(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 255 580**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **87107401.9**

(22) Date of filing: **21.05.87**

(51) Int. Cl.⁴: **G 08 C 17/00**, G 08 C 23/00

(30) Priority: **06.06.86 IT 2071186**

(43) Date of publication of application: **10.02.88 Bulletin 88/6**

(84) Designated Contracting States: **DE FR GB NL**

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(54) **Electrical lighting system with telecontrolled light sources.**

(57) The light sources (lighting points) are switched by switches, which in turn are operated from control points.
The system has at least one telecontrol device, which, by means of signals irradiable from a control point, can emit different control signals, each associated to a different lighting point, and has, near each lighting point, an associated telecontrolled switch, which is operated when it receives a prefixed combination of the aforesaid irradiated signals.

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"ELECTRICAL LIGHTING SYSTEM WITH TELECONTROLLED LIGHT SOURCES"

DESCRIPTION .

The lighting systems are still characterized by a circuit complexity, owing to the fact that the lighting points are controlled by switches, generally distant from the aforesaid lighting points, by means of metallic wires, laid in ducts which can cover several meters. The complexity increases if a lighting point is controlled by several and mutually remote control points.

In the fitting of the buildings, even with the most up-to-date techniques (ceiling distribution, floor distribution etc.), the laying of the wires that connect the switches to the lighting points requires a remarkable cost and brings to a fixed lay -out, whose modifications are very expensive (putting new ducts in the walls, rehanging the tapestry, etc.).

This invention proposes a lighting system which telecontrols the lighting points , thus eliminating the laying of the wires to and from the control points and giving to the lighting system the greatest flexibility and a significant saving in the laying.

To this purpose , according to the invention , the system has at least one telecontrol device,which, by means of signals irradiable from a control point , can emit different control signals , each associated to a different lighting point , and has , near each lighting point, an associated telecontrolled switch, which is operated when it receives a prefixed combination of the aforesaid irradiable signals.

Therefore, a lighting system, according to the invention, consists basically of :

- a short range telecontrol device (room range) , which can emit many different control signals , each one associated to a different lighting point ;
- a telecontrolled switch, put into each lighting point , fixed or by means of a screw lamp cap (or cap types) in the existing lighting point.

Further characteristics and advantages of the invention can be drawn from the following description and claims.

An example of the invention is shown in the hereby enclosed drawings , in which :

- fig.1a shows, by means of a block diagram, a telecontrol device according to the invention ;
- fig.1b shows schematically,in perspective,a phisical realisation of the telecontrol device according to fig.1a ;
- fig.2a shows , by means of a block diagram , a telecontrolled switch according to the invention ;
- fig.2b shows schematically a cross section of a constructive lay-out of the telecontrolled according to fig.2a.

In the example of realisation shown , the telecontrol device consists of the following parts :

- a control key-board 11, with a number of push buttons, such that the pushing of one button,or of the combination of more of them, teleoperates the switching-on or -off of one or more prefixed and associated lighting points ;
- a selective circuit 12 , which can generate electric signals, each different from each other,according to the pushed button , or combination of buttons ;
- a converter 13 , electro-optical or electromagnetic or electro-acustical,which receives the electrical signal locally generated by the selective circuit 12 , converts it respectively into a signal which can be irradiated as a light or electromagnetic or acustical signal and transmits it;
- a power supply circuit 14, realized with Ni-Cd battery cells, in case of hand-held telecontrol devices,or by a network power supply,in case of a fixed telecontrol version (e.g.wall version).

The electric signal, generated from the selective circuit 12 can be of two types :

- analog (frequency , amplitude or phase modulated) or
- digital (pulse signals in PCM , PPM , start-stop code or other types of codes).

