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| 54 | Title of invention |
|---|---|

**Electronic control device**

| 57 | Abstract |
|---|---|
| See next page. | |

| Number of sheets | ~~13~~ 12 |
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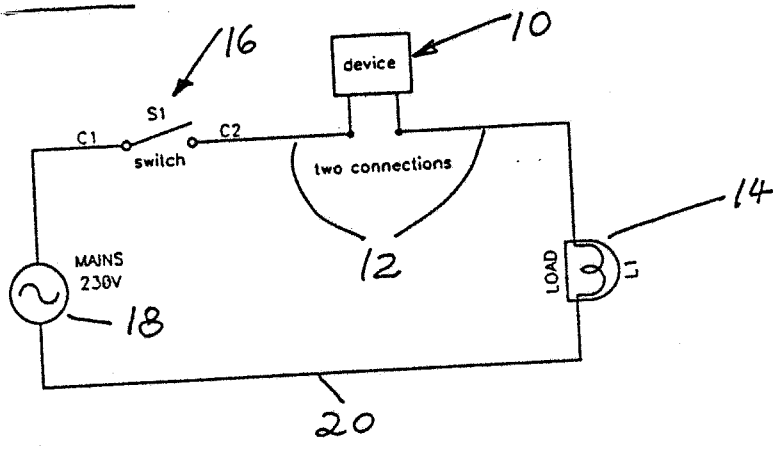
## PATENT CLAIMS

An electronic control device for controlling supply of electrical current to an electrical load is provided. It includes an electrical power supply circuit; suitable connectors for connecting the power supply circuit to a source of electrical energy, e.g. a mains supply; a control switch; and connection means for connecting the control switch in series in an electrical power supply line to a load. The device further includes an electrical control circuit for controlling the control switch, the control circuit being adapted to be programmed by operation of a conventional switch for supplying electrical current to a load by operation of the control switch; and a reset circuit for resetting the control circuit as required.

114 words

FIG. 1


16
10
device
S1
C1
C2
switch
two connections
14
MAINS
230V
12
LOAD
18
20

DrG REF 535314

## TITLE OF INVENTION

Electronic control device.

## FIELD OF INVENTION

The present invention relates to electronic control devices.

More particularly, the invention relates to an electronic control device for controlling the supply of electrical current to a load.

## BACKGROUND TO INVENTION

It often is necessary to control the supply of electrical current to a load. If current is only to be provided on an on/off basis a conventional electrical switch is sufficient.

However, if variations of the supply of current are necessary, for instance if current is to be provided at predetermined intervals, at particular times, in an increasing or decreasing manner or in any other irregular manner, special switching or control units are available. Most of these units are fairly expensive, complicated, and often are difficult to install.

It is an object of the invention to suggest an electronic control device which will be relatively cheap to manufacture and easy to operate and install.

## SUMMARY OF INVENTION

According to the invention, an electronic control device for controlling supply of electrical current to an electrical load includes an electrical power supply circuit; suitable connectors for connecting the power supply circuit

to a source of electrical energy, e.g. a mains supply; a control switch; connection means for connecting the control switch in series in an electrical power supply line to a load; an electrical control circuit for controlling the control switch, the control circuit being adapted to be programmed by operation of a conventional switch for supplying electrical current to a load by operation of the control switch; and a reset circuit for resetting the control circuit as required.

The device may be provided as a separate unit with connection means for connecting it in series with the electrical power supply to an electrical load, e.g. a heater or a light.

The control circuit may include a programmable micro-controller unit adapted to be programmed with a number of functions by operation of a conventional switch, the functions including the following:

a. Switching the conventional switch on once: providing a soft start mode.

b. Switching the conventional switch on twice in quick succession: providing a dim mode, preceded by a soft start.

c. Switching the conventional switch on three times in quick succession: providing a security mode (e.g. switching on intermittently).

d. Switching the conventional swtich on four times in quick succession: providing a further security mode.

e. Switching the conventional switch on five times in quick succession: providing an intermittent current supply, e.g. to cause a flashing light.

The device may be adapted to clear the control circuit if the supply of current is switched off for a predetermined time, e.g. four seconds.

The function of the micro-controller may be adapted to be cleared if the supply of current is switched off for a predetermined time, e.g. four seconds.

The programmable micro-controller may be an electronic chip commercially known as "an IC 12C5X".

The invention also extends to a plug unit, which has plug pins for insertion into a conventional socket and which has sockets for receiving the pins of a conventional socket, which is coupled to a load, such as a heater, the plug unit including an electronic control device as set out herein.

## BRIEF DESCRIPTION OF DRAWINGS

The invention will now be described by way of example with reference to the accompanying schematic drawings.

