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(54) **POWER SUPPLIER**
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Description

Technical Field

[0001] Embodiments of the present disclosure generally relate to the field of lighting, and more particularly, to a power supplier.

Document EP 2 334 155 A1 discloses a solid state lighting system. Document WO 2014/073913 A1 discloses a lighting apparatus having a communication module. Document US 2016/0233605 A1 discloses a power control system. Document WO 2014/101824 A1 discloses a smart home system having a discrete circuit for an authentication and system management method. Document EP 3 125 371 A1 discloses a connector and a connector assembly. Document US 2018/0054907 A1 discloses a multifunctional electronic product combining structure. Document CN 105789962 A discloses a modular extension socket with lock.

Background

[0002] This section introduces aspects that may facilitate better understanding of the present disclosure. Accordingly, the statements of this section are to be read in this light and are not to be understood as admissions about what is in the prior art or what is not in the prior art.

[0003] Nowadays, smart appliances are becoming more and more popular. The use of wireless communication is also becoming more common. Therefore, in the lighting industry, some lighting power sources add wireless communication functionality. The wireless communication may be Bluetooth communication, near field communication (NFC), etc.

[0004] Fig. 1 is a diagram of a power supplier with wireless communication module in related art. As shown in Fig. 1, a wireless communication module 10 and multiple terminal modules 20 are placed on a substrate 30. The wireless communication module 10 is made into an independent component and placed on the edge of the substrate 30.

Summary

[0005] Inventors of this disclosure found the following limitation in related art: the wireless communication module 10 is easily tilted to one side. When it tilts, it will affect the wireless communication function, and when it tilts outward, it will be easily hit by a shell of the power supplier.

[0006] The invention is defined by a power supplier in accordance with claim 1. Further preferred embodiments are defined in the dependent claims. In general, embodiments of the present disclosure provide a power supplier. In the embodiments, a wireless communication module is spliced with a terminal module. Therefore, the wireless communication module of the power supplier will be more solid and will not be easy to tilt.

[0007] In a first aspect, there is provided a power supplier, which includes: a substrate; at least one terminal module, configured to be placed on the substrate; and a wireless communication module, configured to be spliced with the terminal module when the terminal module and the wireless communication module are placed on the substrate. The terminal module comprises a connecting hole, which is configured to be connected to an electrical device and supply power to the electrical device.

[0008] In an embodiment, the wireless communication module has the same size as the terminal module.

[0009] In an embodiment, the terminal module and the wireless communication module are spliced together by using a first connecting structure.

[0010] In an embodiment, the first connecting structure includes: a first connecting part, configured to be placed on a first surface of the terminal module; a second connecting part, configured to be placed on a first surface of the wireless communication module, the first connecting part is any one of a first convex part and a first receiving hole, the second connecting part is the other one of the first convex part and the first receiving hole, the first convex part is received in the first receiving hole when the terminal module and the wireless communication module are spliced together.

[0011] In an embodiment, two adjacent terminal modules are spliced together by using a second connecting structure.

[0012] In an embodiment, the second connecting structure includes: a third connecting part, configured to be placed on a first surface of the terminal module; a fourth connecting part, configured to be placed on a second surface of the terminal module, the second surface is opposite the first surface, the third connecting part is any one of a second convex part and a second receiving hole, the fourth connecting part is the other one of the second convex part and the second receiving hole, the second convex part is received in the second receiving hole when two adjacent terminal modules are spliced together.

[0013] In an embodiment, the wireless communication module includes an antenna.

[0014] In an embodiment, the wireless communication module further includes a wireless communication controller which is integrated with the antenna.

[0015] In an embodiment, the terminal module includes a connecting pin,

[0016] the terminal module is placed on the substrate via the connecting pin.

[0017] The terminal module includes a connecting hole, which is used to connect to an electrical device and supply power to the electrical device.

[0018] According to various embodiments of the present disclosure, a wireless communication module is spliced with a terminal module. Therefore, the wireless communication module of the power supplier will be more solid and will not be easy to tilt.

