may include a rounding and/or a bevel deviating from the essentially parallel direction. The rounding and/or the bevel may be a transition from an inner surface of the pot wall 12 to the pot flange 14. The inner surface of the pot wall 12 may be facing the socket pot 16.

[0044] In the embodiment of Fig 1a and Fig 1b, the sealing unit 20 may be permanently mounted on the power socket 10 by gluing and/or molding. The area of the sealing unit 20 mounted to the power socket 10 may be the mounting portion 24 of the sealing unit 20.

[0045] Fig. 2a, 2d and 2e each schematically illustrate a sealing unit 20 mounted to a power socket 10. A power plug 30 may be plugged in the power socket 10. The plug body 34 may be the part of the power plug 30 received by the socket pot 16. The plug body 34 may have an essentially cylindrical shape. In a plugged-in state, an outer surface of the plug body 34 may face the inner surface of the pot wall 12. The

power plug 30 may have a plug flange 32. The plug flange 32 may deviate from the outer surface of the plug body 34, particularly in an essentially perpendicular orientation. The plug flange 32 may include a rounding and/or a bevel. The rounding and/or bevel may be a transition from the outer surface of the plug body 34 to the plug flange 32.

[0046] The sealing unit 20 may include a sealing element 22 which is in contact with the pot flange 14 and the plug flange 32 when the sealing unit 20 is mounted on a power socket 10 and a power plug 30 is plugged in the power socket 10. The sealing unit 20 may include a mounting portion 24. In a mounted state, the mounting portion 24 may extend in a mounting recess 18 of the pot flange 14.

[0047] The mounting portion 24 of the sealing unit 20 may include at least one retaining structure 26 and particularly a main body 28. In a mounted state, the main body 28 of the mounting portion 24 may extend essentially perpendicular to the bottom surface 11 of the socket pot 16. The at least one retaining structure 26 may extend from the main body 28 along an axis deviating from the surface normal of the bottom surface 11 of the socket pot 16. In the embodiment illustrated in Fig 2b, the at least one retaining structure 26 may extend from the main body 28 of the mounting portion 24 along an axis tilted by essentially 45° compared to the surface normal of the bottom surface 11 of the socket pot 16. In the embodiment of Fig 2c, the at least one retaining structure 26 may extend from the main body 28 of the mounting portion 24 along an axis essentially parallel to the bottom surface 11 of the socket pot 16.

[0048] The at least one retaining structure 26 may extend from the main body 28 in the direction of the socket pot 16 and/or away from the socket pot 16. The extension direction may be different for a retaining structure 26 extending in the direction of the socket pot 16 compared to a retaining structure 26 extending away from the socket pot 16.

[0049] The main body 28 of the mounting portion 24 may extend from the sealing element 22. The sealing element 22 may form a closed loop, particularly a closed circle. The mounting portion 24 may extend from the sealing element 22 only around at least one part, particularly at least two parts, from the closed loop of the sealing element 22. In an embodiment, the mounting portion 24 may extend from the sealing element 22 around the whole periphery, particularly around the whole closed loop, of the sealing element 22.

[0050] Fig 3a and 3b schematically illustrate a power socket 10 similarly to the power socket illustrated in figure 1a. The pot flange 14 of the pot wall 12 of the power socket 10 may include at least one mounting recess 18. Each mounting recess 18 may extend from the pot flange 14 essentially perpendicular to the bottom surface 11 of the socket pot 16 and in the direction of the bottom surface 11 of the socket pot 16.

[0051] The pot flange 14 may form a closed loop,

particularly a closed circle. The sealing element 22 of the sealing unit 20 may form a closed loop, particularly a closed circle. Typically, in a mounted state, the closed loop formed by the sealing element 22 may overlap with the closed loop formed by the pot flange 14.

[0052] The mounting recess 18 may extend from the pot flange 14 only around at least one part, particularly at least two parts, from the closed loop of the pot flange 14. The mounting portion 24 of the sealing unit 20 may extend from the sealing element 22 only around at least one part, particularly at least two parts, from the closed loop of the sealing element 22. In an embodiment, the mounting recess 18 may extend from the pot flange 14 around the whole periphery, particularly around the whole closed loop, of the pot flange 14. The mounting recess 18 of the pot flange 14 and the mounting portion 24 of the sealing unit 20 may be compatible such that the mounting portion 24 may be mounted in the mounting recess 18.

[0053] In Fig 3a and Fig 3b the sealing unit 20 is not shown in order to better illustrate the mounting recess 18 of the pot flange 14 in more detail.

