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Remarks:

Amended claims in accordance with Rule 137(2) EPC.

(54) **Bathroom mirror demister**

(57) A bathroom mirror (1), comprising a cabinet (11); a mirror door (12) disposed on the front of said cabinet (11), a contact switch (2), and a demister device (3) disposed on the back of said mirror door (12) and electrically connected to said contact switch (2), characterized in that: said contact switch (2) comprises a first contact member (21) and a second contact member (22); said first contact member (21) disposed on said cabinet (11)

including a first electrode rod (211), a insulator (212) and a spring (213) ; said second contact member disposed (22) on said mirror door (12) including a second electrode rod (221) and a second contact pin (222); when said mirror door (12) closed on the said cabinet (11), said second contact member (22) connected to said first contact member (21) and switch on said demister device (3), in which heats up and demists bathroom mirror.

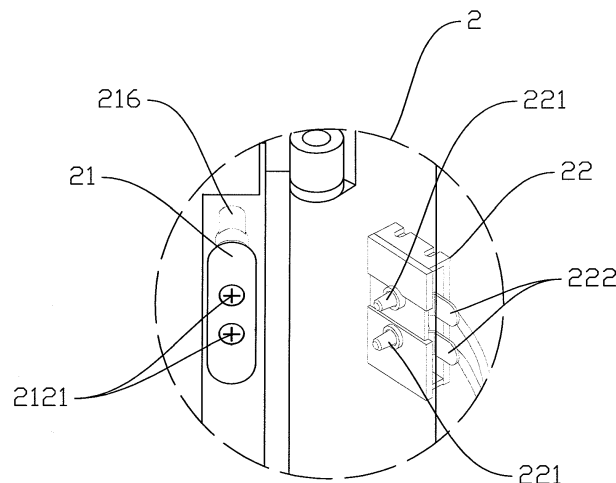


FIG. 2

Description

Field of the Invention

[0001] The present invention relates to a bathroom mirror, and more particularly to a bathroom mirror demister including a contact switch.

[0002] A bathroom mirror, comprising a cabinet; a mirror door disposed on the front of said cabinet, a contact switch, and a demister device disposed on the back of said mirror door and electrically connected to said contact switch, characterized in that: said contact switch comprises a first contact member and a second contact member; said first contact member disposed on said cabinet including a first electrode rod, an insulator and a spring; said second contact member disposed on said mirror door including a second electrode rod and a second contact pin; when said mirror door closed on the said cabinet, said second contact member connected to said first contact member and switch on said demister device, in which heats up and demists bathroom mirror.

Description of the Related Art

[0003] The misting over of a bathroom mirror is a problem that one frequently encounters after showering, especially, when a cabinet is attached behind the bathroom mirror. When it happens to the mirror temporarily unusable for such tasks as shaving, grooming and applying makeup. A common approach to the problem is to wipe the mirror off with a dry towel; however, this usually provides only temporary relief since the moisture remains in the bathroom and will continue fog up the mirror.

[0004] Other common approach is bathroom mirror install a demister device, a conventional bathroom mirror demister includes a power cable, a plug and a switch. The plug needs to be connected to a power socket and turn on the switch to operate the demister device. In Taiwan Utility Patent No. 257053, the power switch is located on the bottom of the bathroom mirror, the power cable need to be connected to a power socket and to operate the demister device the switch needed to be switched on. It is a hassle for the user to switch on and off consistently in order to demist the bathroom mirror. Moreover, while there is a cabinet attached behind the bathroom mirror. The power cable has to go around the cabinet, and be connected to the wall plug. The bathroom mirror is opened and closed when put the necessity in or out of the cabinet, the power cable will be stretched and squeezed time after time. The power cable will soon be broken, after using a period of time.

[0005] In view of the problems existed in the prior art and for solving them concurrently, the inventor proposes a method to combine a demister to the bathroom mirror and uses a contact switch which provide a easy, convenient and safe way of demisting bathroom mirror.

SUMMARY OF THE INVENTION

[0006] It is an object of the present invention to provide a bathroom mirror demister having a contact switch which is safe and fully integrated method of demisting bathroom mirror.

[0007] A bathroom mirror, comprising a cabinet; a mirror door disposed on the front of said cabinet, a contact switch, and a demister device disposed on the back of said mirror door and electrically connected to said contact switch, characterized in that: said contact switch comprises a first contact member and a second contact member; said first contact member disposed on said cabinet including a first electrode rod, an insulator and a spring; said second contact member disposed on said mirror door including a second electrode rod and a second contact pin; when said mirror door closed on the said cabinet, said second contact member connected to said first contact member and switch on said demister device, in which heats up and demists bathroom mirror.

[0008] Wherein said first contact member and second contact member is an insert type electric contact switch.

[0009] Wherein said first contact member and second contact member is an incline surface electric contact switch.

[0010] Wherein said first contact member and second contact member is a magnetic electric contact switch.

[0011] Wherein said insulator is a silicon material.

[0012] Wherein said insulator is a rubber material.

[0013] Further scope of applicability of the invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

FIG. 1 is a perspective view of a bathroom mirror according to the present invention;

FIG. 2 is an enlarged perspective view of the contact switch of FIG. 1;

FIG. 3 is a perspective view of a contact switch;

FIG. 4 is an assembly diagram of a second contact member;

FIG. 5 is a perspective view of a second contact member;

FIG. 6 is an assembly diagram of a first contact mem-

ber;

FIG. 7 is a perspective view of a first contact member;

FIG. 8 is a cross-sectional view of a contact switch, according to an embodiment of the invention;

FIG. 9 is a perspective view of a contact switch, according to an embodiment of the invention;

FIG. 10 is a cross-sectional view of a contact switch, according to another embodiment of the invention; and

FIG. 11 is a perspective view of a contact switch, according to another embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Embodiment 1

[0015] Referring to FIG. 1 to FIG. 7, illustrates a preferred embodiment of the present invention, a bathroom mirror 1 comprised a cabinet 11, a mirror door 12 disposed on the front of the cabinet 11, a contact switch 2, and a demister device 3 disposed on the back of the mirror door 12 as shown in FIG. 1. The demister device 3 is electrically connected to the contact switch 2 and the contact switch 2 comprises a first contact member 21 and a second contact member 22 shown in FIG. 3. The first contact member 21 and the second contact member 22 are constructed of a suitable plastic material. The first contact member 21 is attached on the edge of the cabinet 11 and comprised of a first contact upper cover 214 and a first contact body 215. FIG. 6 shows a insulator 212, at least one first electrode rod 211, and at least one corresponding spring 213, is fitted in between the first contact upper cover 214 and the first contact body 215. The first contact upper cover 214 which has at least one first contact upper cover aperture 2141, and on the bottom surface has at least one first contact upper cover boss 2142 and a pair of slot 2143. The insulator 212 has at least one insulator opening 2121 and is positioned in between the slot 2143, which is corresponding to the first contact upper cover aperture 2141 of the first contact upper cover 214. The first contact body 215 has at least one first contact body aperture 2151 and at least one first contact body boss 2152.

