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(54) **WATERPROOF WIRING TERMINAL AND HOUSEHOLD APPLIANCE**

(57) A waterproof wiring terminal and a household appliance are provided in the present invention, which relates to the field of household appliance waterproofing. The waterproof wiring terminal includes a male head and a female head. The male head includes a male head body and an insulating sleeve, wherein the male head body passes through the insulating sleeve and is fixedly connected to the insulating sleeve. The female head includes a female head body and a water wiping pad, wherein the water wiping pad is mounted in the female head body. When the male head is inserted into the female head, the male head body and the insulating sleeve successively enter the water wiping pad. The water wiping pad exerts a pressing force on the male head body, such that the water on the male body is stopped outside

the water wiping pad, and then flows out of the insulating sleeve to prevent water from being conducted by the current. Compared to the wiring terminal in the prior art, for the waterproof wiring terminal in the present invention, the water on the male head body is squeezed out of the insulating sleeve due to the use of the insulating sleeve placed on the outside of the male head body and the water wiping pad mounted on the inside of the female head body, so that the water is prevented from causing the risk of current leakage after entering the female head body, thereby facilitating the use and being practical and safe.

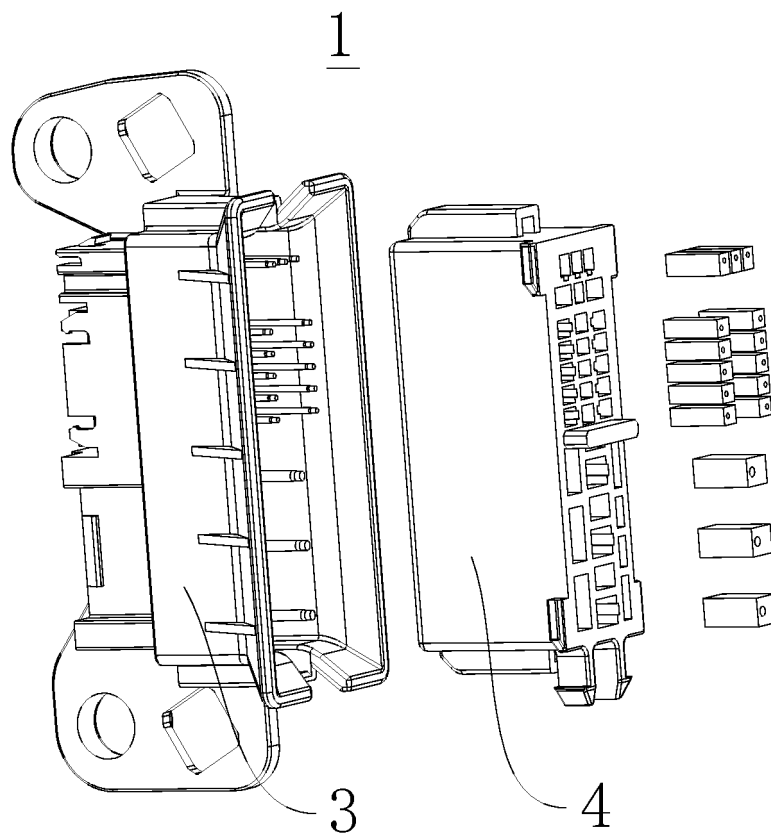


Fig. 1

Description**FIELD OF THE INVENTION**

5 [0001] The present invention relates to the technical field of household appliance waterproofing, in particular to a waterproof wiring terminal and a household appliance.

BACKGROUND OF THE INVENTION

10 [0002] The existing terminal connecting structures can achieve accurate alignment of wires and signal wires, and have a broad application range in household appliances. However, during the service or disassembly of the household appliance, if the male head of the terminal is accidentally stuck with water and then connected to the female head of the terminal, there is a potential danger of leakage. If it breaks, the break point will trip, and if it is too heavy, it will cause a fire. In this way, the power will trip in light cases and a fire accident will occur in severe cases, thereby endangering
15 users' lives and property.