[0054] Fig. 4a schematically illustrates a sealing unit 20 according to an embodiment of the disclosure. The sealing unit 20 may include a sealing element 22 and a mounting portion 24. In a mounted state, the mounting portion 24 may extend from the sealing element 22 essentially parallel to the bottom surface 11 of the socket pot 16. The mounting portion 24 may include a hole. The sealing unit 20 may be mounted to the power socket 10 by a mounting element, e.g. a screw and/or a rivet. The mounting element may be configured to penetrate the hole of the mounting portion 24. The power socket 10 may be configured such that the mounting element may be mounted in the power socket 10, wherein the mounting element may mount the sealing unit 20 on the power socket 10.

[0055] Fig. 4b schematically illustrates a sealing unit 20 according to an embodiment of the disclosure. The sealing unit 20 may include a sealing element 22 and a mounting portion 24. The mounting portion 24 may include a main body 28 and a retaining structure 26. In a mounted state, the main body 28 may extend essentially parallel to the bottom surface 11 of the socket pot 16. The retaining structure 26 may extend from the main body 28 essentially parallel to the surface normal of the bottom surface 11 of the socket pot 16. The power socket 10 may include a mounting recess. The retaining structure 26 may be configured to be inserted in the mounting recess, such that the sealing unit 20 is mounted to the power socket 10.

[0056] Fig. 5 schematically illustrates a flow diagram of a method 100 of sealing a socket pot 16 of a power socket 10. The method comprises at least the following steps. Providing 101 a sealing unit 20. The sealing unit 20 comprises a sealing element 22. The sealing unit 20 may further be configured according to any embodiment or combination of embodiments disclosed herein.

Contacting 103 the sealing element 22 with a pot flange 14 of a pot wall 12. The pot wall surrounding the socket pot 16. The power socket 10 may be configured according to any embodiment or combination of embodiments disclosed herein. Plugging 105 a power plug 30 in the power socket 10. The power plug being configured according to any embodiment or combination of embodiments disclosed herein. Plugging 105 the power plug 30 in the power socket 10 may be understood as inserting the pins of the power plug 30 into the female socket headers 13 of the power socket 10. Contacting 107 the sealing element 22 with a plug flange 32 of the power plug 30.

[0057] Further optional steps may be comprised by the method 100. An optional step may be: mounting 104a the sealing element 22 on the pot flange 14, e.g. by molding. Another optional step may be: inserting 104b a mounting portion 24 of the sealing unit 20 in a mounting recess 18 of the pot flange 14. Another optional step may be: removing 108a the power plug 30 from the power socket 10. Another optional step may be: dismounting 108b the sealing element 22 from the pot flange 14, e.g. by removing the mounting portion 24 of the sealing unit 20 from the mounting recess 18 of the pot flange 14.

[0058] The steps of the method 100 may be executed in any order. In an embodiment, the sealing element 22 may be contacted 103 with the pot flange 14 after the sealing unit 20 is provided 101. The power plug 30 may be plugged 105 in the power socket 10 after the sealing element 22 was contacted 103 with the pot flange 14. Contacting 107 the sealing element 22 with the plug flange 32 may end the plugging 105 in of the power plug 30. In an embodiment, the sealing element 22 may be contacted 103 with the pot flange 14 while mounting 104 the sealing element 22 on the pot flange 14, particularly while inserting 104b the mounting portion 24 in the mounting recess 18. In another embodiment, the sealing element 22 may be contacted 107 with the plug flange 32 while plugging 105 the power plug 30 in the power socket 10. In another embodiment, the power plug 30 may be removed 108a from the power socket 10 before dismounting 108b the sealing element 22. In another embodiment, the sealing element 22 may be contacted 103 with the pot flange 14 before the power plug 30 is plugged 105 in the power socket 10.

List of reference signs

[0059]

10	power socket
11	bottom surface
12	pot wall
13	female socket header
14	pot flange
16	socket pot

17	guiding element
18	mounting recess
20	sealing unit
22	sealing element
5 24	mounting portion
26	retaining structure
28	main body
30	power plug
32	plug flange
10 34	plug body
100	method of sealing
101	providing a sealing unit
103	contacting the sealing element with a pot flange
104a	mounting the sealing element on the pot flange
15 104b	inserting a mounting portion in a mounting recess
105	plugging a power plug in the power socket
107	contacting the sealing element with a plug flange
20 108a	removing the power plug from the power socket
108b	dismounting the sealing element