[0016] Referring to FIG. 6, at least one first contact pin 216 is beneath the first contact body 215, the first contact pin 216 has at least one first contact pin aperture 2161 corresponding to the first contact body boss 2152. At least one screw 217 is used to secure the first contact upper cover 214, the first contact body 215 and the first contact pin 216 together through the first contact pin aperture 2161, the first contact body boss 2152 and fix into the first contact upper cover boss 2142. Assembly the first contact member 21, the insulator 212, the first elec-

trode rod 211 and the spring 213 is positioned inside between the first contact upper cover 214 and the first contact body 215 as shown in FIG. 7.

[0017] When the spring 213 is compressed and the first electrode rod 211 is protruded through the first contact body aperture 2151 and touches the first contact pin 216, which creates a link in the circuit. When the spring 213 is decompressed pushing the first electrode rod 211 back into its original place inside the first contact body aperture 2151 cutting the link in the circuit between the first electrode rod 211 and the first contact pin 216.

[0018] Referring to FIG. 1, the second contact member 22 is attached on the back of mirror door 12 and comprised of a second contact upper cover 223 and a second contact lower cover 224. At least one second electrode rod 221, and at least one second contact pin 222, is fitted in between the second contact upper cover 223 and the second contact lower cover 224. The second contact upper cover 223 has at least one second contact upper cover aperture 2231, and on the second contact lower cover 2241 has at least one second contact lower cover boss 2241, corresponding to the second contact upper cover aperture 2231.

[0019] Referring to FIG. 4, at least one second contact pin 222 has at least one second contact pin aperture 2220. FIG. 4 shows at least one screw 225 is used to secure the second contact upper cover 223 and the second contact lower cover 224 together through the second contact upper cover aperture 2231 and the second contact lower cover boss 2241. Assembly the second contact member 22, the second electrode rod 221 and the second contact pin 222 is positioned inside between the second contact upper cover 223 and the second contact lower cover 224 as shown in FIG. 5.

[0020] Referring to FIG. 1, the first contact member 21 is attached to the edge of cabinet 11 and the second contact member 22 is attached on the back of mirror door 12, the demister device 3 is electrically connected to the second contact pin 222 of the second contact member 22.

[0021] When the mirror door 12 is closed, the second electrode rod 221 of the second contact member 22 pushes through the insulator openings 2121 of the insulator 212, and the second electrode rod 221 comes in and then contacts with the first electrode rod 211 of the first contact member 21. The second electrode rod 221 then pushes against the first electrode rod 211 and compressed the spring 213. The first electrode rod 211 then is protruded through the first contact body aperture 2151 and touches the first contact pin 216, which creates a link in the circuit. The electricity is then provided to the demister device 3 and heats up the mirror door 12 demisting the mirror. When the mirror door 12 is opened, the second electrode rod 221 of the second contact member 22 retrieves from the insulator openings 2121 of the first contact member 21, the spring 213 decompresses pushing the first electrode rod 211 back into its original place inside the first contact body aperture 2151 disconnecting the link in the circuit between the first electrode

rod 211 and the first contact pin 216, as result switching the demister device 3 off.

Embodiment 2

[0022] Referring to FIG. 8 to FIG. 9, illustrate second embodiment of the present invention. The contact switch 2 is similarly constructed as preferred embodiment, having a first contact member 210 and a second contact member 220. The first contact member 210 is comprised of a first contact front cover 61 and a first contact back cover 611 as shown in FIG. 9. FIG. 8 shows a pair of first contact pin 63 disposed on either side of the first contact member 210 and a pair of spring 213 pushing against a pair of electrode rod 65. The first contact member 210 has two incline surfaces forming a triangular opening and the pair of electrode rod 65 are positioned horizontally inside the first contact member 210. The second contact member 220 also has a pair of second incline surface 681 forming a triangular tip matching the triangular opening of the first contact member 210 as shown in FIG. 9. A pair of second contact pin 68 is assembled inside the second contact member 220 from the second incline surface 681 to the either side of the second contact member 220.

[0023] When the mirror door 12 is closed, the second incline surfaces 681 of the second contact member 220 pushed against the pair of the electrode rods 65. The pair of electrode rods 65 then compressed the spring 213 and protruded through the insulator opening 671 touching the first contact pin 63, which creates a link in the circuit. The electricity is then provided to the demister device 3 and heats up the mirror door 12 demisting the mirror. When the mirror door 12 is opened, the first contact member 210 is separated from the second contact member 220, therefore the second incline surface 681 is separated from the first incline surface 651. The spring 213 decompresses and pushes the electrode rod 65 back to its original place inside the first contact body 210, therefore the electrode rod 65 is separated from the first contact pin 63 of the first contact member 210 disconnecting the link in the circuit, as result switching the demister device 3 off.

Embodiment 3

[0024] Referring to FIG. 10 and FIG. 11, illustrate third embodiment of the present invention. The contact switch 2 is similarly constructed as preferred embodiment, having a first contact member 2100 and a second contact member 2200. The first contact member 2100 is comprised of a first contact front cover 71 and a first contact back cover 711 as shown in FIG. 11. FIG. 10 shows a pair of first contact pin 73 disposed on either side of the first contact member 2100, a pair of spring 213 pushing against a pair of electrode rod 75 and a magnet 74 positioned in the center of the first contact member 2100. A pair of second contact pin 78 and a metal plate 79 are assembled inside the second contact member 2200. The

second contact pin 78 has a second contact pin tip 781 situated on one end and aligned with the electrode rod 75 in the first contact switch 2100.

[0025] When the mirror door 12 is closed, the first contact member 2100 and the second contact member 2200 connected together due to the magnet 78 and the metal plate 79. When the magnet 78 magnetizes the metal plate 79, the second contact pin tip 781 pushes against the electrode rod 75 and compresses the spring 213, therefore the electrode rod 75 touches the first contact pin 73 and creates a link in the circuit. The electricity is provided to the demister device 3 and heats up the mirror door 12 demisting the mirror. When the mirror door 12 is opened, the first contact member 2100 is separated from the second contact member 2200, therefore the second contact pin tip 781 is separated from the first contact pin 73. The spring 213 decompresses and pushes the electrode rod 75 back into its original place therefore separated from the first contact pin 73 of the first contact member 2100 disconnecting the link in the circuit, as result switching the demister device 3 off.