SUMMARY OF THE INVENTION

20 [0003] In view of this, a waterproof wiring terminal with a simple structure is proposed in the present invention. The waterproof wiring terminal can eliminate water on the male head during assembly, prevent water from entering the female head to cause potential leakage risk, thereby facilitating the use and being practical and safe.

[0004] To achieve the above purpose, the technical solution of the present invention is implemented as follows.

25 [0005] A waterproof wiring terminal includes a male head and a female head. The male head includes a male head body and an insulating sleeve, wherein the male head body passes through the insulating sleeve and is fixedly connected to the insulating sleeve. The female head includes a female head body and a water wiping pad, wherein the water wiping pad is mounted in the female head body. When the male head is inserted into the female head, the water wiping pad is used to squeeze water on the male head body out of the insulating sleeve.

30 [0006] Further, the male head body has a cylindrical shape, and the male head body includes a connecting portion and a pin portion. The connecting portion is connected to the pin portion, and the insulating sleeve is sleeved outside the connecting portion and is fixedly connected to the connecting portion.

[0007] Further, one end of the insulating sleeve adjacent to the pin portion has a diameter smaller than a diameter of one end of the insulating sleeve away from the pin portion.

35 [0008] Further, a mounting cavity and a conductive cavity are disposed on the female head body, and the mounting cavity is communicated with the conductive cavity. The water wiping pad is mounted in the mounting cavity, and the male head passes through the water wiping pad and extends into the conductive cavity.

[0009] Further, an inserting hole is disposed on the water wiping pad, a position of the inserting hole corresponds to a position of the conductive cavity (12), and the inserting hole (13) is used for being passed through by the male head (3).

[0010] Further, the insulating sleeve is in an interference fit with the inserting hole, and the male head body is in a clearance fit with the inserting hole.

40 [0011] Further, a flared structure is disposed on one end of the water wiping pad away from the conductive cavity, and the flared structure is communicated with the inserting hole.

[0012] Further, the flared structure has a trumpet-like shape, and the flared structure includes a large end and a small end that are oppositely disposed. The large end is used for being inserted by the male head, and the small end is connected to the inserting hole.

45 [0013] Further, the water wiping pad is made of rubber material, and the insulating sleeve is made of insulating grease material.

[0014] Compared to the prior art, the waterproof wiring terminal of the present invention has the following advantages: For the waterproof wiring terminal of the present invention, a male head body passes through an insulating sleeve and is fixedly connected to the insulating sleeve, and a water wiping pad is mounted inside a female head body, so that when
50 the male head is inserted into the female head, the male head body and the insulating sleeve enter the water wiping pad one after another, and the water wiping pad produces a pressing force on the male head body to stop water on the male head body outside the water wiping pad and then flow the water to the outside of the insulating sleeve, so as to prevent the water being conducted by the current. Compared to the wiring terminal in the prior art, for the waterproof wiring terminal in the present invention, the water on the male head body is squeezed out of the insulating sleeve due
55 to the use of the insulating sleeve placed on the outside of the male head body and the water wiping pad mounted on the inside of the female head body, so that the water is prevented from causing the risk of current leakage after entering the female head body, thereby facilitating the use and being practical and safe.

[0015] Another object of the present invention is to provide a household appliance with a simple structure, which can

eliminate water on the male head during assembling, prevent water from entering the female head to cause potential leakage risk, thereby facilitating the use, being practical and safe, and being stable and durable.

[0016] To achieve the above purpose, the technical solution of the present invention is implemented as follows.

[0017] A household appliance includes the above-mentioned waterproof wiring terminal.

[0018] Compared to the prior art, the household appliance of the present invention has the following advantages:

The household appliance of the present invention includes a waterproof wiring terminal, with a simple structure, so as to squeeze the water on the male head body to the outside of the insulating sleeve to prevent water from entering the female head body to cause potential current leakage, thereby facilitating the use, being practical and safe and being stable and durable.