Claims

- 25 1. A sealing unit (20) for sealing a power socket (10), wherein the sealing unit (20) is configured to be mounted on the power socket (10), the power socket (10) comprising a pot wall (12) surrounding a socket pot (16), the socket pot (16) being configured to receive a power plug (30);
30 the sealing unit (20) comprising:
 - 35 - a sealing element (22), wherein, when the sealing unit (20) is mounted on the power socket (10) and the power plug (30) is plugged in the power socket (10), the sealing element (22) is in contact with a plug flange (32) of the power plug (30) and a pot flange (14) of the pot wall (12) to seal the socket pot (16).
- 40 2. The sealing unit (20) of the previous claim, wherein the sealing element (22) contacts the plug flange (32) around the whole periphery of the plug flange (32) and/or the sealing element (22) contacts the
45 pot flange (14) around the whole periphery of the pot flange (14).
- 50 3. The sealing unit (20) of any previous claims, wherein the sealing element (22) comprises an elastic material and/or a UV-resistant material.
- 55 4. The sealing unit (20) of any previous claims, the sealing unit (20) further comprising:
 - a mounting portion (24), wherein the mounting portion (24) is configured to contact the pot wall (12) of the socket pot (16).

5. The sealing unit (20) of the previous claims, wherein the mounting portion (24) comprises at least one retaining structure (26) to increase friction between the mounting portion (24) and the pot wall (12). 5
6. The sealing unit (20) of any of the claims 4 or 5, wherein, when the sealing unit (20) is mounted on the power socket (10), the mounting portion (24) is elastically deformed by the pot wall (12). 10
7. The sealing unit (20) of any of the claims 4 to 6, wherein, when the sealing unit (20) is mounted on the power socket (10), the mounting portion (24) extends around the whole periphery of the pot wall (12). 15
8. A power socket (10), comprising:
 - a socket pot (16) configured to receive a power plug (30), the socket pot (16) being surrounded by a pot wall (12), the pot wall (12) having a pot flange (14); 20
 - a sealing unit (20) mounted on the power socket (10), wherein the sealing unit (20) is a sealing unit (20) according to any previous claim. 25
9. The power socket (10) of claim 8, wherein the pot flange (14) comprises a mounting recess (18), wherein the mounting portion (24) of the sealing unit (20) is mounted in the mounting recess (18). 30
10. The power socket (10) of claim 9, wherein the mounting recess (18) extends along the whole periphery of the pot flange (14). 35
11. The power socket (10) according to any of the claims 8 to 10, wherein the power socket (10) being at least one of an IPX4 socket, an IPX5 socket, DIN 49440-1 conform, DIN 49440-7 conform, DIN 49406-2 conform or DIN 49441-2 conform. 40
12. The power socket (10) according to any of the claims 8 to 11, wherein the power socket (10) is a cover-free power socket. 45
13. The power socket (10) according to any of the claims 8 to 12, wherein the sealing unit (20) is permanently mounted to the pot flange (14). 50
14. The power socket (10) according to any of the claims 8 to 13, wherein the sealing unit (20) is mounted to the pot flange (14) by molding.
15. A method (100) of sealing a socket pot (16) of a power socket (10), the method comprising: 55
 - providing (101) a sealing unit (20), the seal-

ing unit (20) comprising a sealing element (22);

- contacting (103) the sealing element (22) with a pot flange (14) of a pot wall (12), the pot wall (12) surrounding the socket pot (16);
- plugging (105) a power plug (30) in the power socket (10);
- contacting (107) the sealing element (22) with a plug flange (32) of the power plug (30).

