

## **Fixed Socket with USB for Preventing High Voltage Test Impact**

### **Technical Field**

The present invention relates to a socket, in particular to a fixed socket with USB for preventing high voltage test impact.

### **Background Art**

Fixed sockets with USB power supply are gradually infiltrating into everyday life, and every country has begun to develop its own safety standards to regulate such products. Recently, the Housing Department of Singapore has first formulated relevant safety inspection requirements (it is estimated that other countries will follow it), including: after building construction and wire installation works are completed, insulation high-voltage test will be conducted on the whole house in each unit by applying high-voltage current, etc., which aims to ensure that the circuit or power distribution components in the house will not suffer short circuit. However, the design of such USB sockets in the market is difficult to pass the insulation high voltage test because the product has many low-voltage electronic components, which are easily damaged by high voltage impact.

In addition to the anti-high voltage test impact protection technology, it is also possible to use a combined product. For example, the socket and the USB are originally independent components. They may be combined into the same fixed frame and the USB is connected to the power supply after high voltage test is completed, which may avoid from high voltage test but it is not convenient for the electrician to install and it will cost a lot of time.

The traditional power supply sockets, due to lack of space, are basically not provided with a switch for a USB power supply device.

Since USB electronic components cannot withstand 500V high-voltage test, it is necessary to find ways to protect it from damage due to high voltage

impact. Some manufacturers add an additional set of mechanical switch system next to the USB to control the power supply. However, since the position of the mounting box on the wall is limited an additional set of mounting box is required to meet the space requirements. It is costly, inefficient, complex in structure and unattractive in appearance.

### **Summary**

The main technical problem solved by the present invention is to provide a new fixed socket with USB, which not only prevents the USB electronic board from being damaged due to insulation high-voltage test but also keeps the appearance and structure of the product simple.

The technical means employed in the present invention are as follows.

A fixed socket with USB for preventing high voltage test impact, comprising a common socket component and a USB port component, wherein the USB port component is connected with a wire and is electrically connected by a wire, which is provided with an independent switch, wherein the independent switch controls connection or disconnection through a control component, and the independent switch and control component are disposed in the fixed socket.

The independent switch is a push-type one-way switch connected to a wire, and the one-way switch is hidden inside a fixed socket; a control component is a knob control rod, which is provided with a protrusion, wherein the protrusion and the one-way switch are matched and connected, and the knob control rod can be rotated to cause the protrusion to press the one-way switch to control connection or disconnection of the independent switch.

An outer end of the knob control rod is provided with a groove for matching with a screwdriver.

The independent switch is two metal domes pressed against each other, the two metal domes are respectively connected to a wire; and the control

component is an insulation film which is inserted between the two metal domes.

The insulation film protrudes outside the fixed socket panel.

The insulation film is 0.4 mm thick.

The beneficial effects of the present invention are as follows: the present invention provides a new fixed socket with USB, which may conveniently turn off power supply to USB so as to not only prevent USB electronic board from being damaged by insulation high voltage test but also keep the appearance and structure of the product simple.

### **Brief Description of the Drawings**

FIG. 1 is a schematic diagram of a wiring principle of Embodiment 1 of the present invention.

FIG. 2 is a perspective view of a combined structure according to Embodiment 1 of the present invention.

FIG. 3 is a schematic diagram of an appearance structure according to Embodiment 1 of the present invention.

FIG. 4 is a schematic cross-sectional view of the plane A-A of FIG. 3.

FIG. 5 is schematic diagram of an explosion structure according to Embodiment 1 of the present invention.

FIG. 6 is a schematic diagram of a wiring principle according to Embodiment 2 of the present invention.

FIG. 7 is a schematic diagram of an appearance structure according to Embodiment 2 of the present invention.

FIG. 8 is a schematic cross-sectional view of the plane B-B of FIG. 7.

FIG. 9 is a schematic diagram of an explosion structure according to Embodiment 2 of the present invention.