Brief Description of the Drawings

[0019] The above and other aspects, features, and benefits of various embodiments of the disclosure will become more fully apparent, by way of example, from the following detailed description with reference to the accompanying drawings, in which like reference numerals or letters are used to designate like or equivalent elements. The drawings are illustrated for facilitating better understanding of the embodiments of the disclosure and not necessarily drawn to scale, in which:

Fig. 1 is a diagram of a power supplier with wireless communication module in related art;

Fig. 2 is a diagram of a power supplier in accordance with an embodiment of the present disclosure;

Fig. 3 is a diagram of the terminal module and the wireless communication module in accordance with an embodiment of the present disclosure.

Detailed Description

[0020] The present disclosure will now be discussed with reference to several example embodiments. It should be understood that these embodiments are discussed only for the purpose of enabling those skilled persons in the art to better understand and thus implement the present disclosure, rather than suggesting any limitations on the scope of the present disclosure.

[0021] As used herein, the terms "first" and "second" refer to different elements. The singular forms "a" and "an" are intended to include the plural forms as well, unless the context clearly indicates otherwise. The terms "comprises," "comprising," "has," "having," "includes" and/or "including" as used herein, specify the presence of stated features, elements, and/or components and the like, but do not preclude the presence or addition of one or more other features, elements, components and/or combinations thereof. The term "based on" is to be read as "based at least in part on." The term "one embodiment" and "an embodiment" are to be read as "at least one embodiment." The term "another embodiment" is to be read as "at least one other embodiment." Other definitions, explicit and implicit, may be included below.

First aspect of embodiments

[0022] A power supplier is provided in a first embodiment.

[0023] Fig. 2 is a diagram of a power supplier in accordance with an embodiment of the present disclosure. As shown in Fig. 2, a power supplier 1 includes a substrate 11, at least one terminal module 12, and a wireless communication module 13.

[0024] In the embodiment, the terminal module 12 is placed on the substrate. The wireless communication

module 13 is spliced with the terminal module 12. Therefore, the wireless communication module of the power supplier will be more solid and will not be easy to tilt.

[0025] As shown in Fig. 2, the wireless communication module 13 has the same size as the terminal module 12.

[0026] In the embodiment, the terminal module 12 and the wireless communication module 13 are spliced together by using a first connecting structure.

[0027] Fig. 3 is a diagram of the terminal module and the wireless communication module in accordance with an embodiment of the present disclosure.

[0028] As shown in Fig. 3, the terminal module 12 includes a first surface S11. A first connecting part 121 is placed on the first surface S11. The wireless communication module 13 includes a first surface S21. A second connecting part 131 is placed on the first surface S21.

[0029] In the embodiment, the first connecting structure 14 includes the first connecting part 121 and the second connecting part 131.

[0030] In the embodiment, the first connecting part 121 may be any one of a first convex part and a first receiving hole, and the second connecting part 131 is the other one of the first convex part and the first receiving hole. The first convex part may be received in the first receiving hole when the terminal module 12 and the wireless communication module 13 are spliced together.

[0031] In the embodiment, the number of first connecting part 121 may be at least one, and the number of the second connecting part 131 may be at least one.

[0032] In the embodiment, function of the first connecting structure 14 is realized by mechanical connection of the first connecting part 121 and the second connecting part 131. However, the embodiment will not be limited thereto, for example, the first connecting structure 14 may include magnetic parts, thus function of the first connecting structure 14 may be realized by magnetic attraction between the magnetic parts.

[0033] In the embodiment, two adjacent terminal modules 12 may be spliced together by using a second connecting structure. Therefore, the terminal modules 12 of the power supplier will be more solid and will not be easy to tilt.

[0034] As shown in Fig. 3 a third connecting part 122 is placed on the first surface S11 the terminal module 12. The terminal module 12 further includes a second surface S12. A fourth connecting part 123 is placed on the second surface S12.

[0035] In the embodiment, the second connecting structure 15 includes the third connecting part 122 and the fourth connecting part 123.

[0036] In the embodiment, the third connecting part 122 may be any one of a second convex part and a second receiving hole, and the fourth connecting part 123 is the other one of the second convex part and the second receiving hole. The second convex part may be received in the second receiving hole when two adjacent terminal modules 12 are spliced together.

[0037] In the embodiment, the number of third connect-

ing part 122 may be at least one, and the number of the fourth connecting part 123 may be at least one.