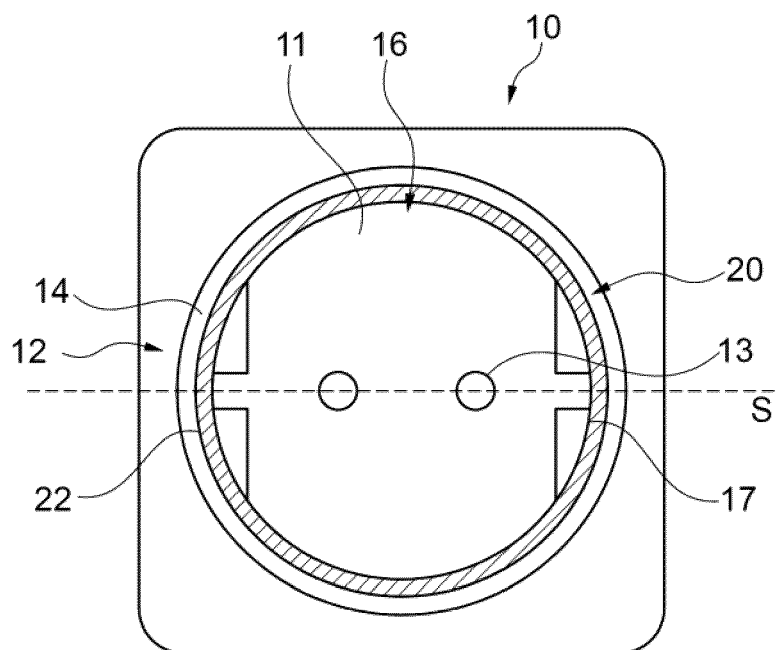


Fig. 1a

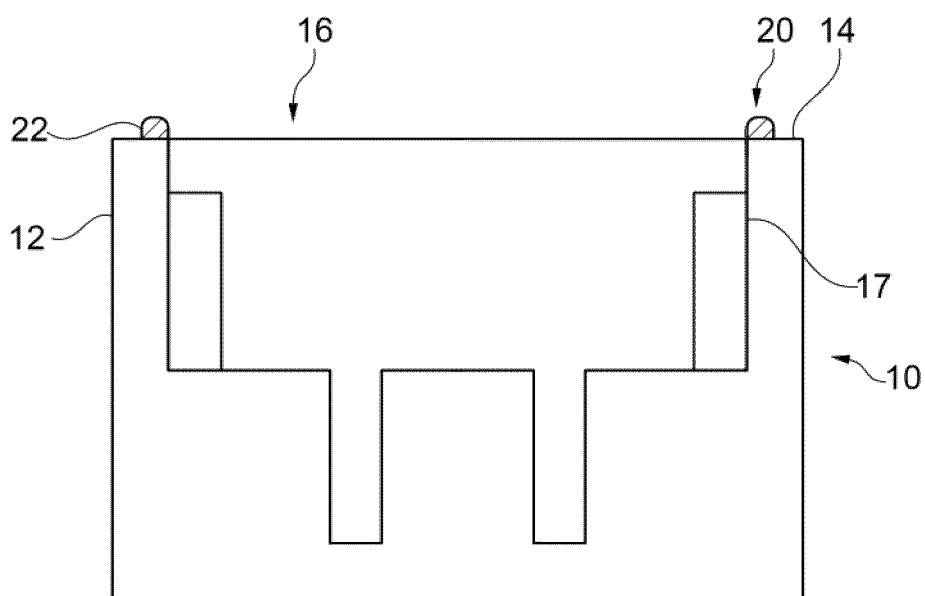


Fig. 1b

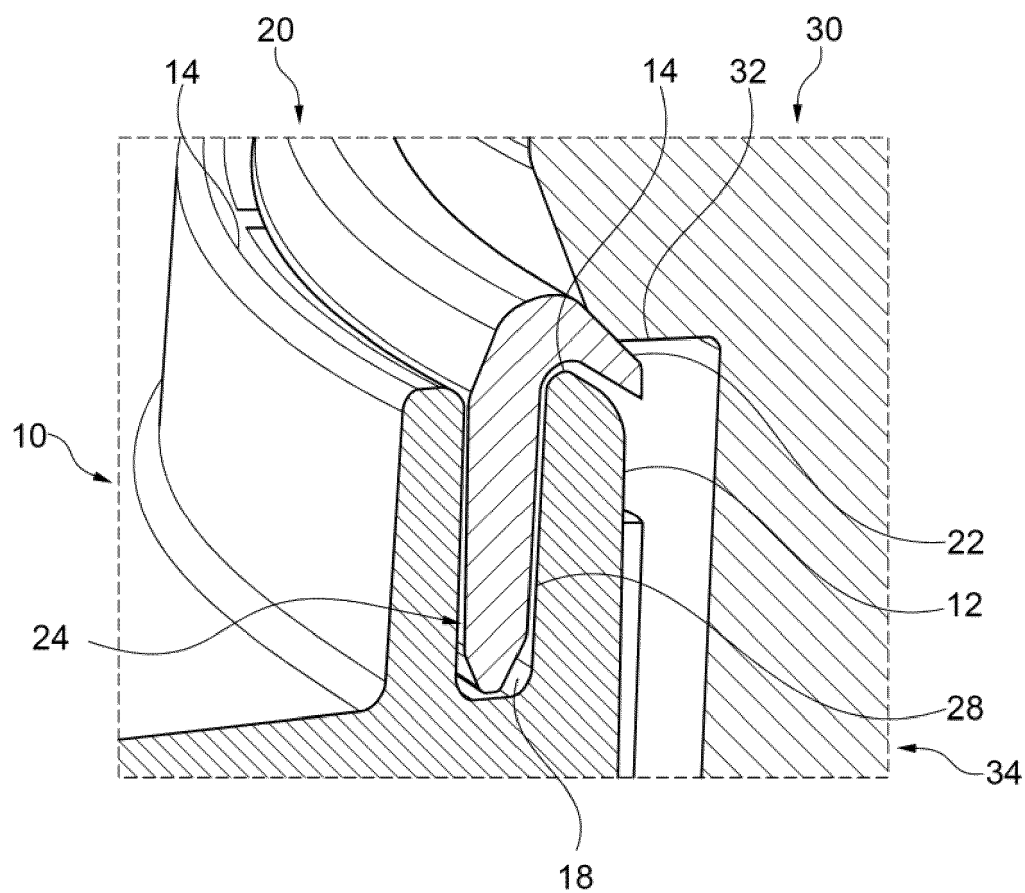


Fig. 2a

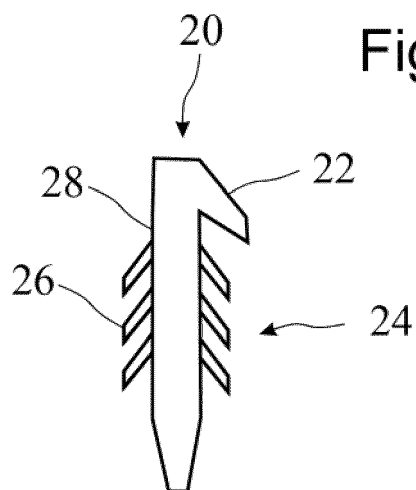


Fig. 2b

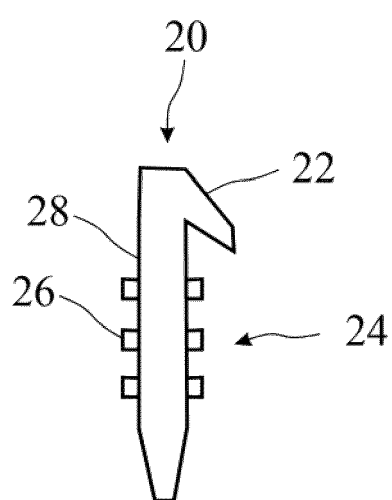


Fig. 2c

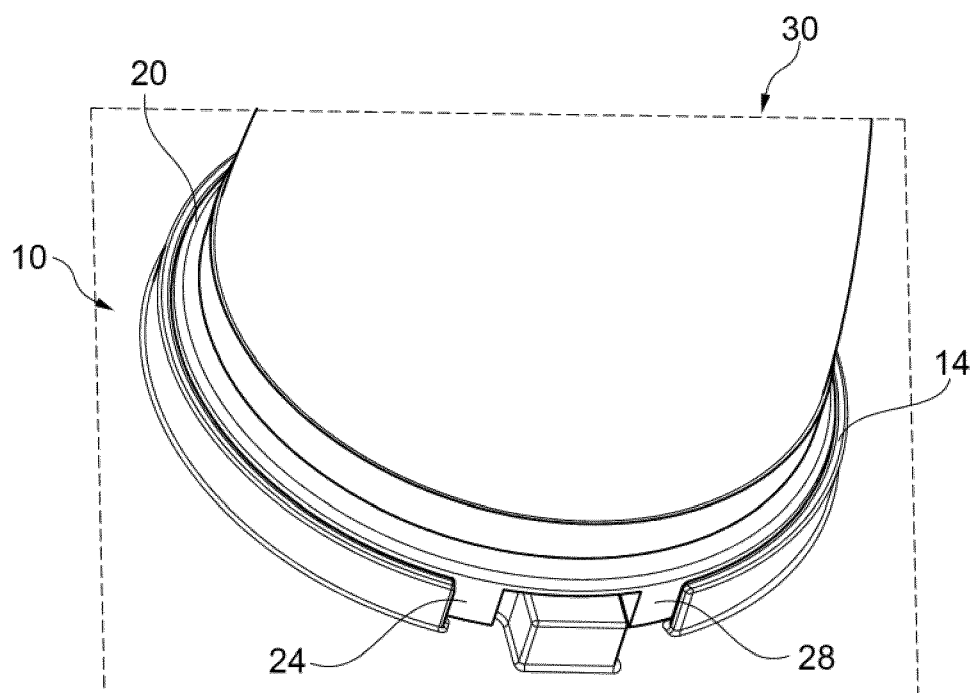


Fig. 2d

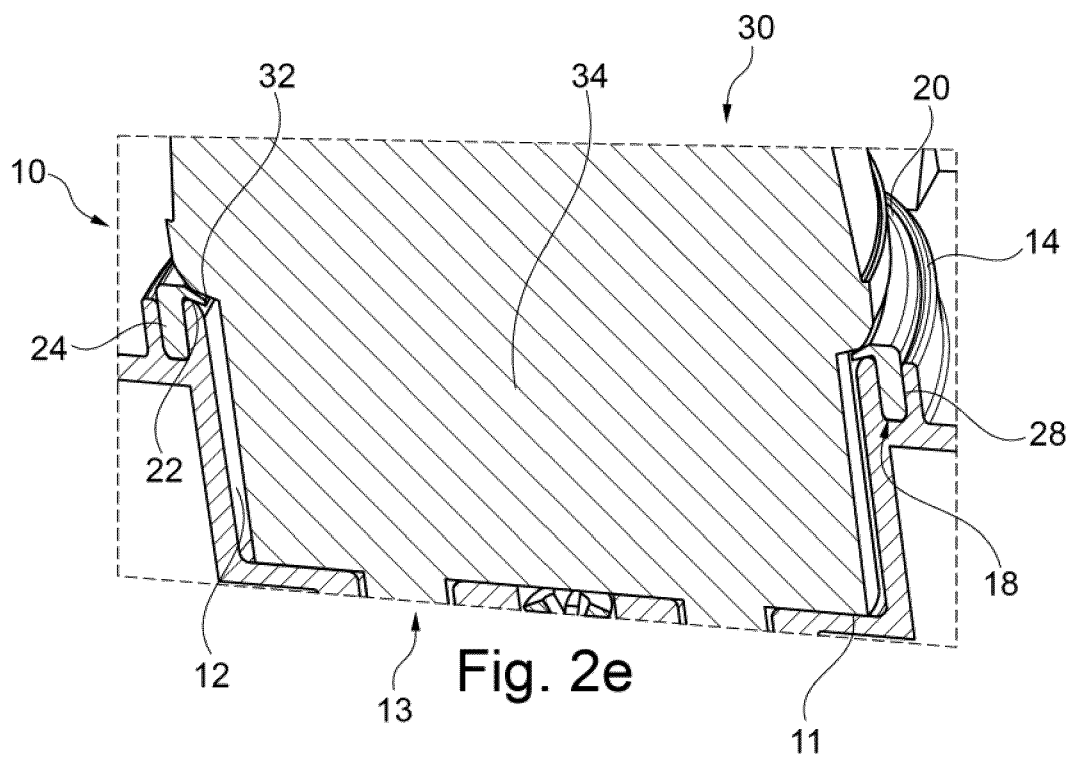


Fig. 2e

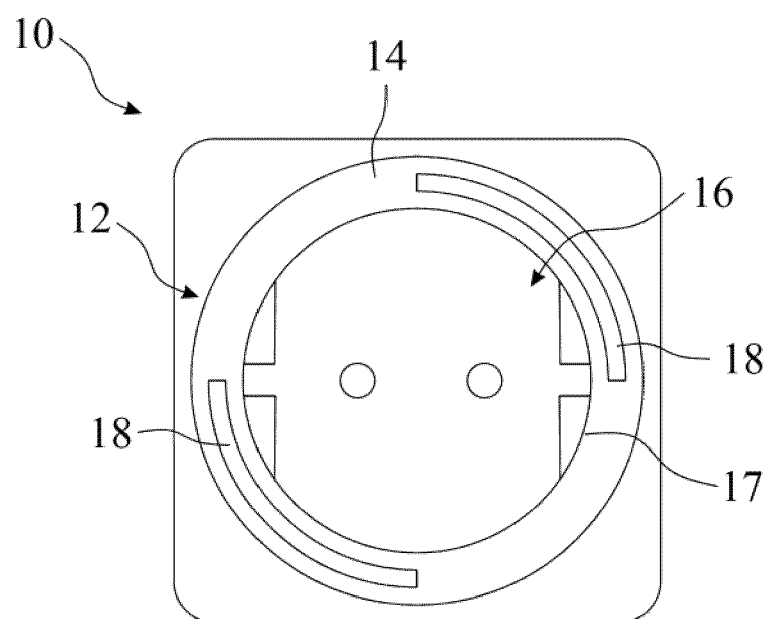


Fig. 3a

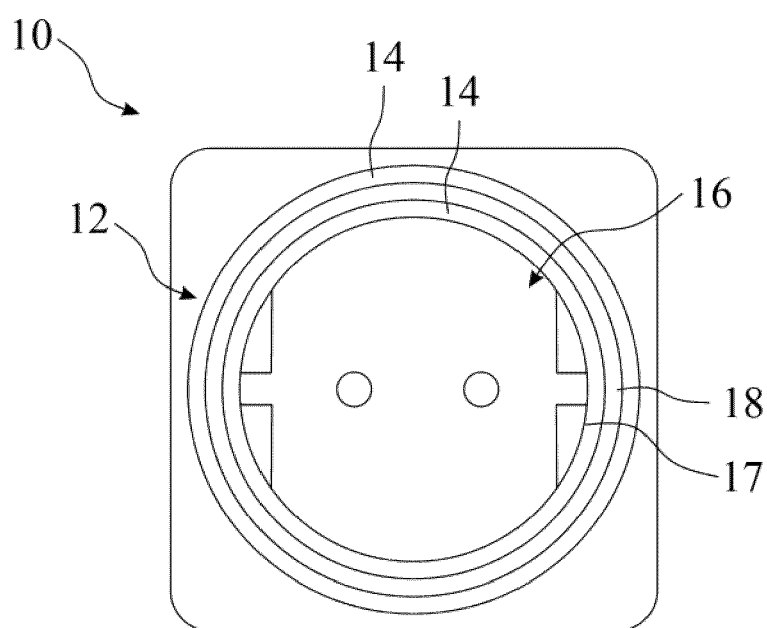


Fig. 3b

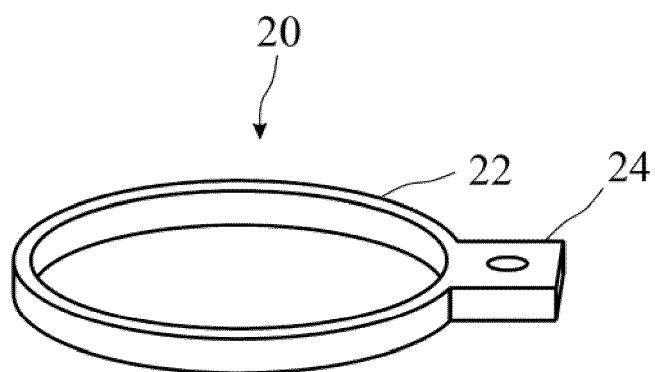


Fig. 4a

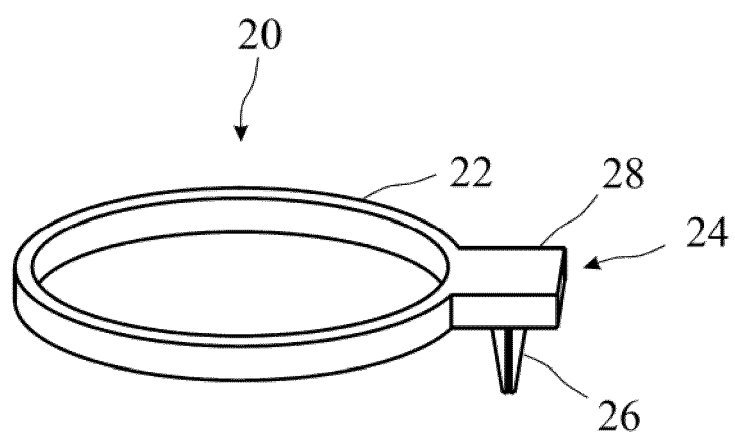


Fig. 4b

