



(11)

EP 3 236 540 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
25.10.2017 Bulletin 2017/43

(51) Int Cl.:
H01R 13/73 (2006.01) **H01R 13/10** (2006.01)
H01R 13/66 (2006.01)

(21) Application number: **16876966.9**

(86) International application number:
PCT/CN2016/086978

(22) Date of filing: **24.06.2016**

(87) International publication number:
WO 2017/121075 (20.07.2017 Gazette 2017/29)

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **Guangzhou Leishen Electric Manufacturing Co., Ltd.**
Guangzhou, Guangdong 510730 (CN)

(72) Inventor: **LIANG, Peirong**
Guangzhou
Guangdong 510730 (CN)

(30) Priority: **12.06.2016 CN 201620564121 U**

(74) Representative: **Prüfer & Partner mbB**
Patentanwälte · Rechtsanwälte
Sohnckestraße 12
81479 München (DE)

(54) **WALL POWER SUPPLY SOCKET PROVIDED WITH USB CHARGING DEVICE**

(57) The present invention discloses a wall outlet with USB charging device, comprising a panel and a bottom cover provided at the backside thereof; the panel is provided with a power slot and a USB charging socket; an accommodating space formed by the panel and the bottom cover is provided with a USB charging device, a live wire metallic strip, a null wire metallic strip and an earth wire metallic strip; the distance between the power slot center and the panel center is 2-5mm. By deviating the power slot center from the panel center, it reserves space on one side of the panel for providing a USB charging socket, and space for installing a USB charging circuit board and a USB port inside the accommodating space formed by the panel and the bottom cover, and thus makes the wall outlet directly take the place of those wall outlets that only provide power slots for connecting electric plugs of external appliances after adding USB charging function. This enables the wall outlet to have both USB charging function and power supply function for external electrical appliance, which meets the needs of modern life better.

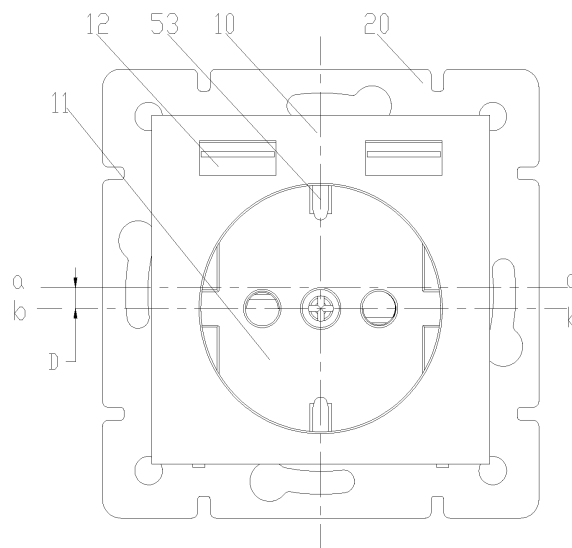


Fig. 1

EP 3 236 540 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to an outlet, and more particularly, to a wall outlet with USB charging device.

BACKGROUND

[0002] For electrical safety, countries around the world set standards for power outlets. Many countries set standards for the single wall outlet's overall dimension, and the dimension of reserved space inside the wall for installation. In European, French and German standard, the middle panel dimension of single wall outlet is 55 × 55mm; inside the wall, it always provides a cylinder with about 65mm diameter and 55mm depth for installing the wall outlet. In this case, only one power slot been connected to plugs can be provided for each single wall outlet, and the center of wall outlet almost coincides with the center of the middle panel.

[0003] With the growing popularity of mobile electronic devices nowadays, charging is often needed, and it is very inconvenient to carry power adapters all times. Moreover, if one wants to add USB charge outlet on well decorated wall, extra drilling and wiring would be needed, which is also very inconvenient. Furthermore, if one wants to replace existed wall outlet with USB charge outlet, it would result in less power slots for connecting electrical appliances, which brings new troubles to daily work and life.

SUMMARY

[0004] The present invention provides a wall outlet with USB charging device, solving the above mentioned problems under such circumstances as not changing the existed overall dimension of wall outlet, replacing or adding prefabricated cylinder for installing wall outlet, as well as reducing the existed number of power slots been connected to plugs of electrical appliance.

[0005] According to one aspect of the invention, it provides a wall outlet with USB charging device, comprising a panel and a bottom cover provided at the backside thereof; the panel is provided with a power slot and a USB charging socket; an accommodating space formed by the panel and the bottom cover is provided with a USB charging device, a live wire metallic strip, a null wire metallic strip and an earth wire metallic strip; the USB charging device further comprises a USB port, and a USB charging circuit board which is connected to the USB port; the USB port corresponds to the USB charging socket; the power slot is provided with through-holes respectively which are correspond to the live wire metallic strip, null wire metallic strip and earth wire metallic strip in terms of location and shape; the distance between the power slot center and the panel center is 2-5mm.

[0006] With regard to the wall outlet of the present invention, the power slot center is set deviate 2-5mm from the panel center, reserving space on one side of the panel for providing the USB charging socket; in the accommodating space formed by the panel and the bottom cover, space is also reserved on the corresponding side of the USB charging socket for installing the USB charging circuit board and the USB port, which denies alterations in external form of the wall outlet after adding USB charging function, and makes it directly take the place of those wall outlets that only provide power slots for connecting plugs of external electrical appliances. This enables a single wall outlet to have both USB charging function and power supply function for external electrical appliance, which meets the needs of modern life better.

[0007] In some embodiments, the power slot center of this invention deviates from the panel center by 2-5mm towards lower end; the USB charging socket is provided above the power slot. The power slot is off the panel center towards lower end, there is reserving space at upper part of the panel for providing the USB charging socket.

[0008] In some embodiments, two of the USB charging sockets of this invention are provided in horizontal direction at two corners of the upper part of the panel respectively. The USB charging circuit board comprises the first circuit board and the second circuit board, wherein the first circuit board connects to the second circuit board appearing in the shape of L, the first circuit board is located at the flank inside of the upper side of the bottom cover, the second circuit board is located at the inside of back face of the bottom cover; the first circuit board appears in the shape of U; two of the USB ports are provided at the free end of the first circuit board respectively. Inside the accommodating space formed by the panel and the bottom cover, the layout above mentioned fully utilizes the space located by the live wire metallic strip and the null wire metallic strip, which is saved by deviating the power slot center from the panel center towards the lower end, and the backside space of the live wire metallic strip and the null wire metallic strip, meaning, it effectively utilizes the upper and the backside space of the accommodating space formed by the panel and the bottom cover. The first circuit board appears in U shape, which is capable of reserving space for installing the earth wire metallic strip, wherein the upper part of the earth wire metallic strip is located inside of the open end of the U shape, which is effective utilization of space.

[0009] In some embodiments, the second circuit board of the invention provides a transformer, a capacitor, -a word inductor, a common mode inductor, an IC chip, a Y capacitor, and an X capacitor, the first circuit board provides a solid capacitor. These above-mentioned electrical components can form a charging voltage stabilization filter circuit, making electronic devices safer during charging process. The electrical components with big size are almost installed intensively on the second circuit board, effectively utilizing the backside space of the live

wire metallic strip and the null wire metallic strip.

