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(54) Title: ADAPTER

(57) Abstract: An adapter, comprising a base (1), an upper cover (2) that is disposed on the base (1) and that is used for covering the base (1), a control board disposed in the base (1), a connector (4) used for connecting to an external electronic device, a conductor (5) that connects the adapter (4) to the control board, and a plurality of universal serial buses separately electrically connected to the control board; the connector (4) comprises a first plug (41) connected to the conductor (5), a second plug (42) connected to the conductor (5) and a third plug (43) connected to the conductor (5).

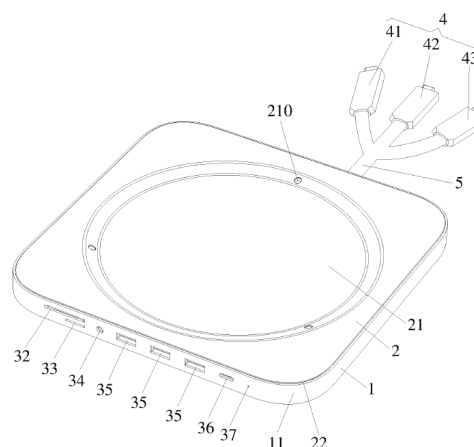


Figure 1

Specification

Invention Title: ADAPTER

FIELD OF THE INVENTION

5 [0001] This solution is applicable to the field of electronic device technology, and more specifically, relates to an adapter.

STATE OF THE ART

[0002] An adapter is a port conversion device that can be an independent hardware port device that
10 allows hardware or electronic ports to be connected to other hardware or electronic ports, enabling signal transfer between electronic devices.

SUMMARY OF THE INVENTION

Technical problem

15 [0003] Currently, when connecting an adapter to an external electronic device, the connection is typically established by inserting an adapter head on the adapter into a port of the electronic device. However, the type and quantity of the adapter heads of the adapter are often designed to be single, which results in the connector only being able to connect to a specific port on the electronic device, making adapters have significant limitations in use and poor adaptability.

20

Solution to the problem

Technical solution

[0004] The purpose of this solution is to provide an adapter to solve the problem of poor adaptability caused by the single type and quantity of adapter heads in the existing technology.

25 [0005] In order to achieve the above purpose, the technical solution adopted in this solution is to provide an adapter, comprising a base, an upper cover provided on the base and used to cover the base, a control board provided in the base, an adapter head for connecting with external electronic devices,

a conductor connecting the adapter head to the control board, and several adapter ports respectively electrically connected to the control board. The adapter head comprises a first plug connected to the conductor, a second plug connected to the conductor, and a third plug connected to the conductor.

[0006] Furthermore, the base is provided with a card slot for accommodating the adapter head.

5 [0007] Furthermore, the card slot is provided with a magnetic strip, and the first plug is correspondingly provided with a first magnetic conductive sheet connected to the magnetic strip, the second plug is correspondingly provided with a second magnetic conductive sheet connected to the magnetic strip, and the third plug is correspondingly provided with a third magnetic conductive sheet connected to the magnetic strip.

10 [0008] Furthermore, the upper cover is provided with a groove protruding towards the bottom surface of the base for supporting the electronic devices.

[0009] Furthermore, a side wall of the groove is provided with several threaded holes at equal intervals, and the base is provided with mounting holes at positions corresponding to the threaded holes. The adapter also comprises several screws for mounting the upper cover on the base, and each of the screws
15 passes through a corresponding mounting hole and is threaded with a corresponding threaded hole.

[0010] Furthermore, the adapter further comprises a memory provided in the base, which is electrically connected to the control board.

[0011] Furthermore, the base is provided with an opening at a location corresponding to the memory, and a card board that can be detachably connected to the base is provided in the opening.

20 [0012] Furthermore, several anti-slip rubber pads uniformly spaced are provided on a side of the base facing away from the upper cover.

[0013] Furthermore, the base is provided with a light hole, and an indicator light is provided in the light hole, which is electrically connected to the control board.

[0014] Furthermore, the base is square in shape and has several first rounded corners. The upper cover
25 is provided with several second rounded corners that match correspondingly the first rounded corners.

The beneficial effects of the invention

Beneficial effect

[0015] In this solution, the adapter head is connected to the control board through a conductor. The adapter head is divided into a first plug, a second plug, and a third plug. The first plug, the second plug, and the third plug can be respectively plugged into different ports on external electronic devices, thereby realizing the connection between the adapter and different electronic devices, diversifying the type and quantity of the adapter head, and improving the wide adaptability of the adapter.

BRIEF EXPLANATION OF THE DRAWINGS

Illustration of the drawings

[0016] In order to provide a clearer explanation of the technical solution in the embodiments of this solution, the following will briefly introduce the accompanying drawings required for the embodiments or prior art descriptions. It is obvious that the accompanying drawings described below are only some embodiments of this solution. For those skilled in the art, other drawings can be obtained based on these drawings without requiring any creative labor.