[0026] Various modifications in structure and/or function may be to the disclosed embodiments by one skilled in the art without departing from the scope of the invention as defined by the claims.

Claims

1. A bathroom mirror (1), comprising:
 - a cabinet (11);
 - a mirror door (12) disposed on the front of said cabinet (11);
 - a contact switch (2); and
 - a demister device (3) disposed on the back of said mirror door (12) and electrically connected to said contact switch (2),

characterized in that:

- said contact switch (2) comprises a first contact member (21) and a second contact member (22);
 - said first contact member (21) disposed on said cabinet (11) including a first electrode rod (211), a insulator (212) and a spring (213);
 - said second contact member (22) disposed on said mirror door (12) including a second electrode rod (221) and a second contact pin (222);
 - said mirror door (12) closed on the said cabinet (11), said second contact member (22) connected to said first contact member (21) and switch on said demister device (3), in which heats up the mirror on the said mirror door (12).
2. The bathroom mirror (1) as claimed in claim 1, where-in said first contact member (21) and second contact

member (22) is an insert type electric contact switch.

3. The bathroom mirror (1) as claimed in claim 1, wherein said first contact member (21) and second contact member (22) is an incline surface electric contact switch. 5
4. The bathroom mirror (1) as claimed in claim 1, wherein said first contact member (21) and second contact member (22) is a magnetic electric contact switch. 10
5. The bathroom mirror (1) as claimed in claim 1, wherein said insulator (212) is a silicon material.
6. The bathroom mirror (1) as claimed in claim 1, wherein said insulator (212) is a rubber material. 15

Amended claims in accordance with Rule 137(2) EPC. 20

1. A bathroom mirror (1), comprising:

a cabinet (11);
 a mirror door (12) disposed on the front of said cabinet (11); 25
 a contact switch (2); and
 a demister device (3) disposed on the back of said mirror door (12) and electrically connected to said contact switch (2), 30

characterized in that:

said contact switch (2) comprises a first contact member (21) and a second contact member (22); 35
 said first contact member (21) disposed on said cabinet (11) including a first electrode rod (211), a insulator (212) and a spring (213);
 said second contact member (22) disposed on said mirror door (12) including a second electrode rod (221) and a second contact pin (222); 40
 said mirror door (12) closed on the said cabinet (11), said second contact member (22) connected to said first contact member (21) and switch on said demister device (3), in which heats up the mirror on the said mirror door (12); 45
 wherein when the mirror door (12) is closed, the second electrode rod (221) of the second contact member (22) pushes through insulator opening (2121) of the insulator (212), and the second electrode rod (221) then comes in contact with the first electrode rod (211) then pushes against the first electrode rod (211) and compresses the spring (213); and 50
 wherein when the spring (213) is compressed, the first electrode rod (211) is protruded through a first contact body aperture (2151) and touches 55

a first contact pin (216), which creates a link in the circuit and that when the spring (213) is decompressed pushing the first electrode rod (211) back into its original place inside the first contact body aperture (2151) cutting the link in the circuit between the first electrode rod (211) and the first contact pin (216).

2. The bathroom mirror (1) as claimed in claim 1, wherein said insulator (212) is a silicon material.
3. The bathroom mirror (1) as claimed in claim 1, wherein said insulator (212) is a rubber material.

4. A bathroom mirror (1), comprising:

a cabinet (11);
 a mirror door (12) disposed on the front of said cabinet (11);
 a contact switch (2); and
 a demister device (3) disposed on the back of said mirror door (12) and electrically connected to said contact switch (2),

characterized in that:

said contact switch (2) comprises a first contact member (210) and a second contact member (220);
 said first contact member (210) comprises a pair of first contact pin (63) and a pair of spring (213) pushing against a pair of electrode rod (65), wherein the first contact member (210) has two incline surfaces forming a triangular opening;
 said second contact member (220) comprises a pair of second contact pin (68) and a pair of second incline surface (681) forming a triangular tip matching the triangular opening of the first contact member (210);
 said mirror door (12) closed on the said cabinet (11), said second contact member (22) connected to said first contact member (21) and switch on said demister device (3), in which heats up the mirror on the said mirror door (12);
 wherein when the mirror door (12) is closed, the second incline surfaces (681) of the second contact member (220) pushed against the pair of the electrode rods (65), the pair of electrode rods (65) then compresses the spring (213) and protruded through the insulator opening (671) touching the first contact pin (63), which creates a link in the circuit; and
 wherein when the mirror door (12) is opened, the first contact member (210) is separated from the second contact member (220) and the second incline surface (681) is separated from the first incline surface (651), and then the spring (213) decompresses and pushes the electrode

rod (65) back to its original place inside the first contact pin (63) of the first contact member (210) disconnecting the link in the circuit.

5. A bathroom mirror (1), comprising: 5

a cabinet (11);
 a mirror door (12) disposed on the front of said cabinet (11);
 a contact switch (2); and 10
 a demister device (3) disposed on the back of said mirror door (12) and electrically connected to said contact switch (2),

characterized in that: 15

said contact switch (2) comprises a first contact member (2100) and a second contact member (2200);
 said first contact member (2100) comprises a 20
 first contact pin (73), a pair of spring (213) pushing against a pair of electrode rod (75) and a magnet (74);
 said second contact member (2200) comprises 25
 a metal plate (79) and a pair of second contact pin (78) having a second contact pin tip (781);
 said mirror door (12) closed on the said cabinet (11), said second contact member (22) connected to said first contact member (21) and switch 30
 on said demister device (3), in which heats up the mirror on the said mirror door (12);
 wherein when the mirror door (12) is closed, the first contact member (2100) and the second contact member (2200) connected together due to 35
 the magnet (78) and the metal plate (7), and when the magnet (78) magnetizes the metal plate (79), the second contact pin tip (781) pushes against the electrode rod (75) and compresses the spring (213), and then the electrode rod (75) touches the first contact pin (73) and creates a link in the circuit; and 40
 wherein when the mirror door (12) is opened, the first contact member (2100) is separated from the second contact member (2200), and then the second contact pin tip (781) is separated 45
 from the first contact pin (73), and the spring (213) decompresses and pushes the electrode rod (75) back into its original place, and then being separated from the first contact pin (73) of the first contact member (2100) disconnecting 50
 the link in the circuit.