[0010] In some embodiments, the output of the USB charging port in this invention is 2100mA and 4200mA respectively. With the output current of the USB port being large, it means quick charge.

[0011] In some embodiments, two of the USB charging sockets of this invention are inclined at two corners of the upper part of the panel respectively; a USB bracket is provided on top of the earth wire metallic strip, appearing in "II" shape overall; a step is provided at the contact part of the earth wire metallic strip and the USB bracket to make them adapt to each other; the USB charging circuit board comprises the first circuit board and the second circuit board, which are connected to each other; two of the first circuit board are connected to two of the USB ports respectively, and are inclined at the two ends of the upper part of the USB bracket; the second circuit board provides the transformer, which is located at the upper part of the live wire metallic strip and the null wire metallic strip. This layout sufficiently utilizes the upper part space of the accommodating space formed by the panel and the bottom cover. The earth wire metallic strip enables electricity conduction, as well enables connection between the USB bracket and the bottom cover, which avoids too many components inside the wall outlet. The step better stabilizes the relative position of the USB bracket and the earth wire metallic strip.

[0012] In some embodiments, the first circuit board of the invention provides a locating through-hole, and the USB bracket provides a locating flange to match the locating through-hole. This layout maintains stabilized position of the USB port when been inserting plugs and pulling plugs.

[0013] In some embodiments, the present invention further comprises a face frame surrounding the outside of panel, wherein the face frame provides a baffle plate at the front upper frame. When an electronic device is charging, it can be placed on top of the face frame, and the baffle plate shall prevent it from slipping.

[0014] In some embodiments, the present invention further comprises a pad frame provided behind the panel. When the prefabricated cylinder inside the wall for installing the wall outlet is not deep enough, the pad frame with adequate thickness can be added behind the panel, pushing the panel forward, so as to adapt to the depth of the cylinder inside the wall.

[0015] In some embodiments, the power slot center of this invention deviates from the panel center by 3-3.5mm towards the lower end.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1 is a structural schematic diagram of the front view of a wall outlet according to one embodiment of the present invention;

Fig. 2 is a three-dimensional structural schematic diagram of the wall outlet according to Fig. 1;

Fig. 3 is a structural schematic diagram of the decomposing state of the wall outlet according to Fig. 1;

Fig. 4 is an interior structural schematic diagram of the wall outlet according to Fig. 1;

Fig. 5 is a structural schematic diagram of the wall outlet according to Fig. 1 adding a pad frame;

Fig. 6 is a structural schematic diagram of the front view of a wall outlet according to another embodiment of the present invention;

Fig. 7 is a three-dimensional structural schematic diagram of the wall outlet according to Fig. 6;

Fig. 8 is a structural schematic diagram of the decomposing state of the wall outlet according to Fig. 6;

Fig. 9 is a structural schematic diagram of a live wire metallic strip according to prior arts;

Fig. 10 is a structural schematic diagram of a null wire metallic strip according to prior arts;

Fig. 11 is a structural schematic diagram of a live wire metallic strip of the wall outlet according to Fig. 6;

Fig. 12 is a structural schematic diagram of a wall outlet according to an additional embodiment of the present invention;

Fig. 13 is a structural schematic diagram of a wall outlet according to a further embodiment of the present invention;

Fig. 14 is a structural schematic diagram of the wall outlet according to Fig. 6 adding a face frame;

DETAILED DESCRIPTION

[0017] The invention is further described for details with reference to the drawings hereinafter.

[0018] Fig. 1 to Fig. 4 schematically show the structure of a wall outlet with USB charging device according to one embodiment of the present invention.

[0019] As shown in Fig. 1 to Fig. 4, the wall outlet is of European standards, comprising a panel 10, and a bottom cover 70 which is provided behind the panel 10. The length and the width of the panel 10 are both 55mm, the length and the width of the bottom cover 70 are both 46.5mm. The wall outlet can be inserted into a wall to a depth of 50mm. A mounting rack 20 is provided behind the panel 10.

[0020] As shown in Fig. 1 and Fig. 2, the panel 10 provides a power slot 11 for connecting electrical plugs and two USB charging sockets 12. Line aa is the horizontal midline of the panel 10, line bb is the horizontal midline of the power slot 11. A distance D between the line aa and the line bb is 3mm. The two USB charging sockets 12 are provided above the power slot 11, locating at the upper corners of the panel 10.

[0021] As shown in Fig. 3 and Fig. 4, an accommodating space formed by the panel 10 and the bottom cover 70 is provided with a USB charging device, as well as a live wire metallic strip 51, a null wire metallic strip 52 and an earth wire metallic strip 53. The USB charging device further comprises a USB charging circuit board and two USB ports 61. The two USB ports 61 correspond to the location of the two USB charging sockets 12 of the panel 10 respectively.

[0022] The USB charging circuit board comprises a first circuit board 601 and a second circuit board 602. The first circuit board 601 connects to the second circuit board 602 appearing in the shape of L. As shown in Fig. 4, the first circuit board 601 is located at the flank inside of the upper side of the bottom cover 70, the second circuit board 602 is located at the inside of back face of the bottom cover 70. As shown in Fig.3, The first circuit board 601 appears in the shape of U. The two USB ports 61 are provided at the two free ends of the first circuit board 601 respectively.

[0023] The second circuit board 602 provides an IC chip 69, a transformer 64, two capacitors 68, a word inductor 67, a common mode inductor 66, a Y capacitor 62 and an X capacitor 65; the first circuit board 601 provides two solid capacitors 63. The live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53 are all installed on a bracket 40. The power slot 11 is provided with through-holes respectively which are correspond to the live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53 in terms of location and shape.

[0024] Given the reason that the center of the power slot 11 deviates from the center of the panel 10 towards the lower end, the live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53 are all moved downwards, thus space is saved above the live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53. This layout effectively utilizes the space of the upside and the backside of the accommodating space formed by the panel 10 and the bottom cover 70. The first circuit board 601 appears in a U shape, which is capable of reserving space for installing the earth wire metallic strip 53, wherein the upper part of the earth wire metallic strip 53 is located inside of the open end of the U shape of the first circuit board 601, and thus utilizes space effectively.

[0025] In this embodiment, the center of the power slot 11 of the wall outlet deviates from the center of the panel 10 by 3mm, reserving space for installing the USB charging device inside the accommodating space formed by

the panel 10 and the bottom cover 70, and thus one doesn't alter the external form of the wall outlet after adding USB charging function, which makes the wall outlet directly take the place of those wall outlet that only provide power slots for connecting electric plugs of external appliances. This enables the wall outlet to have both USB charging function and power supply function for external electrical appliance, which meets the needs of modern life better.

[0026] In other embodiments, the center of the power slot 11 can be deviated from the center of the panel 10 towards the lower end or towards one of the corners according to needs, wherein the deviation distance D can be 2-5mm. The number of the USB charging sockets 12 can be 1 or 3 and so on. The USB charging sockets 12 can be provided in horizontal direction, or be tilted from different angles.