[0019] The advantages of the household appliance are the same as the advantages of the above-mentioned waterproof wiring terminal over the prior art, and details are not repeated here.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Aspects of the present invention are best understood from the following detailed description when read with the accompanying figures. The exemplary embodiments of the present invention and the description thereof are used to explain the present invention, and do not constitute improper limitations on the present invention. In the drawings:

Fig. 1 is a structural diagram of a waterproof wiring terminal according to an embodiment of the present invention.

Fig. 2 is a structural diagram of a male head in a waterproof wiring terminal according to an embodiment of the present invention.

Fig. 3 is a structural diagram of a female head in a waterproof wiring terminal according to an embodiment of the present invention.

Fig. 4 is a structural diagram of a water wiping pad in Fig. 3.

List of serial numbers in the figures:

[0021]

1 - Waterproof wiring terminal;	3 - Male head;	4 - Female head;
5 - Male head body;	6 - Insulating sleeve;	7 - Connecting portion;
8 - Pin portion;	9 - Female head body;	10 - Water wiping pad;
11 - Mounting cavity;	12 - conductive cavity;	13 - Inserting hole;
14 - Flared structure;	15 - Large end;	16 - Small end.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] It should be noted that, in the case of no conflicts, the embodiments and features in the embodiments of the present invention can be combined mutually.

[0023] The present invention is described in detail with reference to drawings and with combination of embodiments.

Embodiments

[0024] With reference to Fig. 1, an embodiment of the present invention provides a household appliance (not shown) to facilitate daily life of the users. It has a simple structure, may remove the water contaminated on the male head 3 during assembly, preventing water from entering the female head 4 and causing potential current leakage, so as to facilitate the use and to be practical and safe. The household appliance includes a waterproof wiring terminal 1, and the waterproof wiring terminal 1 is used to achieve accurate positioning of wires and signal wires in the household appliance. In this embodiment, a household appliance is used as an air conditioner as an example for specific description.

[0025] The waterproof wiring terminal 1 includes a male head 3 and a female head 4. The male head 3 is inserted into the female head 4 to achieve assembly, and achieve accurate positioning of wires and signal wires. During the normal use of the air conditioner, after the male head 3 is assembled with the female head 4, external water may not enter; when the air conditioner is maintained and cleaned, the male head 3 and the female head 4 are separated with each other, the male head 3 may accidentally get wet with water, and then if the male head 3 is assembled with the

female head 4 again, the female head 4 will squeeze out the water on the male head 3 to prevent the potential leakage of electricity.

[0026] With reference to Fig. 2, the male head 3 includes a male head body 5 and an insulating sleeve 6. The male head body 5 passes through the insulating sleeve 6, and is fixedly connected to the insulating sleeve 6. The male head body 5 is made of a conductive material, so as to achieve conduction between the male head 3 and the female head 4. The female head 4 squeezes the water on the male head body 5 out of the insulating sleeve 6, and the insulating sleeve 6 is isolated between the water and the male head body 5 to prevent water from contacting the male head body 5 and conducting electricity

[0027] The male head body 5 includes a connecting portion 7 and a pin portion 8. The connecting portion 7 is connected to the pin portion 8, and the insulating sleeve 6 is sleeved outside the connecting portion 7 and is fixedly connected to the connecting portion 7. The pin portion 8 extends from the insulating sleeve 6, and the pin portion 8 is used to be conducted directly with the female head 4. A diameter of one end of the insulating sleeve 6 close to the pin portion 8 is smaller than a diameter of the one end of the insulating sleeve 6 away from the pin portion 8, so as to facilitate the extension of the insulating sleeve 6 into the female head 4.

[0028] In this embodiment, the male head body 5 has a cylindrical shape, but is not limited to this. The male head body 5 may also have a rectangular column shape, and the shape of the male head body 5 is not specifically limited.