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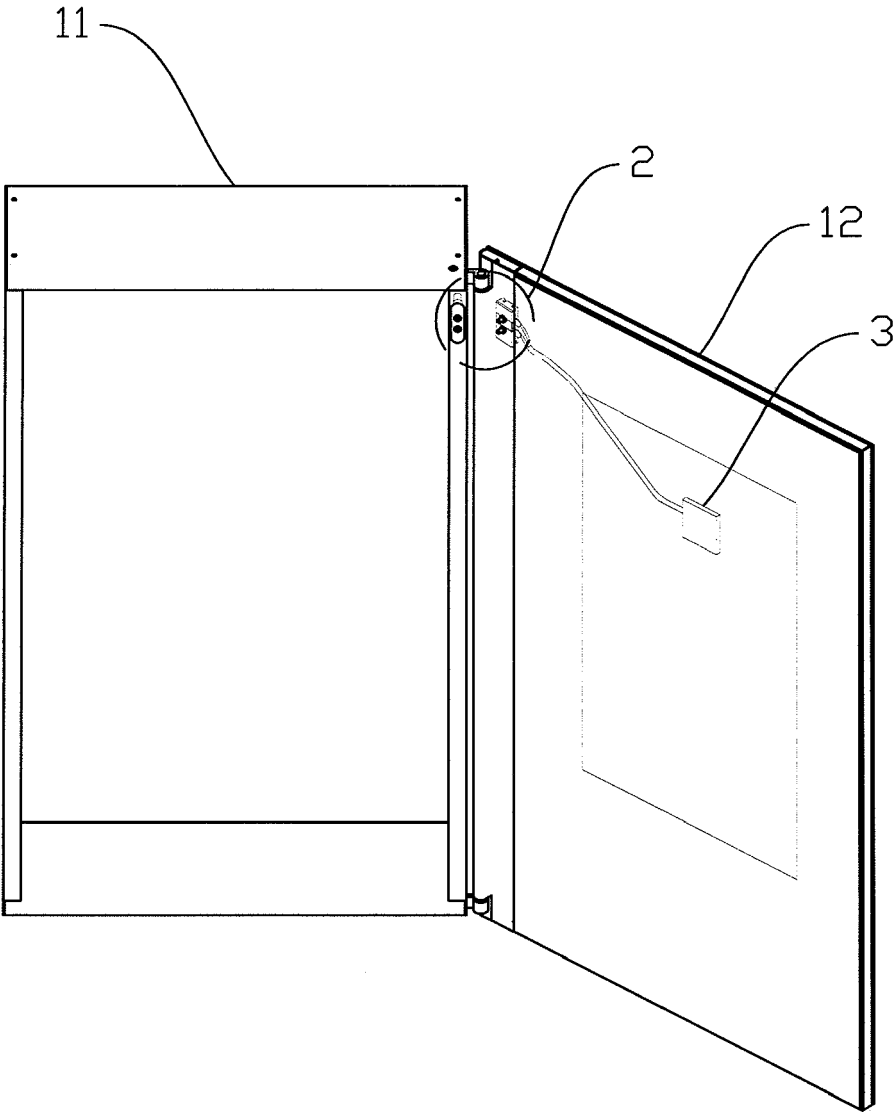