[0027] The bottom cover 70 appears in the shape of L, and is connected to the bracket 40 by a screw. The bottom cover 70 provides an installation locating bar 72 to conveniently install and stabilize the first circuit board 601. The four corners of the bottom cover 70 are provided as rounded, making it easy to rotate and adjust installation angle when installing the wall outlet. The bottom cover provides a radiating window 71 to help radiate heat.

[0028] An anti-misplug protection device is provided between the power slot 11 and the live wire metallic strip 51 as well as the null wire metallic strip 52.

[0029] The panel 10 is connected to the bracket 40 by a screw. The screw goes through the anti-misplug protection device 90 and the earth wire metallic strip 53.

[0030] In this embodiment, the output of the USB port 61 is 2100mA and 4200mA respectively. Compared with electrical components with small output current from the USB port 61, the IC chip 69, the transformer 64, the two capacitors 68, the word inductor 67, the common mode inductor 66, the Y capacitor 62 and the X capacitor 65 in this embodiment are larger in terms of size and power, and the distance between a high voltage circuit and a low voltage circuit is more than 6mm. Thus, in this embodiment, the internal structure of the wall outlet needs to be better arranged in order to provide enough space for these electrical components.

[0031] As shown in Fig. 5, if the prefabricated cylinder inside the wall for installing the electric wall socket is not deep enough, causing the panel 10 of the wall outlet to protrude from a wall too much and the backside surface of the panel 10 cannot contact surface of the wall, a pad frame 80 can be added between the panel 10 and the mounting rack 20 to fill in the gap between the panel 10 and the wall, so as to adapt the depth of the prefabricated cylinder inside the wall.

[0032] Fig. 6 to Fig. 8 schematically show the structure of a wall outlet with USB charging device according to another embodiment of the present invention.

[0033] As shown in Fig. 6 and Fig. 7, the wall outlet is of European standards, comprising a panel 10, and a bottom cover 70 which is provided behind the panel 10.

The length and the width of the panel 10 are both 55mm, and the bottom cover 70 is of a maximum height of 50mm and width of 52mm. The wall outlet can be inserted into a wall to a depth of 38mm. A mounting rack 20 is provided behind the panel 10. The panel 10 provides a power slot 11 for connecting electrical plugs and two USB charging sockets 12. The two USB charging sockets 12 are located at two corners of the panel 10 respectively, tilting at 45 degree.

[0034] The line aa is the horizontal midline of the panel 10, the line bb is the horizontal midline of the power slot 11. The distance D between the line aa and the line bb is 3.5mm.

[0035] The accommodating space formed between the panel 10 and the bottom cover 70 provides the USB charging device, the live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53. The USB charging device comprises the USB charging circuit board and two USB ports 61. The two USB ports 61 correspond to the location of the two USB charging sockets 12 of the panel 10 respectively.

[0036] Given the reason that the center of the power slot 11 deviates from the center of the panel 10 towards the lower end, the live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53 are all moved downwards, thus space is saved above the live wire metallic strip 51, the null wire metallic strip 52 and the earth wire metallic strip 53.

[0037] As shown in Fig. 8, a USB bracket 30 is provided on top of the earth wire metallic strip 53, appearing in "II" shape overall. A step 31 is provided at the contact part of the earth wire metallic strip 53 and the USB bracket 30 to make them adapt to each other. The step 31 better stabilizes the relative position of the USB bracket 30 and the earth wire metallic strip 53. The earth wire metallic strip 53 enables electricity conduction, as well as enables the movement restriction to the USB bracket 30, and thus avoids too many components inside the wall outlet.

[0038] Two through-holes 32 are provided on the USB bracket 30, to let the live wire rod and the null wire rod of external electrical plug pass through. The anti-misplug protection device is provided between the power slot 11 and the live wire metallic strip 51 as well as the null wire metallic strip 52.

[0039] Fig. 9 schematically shows the structure of an earth wire metallic strip according to prior arts. The two ends of this null wire metallic strip is almost as the same in shape as the one disclosed in this embodiment, and with a flat middle part. Adaptive modifications with the structure is done to the null wire metallic strip 53 in this embodiment.

[0040] The USB charging circuit board comprises the first circuit board 601 and the second circuit board 602, which are connected to each other. Two of the first circuit board 601 are connected to two of the USB ports 61 respectively, tilting at 45 degree at the two top corners of the USB bracket 30. The second circuit board 602 provides the transformer 64 and other electrical compo-

nents, and the second circuit board 602 and the transformer 64 are located on top of the live wire metallic strip 51 and the null wire metallic strip 52.

[0041] This layout effectively utilizes the upper part and the backside space of the accommodating space formed by the panel 10 and the bottom cover 70. In this embodiment, the center of the power slot 11 is deviated from the center of the panel 10 by 3.5mm, reserving space for installing the USB charging device in the accommodating space formed by the panel 10 and the bottom cover 70, and thus one doesn't alter external form of the wall outlet after adding USB charging function, which makes the wall outlet directly take the place of those wall outlet that only provide power slots 11 for connecting electric plugs of external appliances. This enables the wall outlet to have both USB charging function and power supply function for external electrical appliances, which meets the needs of modern life better.

[0042] The first circuit board 601 provides a locating through-hole, and the USB bracket 30 provides a locating flange 31 to match the locating through-hole. This layout maintains stabilized position of the USB port 61 when inserting and pulling plugs. In this embodiment, the locating flange 31 is a quadrangular prism sized in 8*8*4mm. In other embodiments, the locating flange can be modified to a triangular prism, an elliptic cylinder or other shape according to needs, and to other specifications.

[0043] An installation frame 20 is provided behind the panel 10, wherein the installation frame 20 provides a retaining groove 21 within its upper boarder. The USB bracket 30 provides a buckle 31 within its upper boarder, which adapts to the retaining groove 21. This layout better stabilizes the position of the USB bracket 30.

[0044] The inner frame dimension of the installation frame 20 is 51*51mm, which prevents the USB port 61 and the panel 10 from inward sinking.

[0045] The earth wire metallic strip 53 is connected to the bottom cover 70 in a fixed manner. An internal thread is provided on null wire metallic strip 53 at the location which corresponds to the center of the power slot 11; a through hole 13 is provided at the center of the power slot 11. Therefore, the panel 10 and the null wire metallic strip 53 can be connected by a screw matching the internal thread, so as to conveniently install and uninstall the panel 10 for checking the inside of the outlet.

[0046] Fig. 10 schematically shows the structure of a live wire metallic strip or a null wire metallic strip according to prior arts. As shown in Fig. 10, a contact point 55 on the live wire metallic strip 51 for connecting external electric plugs is formed by two curved parts buckling together. The live wire metallic strip in prior arts is about twice the height of the contact point 55.

[0047] In this embodiment, to reserve more space for the USB charging device in the accommodating space formed by the panel 10 and the bottom cover 70, the height of the live wire metallic strip 51 is reduced, moreover, the contact position between external power and

the live wire metallic strip 51 is provided in the backside, as shown in Fig. 11. This structure is also suitable for the null wire metallic strip 52.