[0029] With reference to Fig. 3, the female head 4 includes a female head body 9 and a water wiping pad 10. The water wiping pad 10 is mounted in the female head body 9, and the water wiping pad 10 is used to squeeze the water on the male head body 5 out of the insulating sleeve 6 when the male head 3 is inserted into the female head 4. The female head body 9 is provided inside with a mounting cavity 11 and a conductive cavity 12. The mounting cavity 11 is communicated with the conductive cavity 12, the water wiping pad 10 is mounted in the mounting cavity 11, and the male head 3 passes through the water wiping pad 10 and extends into the conductive cavity 12. The water on the male head body 5 is squeezed out of the insulating sleeve 6 under the action of the water wiping pad 10 to prevent water from entering the mounting cavity 11 and causing a potential safety hazard; the male head body 5 extends into the conductive cavity 12 to achieve electrical conductivity.

[0030] An inserting hole 13 is disposed on the water wiping pad 10, and a position of the inserting hole 13 corresponds to a position of the conductive cavity 12. The inserting hole 13 is used for the male head 3 to pass through. The male head 3 is communicated to the conductive cavity 12 after passing through the inserting hole 13. The insulating sleeve 6 is in an interference fit with the inserting hole 13, and the male head body 5 is in a clearance fit with the inserting hole 13, so as to facilitate the cooperation between the male head 3 and the female head 4.

[0031] With reference to Fig. 4, in this embodiment, a flared structure 14 is disposed on one end of the water wiping pad 10 away from the conductive cavity 12, and the flared structure 14 is communicated with the inserting hole 13. The flared structure 14 has a trumpet-like shape, and the flared structure 14 includes a large end 15 and a small end 16 that are oppositely disposed; the large end 15 is used for the male head 3 to insert into, and the small end 16 is connected to the inserting hole 13, so as to facilitate the insertion of the male head 3 and prevent the male head 3 from being deformed and bent during insertion.

[0032] In this embodiment, the water wiping pad 10 is made of a rubber material, and the insulating sleeve 6 is made of an insulating grease material, which is not limited to this, and the materials for manufacturing the water wiping pad 10 and the insulating sleeve 6 are not specifically limited.

[0033] During the assembly of the male head 3 and the female head 4, first, the male head body 5 passes through the inserting hole 13 of the water wiping pad 10, wherein since the male head body 5 is in a clearance fit with the inserting hole 13, the water on the male head body 5 is stopped by the water wiping pad 10 outside the inserting hole 13 and may not enter the inserting hole 13 with the male head body 5, at which time part of the water will drip from the male head body 5; then, the insulating sleeve 6 passes through inserting hole 13 of water wiping pad 10, wherein since the insulating sleeve 6 is in an interference fit with the inserting hole 13, part of the water outside the inserting hole 13 will be squeezed out of the insulating sleeve 6 by the water wiping pad 10, and may not enter the insertion hole 13 with the water wiping pad 10, so as to cause current leakage.

[0034] For the waterproof wiring terminal 1 of the embodiments of the present invention, a male head body 5 passes through an insulating sleeve 6 and is fixedly connected to the insulating sleeve 6, and a water wiping pad 10 is mounted inside a female head body 9, so that when the male head 3 is inserted into the female head 4, the male head body 5 and the insulating sleeve 6 enter the water wiping pad 10 one after another, and the water wiping pad 10 produces a pressing force on the male head body 5 to stop water on the male head body 5 outside the water wiping pad 10 and then flow the water to the outside of the insulating sleeve 6, so as to prevent the water being conducted by the current. Compared to the wiring terminal in the prior art, for the waterproof wiring terminal 1 in the present invention, the water on the male head body is squeezed out of the insulating sleeve due to the use of the insulating sleeve 6 placed on the outside of the male head body 5 and the water wiping pad 10 mounted on the inside of the female head body 9, so that the water on the male head body 5 is squeezed out of the insulating sleeve 6 to prevent the water from causing the risk of current leakage after entering the female head body 9, thereby facilitating the use and being practical and safe.