[0038] In one embodiment, the location and size of the third connecting part 122 may be different from the location and size of the first connecting part 121.

[0039] In another embodiment, the location and size of the third connecting part 122 may be the same as the location and size of the first connecting part 121, then, the first connecting part 121 may realize the function of the third connecting part 122 to connect with the fourth connecting part 123.

[0040] In the embodiment, function of the second connecting structure 15 is realized by mechanical connection of the third connecting part 122 and the fourth connecting part 123. However, the embodiment will not be limited thereto, for example, the second connecting structure 15 may include magnetic parts, thus function of the second connecting structure 15 may be realized by magnetic attraction between the magnetic parts.

[0041] As shown in Fig. 3, the first surface S21 of the wireless communication module 13 may include a receiving part 131a which may receive the third connecting part 122 on the first surface S11 of the terminal module 12.

[0042] The second surface S12 of the terminal module 12 may include a receiving part 123a which may receive the first connecting part 121 on the first surface S11 of the adjacent terminal module 12.

[0043] In the embodiment, as shown in Fig. 3, the terminal module 12 may further include a connecting pin 124. The terminal module 12 may be placed on the substrate 11 via the connecting pin 124. The connecting pin 124 may provide mechanical and electrical connection between the terminal module 12 and the substrate 11.

[0044] In the embodiment, as shown in Fig. 3, the terminal module 12 may further include a connecting hole 125. The connecting hole 125 may be used to connect to an electrical device and supply power to the electrical device. The electrical device may be a lighting device, for example, a LED (Light Emitting Diode) device.

[0045] In the embodiment, the wireless communication module 13 may communicate with other devices via wireless signals. For example, the wireless communication module 13 may be near field communication (NFC) module.

[0046] In the embodiment, the wireless communication module 13 may include an antenna, which is used to receive and transmit wireless signals.

[0047] In the embodiment, the wireless communication module 13 may further include a wireless communication controller which is integrated with the antenna. The wireless communication controller may perform digital or analogue process on the received and/or to be transmitted wireless signals.

[0048] As can be seen from the above embodiments, the wireless communication module 13 is spliced with the terminal module 12. Therefore, the wireless communication module of the power supplier will be more solid and will not be easy to tilt. The use of the wireless com-

munication module 13 will be more flexible, as the wireless communication module 13 can be easily assembled or not assembled with the terminal module 12. In some cases, the wireless communication module 13 may be spliced with the terminal module 12 which is located outside of an iron shell of the power supplier, thus the interference of other components and the iron shell on wireless communication function will be prevented.

[0049] Further, while operations are depicted in a particular order, this should not be understood as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results. In certain circumstances, multitasking and parallel processing may be advantageous. Likewise, while several specific implementation details are contained in the above discussions, these should not be construed as limitations on the scope of the present disclosure, but rather as descriptions of features that may be specific to particular embodiments. The invention is defined by the appended claims.

[0050] Although the present disclosure has been described in language specific to structural features and/or methodological acts, it is to be understood that the present disclosure defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

Claims

1. A power supplier (1), comprising:

a substrate (11);
at least one terminal module (12), configured to be placed on the substrate (11), wherein the at least one terminal module (12) comprises a connecting hole (125) configured to be connected to an electrical device to thereby supply power to the electrical device,

characterized in that the power supplier (1) further comprises:

a wireless communication module (13), configured to be spliced with the at least one terminal module (12) when the at least one terminal module (12) and the wireless communication module (13) are placed on the substrate (11).

2. The power supplier (1) according to claim 1, wherein the wireless communication module (13) has the same size as the at least one terminal module (12).

3. The power supplier (1) according to claim 1, wherein the at least one terminal module (12) and the wireless communication module (13) are configured to be spliced together by a first connecting structure (14).

4. The power supplier (1) according to claim 3, wherein the first connecting structure (14) comprises:

a first connecting part (121), configured to be placed on a first surface (S11) of the at least one terminal module (12);
 a second connecting part (131), configured to be placed on a first surface (S21) of the wireless communication module (13),
 the first connecting part (121) is any one of a first convex part and a first receiving hole,
 the second connecting part (131) is the other one of the first convex part and the first receiving hole,
 the first convex part is configured to be received in the first receiving hole when the at least one terminal module (12) and the wireless communication module (13) are spliced together.