[0048] The structure of this embodiment can also be used for outlet in French, German and other standards, corresponding modifications are only needed for the specification of the sockets of outlet.

[0049] As shown in Fig. 12, the four corners of the panel 10 can be rounded, to meets the needs of the users.

[0050] Fig. 13 schematically shows the structure of a wall outlet of the present invention made suitable for French standards. As shown in Fig. 13, the null wire metallic strip 53 is modified to protruding cylinder in shape.

[0051] In the wall outlet of the present invention, a face frame 14 can be provided surrounding the outside of panel 10, wherein the face frame 14 provides a baffle plate 141 at the front upper frame. When an electronic device is charging, it can be placed on top of the face frame 14, and the baffle plate 141 shall prevent it from slipping. The structure of the face frame 14 is shown in Fig. 14.

[0052] The above only describes the preferable embodiments of the present invention. It should be indicated that those skilled in the art may also make various modifications and improvements without departing from the spirit of the present invention, which shall all be deemed within the protection scope of the present invention.

Claims

1. A wall outlet, comprising a panel (10), and a bottom cover (70) which is provided behind the panel (10); wherein the panel (10) provides a power slot (11) and a USB charging socket (12); an accommodating space formed by the panel (10) and the bottom cover (70) provides a USB charging device, a live wire metallic strip (51), a null wire metallic strip (52) and an earth wire metallic strip (53); the USB charging device further comprises a USB port (61), and a USB charging circuit board (60) which is connected to the USB port (61); the USB port (61) corresponds to the USB charging socket (12) in terms of location; the power slot (11) provides through-holes respectively which correspond to the live wire metallic strip (51), the null wire metallic strip (52) and the earth wire metallic strip (53) in terms of location and shape; a distance between the center of the power slot (11) and the center of the panel (10) is 2-5mm.
2. The wall socket according to claim 1, wherein the center of the power slot (11) deviates from the center of the panel (10) by 2-5mm towards the lower end; the USB charging socket (12) is provided above the power slot (11).
3. The wall outlet according to claim 2, wherein two of the USB charging sockets (12) are provided in horizontal direction at two corners of the upper part of the panel (10) respectively; the USB charging circuit board (60) comprises first circuit board (601) and second circuit board (602), the first circuit board (601) connects to the second circuit board (602), appearing in the shape of L, the first circuit board (601) is located by the flank inside of the upper side of the bottom cover (70), the second circuit board (602) is located at the back face of the bottom cover (70); the first circuit board (601) appears in the shape of U; two of the USB ports (61) are provided at the two free ends of the first circuit board (601) respectively.
4. The wall outlet according to claim 3, wherein the second circuit board (602) provides a transformer (64), a capacitors (68), a word inductor (67), a common mode inductor (66), an IC chip (61), a Y capacitor (62) and an X capacitor (65), the first circuit board 601 provides a solid capacitor (63).
5. The wall outlet according to claim 4, wherein the output of the USB port (61) is 2100mA and 4200mA respectively.
6. The wall outlet according to claim 2, wherein two of the USB charging sockets (12) are provided inclined at two upper corners of the panel (10) respectively; a USB bracket (30) is provided on top of the earth wire metallic strip (53), appearing in "II" shape overall; a step (31) is provided at the contact part of the earth wire metallic strip (53) and the USB bracket (30) to make them adapt to each other; the USB charging circuit board (60) comprises the first circuit board (601) and the second circuit board (602), which are connected to each other; two of the first circuit board (601) are connected to two of the USB ports (61) respectively, and are inclined at the two ends of the upper part of the USB bracket (30); the second circuit board (602) provides the transformer (64), wherein the transformer (64) is located at the upper part of the live wire metallic strip (51) and the null wire metallic strip (52).
7. The wall outlet according to claim 6, wherein the first circuit board (601) provides locating through-hole, and the USB bracket (30) provides locating flange (301) to match the locating through-hole.
8. The wall outlet according to claim 1-7, further comprising a face frame (14) provided surrounding the outside of panel (10), wherein the face frame (14) provides a baffle plate (141) at the front upper frame.
9. The wall outlet according to claim 1-7, further comprises a pad frame (80) provided behind the panel (10).
10. The wall outlet according to claim 1-7, wherein the center of the power slot (11) deviates from the center

of the panel (10) by 3-3.5mm towards the lower end.