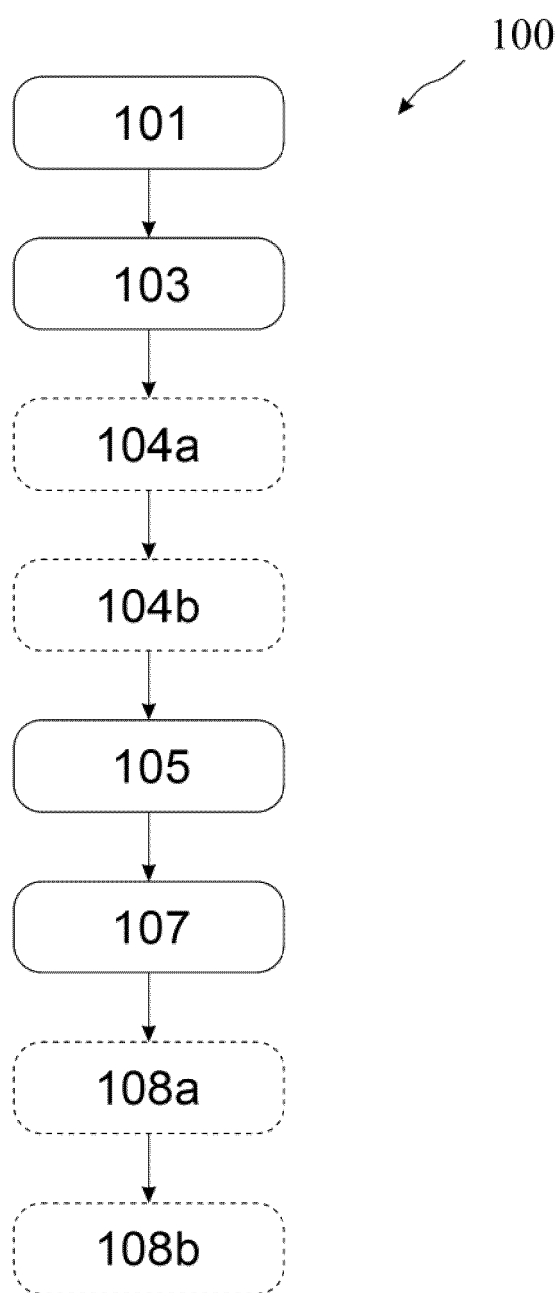


Fig. 5



EUROPEAN SEARCH REPORT

Application Number

EP 25 17 1300

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 980 278 A (WINKLER PHILIPPE [FR]) 9 November 1999 (1999-11-09) * column 3, line 24 - column 4, line 26; figures 2,3,4,5 *	1-11, 13-15	INV. H01R13/52 H01R24/78 H01R43/00
X	US 2013/330951 A1 (YUDATE SHINYA [JP]) 12 December 2013 (2013-12-12) * paragraph [0045] - paragraph [0057]; figures 2a,2b,3,7 *	1-15	
X	CN 221 407 785 U (SUZHOU DAFENGQI INFORMATION TECH CO LTD) 23 July 2024 (2024-07-23) * paragraph [0041] - paragraph [0044]; figures 2,3 *	1-3,6-8, 11-15	