[0035] The above are only the preferred embodiments of the present invention and are not intended to limit the present invention. Any modification, equivalent replacement, or improvement made within the spirit of the present invention shall be included in the protection scope of the present invention.

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Claims

1. A waterproof wiring terminal, **characterized in that**, the waterproof wiring terminal comprises a male head (3) and a female head (4), the male head (3) comprising a male head body (5) and an insulating sleeve (6), the male head body (5) passing through the insulating sleeve (6) and being fixedly connected to the insulating sleeve (6), the female head (4) comprising a female head body (9) and a water wiping pad (10), the water wiping pad (10) being mounted in the female head body (9), the water wiping pad (10) being used to squeeze water on the male head body (5) out of the insulating sleeve (6) when the male head (3) is inserted into the female head (4).
2. The waterproof wiring terminal according to claim 1, wherein the male head body (5) has a cylindrical shape, and the male head body (5) comprises a connecting portion (7) and a pin portion (8); the connecting portion (7) is connected to the pin portion (8), and the insulating sleeve (6) is sleeved outside the connecting portion (7) and is fixedly connected to the connecting portion (7).
3. The waterproof wiring terminal according to claim 2, wherein one end of the insulating sleeve (6) adjacent to the pin portion (8) has a diameter smaller than a diameter of one end of the insulating sleeve (6) away from the pin portion (8).
4. The waterproof wiring terminal according to claim 1, wherein a mounting cavity (11) and a conductive cavity (12) are disposed on the female head body (9), and the mounting cavity (11) is communicated with the conductive cavity (12); and the water wiping pad (10) is mounted in the mounting cavity (11), and the male head (3) passes through the water wiping pad (10) and extends into the conductive cavity (12).
5. The waterproof wiring terminal according to claim 4, wherein an inserting hole (13) is disposed on the water wiping pad (10), a position of the inserting hole (13) corresponds to a position of the conductive cavity (12), and the inserting hole (13) is used for being passed through by the male head (3).
6. The waterproof wiring terminal according to claim 5, wherein the insulating sleeve (6) is in an interference fit with the inserting hole (13), and the male head body (5) is in a clearance fit with the inserting hole (13).
7. The waterproof wiring terminal according to claim 5, wherein a flared structure (14) is disposed on one end of the water wiping pad (10) away from the conductive cavity (12), and the flared structure (14) is communicated with the inserting hole (13).
8. The waterproof wiring terminal according to claim 7, wherein the flared structure (14) has a trumpet-like shape, and the flared structure (14) comprises a large end (15) and a small end (16) that are oppositely disposed; and the large end (15) is used for the male head (3) to insert into, and the small end (16) is connected to the inserting hole (13).
9. The waterproof wiring terminal according to claim 1, wherein the water wiping pad (10) is made of rubber material, and the insulating sleeve (6) is made of insulating grease material.
10. A household appliance, **characterized in that**, the household appliance comprises the waterproof wiring terminal according to any one of claims 1 to 9.

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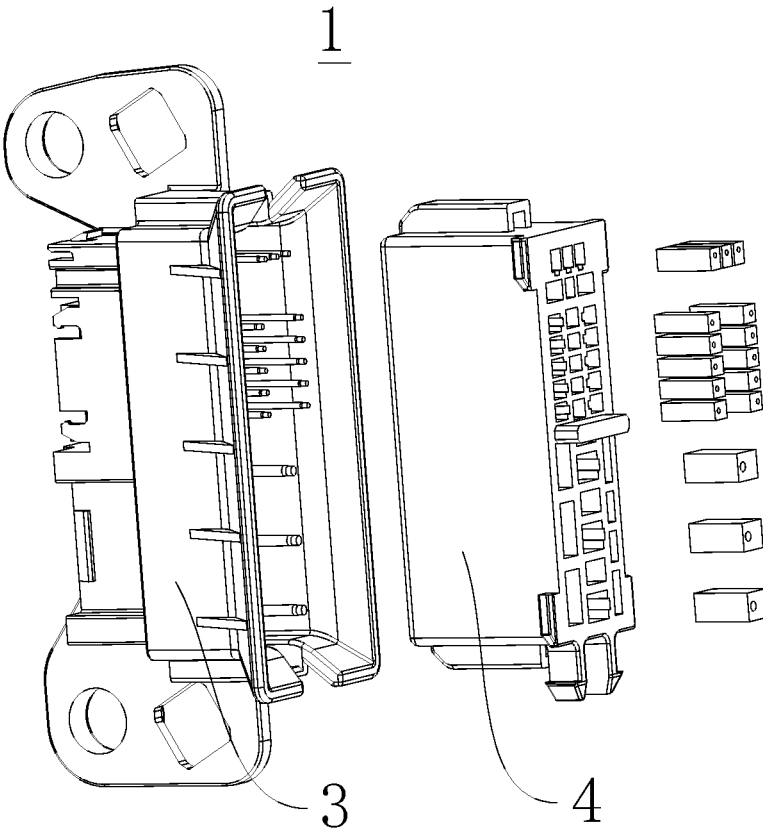