5

10

15

20

25

30

35

40

45

50

55

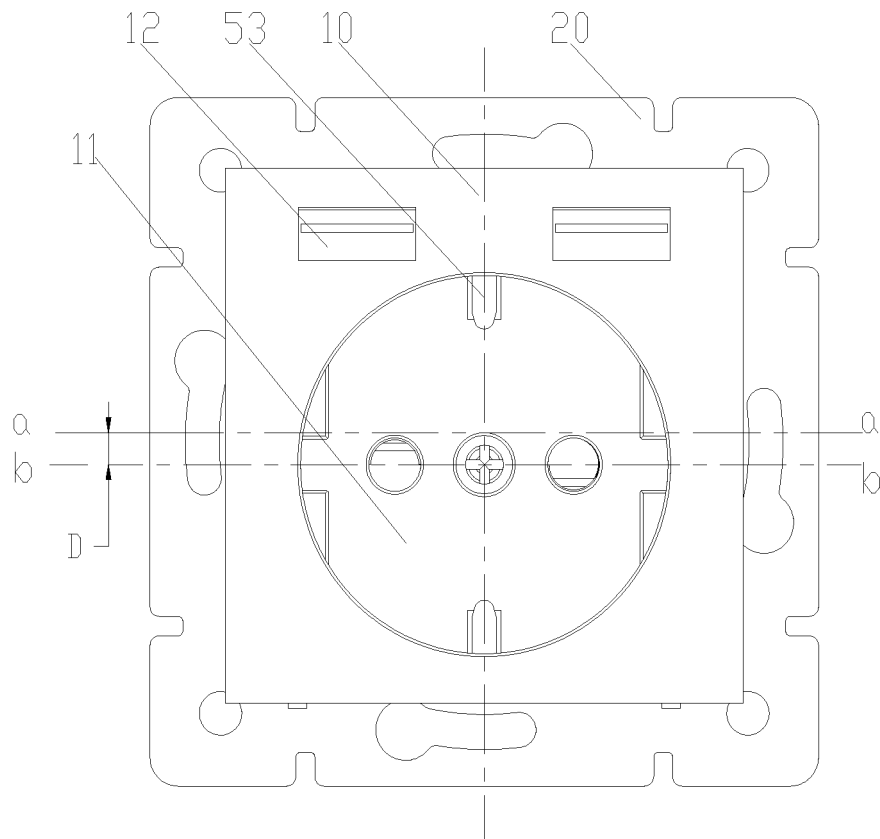


Fig. 1

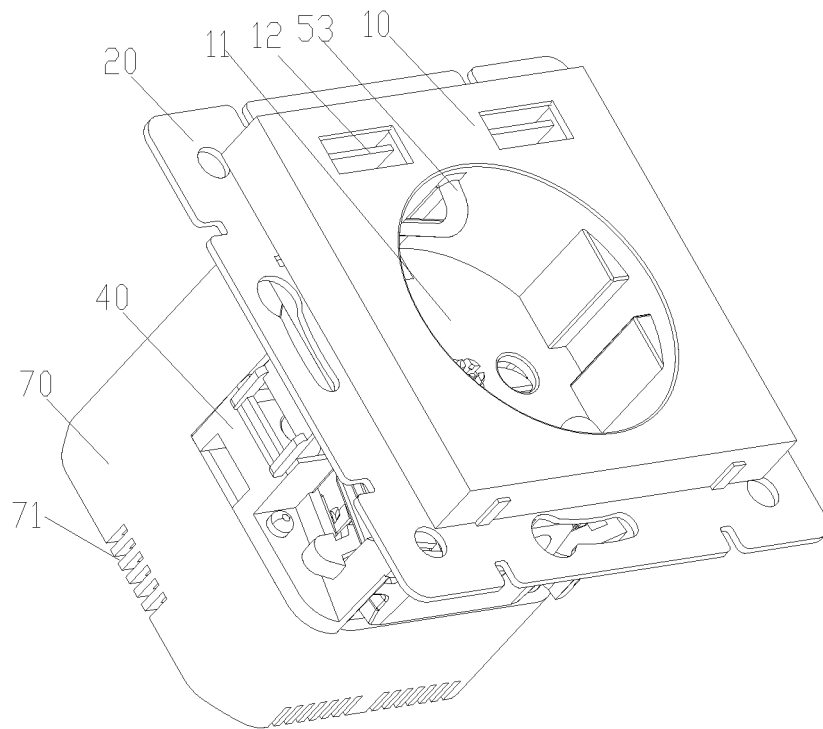


Fig. 2

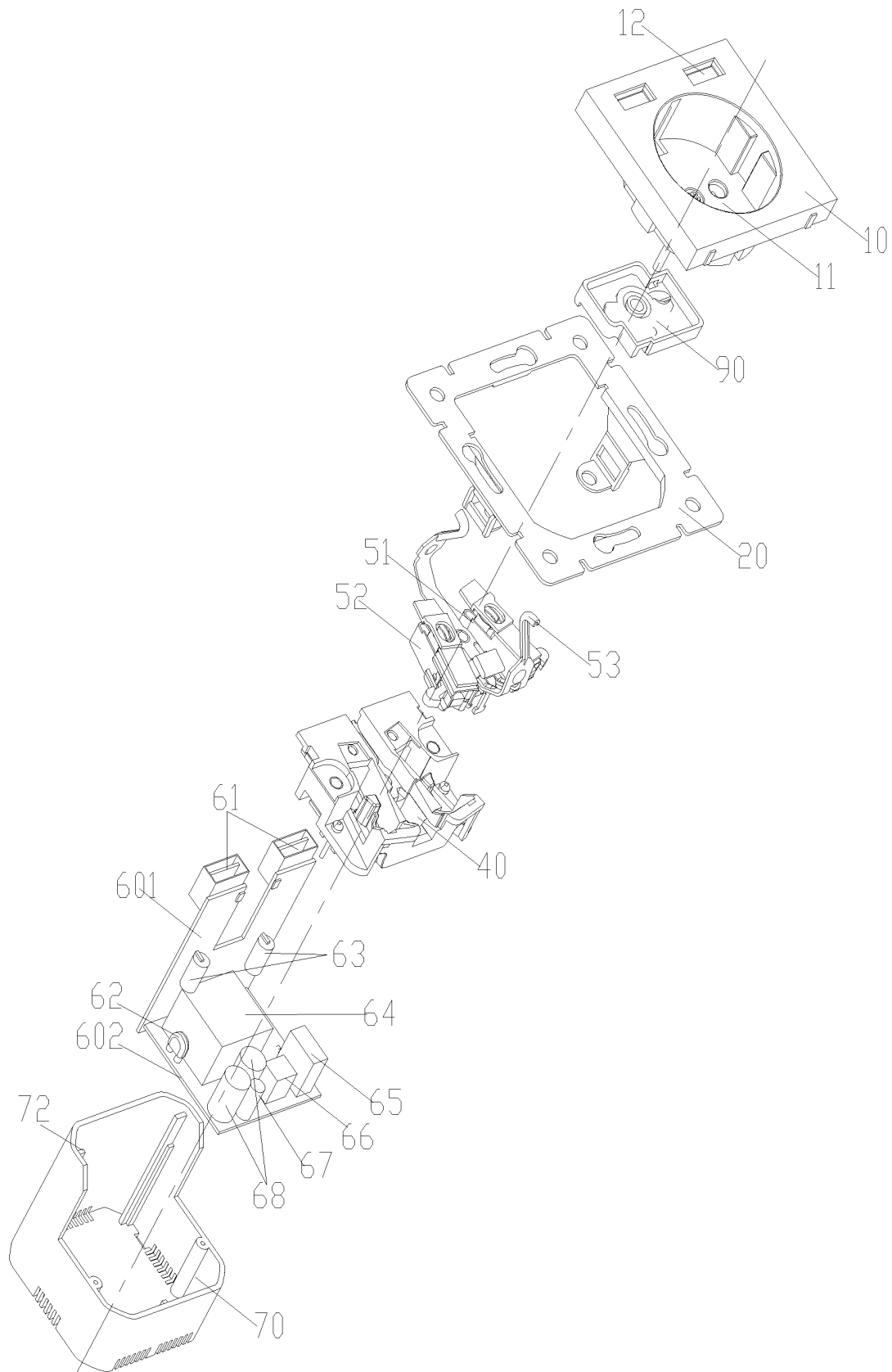


Fig. 3

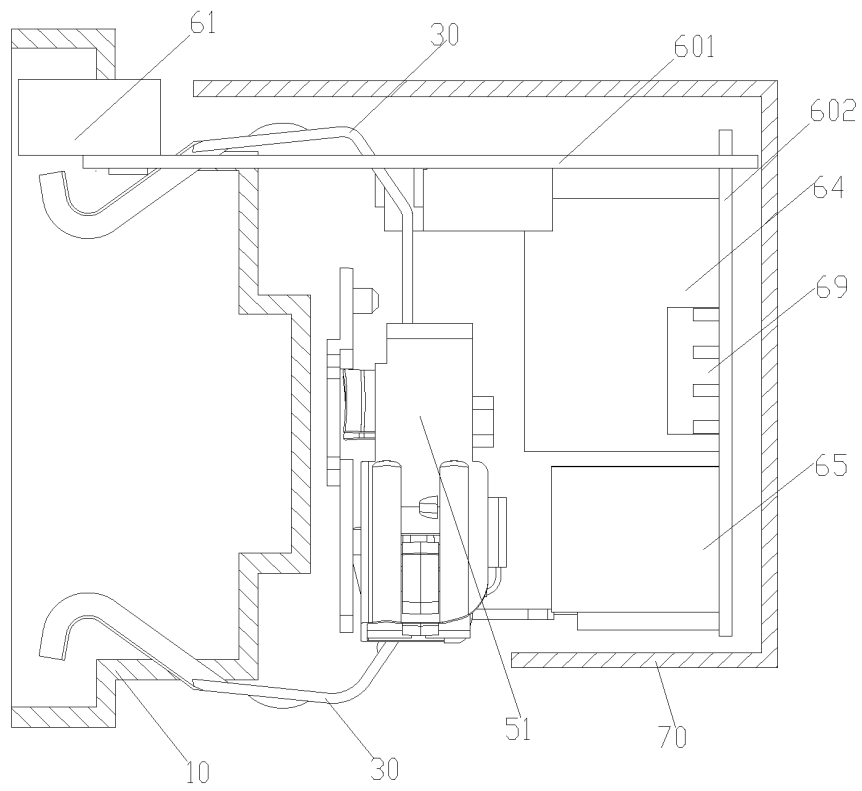


Fig. 4

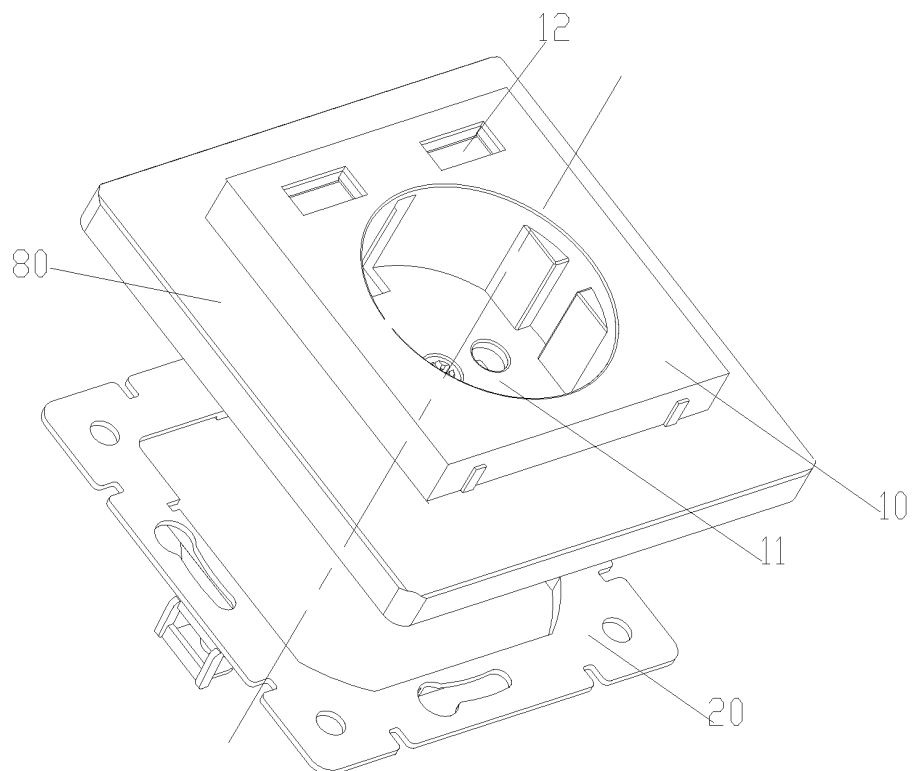


Fig. 5

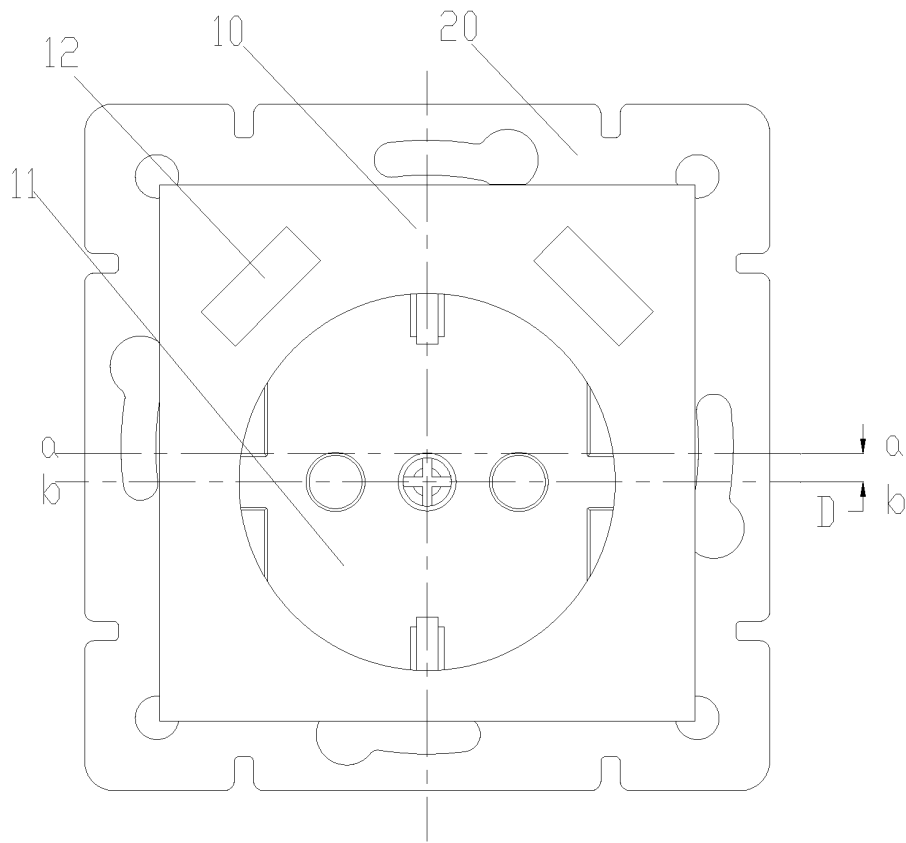


Fig. 6

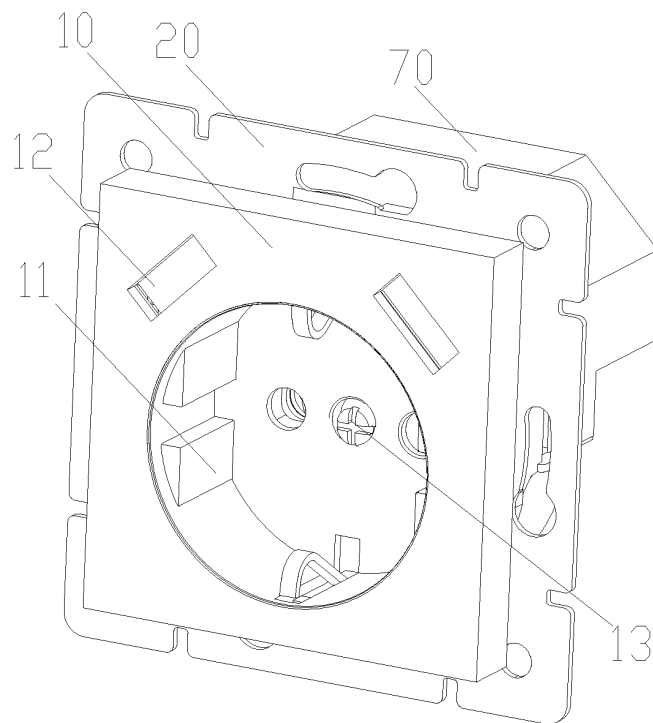


Fig. 7

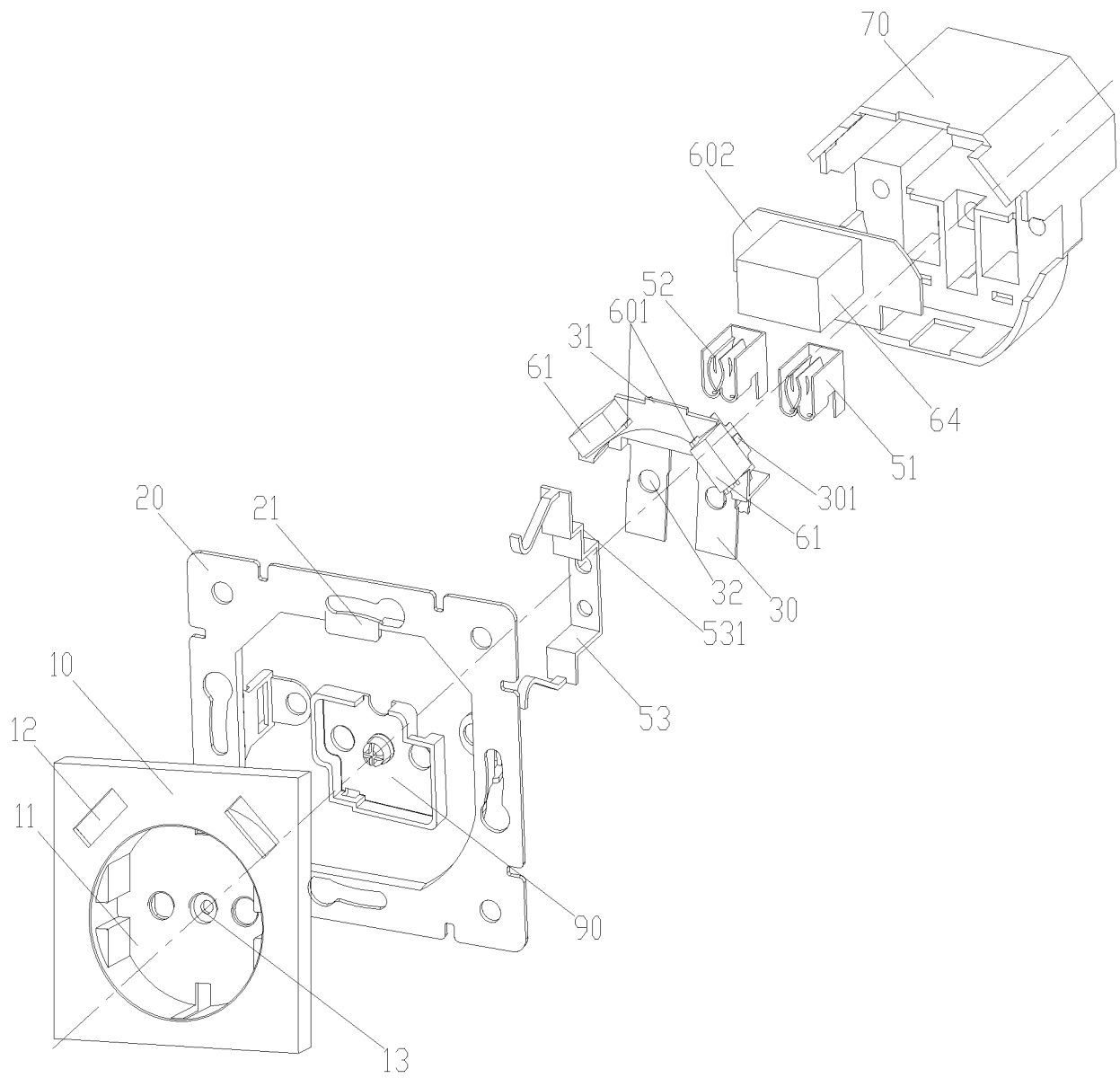


Fig. 8

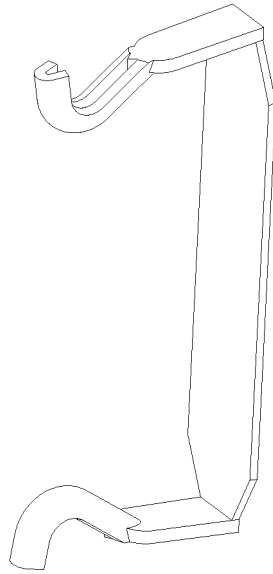


Fig. 9

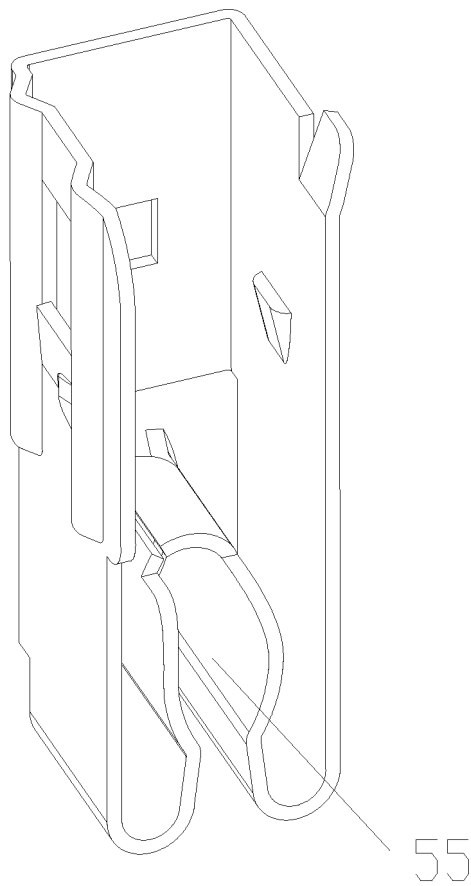


Fig. 10