5. The power supplier (1) according to claim 1, wherein the at least one terminal module (12) comprises two adjacent terminal modules (12) configured to be spliced together by a second connecting structure (15).

6. The power supplier (1) according to claim 5, wherein, for each terminal module of the two adjacent terminal modules (12), the second connecting structure (15) comprises:

a third connecting part (122), configured to be placed on a first surface (S11) of the terminal module (12);
 a fourth connecting part (123), configured to be placed on a second surface (S12) of the terminal module (12),
 the second surface (S12) is opposite the first surface (S11),
 the third connecting part (122) is any one of a second convex part and a second receiving hole,
 the fourth connecting part (123) is the other one of the second convex part and the second receiving hole,
 wherein the second convex part of a first module of the two adjacent modules (12) is configured to be received in the second receiving hole a second module of the two adjacent modules (12) when the two adjacent terminal modules (12) are spliced together.

7. The power supplier (1) according to claim 1, wherein the wireless communication module (13) comprises an antenna.

8. The power supplier (1) according to claim 7, wherein the wireless communication module (13) further

comprises a wireless communication controller which is integrated with the antenna.

9. The power supplier (1) according to claim 1, wherein

the at least one terminal module (12) comprises a connecting pin (124),
 the at least one terminal module (12) is configured to be placed on the substrate (11) via the connecting pin (124).

Patentansprüche

1. Stromversorgung (1), umfassend:

ein Substrat (11);
 mindestens ein Anschlussmodul (12), das konfiguriert ist, um auf dem Substrat (11) platziert zu werden, wobei das mindestens eine Anschlussmodul (12) ein Verbindungsloch (125) umfasst, das konfiguriert ist, um mit einer elektrischen Vorrichtung verbunden zu werden, um dadurch die elektrische Vorrichtung mit Strom zu versorgen,

dadurch gekennzeichnet, dass die Stromversorgung (1) ferner umfasst:

ein Drahtloskommunikationsmodul (13), das konfiguriert ist, um mit dem mindestens einen Anschlussmodul (12) gespleißt zu werden, wenn das mindestens eine Anschlussmodul (12) und das Drahtloskommunikationsmodul (13) auf dem Substrat (11) platziert werden.

2. Stromversorgung (1) nach Anspruch 1, wobei das Drahtloskommunikationsmodul (13) die gleiche Größe wie das mindestens eine Anschlussmodul (12) aufweist.

3. Stromversorgung (1) nach Anspruch 1, wobei das mindestens eine Anschlussmodul (12) und das Drahtloskommunikationsmodul (13) konfiguriert sind, um durch eine erste Verbindungsstruktur (14) zusammengespleißt zu werden.

4. Stromversorgung (1) nach Anspruch 3, wobei die erste Verbindungsstruktur (14) umfasst:

ein erstes Verbindungsteil (121), das konfiguriert ist, um auf einer ersten Oberfläche (S11) des mindestens einen Anschlussmoduls (12) platziert zu werden;

ein zweites Verbindungsteil (131), das konfiguriert ist, um auf einer ersten Oberfläche (S21) des Drahtloskommunikationsmoduls (13) platziert zu werden,

wobei das erste Verbindungsteil (121) ein beliebiges von einem ersten konvexen Teil und ei-

