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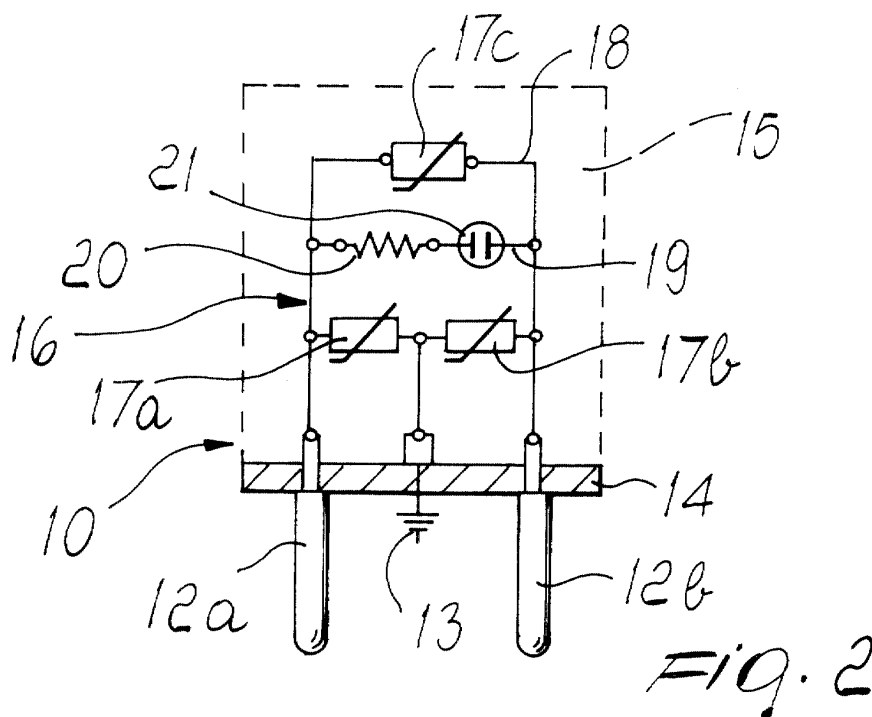
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(54) **Overvoltage protection device**

(57) An overvoltage protection device (10), comprising a plug (11) which can be inserted in a power outlet and whose three terminals (12a, 12b, 12c), two (12a, 12b) for connection to the phases and one (12c) for connection to the ground, are associated with an electric circuit (16). The circuit is contained in a box-like body (15) which is rigidly coupled to a base (14) for supporting the terminals and comprises a first and a second varistor

(17a, 17b) which are respectively connected between each terminal for connection to the phases and the ground connection terminal. The two phase connection terminals are further connected so as to have two parallel branches (18, 19), the first branch (18) being provided with a varistor (17c) and the second branch (19) being provided with a dissipative resistor (20) and a lamp (21) which are connected in series.



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Description

[0001] The present invention relates to an overvoltage protection device.

[0002] The need is currently observed to protect from overvoltage risks the devices that are connected to the electrical systems of user facilities.

[0003] This requirement is increasingly justified by the fact that each individual user facility now has a large number of electrical and electronic appliances which are highly useful and often expensive, such as for example hi-fi systems or personal computers.

[0004] The most frequent and worrisome cause of overvoltages is constituted by lightning during storms.

[0005] In adverse weather, lightning may in fact strike a user facility, producing a voltage peak which propagates over the electrical circuit, irreversibly damaging all the electrical or electronic appliance connected to power sockets.

[0006] In order to solve this problem, some user facilities have flush wall-mounted power sockets associated with protection devices.

[0007] In dangerous conditions, these devices short out, burning out before the voltage peak affects the appliance connected to the socket.

[0008] This type of protection device is effective but scarcely versatile.

[0009] Such devices are in fact associated in advance with a single socket, and the entire socket has to be replaced when they burn out.

[0010] This entails a considerable expenditure of time and money.

[0011] The aim of the present invention is to solve or substantially reduce the problems of conventional overvoltage protection devices.

[0012] Within this aim, an important object of the present invention is to provide an overvoltage protection device which is removable, i.e., associable with different power sockets.

[0013] Another object of the present invention is to provide a device which has a low cost.

[0014] Another object of the present invention is to provide an overvoltage protection device by using conventional elements and equipment.