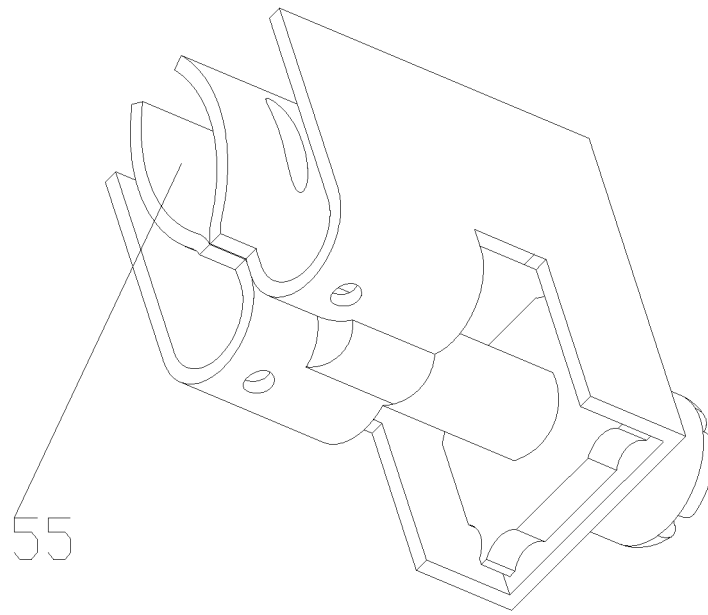


Fig. 11

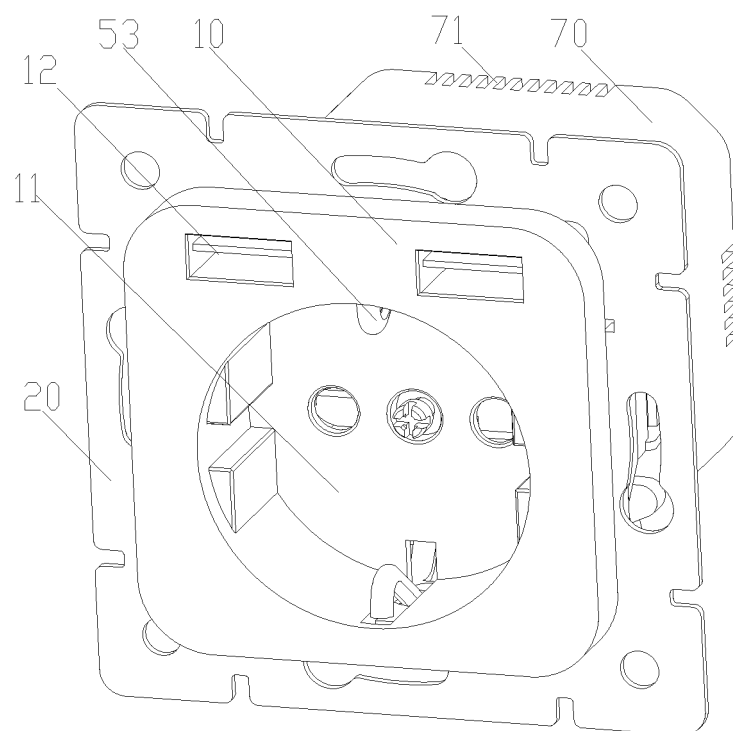


Fig. 12

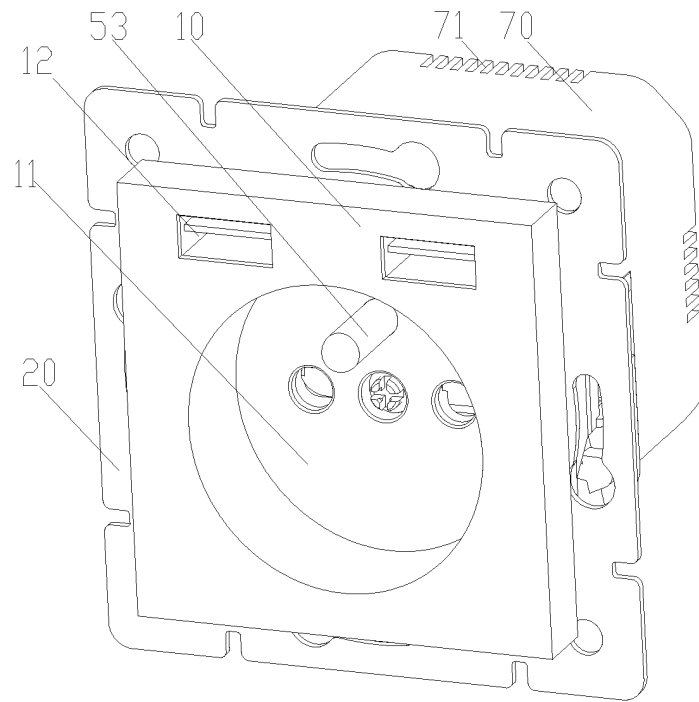


Fig. 13

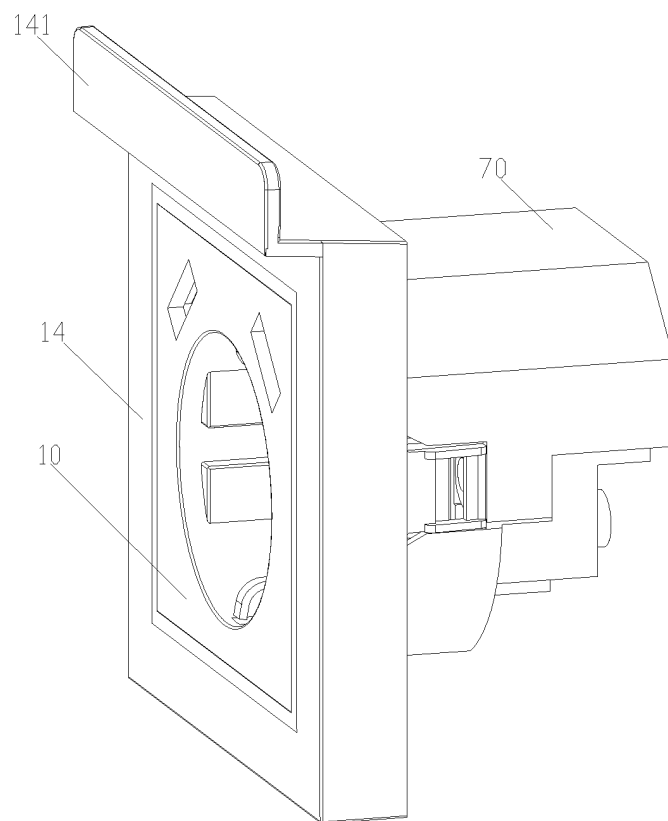


Fig. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2016/086978

A. CLASSIFICATION OF SUBJECT MATTER

H01R 13/73 (2006.01) i; H01R 13/10 (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)

DWPI, CNABS, CNTXT, CNKI: USB, socket, wall, interface, port, charge, circuit board

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 204668628 U (GUANGZHOU LEISHEN ELECTRIC MANUFACTURING CO., LTD.), 23 September 2015 (23.09.2015), description, paragraphs 0021-0037, and figures 1-9	1-10
X	CN 203260857 U (ZHENG, Bingzhang), 30 October 2013 (30.10.2013), description, paragraphs 0020-0033, and figures 1-3	1-10
A	CN 202585966 U (YIN, Shaobin), 05 December 2012 (05.12.2012), the whole document	1-10
A	CN 104953403 A (HUNAN ZHONGPU LIGHTNING PROTECTION CO., LTD.), 30 September 2015 (30.09.2015), the whole document	1-10

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

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“E” earlier application or patent but published on or after the international filing date

“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

03 March 2017 (03.03.2017)

Date of mailing of the international search report

15 March 2017 (15.03.2017)

Name and mailing address of the ISA/CN:
 State Intellectual Property Office of the P. R. China
 No. 6, Xitucheng Road, Jimenqiao
 Haidian District, Beijing 100088, China
 Facsimile No.: (86-10) 62019451

Authorized officer

LIU, Jingjing

Telephone No.: (86-10) 62089413

PCT/CN2016/086978

Form PCT/ISA/210 (patent family annex) (July 2009)