In the example shown , the telecontrolled switch 20 consists of the following parts :

- one or more receivers - converters 21 , opto-electric , electromagnetic or acustic- electric, which can receive the irradiable signal transmitted by the telecontrol device 10 and convert it into a local electric signal ;
- a selective circuit 22 , analog or digital , according to the adopted type of control , which detects , among all electrical signals received , the one and only the one addressed to the associated telecontrolled switch;the selective circuit 22 can be preset from outside by means of pins , staples or other types of connections,so to detect a signal and only one,associated to the related switch , among all possible received signals.
- a switch 23 , which can switch-on and -off a light source 27 ;
- a power supply circuit 24 , realized with a Ni-Cd battery cell or with a network power supply.

The telecontrolled switch 20 can be realized in compact size , by using modern electronic components , and in several versions:

- a version which can be inserted with a 25 cap into a standard light holder and which carries in turn a standard light cap 26 in which a standard lamp can be inserted;
- a version which is integrated into the lamp itself ;
- a version which is integrated into a lighting apparatus (chandelier , table lamp ,etc.).

The version of the system according to the described example is based only on the reception and decoding of the signal by the telecontrolled switch (passive version) .

In ambients with high noise levels, where there is a high probability that false signals can operate erroneusly the switch , the switch can work according to an interactive procedure , that is :

- the telecontrol device emits a signal of operation of a lighting point ;
- the telecontrolled switch detects the signal and requests confirmation , by sending a signal , generated and irradiated as it is done in the telecontrol device ;
- the telecontrol device receives the signal "request of confirmation" and repeats the telecontrol signal ;
- the telecontrolled switch receives the signal for the second time and operates ; if after a prefixed elapsed time the switch does not receive the signal for the second time , the first signal is considered false and the operation is not carried on.

CLAIMS

1 - Electric lighting system , in which light sources (lighting points) are switched by switches , which are in turn operated from control points,characterized by at least one telecontrol device , which , by means of signals irradiable from a control point, can generate different control signals, each associated to a different lighting point and characterized,in association to each lighting point , by a corresponding telecontrolled switch , which is operated when it receives a prefixed combination of the aforesaid irradiable signals.

2 - System according to claim 1 , characterized by the fact that the telecontrolled switch is mounted on a lighting apparatus.

3 - System according to claim 1 , characterized by the fact that the telecontrolled switch is integrated into the lamp holder of the associated lighting point.

4 - System according to claim 1 , characterized by the fact that the telecontrolled switch is integrated into the lamp .

5 - System according to one of the aforesaid claims, characterized by the fact that the telecontrol device consists of a keyboard, of a selective circuit , operated by the keyboard, to generate locally an electric signal depending from the pressed buttons of the keyboard, of a converter,to convert the electric signal into an irradiable signal , and of a power supply.

6 - System according to one of the aforesaid claims, characterized by the fact that the telecontrolled switch consists of one or more detectors-converters , which can receive the irradiable signal transmitted from the telecontrol device and convert it into a local electric signal , of a selective circuit , which among all the electrical signals detects the one and only one addressed to its associated switch , of a switch , which can switch-on and -off a light source , and of a power supply.

7 - System according to claim 1 , characterized by the fact that the irradiable signals can be light signals.

8 - System according to claim 1 , characterized by the fact that the irradiable signals can be electromagnetic signals.

9 - System according to claim 1 , characterized by the fact that the irradiable signals can be acustic signals.

10- System according to claim 5 or 6 , characterized by the fact the electrical signal is an analog signal.

11- System according to claim 5 or 6 , characterized by the fact the electrical signal is a digital signal.

12- System according to claim 5 or 6 , characterized by the fact the power supply is a battery cell.

13- System according to claim 5 or 6 , characterized by the fact the power supply is a network power supply.

14- System according to one of the aforesaid claims, characterized by the fact that the telecontrolled switch is operated from the telecontrol device by means of an interactive procedure, which provides a request of confirmation of the telecontrol signal.