X	CN 203 272 784 U (OTTER CONTROLS LTD) 6 November 2013 (2013-11-06) * figure 50c *	1-7	
A		8-15	
A	CA 2 894 205 A1 (MARECHAL SEPM [FR]) 19 June 2014 (2014-06-19) * the whole document *	1-15	TECHNICAL FIELDS SEARCHED (IPC) H01R
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		19 September 2025	Mateo Segura, C
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	

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 25 17 1300

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-09-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5980278 A	09-11-1999	AU 727944 B2	04-01-2001
		CA 2202927 A1	30-11-1997
		DE 69705676 T2	08-05-2002
		EP 0810693 A1	03-12-1997
		FR 2749444 A1	05-12-1997
		JP H1050394 A	20-02-1998
		US 5980278 A	09-11-1999

US 2013330951 A1	12-12-2013	CN 103444007 A	11-12-2013
		EP 2688152 A1	22-01-2014
		HK 1187452 A1	04-04-2014
		JP 5689000 B2	25-03-2015
		JP 2012195125 A	11-10-2012
		KR 20130122669 A	07-11-2013
		US 2013330951 A1	12-12-2013
		WO 2012124261 A1	20-09-2012

CN 221407785 U	23-07-2024	NONE	

CN 203272784 U	06-11-2013	CN 104039203 A	10-09-2014
		CN 203218500 U	25-09-2013
		CN 203272781 U	06-11-2013
		CN 203272784 U	06-11-2013
		CN 203883177 U	15-10-2014
		CN 203967372 U	26-11-2014
		CN 203967432 U	26-11-2014
		CN 204011828 U	10-12-2014
		CN 204144502 U	04-02-2015
		EP 2793661 A1	29-10-2014
		JP 2015502236 A	22-01-2015
		WO 2013093526 A1	27-06-2013

CA 2894205 A1	19-06-2014	AU 2013357165 A1	09-07-2015
		CA 2894205 A1	19-06-2014
		EP 2932139 A1	21-10-2015
		ES 2659274 T3	14-03-2018
		FR 2999261 A1	13-06-2014
		MX 356242 B	21-05-2018
		US 2015333437 A1	19-11-2015
		WO 2014091102 A1	19-06-2014
