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Remarks:
Amended claims in accordance with Rule 86 (2) EPC.

(54) Igniter with printed circuit board which incorporates the complementary device interconnections

(57) The igniter proposed by the invention is provided with a casing (1) housing in its cavity the conventional elements of an igniter, whose printed circuit incorporates the necessary interconnections replacing the majority of the wiring interconnecting the elements to be used, according to the case, for igniting, feeding, regulating and controlling a sodium vapor lamp, a metal halide lamp and the like; arranging the suitable connections on said printed circuit so that a plurality of outer connectors allow for a simple, quick, reliable and economical connection of the remaining elements that are to intervene, namely the ballast, the sodium vapor lamp, the metal halide lamp or the like, the network, earth and, optionally, the capacitor or capacitors, one or more timers, etc.

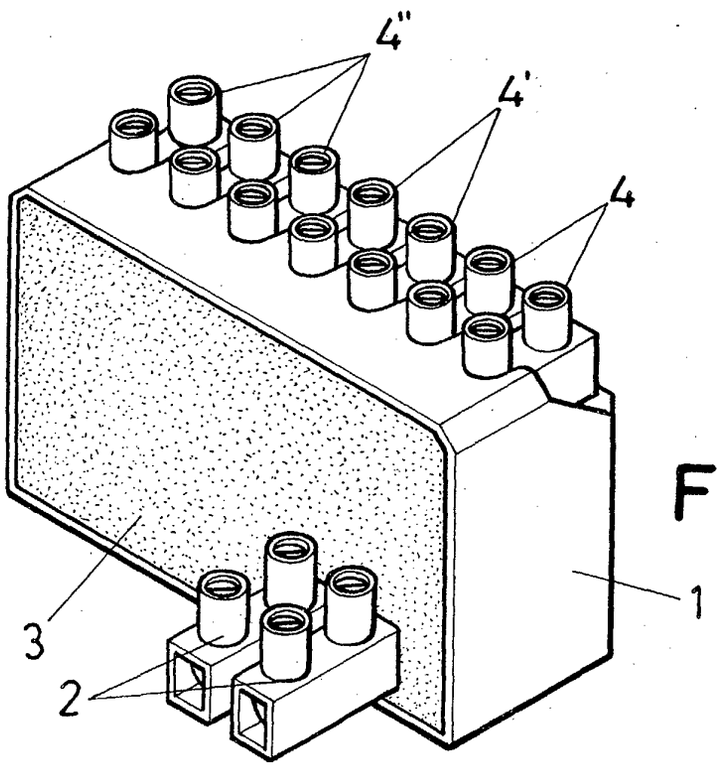

FIG.2

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Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a new igniter for igniting sodium vapor lamps, metal halide lamps and the like, which igniter has been designed and structured to considerably aid in the wiring among all the possible elements intervening in the ignition, feed, regulation and control of a sodium vapor lamp, metal halide lamp and the like, said igniter integrating a printed circuit with the majority of the necessary wiring.

BACKGROUND OF THE INVENTION

[0002] For igniting, feeding, regulating and controlling a sodium vapor lamp, a metal halide lamp and the like, different combinations of elements normally intervene, starting from the simplest, such as the case of the igniter, ballast, lamp, network and earth, to more complex cases in which the igniter, ballast, lamp, network, earth, one or more capacitors, one or more timers, a connection strip, etc., can intervene, the suitable wiring among all these elements being necessary for suitably interconnecting them.

[0003] Said wiring is a complex, cumbersome, expensive and relatively reliable task, in the case in which it is carried out by the luminary manufacturer or by the installer, which increases said drawbacks.

DESCRIPTION OF THE INVENTION

[0004] The igniter proposed by the invention fully and satisfactorily solves the aforementioned drawback.

[0005] To do so and more specifically, the invention consists of housing the igniter components in the cavity of a casing, of a plastic material or not, which incorporates, in the igniter's printed circuit, the necessary interconnections (tracks) replacing the majority of the wiring (connection) interconnecting all the elements necessary for igniting, feeding, regulating and controlling a sodium vapor lamp, a metal halide lamp and the like, at practically no cost and significantly simplifying the luminary manufacturing or installation works.

[0006] On the other hand, it permits replacing any of the elements individually integrating the assembly, preventing that the replacement of one of the elements implies that of two or more elements of the assembly, thereby optimizing maintenance costs.

