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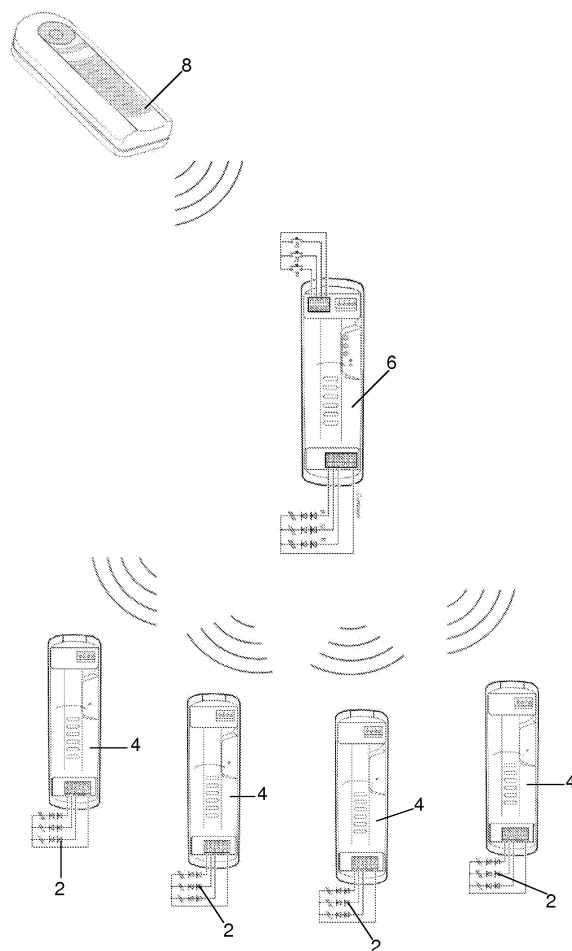
(54) **Multiple LED lighting system with colour variation**

(57) A multiple LED lighting system with colour variation, comprising:

- a plurality of RGB LEDs (2) connected together in groups,
- a plurality of slave units (4), each connected by wire to all the LEDs pertaining to one and the same group,
- at least one master unit (6) controlling said slave units,

characterised by further comprising:

- for generating colour information signals, a plurality of identical circuits contained in a control card with which the master unit and each slave unit is provided,
- a start signal generating circuit contained in a control card with which the master unit is provided, said generating circuit acting on all the slave units,
- a synchronization signal generating circuit also contained in said control card and also acting on all the slave units,
- a radio receiver installed in each slave unit, and
- a radio transmitter (8) installed in the master unit and tuned to all the radio receivers, to transmit to these said start signal and said synchronization signals.



Description

[0001] The present invention relates to a multiple LED lighting system with colour variation.

[0002] Lighting systems for rooms using coloured LEDs are known. These LEDs can be single or be mounted on suitable circuits to form strip LEDs. In the case of single LEDs, these are connected together in series and controlled by a suitable circuit, which powers them at constant current. In the case of strip lighting systems, these are connected together in parallel.

[0003] The LEDs can be operated via control cards, which can be operated by pushbuttons or via buses (for example RS232, DMX, DALI) or be remotely controlled by infrared or radio frequency controllers.

[0004] In these known systems, which use many LEDs, it is required to maintain colour uniformity, particularly when this varies with time in a presettable manner. In general, for room coloration RGB LEDs are used, either in single configuration or in strip configuration, their colour synchronization, and hence the uniformity of the room colour, being obtained by using a master circuit controlling a plurality of slave circuits, themselves connected to the various LEDs. The master unit is currently connected to the slave units by wire or bus.

[0005] More specifically, each slave unit is connected by wire to a group of RGB LEDs, the master unit being connected by wire or bus to all the slave units, there being provided a control card containing one or more programmes for generating colour information signals, which are then transmitted to the various slave units such that they control the switch-on and coloration of the LEDs, in accordance with the chosen programme.

[0006] The master unit can be controlled via wire or radio by the operator.

[0007] The problem of eliminating the cable connections to the master unit and slave units is solved according to the invention, by a multiple LED lighting system with colour variation as described in claim 1.