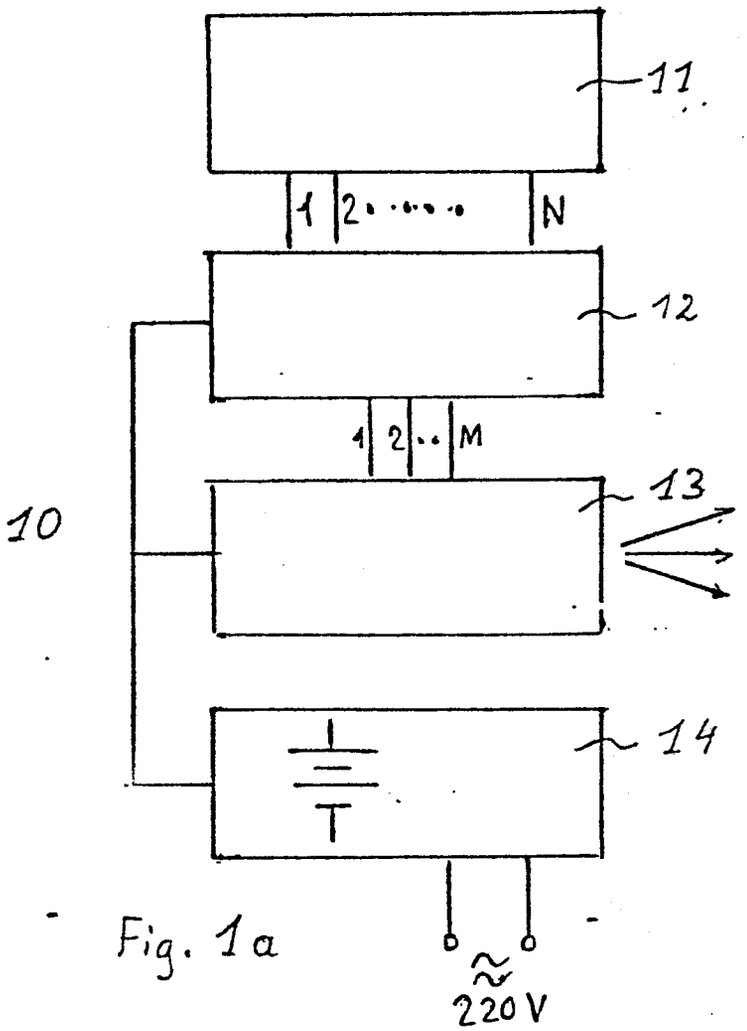

Fig. 1a

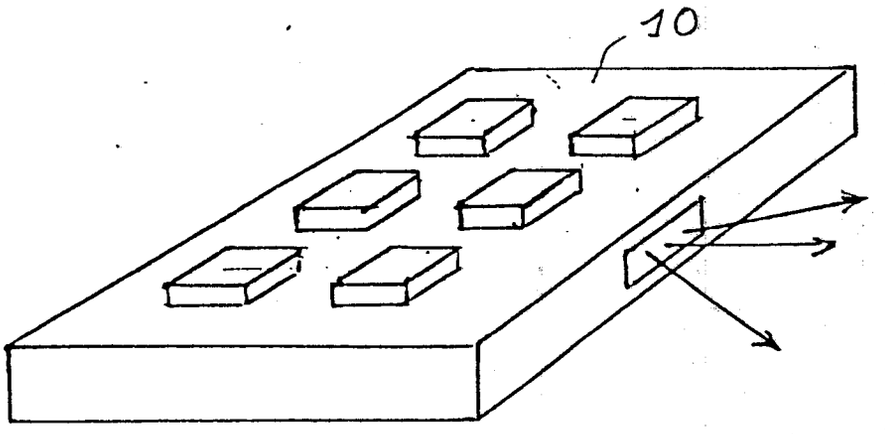

Fig. 1b

