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(54) Switching unit for fluorescent lamps.

(57) The switching unit for fluorescent lamps comprises a casing (1) composed of a base (2), which is provided with means (7,8,10) for fixing to a support, and of a cover (3), which can be associated with the base (2) so as to define a containment compartment; a printed circuit (12) is installed in the compartment, and the components (15-21) which constitute the electric circuit of the switching unit are arranged on the printed circuit (12); the switching unit can be connected to the fluorescent lamp and to the power supply by means of terminal strips (22,23) fixed to the printed circuit.

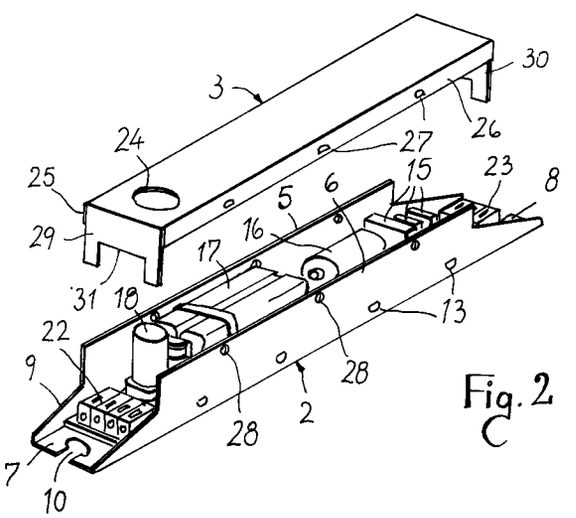

Fig. 2

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The present invention relates to a power supply and switching unit for fluorescent lamps.

In current lighting devices using fluorescent lamps, the power supply and switching unit is constituted by separate electric components which are conveniently connected to one another by means of wires which lead to two terminal strips for connection to the power supply line and to the fluorescent lamp respectively.

The components which form the circuit of the power supply and switching unit are essentially constituted by a ballast and by a starter; a capacitor is usually connected to said circuit, performs power factor correction for the device and can contain, inside it, a discharge resistor and an anti-explosion device, both of which are prescribed by the applicable statutory provisions.

The entire circuit is very often protected by a fuse.

The circuit sometimes furthermore comprises one or more filters for eliminating conducted noise. The amplitude of the noise produced by the lighting device in fact depends on its technical characteristics which, in some cases, require filtering in order to prevent the noise from propagating to neighboring appliances (personal computers, television sets, etc.), which would compromise their operation.

The electric components are arranged inside the lighting device according to an arrangement which depends upon the space available and which depends upon the need to provide the connections, which are usually performed according to empirical criteria according to the contingent situations. This requires a considerable time consuming effort on the part of the assemblers of the lighting device.

The technical aim of the present invention is to provide a power supply and switching unit which can obviate the disadvantages which are present in conventional ones by allowing considerable simplification as regards both the acquisition of components and the wiring and assembly steps.

This aim is achieved by a power supply and switching unit which is characterized in that it comprises a casing composed of a base, which is provided with means for fixing to a support, and of a cover which can be associated with said base so as to define a containment compartment, a printed circuit being installed in said compartment, the components which constitute the electric circuit of the switching unit being arranged on said printed circuit, said circuit being connectable to the fluorescent lamp and to the power supply by means of terminal strips fixed to said printed circuit.

Further characteristics and advantages of the present invention will become apparent from the following description based upon the accompanying drawings, wherein:

figure 1 is a perspective view of the power supply and switching unit according to the present invention;

figure 2 is an exploded perspective view of the power supply and switching unit of figure 1; and

figure 3 is a sectional view of the power supply and switching unit taken along a plane which is normal to the base of the casing.

With reference to the above figures, the power supply and switching unit, hereinafter termed simply switching unit, comprises a casing which is generally indicated by the reference numeral 1, which includes a base 2 and a cover 3.

The base 2 and the cover 3 are preferably made of metal plate, although it is possible to conceive an execution by molding plastic material.

The base 2 comprises a rectangular bottom 4, from the longitudinal edges of which two walls 5, 6 rise perpendicularly. The walls 5, 6 are shorter in longitudinal extension than the bottom 4, so that two ledges 7, 8 are defined at the ends of said bottom and are blended to the walls by triangular ridges 9; slots 10 are defined in said ledges for the passage of fixing screws.