[0017] Figure 1 is a schematic diagram of an unfolded structure of an adapter provided in an embodiment of the solution;

[0018] Figure 2 is a front view of the adapter provided in the embodiment of the solution after being folded up;

[0019] Figure 3 is a first side view of the adapter provided in the embodiment of the solution after being folded up;

[0020] Figure 4 is a second side view of the adapter provided in the embodiment of the solution after being folded up;

[0021] Figure 5 is a rear view of the adapter provided in the embodiment of the solution after being folded up;

[0022] Figure 6 is a schematic diagram of a partial structure of the adapter provided in the embodiment of the solution.

[0023] The reference symbols in the drawings:

[0024] 1-Base; 10- Mounting hole; 11- Anti-slip rubber pad; 12- Card board; 13- Card slot; 14- First rounded corner;

[0025] 2-Upper cover; 21- groove; 210- threaded hole; 22- Second rounded corner;

[0026] 31- First port; 32- Second port; 33- Third port; 34- Fourth port; 35- Fifth port; 36- Sixth port;

5 37- Indicator light;

[0027] 4-Adapter head; 41- First plug; 42- Second plug; 43- Third plug;

[0028] 5-Conductor; 6-Screw.

DETAILED DESCRIPTION OF THE INVENTION

10 Implementation of the present invention

[0029] In order to make the technical problem to be solved by this solution, technical solution, and beneficial effects clearer and more understandable, the following will provide further detailed explanations of this solution in conjunction with the accompanying drawings and embodiments. It should be understood that the specific embodiments described here are only used to explain the present
15 solution and are not intended to limit the present solution.

[0030] It should be noted that when a component is referred to as "fixed to" or "provided to" another component, it can be directly or indirectly on the other component. When a component is referred to as "connected" to another component, it can be directly or indirectly connected to the other component.

[0031] In addition, the terms "first", "second", "third", "fourth", "fifth", and "sixth" are only used for
20 descriptive purposes and cannot be understood as indicating or implying relative importance or implying the number of technical features indicated. Therefore, the features defined by "first", "second", "third", "fourth", "fifth", and "sixth" may explicitly or implicitly include one or more of these features. In the description of this solution, "several" means two or more, unless otherwise specified.

25 [0032] In the description of this solution, it should be understood that the directional or positional relationships indicated by the terms "center", "length", "width", "thickness", "up", "down", "front", "back", "left", "right", "vertical", "horizontal", "top", "bottom", "inside", "outside", etc. are based on

the directional or positional relationships shown in the accompanying drawings, only for the convenience of describing this solution and simplifying the description, and do not indicate or imply that the device or component referred to must have a specific orientation, be constructed and operated in a specific orientation, and therefore cannot be understood as a limitation of this solution.

5 [0033] In the description of this solution, it should be noted that unless otherwise specified and limited, the terms "mounting", "connect with", and "connect to" should be broadly understood, for example, they can be fixed connections, detachable connections, or integrated connections; they can be a mechanical connection or an electrical connection; or a direct connection or an indirect connection through an intermediate medium, and they can be a communication within two components or an
10 interaction relationship between two components. For ordinary technical personnel in this field, the specific meanings of the above terms in this solution can be understood according to the specific situation.

[0034] Please refer to Figures 1 to 6, and now explain the adapter provided in this embodiment of the solution. The adapter comprises a base 1 and an upper cover 2 arranged on the base 1 and used to cover
15 the base 1. A containment chamber is formed between the base 1 and the upper cover 2. The adapter also comprises a control board (not shown in the figures) arranged in the containment chamber, an adapter head 4 for connecting to external electronic devices, a conductor 5 for electrically connecting the adapter head 4 to the control board, and several adapter ports each electrically connected to the control board.

20 [0035] The adapter head 4 comprises a first plug 41 electrically connected to the conductor 5, a second plug 42 electrically connected to the conductor 5, and a third plug 43 electrically connected to the conductor 5.

[0036] Optionally, the first plug 41 can be a Type-C plug, an Apple Lighting plug, a Micro-USB plug, etc., which are not uniquely limited here.

25 [0037] Similarly, the second plug 42 can be a Type-C plug, an Apple Lighting plug, a Micro-USB plug, etc., which are not uniquely limited here.

[0038] Similarly, the third plug 43 can be a Type-C plug, an Apple Lighting plug, a Micro-USB plug,

etc., which are not uniquely limited here.

[0039] The conductor 5 can be selected as a wire or a conductive sheet wrapped by an insulating layer, etc., which is not uniquely limited here.

[0040] Compared with the prior art, in the adapter provided in this solution, the adapter head is
5 connected to the control board through a conductor 5. The adapter head 4 is divided into a first plug 41, a second plug 42, and a third plug 43. The first plug 41, the second plug 42, and the third plug 43 can be respectively plugged into different ports on external electronic devices, thereby realizing the connection between the adapter and different electronic devices, diversifying the type and quantity of adapter head 4, and improving the wide adaptability of the adapter.