[0007] Although, as previously mentioned, there are numerous possible elements to take into account for igniting, feeding, regulating and controlling a sodium vapor lamp, a metal halide lamp and the like, with two or three practical embodiment examples of the invention, practically all the most conventional possibilities would be covered.

[0008] Complementarily, the igniter incorporates at least two connectors, projecting from it through an insulating wall of resin mass or the like, which act as electric connection means between the igniter and, normally, the ballast.

[0009] According to another feature of the invention, a connection strip normally provided with seven connectors is arranged on the upper part of the casing, in which strip a pair of lamp connectors, a pair of capacitor connectors, a pair of network connectors and an earthing terminal are normally arranged.

[0010] As previously mentioned, the igniter of the invention incorporates at least two connectors projecting from it through an insulating wall of a resin mass or the like, but which can be more, according to the features and the number of elements to be interconnected, that possible expansion being enabled, during the manufacturing process, because that side is closed and insulated with resin, which permits that the remaining igniter elements, such as the casing, can remain the same. Furthermore, those possible connectors can be placed on that side in the position considered the most suitable, as there are no restrictions by any rigid element, like the casing.

[0011] The aforementioned resin mass, or other electro-insulating material, is intended for closing and insulating the igniter elements assembly, with regard to the outside, as well as the printed circuit incorporating the elements' connection, from heat, electricity, dust, etc.

[0012] As previously mentioned, if the igniter is to have more connectors, these additional connectors will normally be coupled in the area of the insulating wall with resin mass or the like, however, for various reasons, such as in some assembly types, it may be convenient to place them on the upper part of the casing, after the seven aforementioned connectors, in this case being necessary to modify the elements such as the casing.

DESCRIPTION OF THE DRAWINGS

[0013] To complement the description being made and for the purpose of helping to better understand the features of the invention according to a preferred practical embodiment example thereof, a set of drawings accompanies said description as an integral part thereof, showing, with an illustrative and non-limiting character, the following:

Figure 1 shows a perspective view of an igniter for starting up sodium vapor lamps, metal halide lamps and the like, carried out according to the object of the present invention.

Figure 2 shows the same part as in the previous figure according to a perspective opposite that of said figure.

PREFERRED EMBODIMENT OF THE INVENTION

[0014] In view of the indicated figures, it can be seen how the igniter proposed by the invention is provided

with a casing (1), housing in its cavity the conventional elements of an igniter, whose printed circuit (not shown) incorporates the necessary connections (tracks) replacing the majority of the wiring (connection) interconnecting the elements to be used, according to the case, for igniting, feeding, regulating and controlling a sodium vapor lamp, a metal halide lamp and the like; arranging the suitable connections on said printed circuit so that a plurality of outer connectors allow for a simple, quick, reliable and economical connection of the remaining elements that are to intervene, namely the ballast, the lamp, the network, earth and, optionally, the capacitor or capacitors, one or more timers, etc.

[0015] More specifically, the rear side of the casing (1) has at least a pair of connectors (2), suitably coupled and connected to said printed circuit, which emerge from the resin mass (3) or other electro-insulating material, and which will normally be connected to a ballast.

[0016] Obviously from that explained above, the casing (1) housing the igniter in its cavity must have a rear wall initially open and subsequently sealed by means of a resin mass (3) or other electro-insulating material, in order to suitably protect the igniter elements assembly as well as the printed circuit incorporating the elements' connection, from heat, electricity, dust, etc.

[0017] The connectors (2) and other connectors which can exist on this same side, are complemented with a battery normally having seven connectors (4), also arranged on the casing (1) and suitably coupled and connected to the printed circuit, from which connectors, normally two of them, those corresponding to the reference (4) itself, are intended for connecting the sodium vapor lamp, metal halide lamp or the like, the next two connectors (4') are intended for connecting the capacitor, and from the remaining connectors (4"), two connectors for connecting the power feed and one to earth, this battery being able to incorporate a larger number of connectors (4), as needed.

[0018] The igniter can be placed at any point of the luminary, thus being possible to distance it from other elements that may generate negative influences on it, or vice versa, requiring a minimum space for its assembly.