In the drawings there is shown in:

Figure 1 a basic circuit diagram indicating the location of an electronic control unit or device in accordance with the invention in a power supply arrangement to a load; and

Figure 2 a circuit diagram of the electronic control unit as illustrated in Figure 1.

## DETAILED DESCRIPTION OF DRAWINGS

Referring to Figure 1, an electronic control unit or device in accordance with the invention, generally indicated by reference numeral 10, is provided in series in a current supply conductor 12 leading from a load 14 via a conventional switch 16 to a power supply, in this case a mains 230 volt supply 18. The second conductor 20 leads directly from the supply 18 to the load 14.

The conductors 12, 20 may be directly connected by way of a plug to the supply 18 and the switch 16 and the electronic control unit 10 may be incorporated in the socket of the supply 18.

Referring now to Figure 2, a circuit diagram of the electronic control unit 10 is shown.

The circuit diagram shows that the unit 10 has connection points 22, 24 for connection in series to a current supply, in this instance the conductor 12 illustrated in Figure 1.

The circuit further includes a power supply circuitry 26 including the electronic components as shown. It includes a buffer capacitor 28.

The circuit also includes a programmable micro-controller commercially referred to as 12C5X indicated by reference numeral 30. The micro-controller 30 is connected to a reset circuit 32.

A control switch 34 is provided in series with the connection points 22, 24. This switch 34 controls the supply of current to the load 14 (Figure 1).

In use, the unit 10 is connected in series with the load 14 as shown in Figure 1.

When the current is switched on by way of the switch 16, the micro-controller 30 can be programmed as desired according to particular programs.

For instance, if the micro-controller 30 is to be programmed so that electrical current will be supplied to the load 14 at a particular time, then the switch 16 is switched or toggled twice. Thereafter the switch 16 is left on.

To program the micro-controller 30 to switch off the power supply to the load 14 at a predetermined time, the switch 16 again is switched or toggled three times and then is left on. Thereafter the unit 10 will be programmed to switch on the power supply and to switch it off at the predetermined time.

The electronic circuit is powered by the energy stored by the capacitor 28 when the power supply is switched off.

The unit 10 can be connected anywhere in power lines where power is supplied to a load, such as a heater, a light fitting, a passage light, a light in a garage, a television set or any other electrical apparatus.

The unit 10 in accordance with the invention therefore is able to memorise the functions required and these functions may vary almost indefinitely. In

addition to the functions indicated above, other functions such as strobe or soft start can be programmed.

## PATENT CLAIMS

1. An electronic control device for controlling supply of electrical current to an electrical load, which includes an electrical power supply circuit; suitable connectors for connecting the power supply circuit to a source of electrical energy, e.g. a mains supply; a control switch; connection means for connecting the control switch in series in an electrical power supply line to a load; an electrical control circuit for controlling the control switch, the control circuit being adapted to be programmed by operation of a conventional switch for supplying electrical current to a load by operation of the control switch; and a reset circuit for resetting the control circuit as required.

2. A device as claimed in claim 1, which is provided as a separate unit with connection means for connecting it in series with the electrical power supply to an electrical load, e.g. a heater or a light.

3. A device as claimed in claim 1 or claim 2, in which the control circuit includes a programmable micro-controller unit adapted to be programmed with a number of functions by operation of a conventional switch, the functions including the following:

   a. Switching the conventional switch on once: providing a soft start mode.

   b. Switching the conventional switch on twice in quick succession: providing a dim mode, preceded by a soft start.

c. Switching the conventional switch on three times in quick succession: providing a security mode (e.g. switching on intermittently).

d. Switching the conventional swtich on four times in quick succession: providing a further security mode.

e. Switching the conventional switch on five times in quick succession: providing an intermittent current supply, e.g. to cause a flashing light.

4. A device as claimed in any one of the preceding claims, which is adapted to clear the control circuit if the supply of current is switched off for a predetermined time, e.g. four seconds.

5. A device as claimed in claim 3 or claim 4, in which the function of the micro-controller is adapted to be cleared if the supply of current is switched off for a predetermined time, e.g. four seconds.

6. A device as claimed in any one of claims 3 to 5, in which the programmable micro-controller is an electronic chip commercially known as "an IC 12C5X".

7. An electronic control device for controlling supply of electrical current to an electrical load substantially as hereinbefore described with reference to and as illustrated in the accompanying schematic drawings.

8. A plug unit, which has plug pins for insertion into a conventional socket and which has sockets for receiving the pins of a conventional

socket, which is coupled to a load, such as a heater, the plug unit including an electronic control device as claimed in any one of the preceding claims.