- nem ersten Aufnahmeloch ist,
wobei das zweite Verbindungsteil (131) das andere eine von dem ersten konvexen Teil und dem ersten Aufnahmeloch ist,
wobei das erste konvexe Teil konfiguriert ist, um in dem ersten Aufnahmeloch aufgenommen zu werden, wenn das mindestens eine Anschlussmodul (12) und das Drahtloskommunikationsmodul (13) zusammengespießt werden.
5. Stromversorger (1) nach Anspruch 1, wobei das mindestens eine Anschlussmodul (12) zwei angrenzende Anschlussmodule (12) umfasst, die konfiguriert sind, um durch eine zweite Verbindungsstruktur (15) zusammengespießt zu werden.
6. Stromversorger (1) nach Anspruch 5, wobei die zweite Verbindungsstruktur (15), für jedes Anschlussmodul der zwei angrenzenden Anschlussmodule (12), umfasst:
- ein drittes Verbindungsteil (122), das konfiguriert ist, um auf einer ersten Oberfläche (S11) des Anschlussmoduls (12) platziert zu werden;
ein viertes Verbindungsteil (123), das konfiguriert ist, um auf einer zweiten Oberfläche (S12) des Anschlussmoduls (12) platziert zu werden, wobei die zweite Oberfläche (S12) der ersten Oberfläche (S11) gegenüberliegt,
wobei das dritte Verbindungsteil (122) ein beliebiges von einem zweiten konvexen Teil und einem zweiten Aufnahmeloch ist,
wobei das vierte Verbindungsteil (123) das andere eine von dem zweiten konvexen Teil und dem zweiten Aufnahmeloch ist,
wobei das zweite konvexe Teil eines ersten Moduls der zwei angrenzenden Module (12) konfiguriert ist, um in dem zweiten Aufnahmeloch eines zweiten Moduls der zwei angrenzenden Module (12) aufgenommen zu werden, wenn die zwei angrenzenden Anschlussmodule (12) zusammengespießt werden.
7. Stromversorgung (1) nach Anspruch 1, wobei das Drahtloskommunikationsmodul (13) eine Antenne umfasst.
8. Stromversorgung (1) nach Anspruch 7, wobei das Drahtloskommunikationsmodul (13) ferner eine Drahtloskommunikationssteuerung, die in die Antenne integriert ist, umfasst.
9. Stromversorgung (1) nach Anspruch 1, wobei das mindestens eine Anschlussmodul (12) einen Verbindungsstift (124) umfasst, das mindestens eine Anschlussmodul (12) konfiguriert ist, um über den Verbindungsstift (124)

auf dem Substrat (11) platziert zu werden.

Revendications

1. Dispositif d'alimentation électrique (1), comprenant :
un substrat (11) ;
au moins un module de borne (12), conçu pour être placé sur le substrat (11), dans lequel l'au moins un module de borne (12) comprend un trou de connexion (125) conçu pour être connecté à un dispositif électrique pour ainsi fournir de l'énergie au dispositif électrique,
caractérisé en ce que le dispositif d'alimentation électrique (1) comprend en outre :
un module de communication sans fil (13), conçu pour être assemblé à l'au moins un module de borne (12) lorsque l'au moins un module de borne (12) et le module de communication sans fil (13) sont placés sur le substrat (11).
2. Dispositif d'alimentation électrique (1) selon la revendication 1, dans lequel le module de communication sans fil (13) a la même taille que l'au moins un module de borne (12).
3. Dispositif d'alimentation électrique (1) selon la revendication 1, dans lequel l'au moins un module de borne (12) et le module de communication sans fil (13) sont conçus pour être assemblés par une première structure de liaison (14).
4. Dispositif d'alimentation électrique (1) selon la revendication 3, dans lequel la première structure de liaison (14) comprend :
une première partie de liaison (121), conçue pour être placée sur une première surface (S11) de l'au moins un module de borne (12) ;
une deuxième partie de liaison (131), conçue pour être placée sur une première surface (S21) du module de communication sans fil (13),
la première partie de liaison (121) est l'un quelconque parmi une première partie convexe et un premier trou de réception,
la deuxième partie de liaison (131) est l'autre parmi la première partie convexe et le premier trou de réception,
la première partie convexe est conçue pour être reçue dans le premier trou de réception lorsque l'au moins un module de borne (12) et le module de communication sans fil (13) sont assemblés.
5. Dispositif d'alimentation électrique (1) selon la revendication 1, dans lequel l'au moins un module de borne (12) comprend deux modules de borne adja-

cents (12) conçus pour être assemblés par une seconde structure de liaison (15).

6. Dispositif d'alimentation électrique (1) selon la revendication 5, dans lequel, pour chaque module de borne des deux modules de borne adjacents (12), la seconde structure de liaison (15) comprend :

une troisième partie de liaison (122), conçue pour être placée sur une première surface (S11) du module de borne (12) ;
 une quatrième partie de liaison (123), conçue pour être placée sur une seconde surface (S12) du module de borne (12),
 la seconde surface (S12) est opposée à la première surface (S11),
 la troisième partie de liaison (122) est l'un quelconque parmi une seconde partie convexe et un second trou de réception,
 la quatrième partie de liaison (123) est l'autre parmi la seconde partie convexe et le second trou de réception,
 dans lequel la seconde partie convexe d'un premier module des deux modules adjacents (12) est conçue pour être reçue dans le second trou de réception d'un second module des deux modules adjacents (12) lorsque les deux modules de borne adjacents (12) sont assemblés.