FIG.1

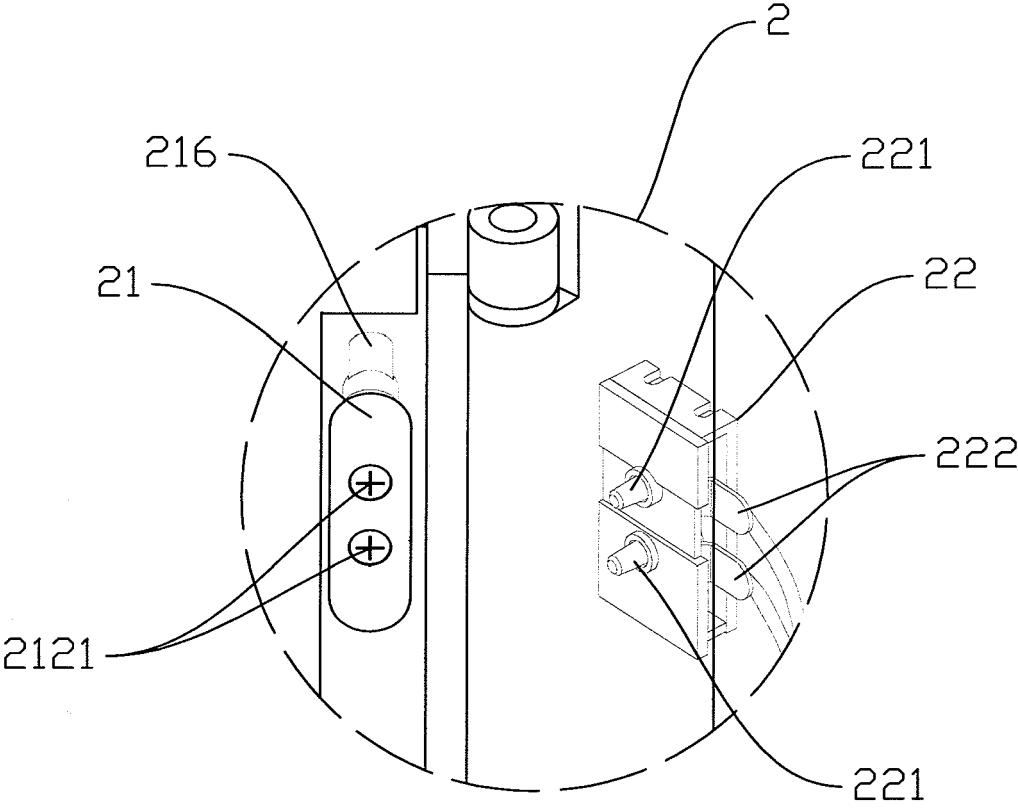


FIG. 2

2

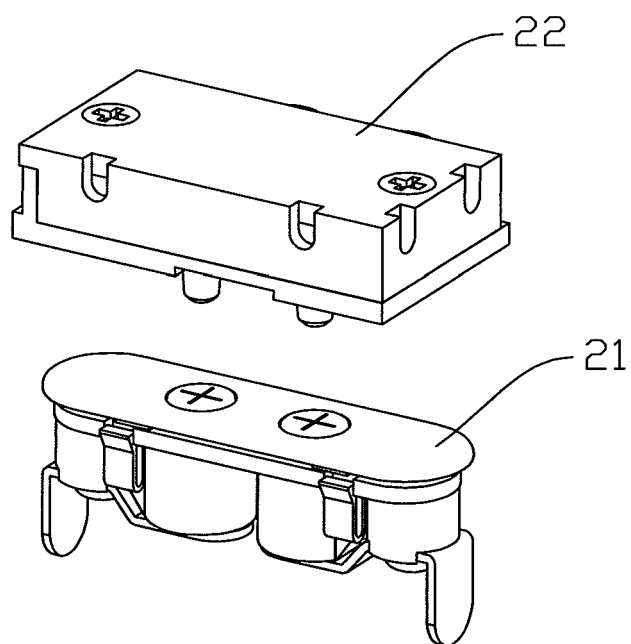


FIG. 3

22

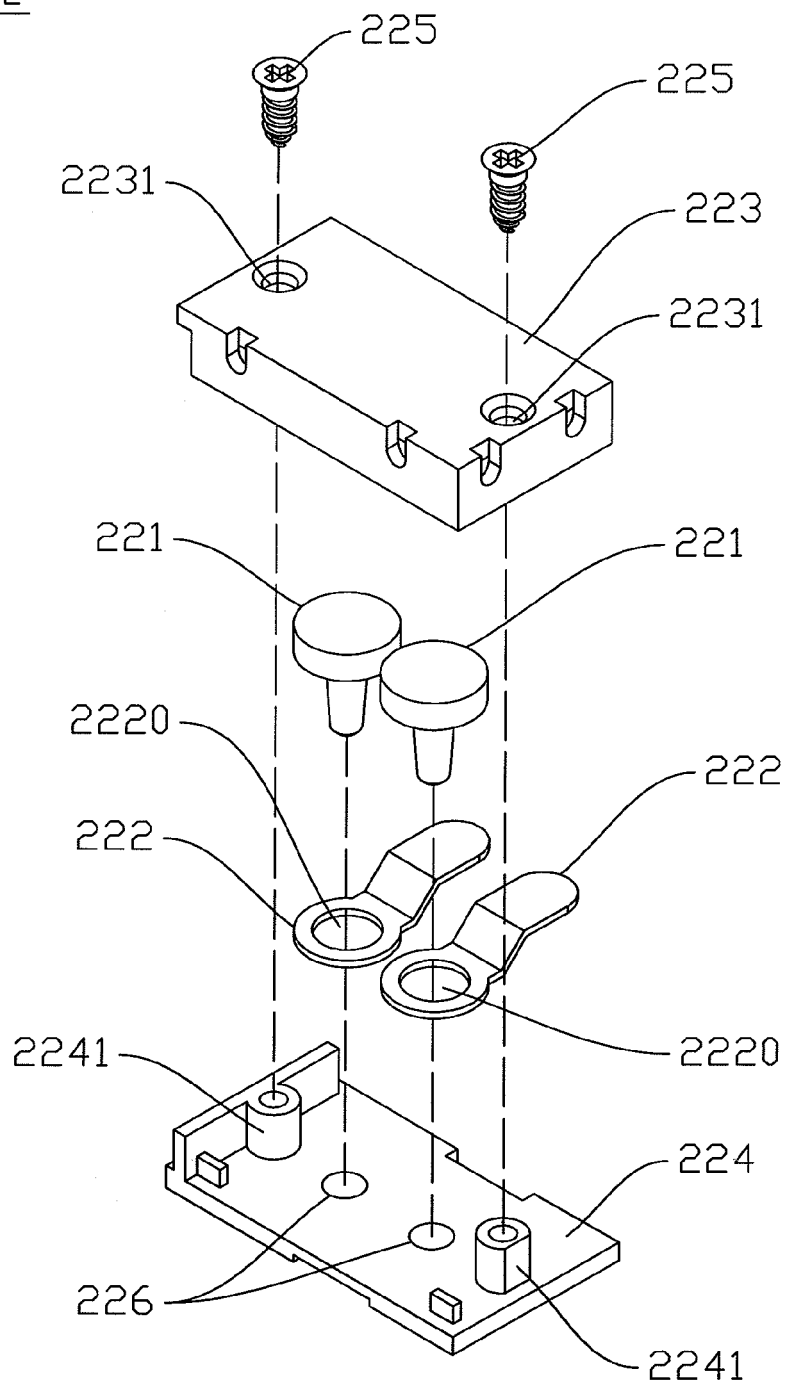


FIG. 4

22

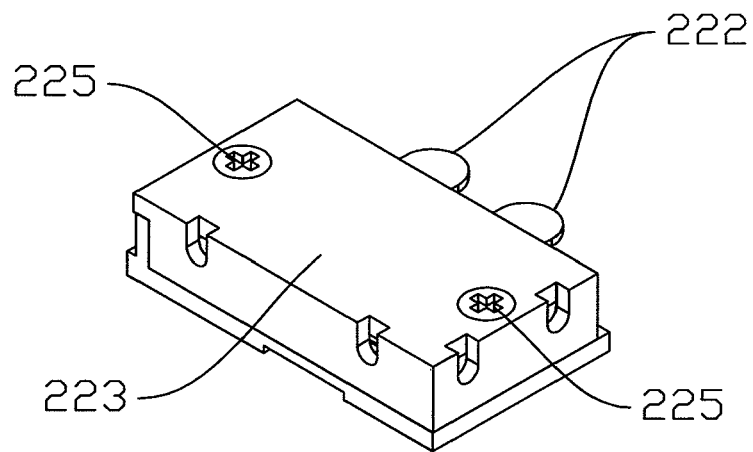


FIG. 5

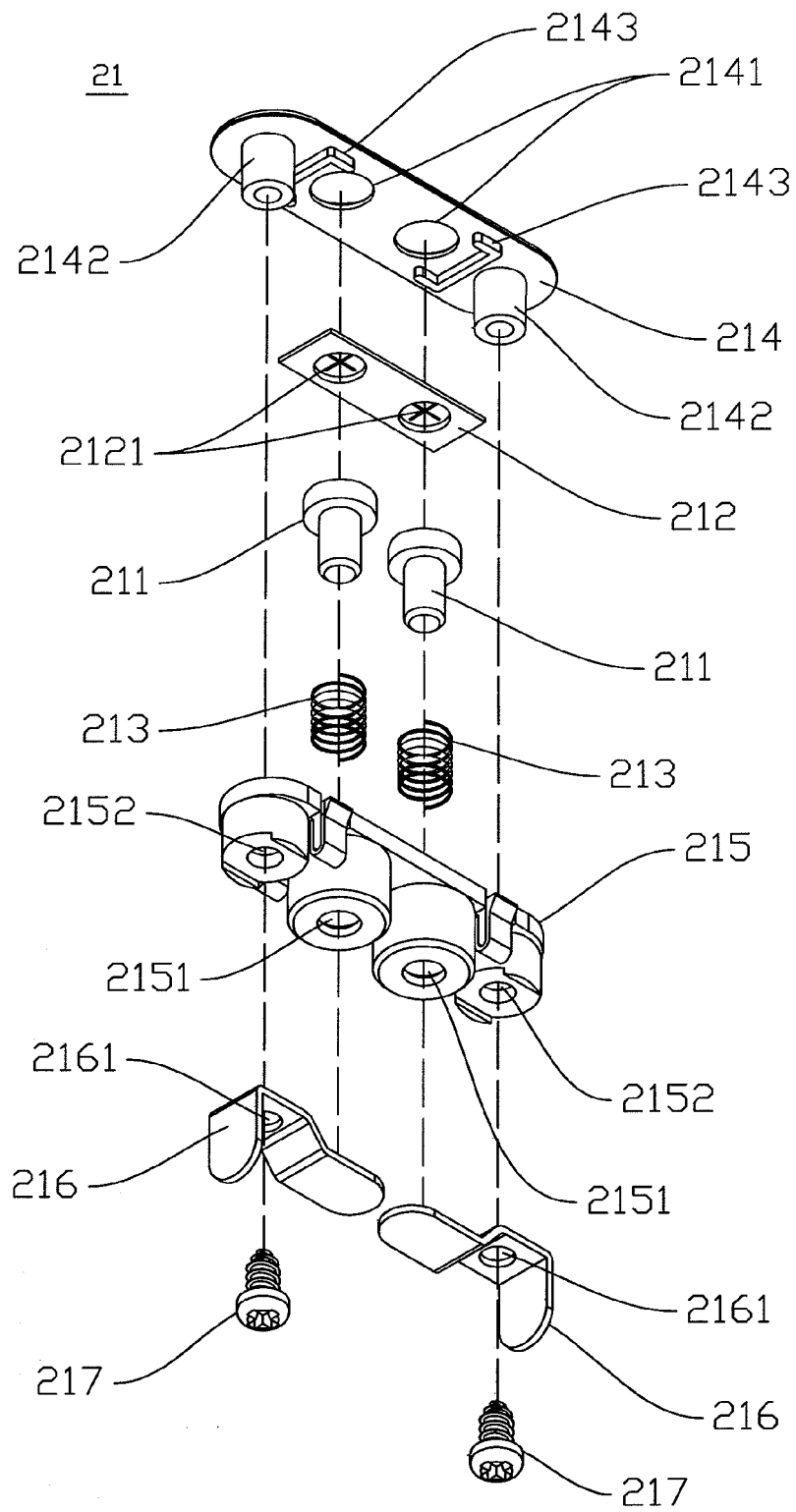


FIG. 6

21

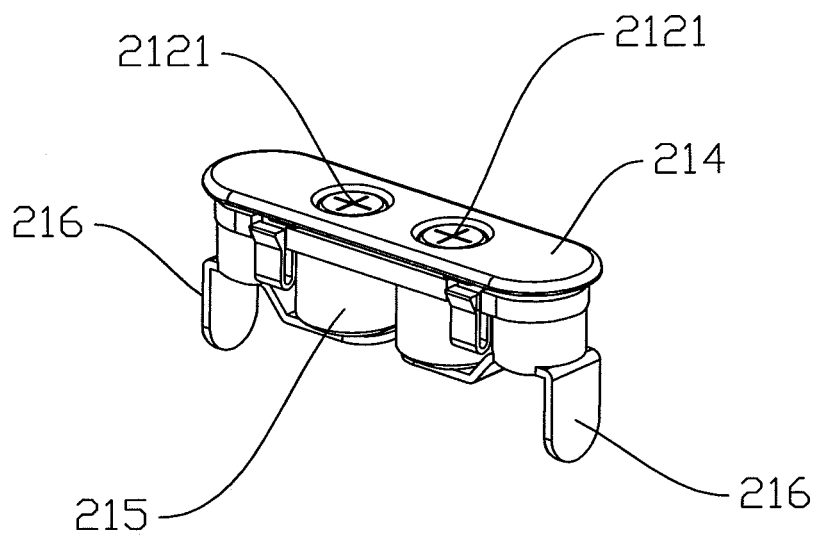


FIG. 7

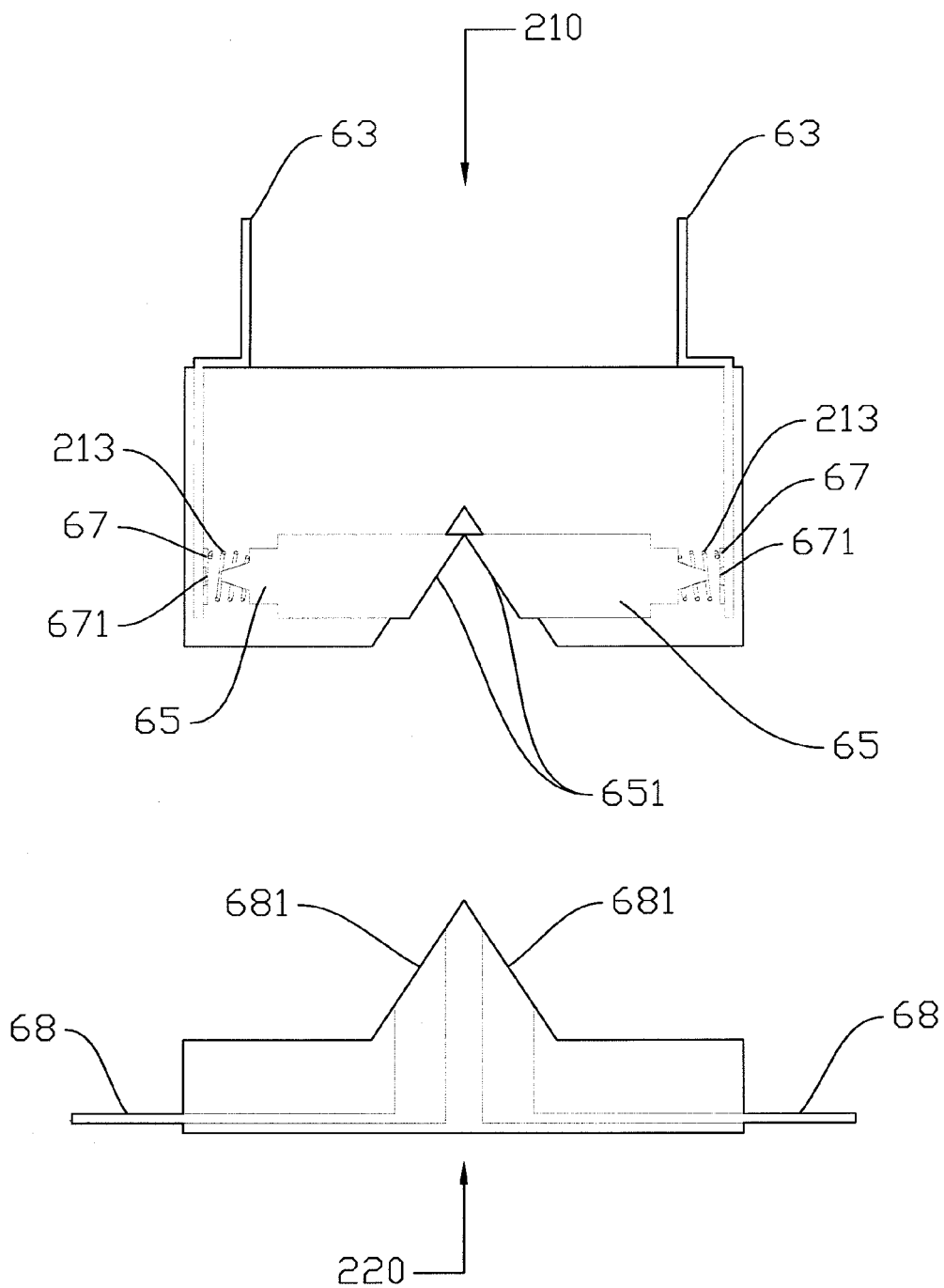


FIG. 8