[0008] The present invention is further clarified hereinafter with reference to the accompanying drawing, which shows a schematic view of a system according to the invention.

[0009] As can be seen from the drawing, the system is provided with LEDs 2 of RGB type for lighting any room in which these are installed. Specifically, the various LEDs are connected in groups to a slave units 4, each provided in its interior with a control card able to command the coordinated switch-on of all LEDs on the basis of a predetermined programme for controlling the colour information, which is fed to the LEDs 2.

[0010] A radio receiver is also mounted in the control card of each slave unit 4, to receive command signals from a master unit 6.

[0011] For this purpose the master unit 6 is provided with a control card on which, in addition to a radio transmitter tuned to the radio receiver of the individual slave units 4, there are also mounted a start signal generator

circuit for controlling the colour information generators installed in the control cards of said slave units 4, and a generator for synchronization signals which act on said colour information generators.

[0012] The master unit also preferably comprises a radio receiver tuned to a portable radio transmitter 8, to remotely control the master unit. As an alternative, the master unit 6 can be controlled via a bus, possibly by a computer.

[0013] The system of the invention operates in the following manner:

when at rest, all the LEDs 2 are extinguished; when the operator wishes to light them on the basis of a predetermined colour variation, the remote controller 8 is operated to execute that particular programme. The master unit 6 receives the relevant command and in addition to executing the predetermined programme, transmits via radio to all the slave units 4 a start signal which also comprises information on the starting value, to enable each of these units to execute that programme. In executing this latter, they switch-on the LEDs 2 connected to them and also control the brightness and colour variations in accordance with that provided by the programme.

[0014] As the various slave units 4 are mutually independent, the inevitable differences between the control cards with which they are provided could, over time, result in a loss of synchronism between the different groups of LEDs, resulting in a loss of uniformity in their colour variation.

[0015] To prevent this, according to the invention the master unit 6 is made to transmit periodically to the slave units 4 colour information based on the programme being executed, in order to periodically synchronize the programmes under execution in the slave units 4 with the programme being executed in the master unit 6.

[0016] Essentially, in order to eliminate cable connections between the master unit and the slave units, and hence to achieve systems without wire connections and resultant installation flexibility, the invention also provides the slave units with colour information signal generators, and makes the master unit transmit, periodically to the slave units, information regarding the programme being executed by the master unit.

[0017] The master unit 6 and each slave unit 4 are preferably provided with receiver transmitters, so that each slave unit 4 transmits to the master unit 6 a signal confirming receipt of the activation command for a programme. This enables the command signal to be re-transmitted should the master unit 6 not have received this confirmation signal from all the slave units 4.

Claims

1. A multiple LED lighting system with colour variation,

comprising:

- a plurality of RGB LEDs (2) connected together in groups,
- a plurality of slave units (4), each connected by wire to all the LEDs pertaining to one and the same group,
- at least one master unit (6) controlling said slave units,

characterised by further comprising:

- for generating colour information signals, a plurality of identical circuits contained in a control card with which the master unit and each slave unit is provided,
- a start signal generating circuit contained in a control card with which the master unit is provided, said generating circuit acting on all the slave units,
- a synchronization signal generating circuit also contained in said control card and also acting on all the slave units,
- a radio receiver installed in each slave unit, and
- a radio transmitter (8) installed in the master unit and tuned to all the radio receivers, to transmit to these said start signal and said synchronization signals.

2. A system as claimed in claim 1, **characterised in that** said synchronization signal circuit comprises means for withdrawing, with the same periodicity as the programme under execution within the master unit (6), the value information existing at that instant and for transmitting it to all the slave units (4).
3. A system as claimed in claim 1, **characterised in that** the master unit (6) and all the slave units (4) are provided with a receiver transmitter.
4. A system as claimed in claim 1, **characterised by** comprising a remote controller for activating the master unit (6).
5. A system as claimed in claim 1, **characterised by** comprising a bus through which the activation command for the master unit (6) is transmitted.