Fig. 1

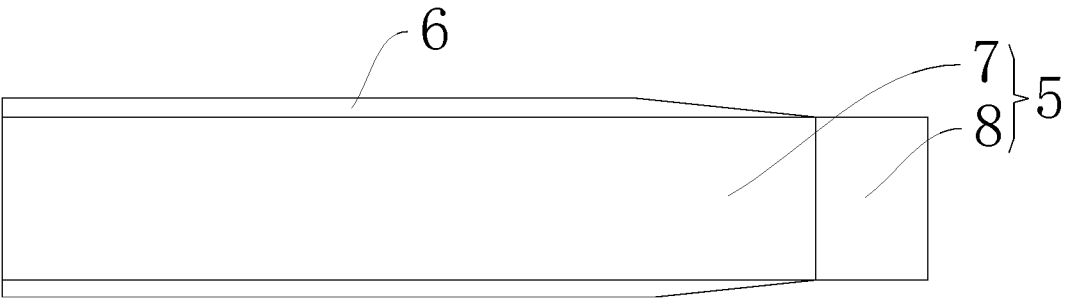


Fig. 2

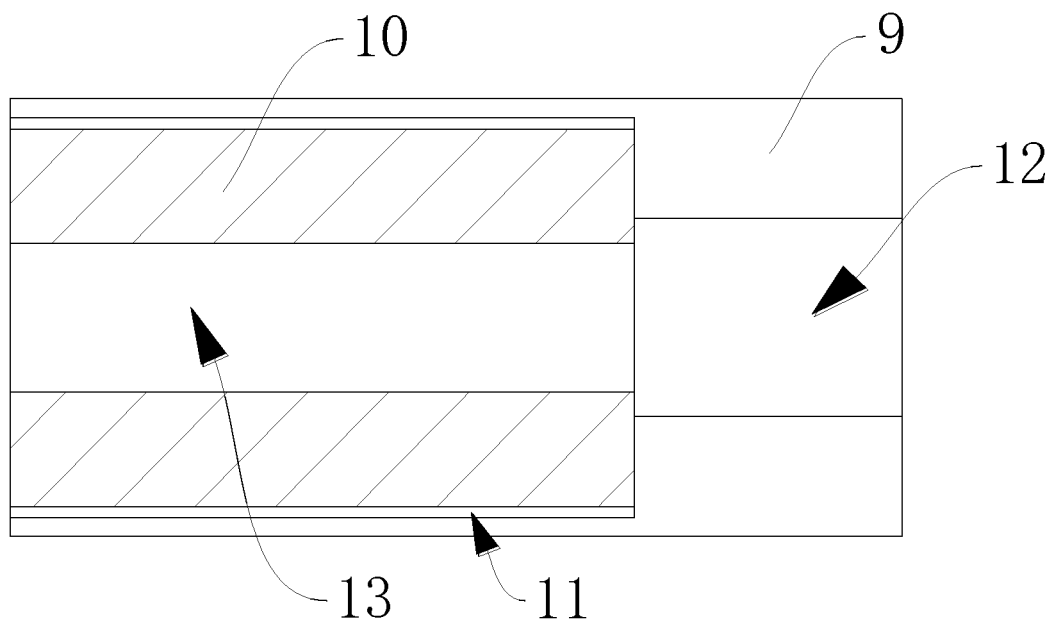


Fig. 3

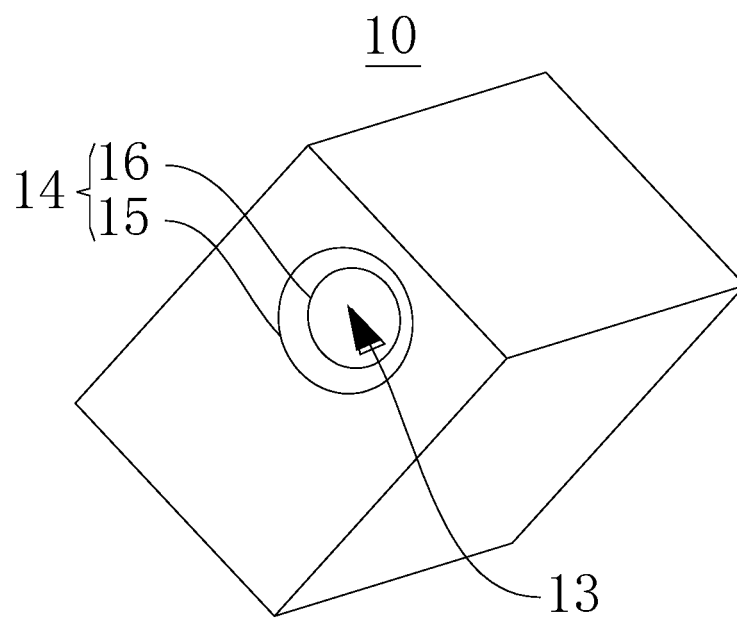


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/125503

A. CLASSIFICATION OF SUBJECT MATTER

H01R 13/52(2006.01)i; H01R 24/00(2011.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, CNKI, WPI, EPODOC: 防水, 接线端子, 连接端子, 绝缘套, 插头, 插针, waterproof, connect+, terminal, insulat+, bush, sleeve, plug, pin

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 207896341 U (AUX AIR CONDITIONING CO., LTD.) 21 September 2018 (2018-09-21) claims 1-10	1-10
A	CN 107134684 A (SHANDONG YOUAN NEW ENERGY AUTO PARTS CO., LTD.) 05 September 2017 (2017-09-05) description, paragraphs [0005]-[0024], and figures 1-3	1-10
A	US 9899764 B1 (LIN, YUNGPING) 20 February 2018 (2018-02-20) entire document	1-10
A	CN 206893942 U (SHENZHEN WOER NEW ENERGY ELECTRICAL TECHNOLOGY CO., LTD. ET AL.) 16 January 2018 (2018-01-16) entire document	1-10
A	CN 101997230 A (K.S. TERMINALS INC.) 30 March 2011 (2011-03-30) entire document	1-10
A	CN 106410509 A (SHENZHEN TONGMAO ELECTRONIC CO., LTD.) 15 February 2017 (2017-02-15) entire document	1-10

☒ Further documents are listed in the continuation of Box C.
☒ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

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International application No.
PCT/CN2018/125503

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 103390829 A (QINGDAO FEITE ELECTRICAL TECHNOLOGY CO., LTD.) 13 November 2013 (2013-11-13) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2018/125503

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 207896341 U	21 September 2018	None	
CN 107134684 A	05 September 2017	None	
US 9899764 B1	20 February 2018	None	
CN 206893942 U	16 January 2018	None	
CN 101997230 A	30 March 2011	CN 101997230 B	29 August 2012
CN 106410509 A	15 February 2017	None	
CN 103390829 A	13 November 2013	None	

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