10 [0041] Furthermore, please refer to Figure 5. As a specific implementation of the adapter provided in this embodiment of the solution, the base 1 is provided with a card slot 13 for accommodating the adapter head 4. In this structure, after the conductor 5 is bent, the adapter head 4 can be placed in the slot 13, thereby improving the structural stability of the adapter after being folded up.

[0042] Furthermore, please refer to Figure 5. As a specific implementation of the adapter provided in
15 this embodiment of the solution, the card slot 13 is provided with a magnetic strip (not shown in the figure), the first plug 41 is correspondingly provided with a first magnetic conductive sheet (not shown in the figure) magnetically connected to the magnetic strip, the second plug 42 is correspondingly provided with a second magnetic conductive sheet (not shown in the figure) magnetically connected to the magnetic strip, and the third plug 43 is correspondingly provided with a third magnetic
20 conductive piece (not shown in the figure) magnetically connected to the magnetic strip. This structure, through magnetic connection, facilitates quick disassembly and assembly of the first plug 41, the second plug 42, and the third plug 43. In other embodiments, the first plug 41, the second plug 42, and the third plug 43 can also be securely placed in the card slot 13 through other means, without being uniquely limited to them.

25 [0043] Furthermore, please refer to Figures 1 and 2. As a specific implementation of the adapter provided in this embodiment of the solution, the upper cover 2 is provided with a groove 21 that protrudes towards the bottom surface of the base 1 for supporting an electronic device. Preferably, the

groove 21 is bowl-shaped, which is not uniquely limited here.

[0044] With the popularity of Apple's latest Mac Mini worldwide, adapters suitable for this Mac Mini electronic product have also been born. Due to the small structural size design of the adapters, they cannot effectively support the Mac Mini when externally connected to the Mac Mini. Therefore, the Mac Mini is generally placed on a flat surface, and liquid on the flat surface may accidentally flow into the Mac Mini, causing serious impact on the Mac Mini; Moreover, the bottom of the Mac Mini has a circular protrusion, which makes it less stable when being placed on a horizontal surface. This structure, by providing a groove 21 on the upper cover 2, can effectively support electronic devices, especially for the Mac Mini. The bottom of the Mac Mini has a circular protrusion, and the groove 21 is designed in a bowl shape, which can form a good fit with the circular protrusion and stably support the Mac Mini.

[0045] Furthermore, please refer to Figure 6. As a specific implementation of the adapter provided in this embodiment of the solution, the side wall of the groove 21 is provided with several threaded holes 210 at equal intervals. The base 1 is provided with mounting holes 10 at the corresponding positions of the threaded holes 210. The adapter also includes several screws 6 for mounting the upper cover 2 on the base 1. Each screw 6 passes through the corresponding mounting hole 10 and is threaded with the corresponding threaded hole 210. This structure connects and fixes the upper cover 2 and the base 1 by screws 6, making it easy to achieve quick disassembly and assembly of the upper cover 2 and the base 1, and facilitating maintenance of the adapter. Furthermore, holes for screws 6 can be correspondingly opened on the circular protrusion of the Mac Mini. The screws 6 can pass through the corresponding mounting holes 10 and the corresponding threaded holes 210, and be engageably fixed in the corresponding holes for screws 6, thereby achieving effective fixation of the Mac Mini. The Mac Mini and the adapter can be integrated, making it easy to carry.

[0046] Optionally, several buckles are provided around the periphery of the upper cover 2, and the base 1 is provided with clamping parts that matches the corresponding buckles, so that the clamping connection between the upper cover 2 and the base 1 can be realized. In other embodiments, the upper cover 2 can also be connected to the base 1 through other means, such as adhesive bonding, welding,

etc., which are not uniquely limited here.

[0047] Furthermore, please refer to Figure 5. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter further comprises a memory (not shown in the figure) located in the base 1, which is electrically connected to the control board. Specifically, the memory
5 can be a Solid State Disk (SSD), which is plugged into the control board. This structure, by providing the memory, can increase the storage function of the adapter. The adapter not only has signal transfer function, but also has storage function similar to devices such as USB flash disks, thereby improving the usage function of the adapter.

[0048] Furthermore, please refer to Figure 5. As a specific implementation of the adapter provided in
10 this embodiment of the solution, the base 1 is provided with an opening (not shown in the figures) at the position corresponding to the memory, and a card board 12 that can be detachably connected to the base 1 is provided in the opening. This structure allows for quick disassembly and assembly of the card board 12 by clamping it to the base 1, and also facilitates the disassembly and assembly of the memory after disassembling the card board 12 due to the card board 12 corresponding to the position
15 of the memory.

[0049] Furthermore, please refer to Figure 5. As a specific implementation of the adapter provided in this embodiment of the solution, several anti-slip rubber pads 11 are uniformly spaced on the side of the base 1 facing away from the upper cover 2. This structure, on the one hand, has several anti-slip rubber pads 11 that provide anti-slip function; on the other hand, the base 1 can be spaced apart from
20 the plane to prevent liquid on the plane from flowing into the adapter or electronic device, thereby improving the safety and reliability of the adapter or electronic device.