7. Dispositif d'alimentation électrique (1) selon la revendication 1, dans lequel le module de communication sans fil (13) comprend une antenne.
8. Dispositif d'alimentation électrique (1) selon la revendication 7, dans lequel le module de communication sans fil (13) comprend en outre un dispositif de commande de communication sans fil qui est intégré à l'antenne.
9. Dispositif d'alimentation électrique (1) selon la revendication 1, dans lequel

l'au moins un module de borne (12) comprend une broche de liaison (124),
 l'au moins un module de borne (12) est conçu pour être placé sur le substrat (11) par l'intermédiaire de la broche de liaison (124).

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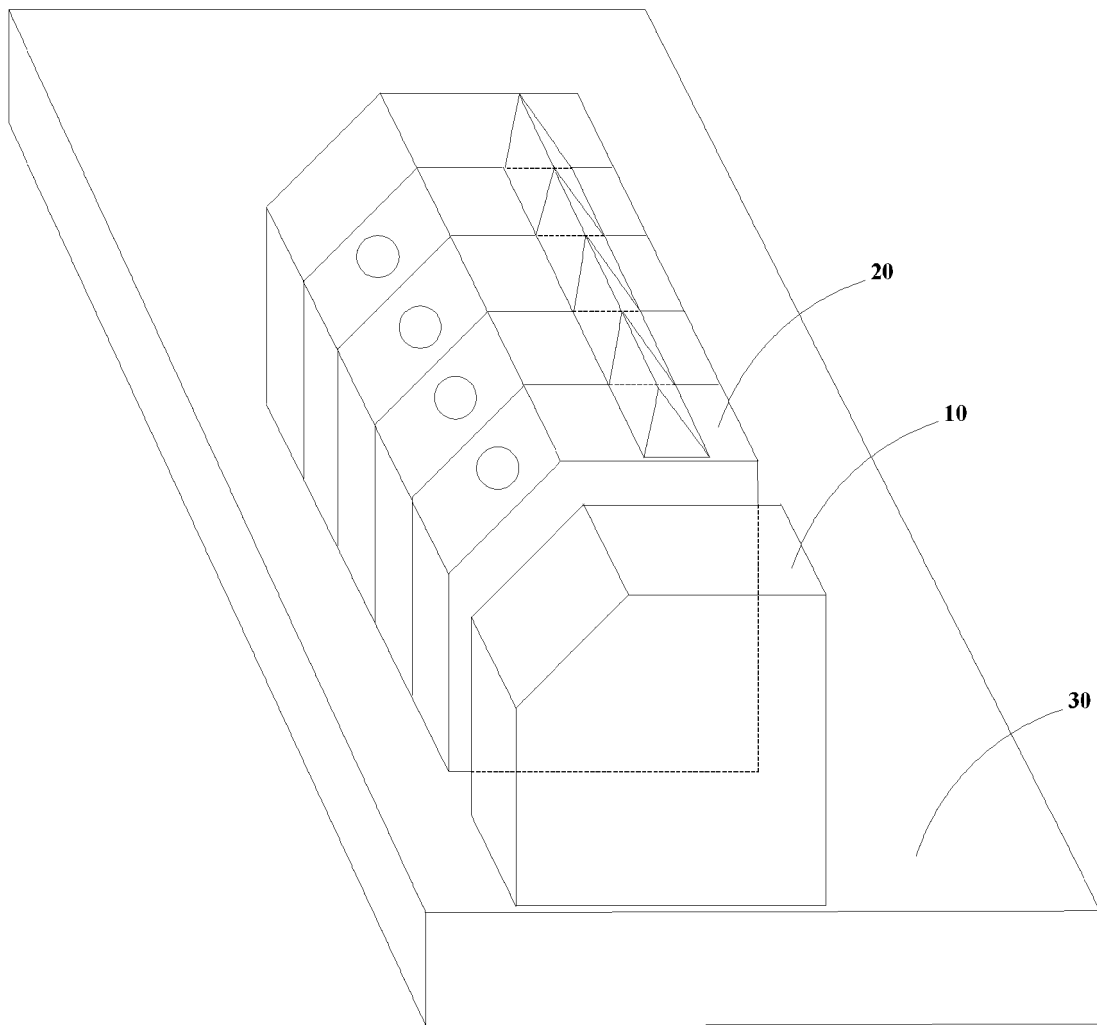