[0019] As a practical embodiment variant to be pointed out, the igniter of the invention will have three connectors on the side with the resin mass (3) or other electro-insulating material, these connectors normally being intended for connecting a complementary device.

[0020] As another possible practical embodiment to be pointed out, the igniter of the invention will have nine connectors arranged on the casing (1), seven of them being normally intended for the connections of the aforementioned elements and the remaining two connectors for connecting an optional element, such as a second capacitor, a timer, etc.

[0021] The different connectors mentioned throughout the description can obviously be replaced by any other conventional connection element, such as cables, pins or the like, with these alternatives in no way affecting the scope of the invention.

Claims

1. An igniter with a printed circuit incorporating the interconnections for complementary devices, of the type intended to be connected to a sodium vapor lamp, a metal halide lamp or the like, and to a ballast, and also, optionally, with other ignition, feed, regulation and control elements, **characterized in that** the igniter and its corresponding printed circuit are arranged in the cavity of a casing (1) provided with a sealing and insulating wall (3) of resin or other electro-insulating material, it having been foreseen that the igniter's printed circuit incorporates the necessary interconnection that connects said igniter with the remaining complementary ignition, feed, regulation and control elements, a circuit in which there are at least a pair of connectors (2) suitably coupled and connected to the printed circuit and which project from the wall (3) of resin or the like, normally intended for connecting a ballast, said casing (1) further incorporating a battery normally having seven connectors (4), (4'), (4") suitably coupled and connected to the printed circuit, from which connectors, two of them (4) are normally intended for connecting the lamp, two other connectors (4') for connecting a capacitor, and from the remaining connectors (4"), two for connecting the network and one for the earth connection.

2. An igniter with a printed circuit incorporating the interconnections for complementary devices according to claim 1, **characterized in that** three connectors project from the wall (3) of resin or the like, which connectors are suitably coupled and connected to the printed circuit, connectors normally intended for connecting a complementary device.

3. An igniter with a printed circuit incorporating the interconnections for complementary devices according to claim 1, **characterized in that** the upper part of the casing (1) incorporates a battery with nine connectors (4) suitably coupled and connected to the printed circuit, from which connectors, two of them (4) are normally intended for connecting the lamp, two other connectors (4') for connecting a capacitor, three other connectors (4"), two of which are for connecting the network and one for the earth connection, and the last two connectors are for connecting an optional element such as a second capacitor, one or more timers, etc.

Amended claims in accordance with Rule 86(2) EPC.

1. An igniter with a printed circuit incorporating the interconnections for complementary devices, of the type intended to be connected to a sodium vapor lamp, a metal halide lamp or the like, and to a ballast, and also, optionally, with other ignition, feed, regulation and control elements; the igniter and its corresponding printed circuit being arranged in the cavity of a casing (1) provided with a sealing and insulating wall (3) of resin or other electro-insulating material, **characterized in that** the igniter's printed circuit incorporates the necessary interconnection that connects said igniter with the remaining complementary ignition, feed, regulation and control elements, a circuit in which there are at least a pair of connectors (2) suitably coupled and connected to the printed circuit and which project from the wall (3) of resin or the like, normally intended for connecting a ballast, said casing (1) further incorporating a battery normally having seven connectors (4), (4'), (4'') suitably coupled and connected to the printed circuit, from which connectors, two of them (4) are normally intended for connecting the lamp, two other connectors (4') for connecting a capacitor, and from the remaining connectors (4''), two for connecting the network and one for the earth connection.

2. An igniter with a printed circuit incorporating the interconnections for complementary devices according to claim 1, **characterized in that** three connectors project from the wall (3) of resin or the like, which connectors are suitably coupled and connected to the printed circuit, connectors normally intended for connecting a complementary device.

3. An igniter with a printed circuit incorporating the interconnections for complementary devices according to claim 1, **characterized in that** the upper part of the casing (1) incorporates a battery with nine connectors (4) suitably coupled and connected to the printed circuit, from which connectors, two of them (4) are normally intended for connecting the lamp, two other connectors (4') for connecting a capacitor, three other connectors (4''), two of which are for connecting the network and one for the earth connection, and the last two connectors are for connecting an optional element such as a second capacitor, one or more timers, etc.