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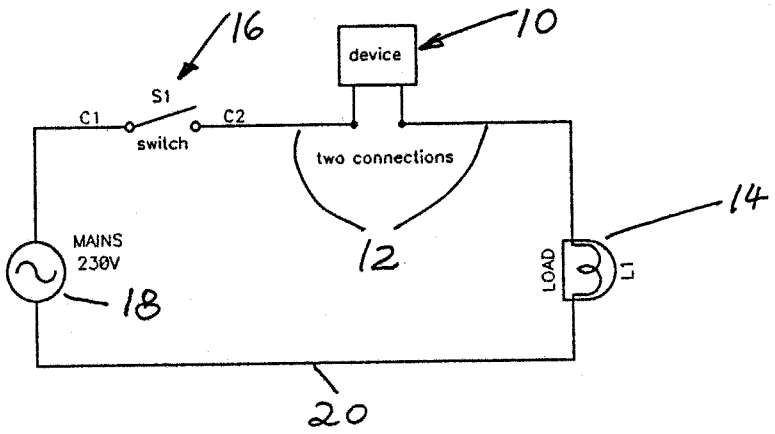
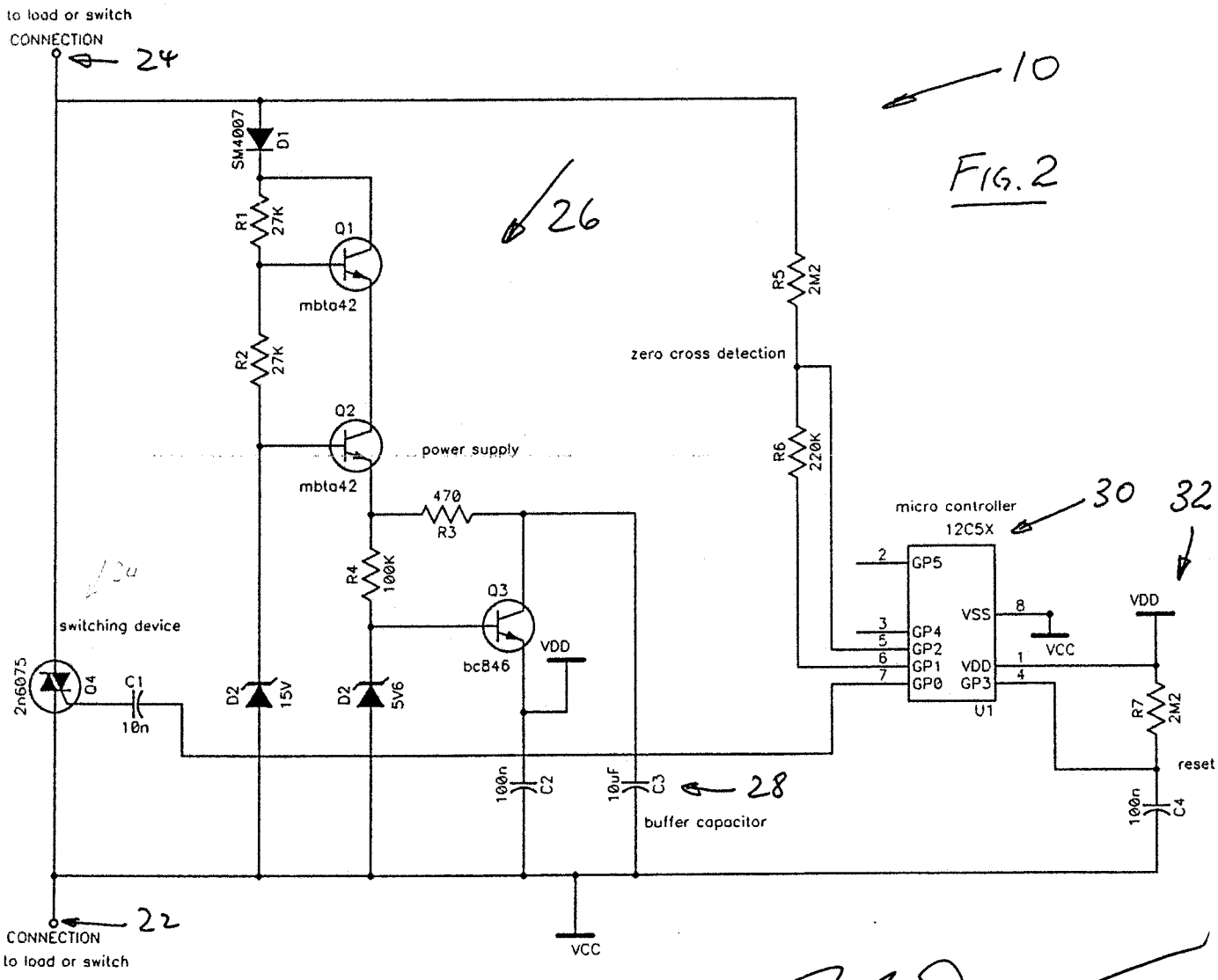
FIG. 1

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