Fig. 1

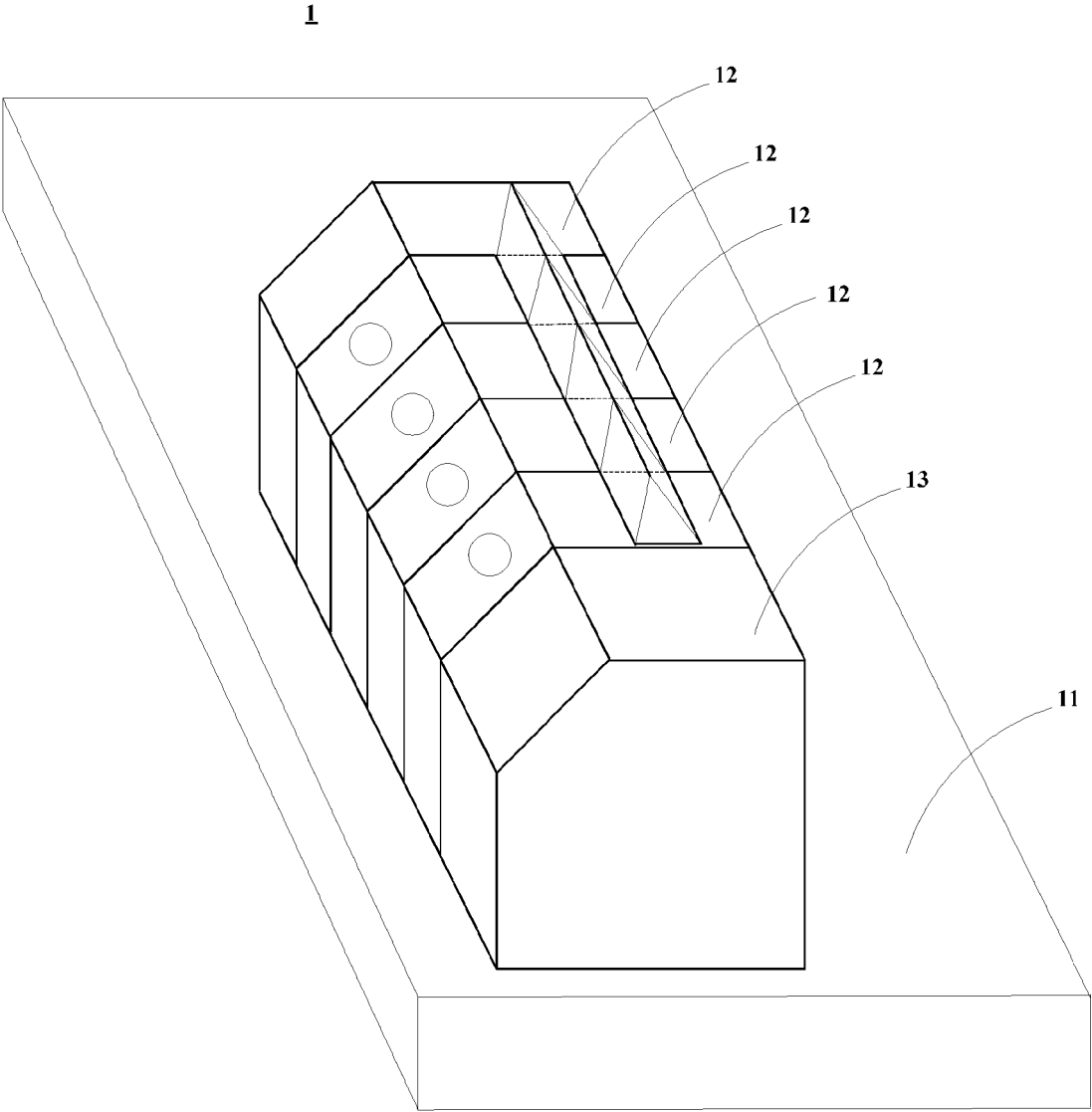


Fig. 2

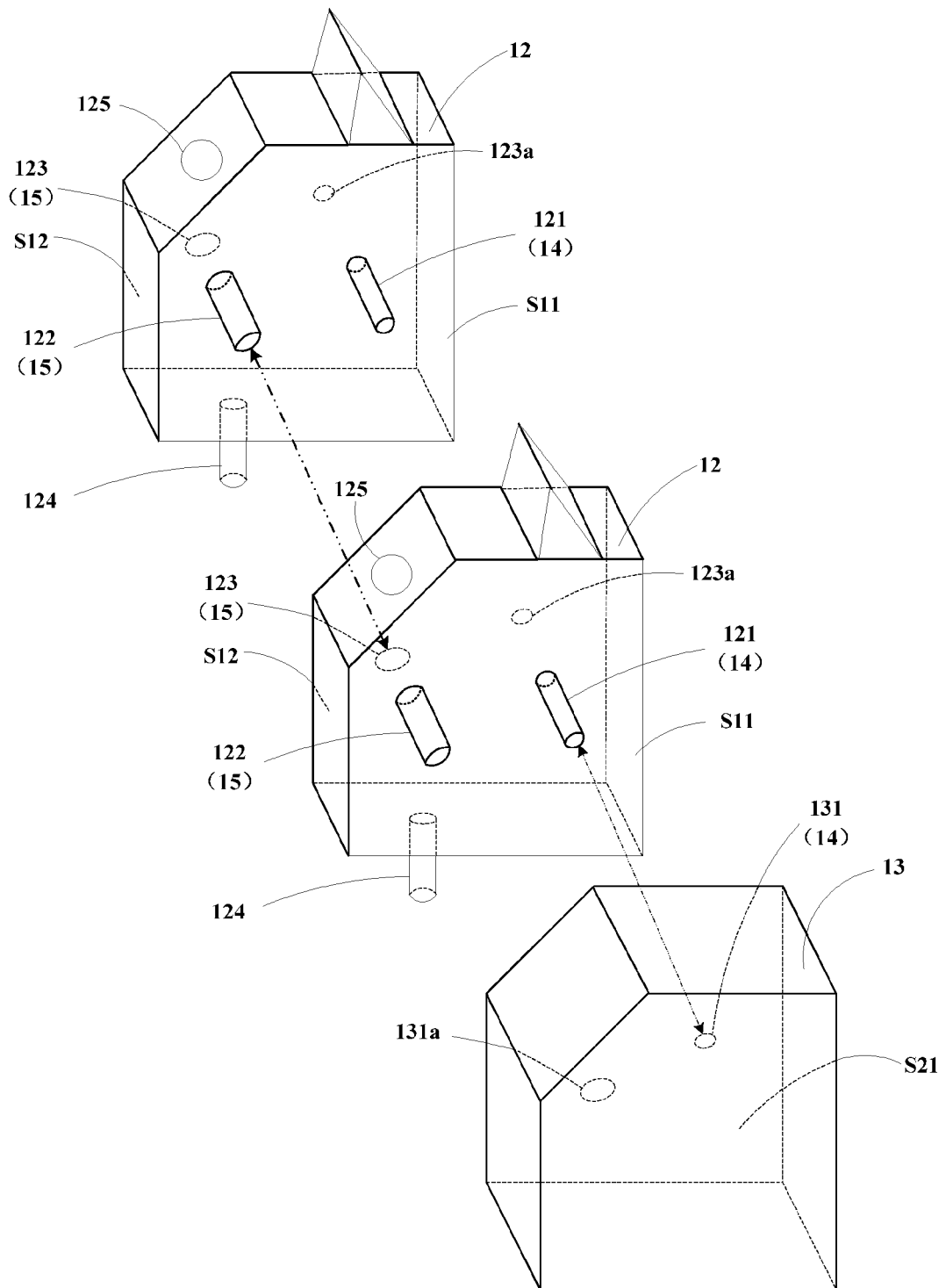


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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