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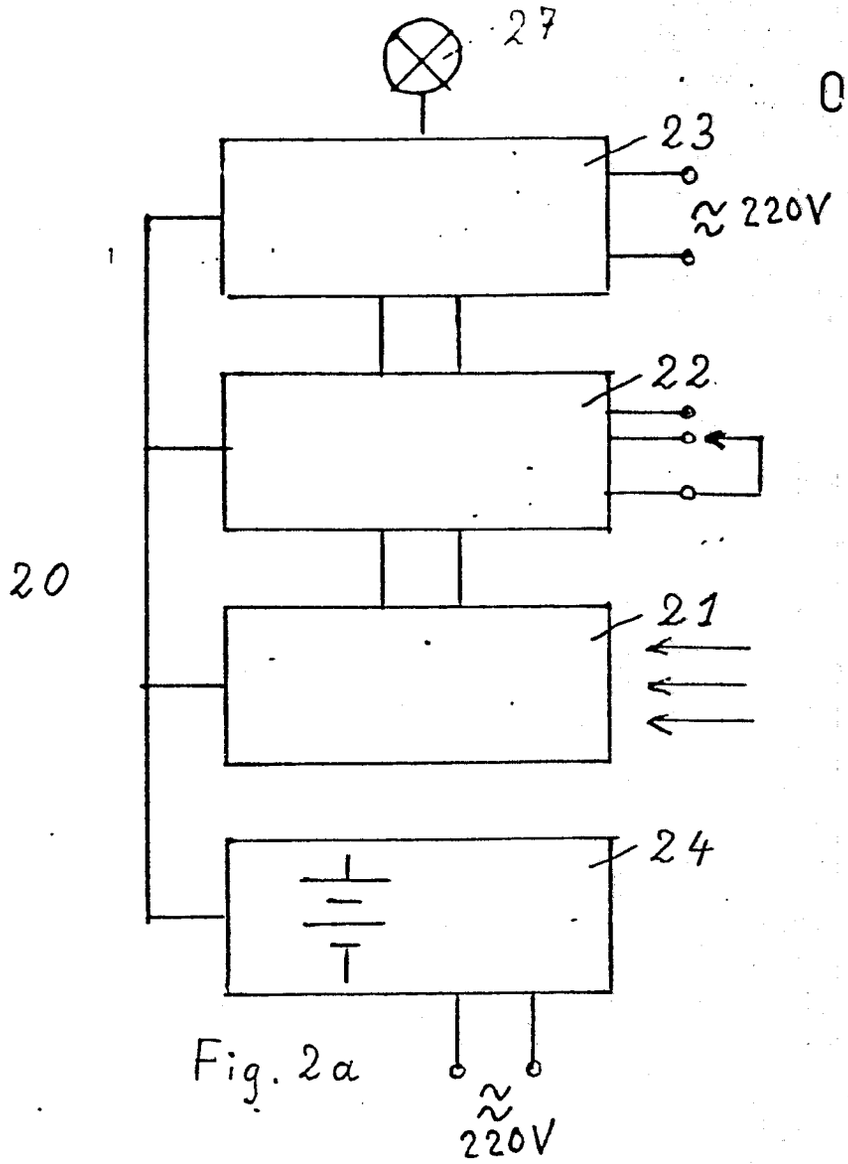

Fig. 2a

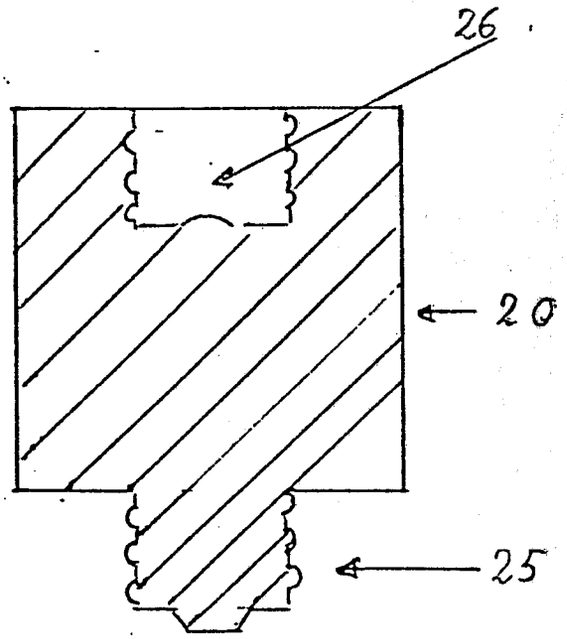

Fig. 2b