[0015] This aim and these and other objects which will become better apparent hereinafter are achieved by an overvoltage protection device, characterized in that it comprises a plug which can be inserted in a power socket and whose three terminals, two for connection to the phases and one for connection to the ground, are associated with an electric circuit, said circuit being contained in a box-like body which is rigidly coupled to a base for supporting said terminals, and comprising a first and a second varistor which are respectively connected between each terminal for connection to the phases and the ground connection terminal, said two phase connection terminals being further connected so as to have two parallel branches, the first one of said

branches being provided with a varistor, the second branch being provided with a dissipative resistor and a lamp which are connected in series.

[0016] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of an overvoltage protection device according to the invention;

Figure 2 is an electrical diagram of the device;

Figure 3 is a perspective view of an example of application of the invention.

[0017] With particular reference to Figures 1 to 3, a device according to the invention is generally designated by the reference numeral 10.

[0018] This device 10 comprises a plug 11 which is constituted by two terminals 12a and 12b for connection to the phases and a terminal 13 for connection to the ground which is rigidly coupled to a base 14.

[0019] The device 10 is further constituted by a box-like body 15 which is also rigidly coupled to the base 14 and contains the elements that constitute the circuit 16 of the device 10.

[0020] The circuit 16 is shown schematically in Figure 2 and is constituted by two varistors 17a and 17b, each of which is connected between each terminal for connection to the phases 12a and 12b and the ground connection terminal 13.

[0021] The phase connection terminals 12a and 12b are further connected in parallel to two branches 18 and 19.

[0022] The branch 18 comprises a third varistor 17c.

[0023] The branch 19 comprises a dissipative resistor 20 which is series-connected to a lamp 21.

[0024] The electronic circuit 16 is contained, as mentioned, inside the box-like body 15, which has an opening 22 arranged at the lamp 21.

[0025] As regards operation, the protection device 10 can be applied to all multiple power sockets.

[0026] Figure 3 illustrates an example of application to a trailing multiple socket 23.

[0027] The varistors 17a, 17b and 17c are inserted in the circuit 16 so as to withstand a supply voltage whose value can vary up to a maximum which depends on the type of varistor.

[0028] If the power supply circuit is subjected to a voltage peak, due for example to the discharge of lightning, if the value of the peak exceeds the voltage that can be withstood by the varistor, said varistor burns out, shorting the multiple socket and protecting any appliances connected to the other sockets of said multiple socket.

[0029] When no varistors 17a, 17b, 17c are damaged, the lamp 21 lights up and is visible from outside through the opening 22 of the body 15.

[0030] In this manner it is possible to see at all times whether the device 10 is operating or needs replacing because it has burned out.

[0031] In practice it has been observed that the present invention has achieved the intended aim and objects. 5

[0032] In particular, it is evident that by means of a device which is simple to manufacture it is possible to protect multiple sockets, or the appliances connected thereto, from overvoltage peaks. 10

[0033] The device is also very versatile, since it can be removed from one multiple socket and applied to others.

[0034] Moreover, depending on the type of varistor that composes the circuit, it is possible to manufacture overvoltage protection devices calibrated for different voltage peaks. 15

[0035] In practice, the materials employed, so long as they are compatible with the contingent use, as well as the shapes and dimensions, particularly of the containers of the device, may be any according to requirements. 20

[0036] The disclosures in Italian Utility Model Application No. PD2000U000006 from which this application claims priority are incorporated herein by reference. 25

[0037] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs. 30

Claims 35

1. An overvoltage protection device (10), characterized in that it comprises a plug (11) which can be inserted in a power outlet and whose three terminals (12a, 12b, 12c), two (12a, 12b) for connection to the phases and one (12c) for connection to the ground, are associated with an electric circuit (16), said circuit being contained in a box-like body (15) which is rigidly coupled to a base (14) for supporting said terminals, and comprising a first and a second varistor (17a, 17b) which are respectively connected between each terminal for connection to the phases and the ground connection terminal, said two phase connection terminals being further connected so as to have two parallel branches (18, 19), the first one (18) of said branches being provided with a varistor (17c), the second branch (19) being provided with a dissipative resistor (20) and a lamp (21) which are connected in series. 40 45 50 55
2. The device according to claim 1, characterized in that said lamp (21) is arranged at an opening (23) provided in said box-like body (15).