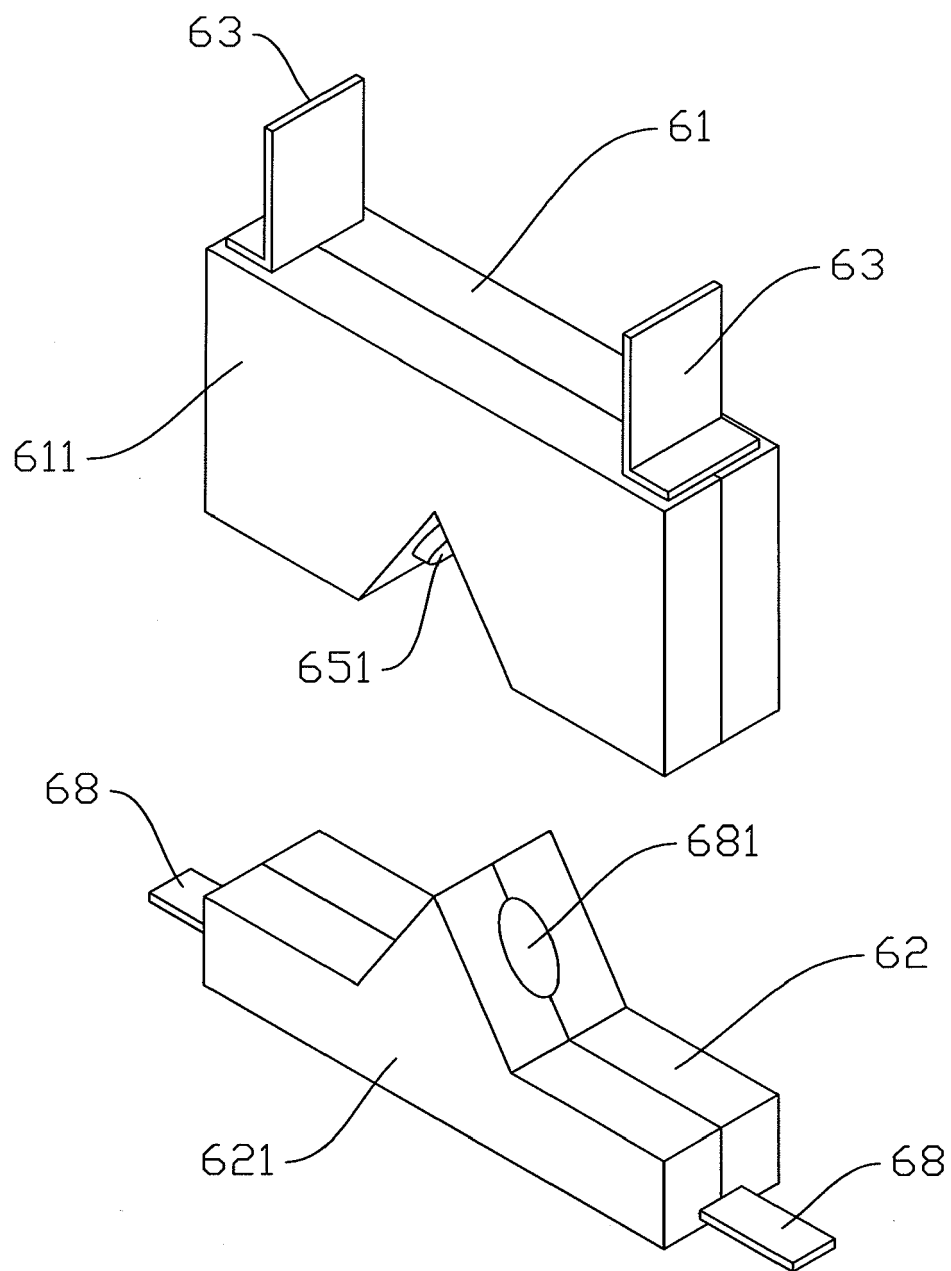


FIG. 9

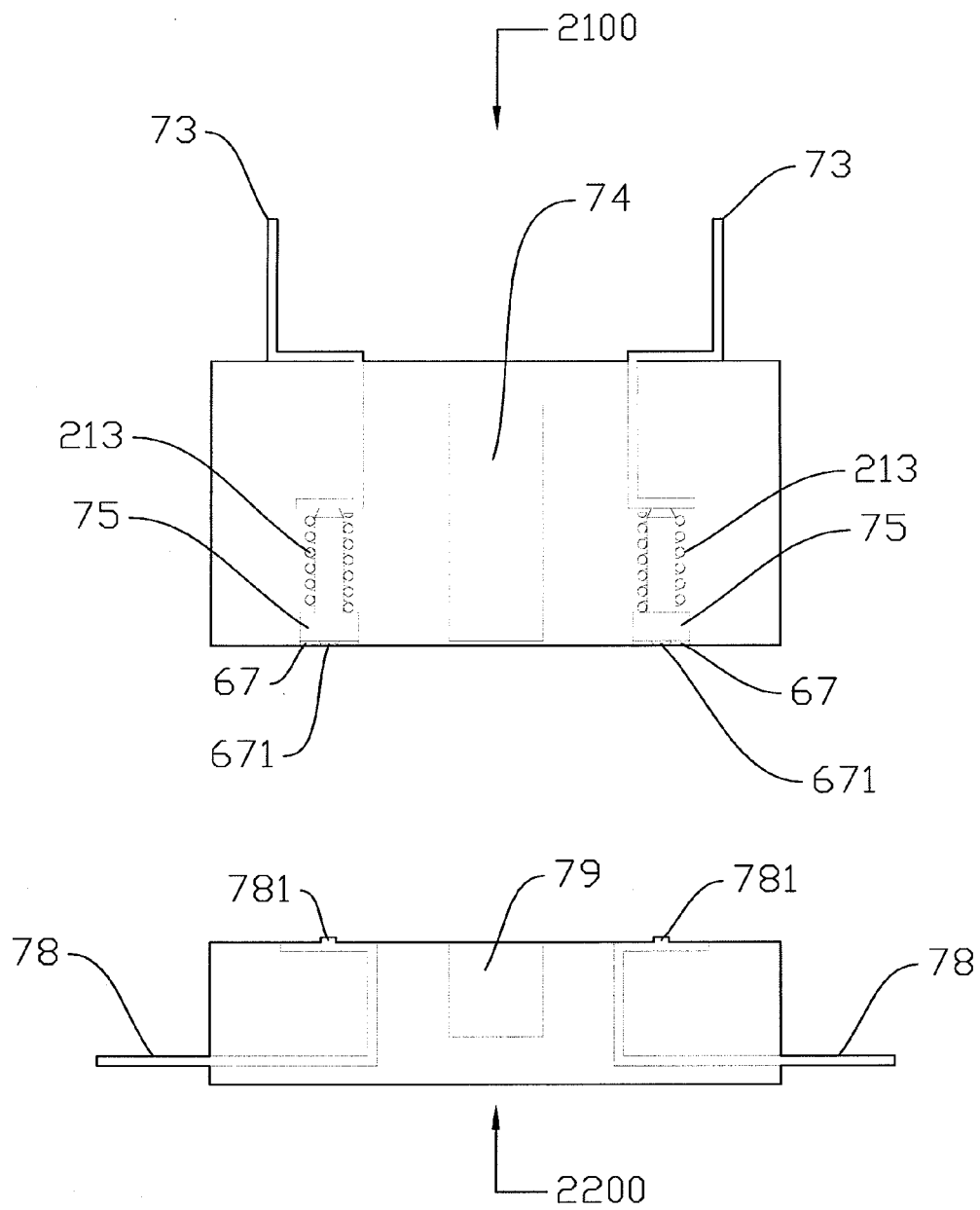


FIG. 10

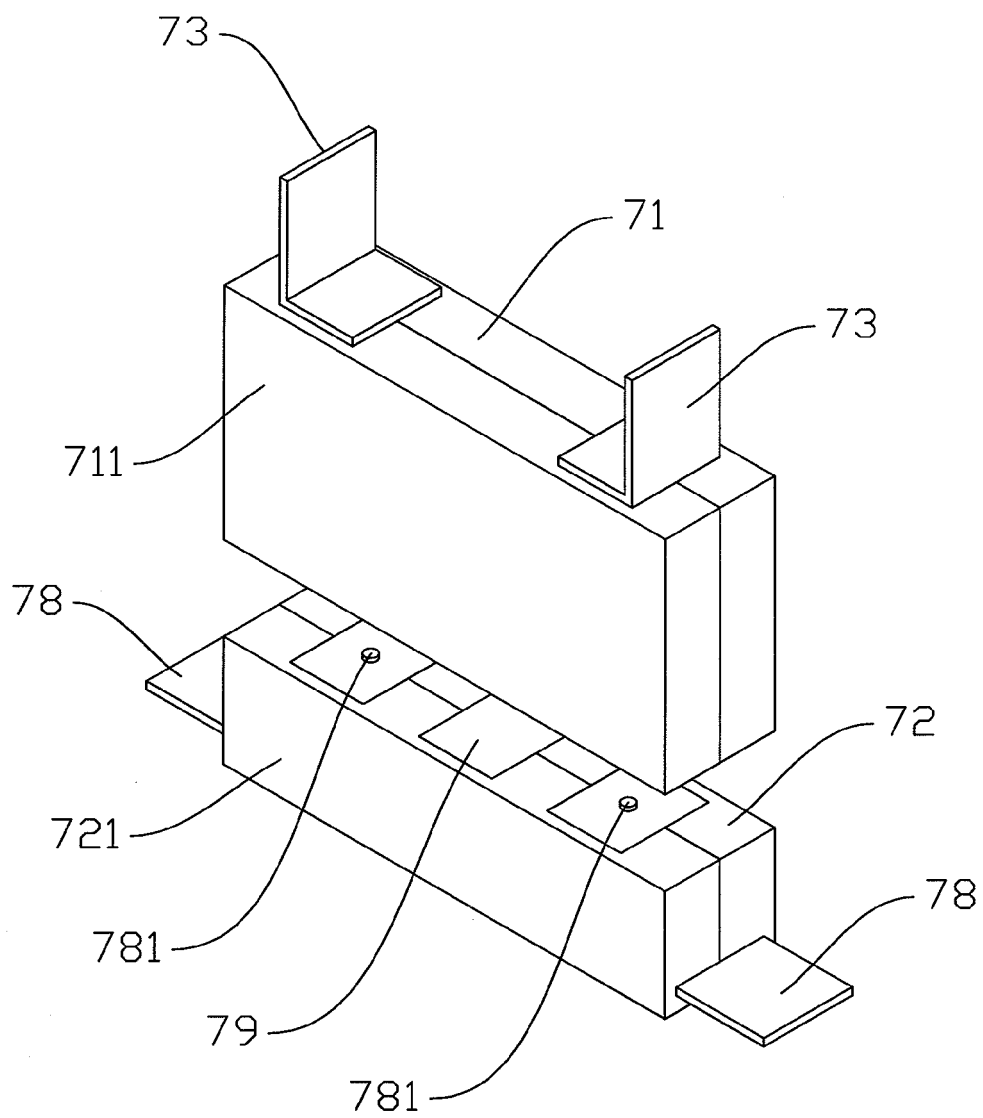


FIG. 11



EUROPEAN SEARCH REPORT

Application Number
EP 10 18 6515

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 160 736 A (CATTERSON THOMAS V) 8 December 1964 (1964-12-08) * column 1, lines 8,16-20 - column 2, lines 28-70; figures 5,6,7-12 * * column 3, lines 1-66 *	1	INV. A47G1/02 H01H13/18
A	IL 54 024 A (GROBER S [IL]) 31 October 1979 (1979-10-31) * figures 1-2 *	1	
A	FR 2 115 538 A5 (CONSTANTINESCO AURORA) 7 July 1972 (1972-07-07) * figures 1-2 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47G H05B H01H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 February 2011	Examiner Longo dit Operti, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

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

EP 10 18 6515

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-02-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3160736	A	08-12-1964	NONE	
IL 54024	A	31-10-1979	NONE	
FR 2115538	A5	07-07-1972	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- TW 257053 [0004]