[0050] Furthermore, please refer to Figures 1 and 4. As a specific implementation of the adapter provided in this embodiment of the solution, the base 1 is provided with a light hole (not shown in the figures), and an indicator light 37 is provided in the light hole, which is electrically connected to the
25 control board. This structure uses the indicator light 37 to indicate the working status of the adapter. When the indicator light 37 is on, it indicates that the adapter is working properly; when the indicator light 37 is not on, it indicates that the adapter is not working.

[0051] Furthermore, please refer to Figure 1. As a specific implementation of the adapter provided in this embodiment of the solution, the base 1 is square in shape and has several first rounded corners 14. The upper cover 2 is provided with several second rounded corners 22 that match the corresponding first rounded corners 14. Specifically, the base 1 has a square structure with four first rounded corners 14. The upper end of the base 1 is an opening, and the upper cover 2 can cooperate with the base 1 to cover the opening. The upper cover 2 has the second rounded corners 22 that match the corresponding first rounded corners 14. The adapter with this structure is compatible with electronic devices, especially with the size of Mac Mini. The adapter supporting the Mac Mini is aesthetically pleasing. The adapter is designed with rounded corners to prevent right angles from scratching the user and improve safety during use.

[0052] Furthermore, please refer to Figure 3. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter ports comprise a first port 31 electrically connected to the control board, and the base 1 is correspondingly provided with a first terminal hole (not shown in the figures) for supporting the first port 31. Specifically, the first terminal hole and a through-hole are located on the same side of the base 1, and the first port 31 is directly provided on the control board. Preferably, the first port 31 is a Type-C interface, which is not uniquely limited here. In this structure, one end of the first port 31 is provided on the control board, and the other end extends into the first terminal hole. The installation of the first port 31 is stable. The first port 31 can be connected to external electronic devices through the first terminal hole.

[0053] Furthermore, please refer to Figures 1 and 4. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter ports further comprise a second port 32 electrically connected to the control board. The base 1 is correspondingly provided with a second terminal hole (not shown in the figures) for supporting the second port 32. Specifically, the second port 32 is directly provided on the control board. Preferably, the second port 32 is an SD card (Secure Digital Card) interface for inserting a SD card, which is not uniquely limited here. In this structure, one end of the second port 32 is provided on the control board, and the other end extends into the second terminal hole. The installation of the second port 32 is stable. The second port 32 can be

connected to external electronic devices through the second terminal hole.

[0054] Furthermore, please refer to Figures 1 and Figure 4. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter ports further comprise a third port 33 electrically connected to the control board. The base 1 is correspondingly provided with a third terminal hole (not shown in the figure) for supporting the third port 33. Specifically, the third terminal hole and the second terminal hole are located on the same side of the base 1, and the third port 33 is directly provide on the control board. Preferably, the third port 33 is a TF card (T-Flash Card, micro SD card) interface for inserting a TF card, which is not uniquely limited here. In this structure, one end of the third port 33 is provided on the control board, and the other end extends into the third terminal hole. The installation of the third port 33 is stable. The third port 33 can be connected to external electronic devices through the third terminal hole.

[0055] Furthermore, please refer to Figures 1 and 4. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter ports further comprise a fourth port 34 electrically connected to the control board. The base 1 is correspondingly provided with a fourth terminal hole (not shown in the figures) for supporting the fourth port 34. Specifically, the fourth terminal hole and the second terminal hole are located on the same side of the base 1, and the fourth port 34 is directly provided on the control board. Preferably, the fourth port 34 is a headphone interface for connecting a headphone, which is not uniquely limited here. In this structure, one end of the fourth port 34 is provided on the control board, and the other end extends into the fourth terminal hole. The installation of the fourth port 34 is stable. The fourth port 34 can be connected to external electronic devices through the fourth terminal hole.

[0056] Furthermore, please refer to Figures 1 and 4. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter ports further comprise a fifth port 35 electrically connected to the control board. The base 1 is correspondingly provided with a fifth terminal hole (not shown in the figure) for supporting the fifth port 35. Specifically, the fifth terminal hole and the second terminal hole are located on the same side of the base 1, and the fifth port 35 is directly provided on the control board. Preferably, the fifth port 35 is a USB 3.0 interface, which is not uniquely

limited here. In this structure, one end of the fifth port 35 is provided on the control board, and the other end extends into the fifth terminal hole. The installation of the fifth port 35 is stable. The fifth port 35 can be connected to external electronic devices through the fifth terminal hole.

[0057] Furthermore, please refer to Figures 1 and 4. As a specific implementation of the adapter provided in this embodiment of the solution, the adapter ports further comprise a sixth port 36 electrically connected to the control board. The base 1 is correspondingly provided with a sixth terminal hole (not shown in the figures) for supporting the sixth port 36. Specifically, the sixth terminal hole and the second terminal hole are located on the same side of the base 1, and the sixth port 36 is directly provided on the control board. Preferably, the sixth port 36 is a Type-C interface, which is not uniquely limited here. In this structure, one end of the sixth port 36 is provided on the control board, and the other end extends into the sixth terminal hole. The installation of the sixth port 36 is stable. The sixth port 36 can be connected to external electronic devices through the sixth terminal hole.