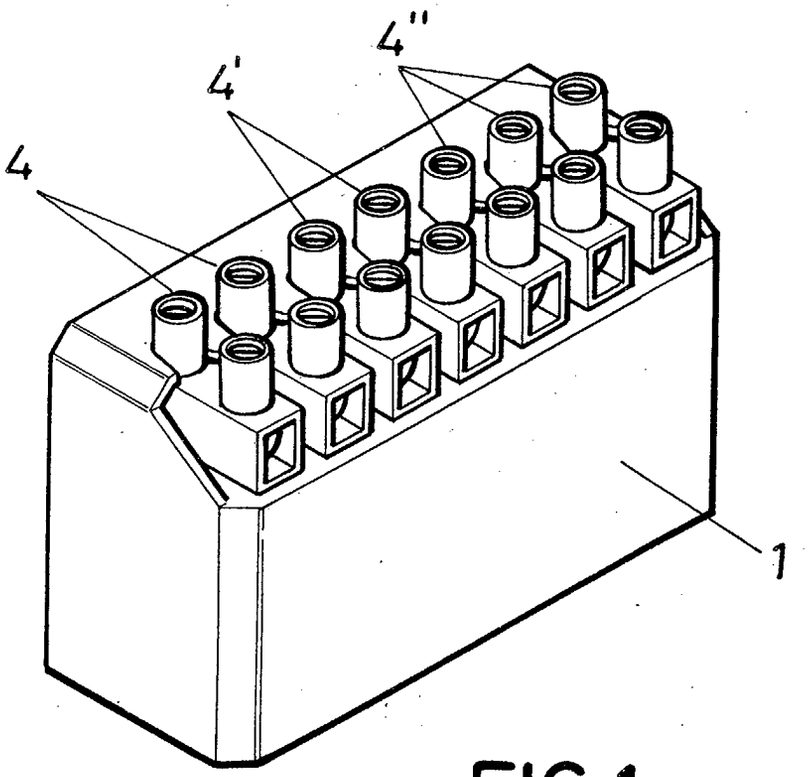

FIG.1

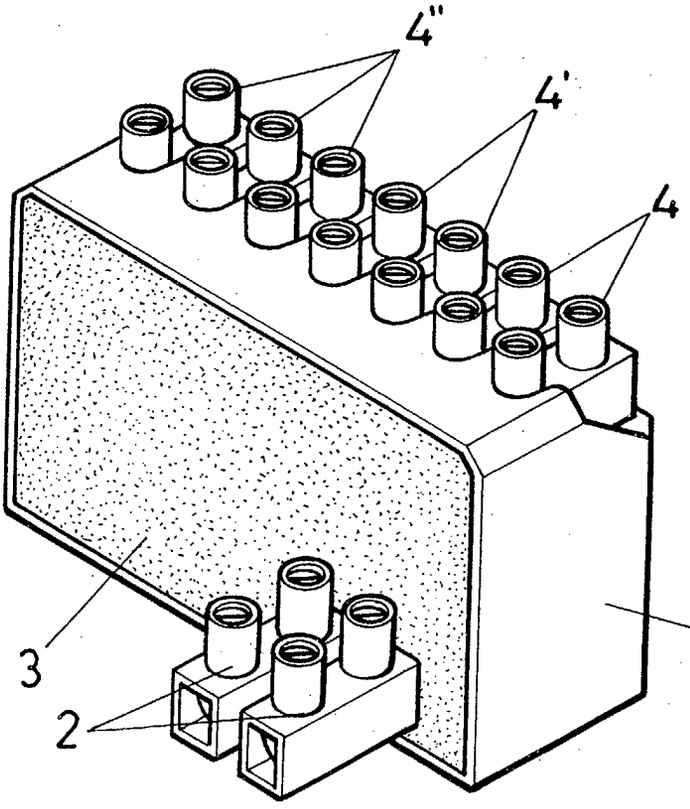

FIG.2

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EUROPEAN SEARCH REPORT

Application Number
EP 03 38 0026

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 855 851 A (TOYO DENSO KK) 29 July 1998 (1998-07-29) * column 1, line 38 - column 3, line 57; figures 1-8 *	1	H05B41/02
A	US 6 175 487 B1 (KELLER MARK FREDERICK ET AL) 16 January 2001 (2001-01-16)		
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

H05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 August 2003	Albertsson, E

CATEGORY OF CITED DOCUMENTS

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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