### **Detailed Description**

The present invention discloses a fixed socket with USB for preventing

high voltage test impact. The fixed socket is a fixed socket installed on a wall surface. The socket is a common product existing in the prior art, generally comprising a common socket component 1 and a USB port component 2, which is connected to a wire 3 and is powered by a wire. In the drawings of the present embodiment, the common socket component is a 13A socket, and similar products may be provided with a plurality of sets of common sockets according to the requirements of different countries or regions, or it may be other forms of two-plug or three-plug sockets, or the one with both two-plug or three-plug socket. The socket may be separately provided with a socket switch 4, or no socket switch may be provided, and a USB port component 2 may also be provided with a plurality of USB ports. In addition, the connection between the components of the present case and a base of a fixed socket may be achieved by plug-in, screw connection and the like. It is well known to those skilled in the art and is not the focus of this case. Thus, it will not be described herein. The focus of this case is that a wire 3 connected to a USB port component 2 is provided with an independent switch 5, which is a micro switch with simple structure, wherein the independent switch 5 controls connection or disconnection through a control component 6, and the independent switch 5 and the control component 6 are disposed in the fixed socket.

In Embodiment 1, the independent switch 5 is a push-type one-way switch 51 connected to a wire 3, and the one-way switch 51 is hidden inside a fixed socket; a control component 6 is a knob control rod 61, which is provided with a protrusion 611, wherein the protrusion 611 and the one-way switch 51 are matched and connected, and the knob control rod 61 may be rotated to cause the protrusion 611 to press the one-way switch 51 to control connection or disconnection of the independent switch 5. For ease of operation, the outer end of the knob control rod 61 is provided with a groove 612 for matching with a screwdriver (not shown in the drawing).

Before high-voltage test, the user only needs to insert a small

screwdriver into a groove at an end of a knob control rod and rotate according to the direction indicated by the side. At this time, the knob control rod will rotate according to the rotation direction of the user to directly control a one-way switch to be on/off. When a one-way switch is turned off, the high-voltage current can be completely prevented from entering the electronic board of a USB port component so that the structure of the electronic board of the USB component is fully protected. After insulation high-voltage test is completed, a knob control rod is reversely turned to restart a one-way switch so that a USB port component will immediately return to the power supply state. The entire process not only protects the components of a USB port but also greatly facilitates installation of the electrician, and it can also meet the inspection requirements of the Housing Department.

In Embodiment 2, the independent switch 5 is two metal domes 7 pressed against each other, the two metal domes 7 are respectively connected to a wire 3; and the control component 6 is an insulation film 62 which is inserted between the two metal domes 7. The insulation film 62 is preferably 0.4 mm thick and protrudes from the fixed socket panel. At the time of high-voltage test, an insulation film is inserted between the two metal domes, which may completely block the impact of the 500V high voltage so as to prevent an electronic board structure of a USB port from being damaged. It is a one-time switch structure, which is simpler to save cost, and insufficient space in design is also solved. It meets the safety regulations.

## CLAIMS:

1. A fixed socket with USB for preventing high voltage test impact, comprising a common socket component and a USB port component which is connected with a wire and is electrically connected by a wire, wherein the wire is provided with an independent switch, the independent switch controls connection or disconnection through a control component, and the independent switch and control component are disposed in the fixed socket.

2. The fixed socket with USB for preventing high voltage test impact according to claim 1, wherein the independent switch is a push-type one-way switch connected to a wire, and the one-way switch is hidden inside a fixed socket; the control component is a knob control rod, which is provided with a protrusion, wherein the protrusion and the one-way switch are matched and connected, and the knob control rod can be rotated to cause the protrusion to press the one-way switch to control connection or disconnection of the independent switch.

3. The fixed socket with USB for preventing high voltage test impact according to claim 2, wherein an outer end of the knob control rod is provided with a groove for matching with a screwdriver.

4. The fixed socket with USB for preventing high voltage test impact according to claim 1, wherein the independent switch is two metal domes pressed against each other, and the two metal domes are respectively connected to a wire; the control component is an insulation film which is inserted between the two metal domes.

5. The fixed socket with USB for preventing high voltage test impact according to claim 4, wherein the insulation film protrudes outside the fixed

socket panel.

6. The fixed socket with USB for preventing high voltage test impact according to claim 4, wherein the insulation film is 0.4 mm thick.