[0058] The above is only the preferred embodiments of this solution and is not intended to limit it. Any modifications, equivalent substitutions, and improvements made within the spirit and principles of this solution should be included within the scope of protection of this solution.

CLAIMS

1. An adapter, characterized in in that the adapter comprises a base, an upper cover provided on the base and used to cover the base, a control board provided in the base, an adapter head for connecting with external electronic devices, a conductor connecting the adapter head to the control board, and several adapter ports respectively electrically connected to the control board, the adapter head comprising a first plug connected to the conductor, a second plug connected to the conductor, and a third plug connected to the conductor.

2. The adapter according to claim 1, characterized in that the base is provided with a card slot for accommodating the adapter head.

3. The adapter according to claim 2, characterized in that the card slot is provided with a magnetic strip, and the first plug is correspondingly provided with a first magnetic conductive sheet connected to the magnetic strip, the second plug is correspondingly provided with a second magnetic conductive sheet connected to the magnetic strip, and the third plug is correspondingly provided with a third magnetic conductive sheet connected to the magnetic strip.

4. The adapter according to claim 1, characterized in that the upper cover is provided with a groove protruding towards the bottom surface of the base for supporting the electronic devices.

5. The adapter according to claim 4, characterized in that a side wall of the groove is provided with several threaded holes at equal intervals, and the base is provided with mounting holes at positions corresponding to the threaded holes, the adapter further comprises several screws for mounting the upper cover on the base, and each of the screws passes through a corresponding mounting hole and is threaded with a corresponding threaded hole.

6. The adapter according to claim 1, characterized in that the adapter further comprises a memory provided in the base, which is electrically connected to the control board.

7. The adapter according to claim 6, characterized in that the base is provided with an opening at a location corresponding to the memory, and a card board that can be detachably connected to the base is provided in the opening.

8. The adapter according to any one of claims 1-7, characterized in that several anti-slip rubber pads uniformly spaced are provided on a side of the base facing away from the upper cover.

9. The adapter according to any one of claims 1-7, characterized in that the base is provided with a light hole, and an indicator light is provided in the light hole, which is electrically connected to the control board.

10. The adapter according to any one of claims 1-7, characterized in that the base is square in shape and has several first rounded corners, and the upper cover is provided with several second rounded corners that match correspondingly the first rounded corners.

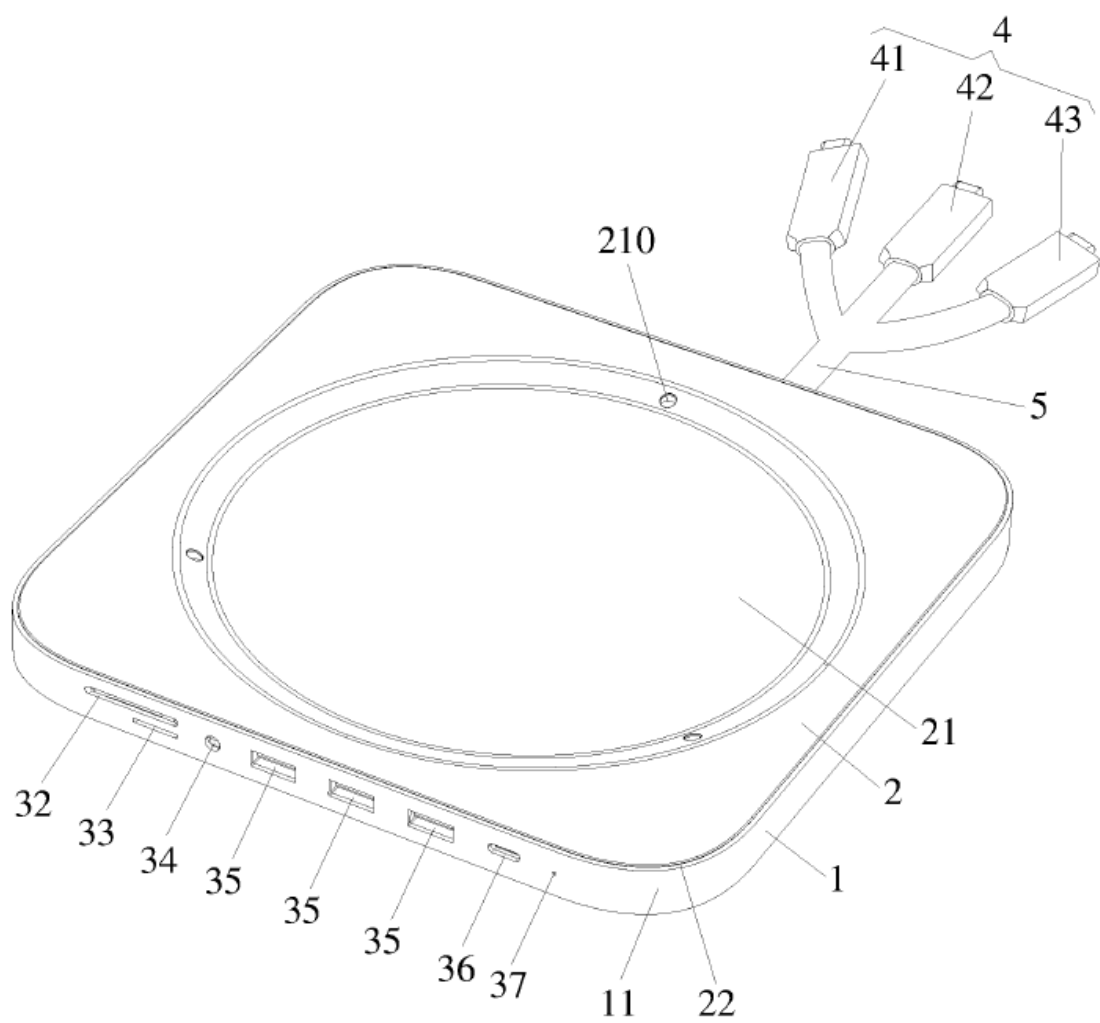


Figure 1

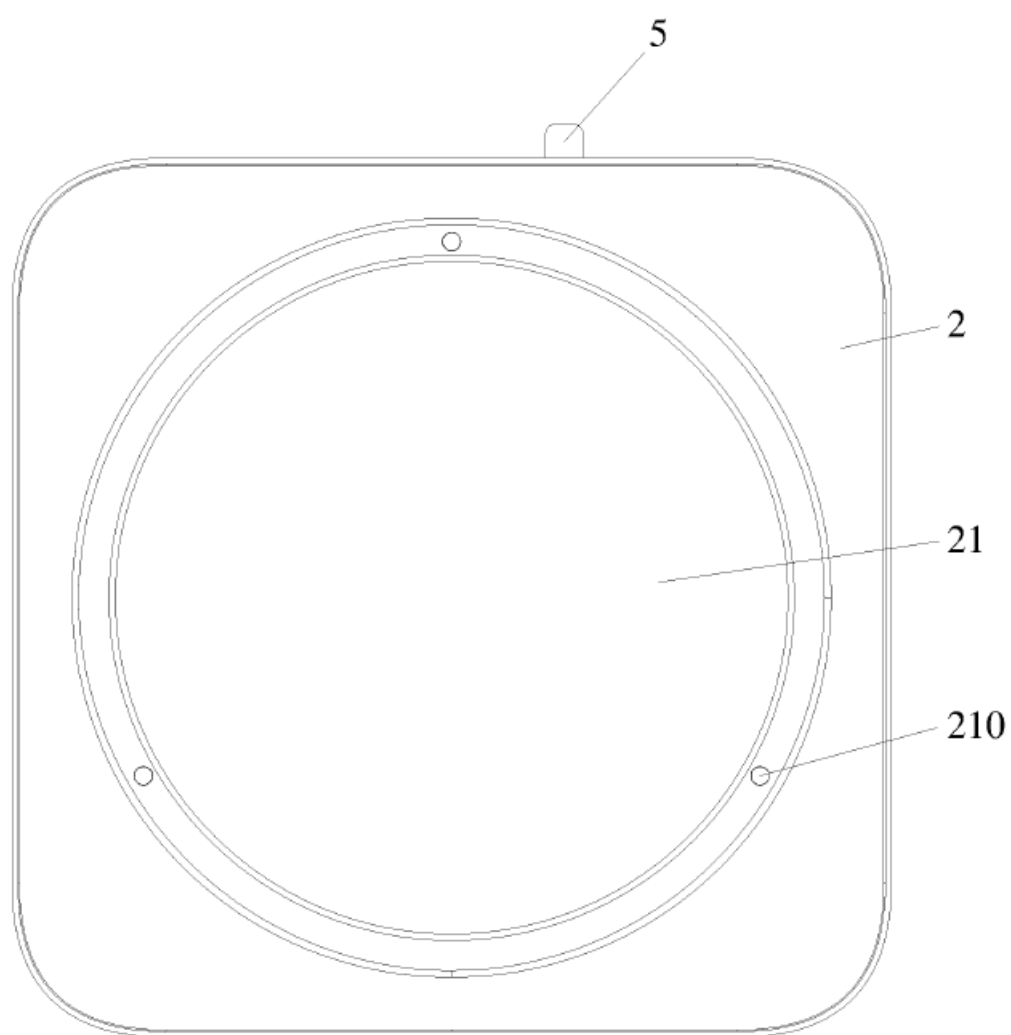


Figure 2

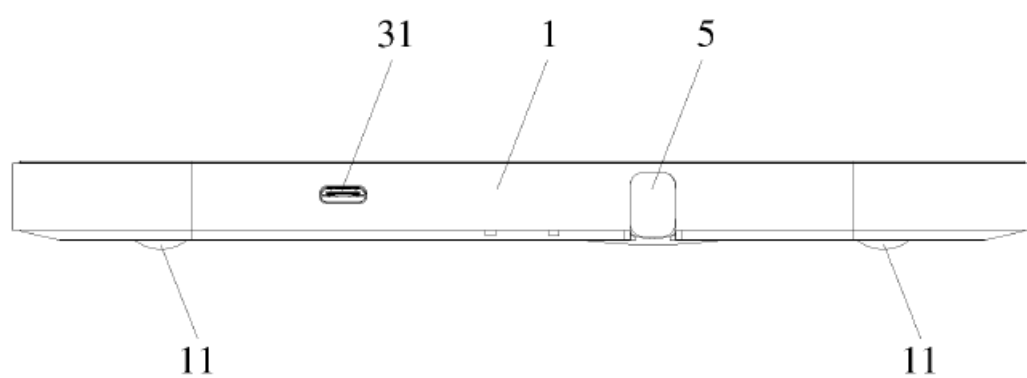


Figure 3

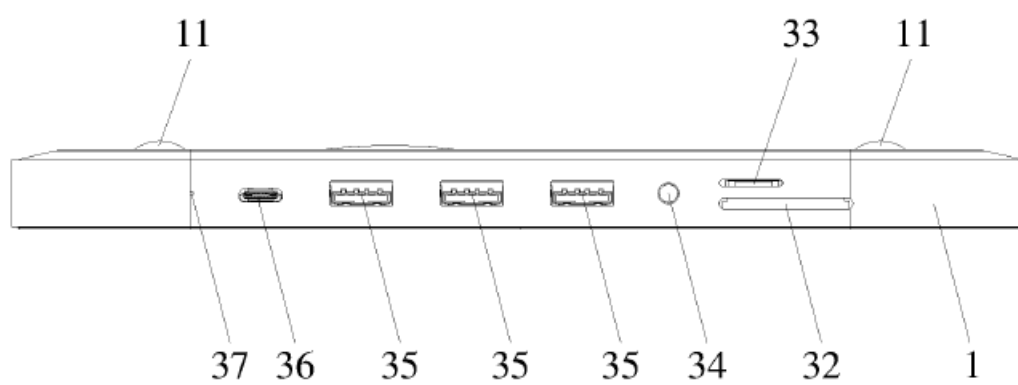


Figure 4

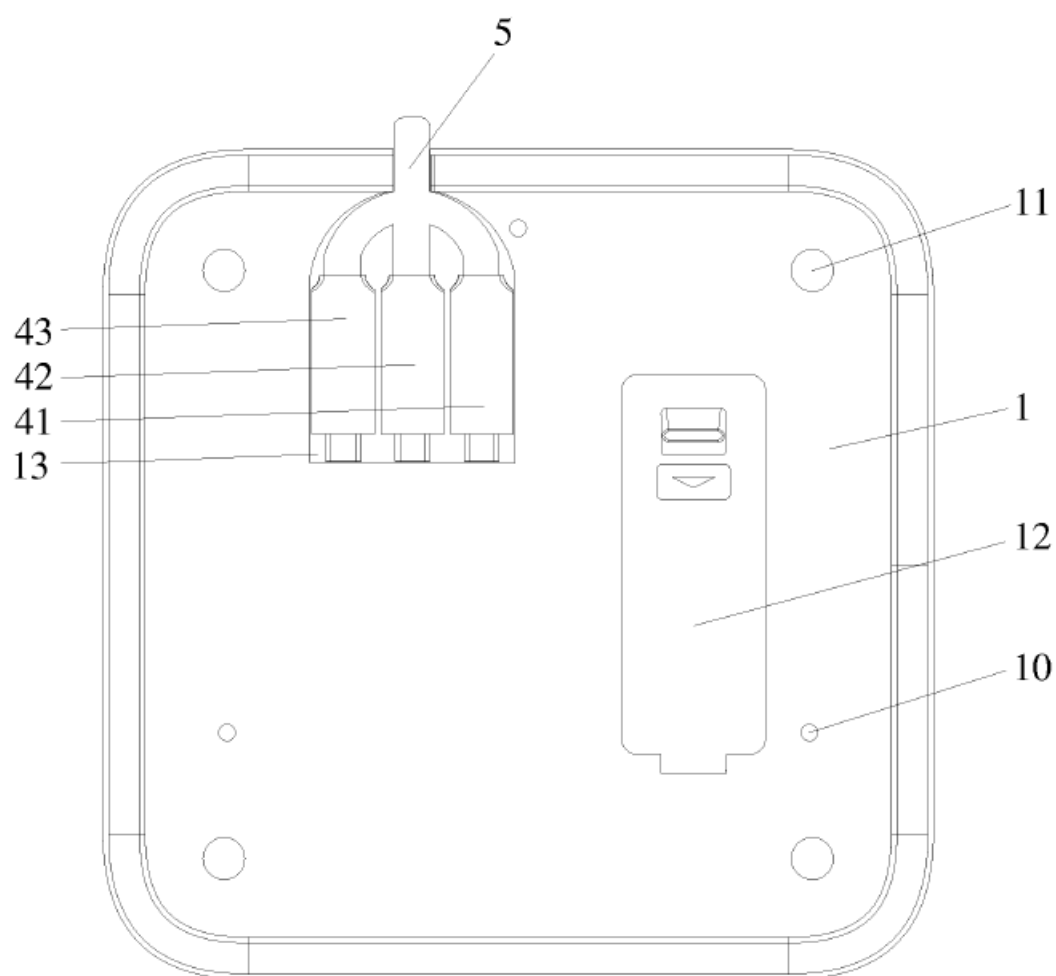


Figure 5

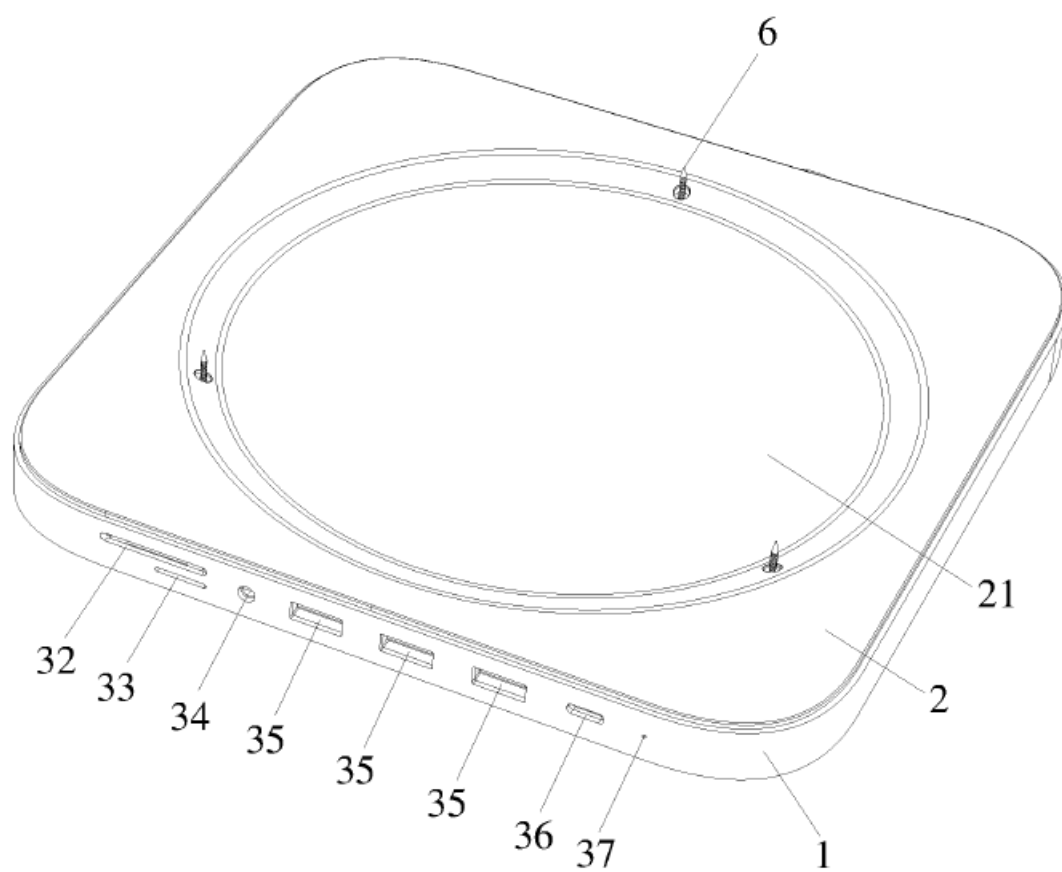


Figure 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/119702

A. CLASSIFICATION OF SUBJECT MATTER

H01R 31/06(2006.01)i; H01R 27/00(2006.01)i; H01R 13/66(2006.01)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; WPI; EPODOC; CNKI: 广东高普达集团股份有限公司, 深圳市高普达科技有限公司, 廖卓文, 转接器, 转换器, 底座, 基座, 盖, 转接头, 转换头, 插头, 接头, 转接口, 转换口, 磁, 卡槽, 凹槽, commutator, concentrator, base, cover, magnet +, plug, groove

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 204315878 U (HAILIN COMPUTER TECHNOLOGY (SHENZHEN) CO., LTD.) 06 May 2015 (2015-05-06) description, paragraphs [0014]-[0017], and figure 1	1-10
Y	CN 207732177 U (DONGGUAN XINGKE SOLAR ENERGY TECHNOLOGY CO., LTD.) 14 August 2018 (2018-08-14) description, paragraphs [0022]-[0028], and figure 1	1-10
A	CN 205376973 U (DONGGUAN JIANGHAN ELECTRONICS CO., LTD.) 06 July 2016 (2016-07-06) entire document	1-10
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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/119702**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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CN	205376973	U	06 July 2016	None			
CN	201797205	U	13 April 2011	None			
CN	205911578	U	25 January 2017	None			
CN	205985670	U	22 February 2017	None			
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