The bottom 4 has recesses which, inside the base, define protrusions 11. The board 12 of a printed circuit is arranged on the protrusions 11 and is retained in place by teeth 13, defined by punching and riveting the walls 5 and 6, which extend inward and engage the lateral edges of the board 12.

The electric components of the switching unit are anchored on the board 12 and are mutually connected by the printed circuit according to known technologies which are therefore not described hereinafter.

Since the conducting part of the printed circuit is on the side opposite to the one on which the electric components are applied and is thus directed toward the bottom 4 which, as mentioned, conducts, a layer 14 of electrically insulating material is interposed between the latter and the board 12.

The electric components of the switching unit comprise noise-reduction capacitors 15, a power factor correction capacitor 16, a ballast 17, a starter 18, a fuse 19 for protecting said capacitor, line fuses 20, a discharge resistor 21 for the capacitor and a pair of terminal strips 22, 23 which are fixed at the opposite ends of the board 12 and protrude partially onto the ledges 7, 8 of the base.

The arrangement of the electric components can naturally vary as required, according to the dimensional characteristics thereof, without altering the concept that their height must not exceed, in assembled condition, that of the walls 5 and 6, so as to allow to apply the cover 3.

An opening 24 is in any case provided on the

cover 3, and the starter 18 can protrude outward therefrom to allow its removal without having to open the cover if the need to replace it arises.

The cover 3 is fixed to the base 2 by providing, along the longitudinal edges of said cover, two wings 25, 26 in which teeth 27 are provided; said teeth are riveted inward so as to engage holes 28 defined in the walls 5 and 6 when the cover is applied so as to cover the components.

The ends of the cover 3 are furthermore folded so as to form two head walls 29 and 30 which are higher than the wings 25 and 26 and have, at their protruding edge, recesses 31 to allow the engagement of the terminal strips 22 and 23 and the closure of the casing.

It should be noted that when the box is closed the terminal strips 22 and 23 remain in any case accessible from the outside to allow the connection of the switching unit to the power supply on one side and to the fluorescent lamp on the other.

The method of use of the described switching unit is fully evident from the provided description. In particular, said switching unit can be fixed to a wall or ceiling fixture or to another support by means of screws driven through the slots 10.

The advantages of the invention are numerous.

From a technical point of view, it should be noted that the circuit lends itself to the automatic mounting and connection of the components by resorting to the same conventional methods used in other electric appliances as well.

The wiring operations on the part of the assemblers of the lighting devices are thus reduced to the simple connection of wires to the two terminal strips 22 and 23, thus eliminating all mutual connections of the components, with a great reduction in assembly costs.

Another advantage is to be found in the fact that the same casing can be adopted for a wide range of circuits having different potentialities. The variations in the dimensions of the components are in fact usually negligible with respect to those of the casing which, if it is given appropriate dimensions, can contain switching units suitable for meeting any requirement.

The present invention offers a further possibility of considerably reducing the total cost of the switching unit by virtue of the casing 1, which ensures the required mechanical and accident-prevention protections and can allow the use of components having no protective container.

One should furthermore not neglect the fact that the paths of the printed circuit, by being shielded by a single metallic casing, produce a much smaller irradiated noise with respect to that produced by conventional wire connections.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the protection expressed in the following claims.

For example, the board of the printed circuit, instead of being fixed onto the base, can equally be applied to the cover, so that if malfunctions occur, instead of replacing the entire switching unit, including the base, it is possible to confine oneself to the replacement of the cover only and of the components associated therewith, the base remaining rigidly associated with the support fixture.

The power supply and switching unit can be given dimensions suitable for the actuation of two lamps. In this case, two starters 18 are provided and are accessible through respective openings of the cover for possible replacement.

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 scope of each element identified by way of example by such reference signs.

Claims

1. Switching unit for fluorescent lamps, characterized in that it comprises a casing (1) composed of a base (2), which is provided with means for fixing to a support, and of a cover (3) which can be associated with said base so as to define a containment compartment, a printed circuit (12) being installed in said compartment, the components (15-21) which constitute the electric circuit of the switching unit being arranged on said printed circuit, said circuit being connectable to the fluorescent lamp and to the power supply by means of terminal strips (22, 23) fixed to said printed circuit.

2. Switching unit according to claim 1, characterized in that said base comprises a bottom (4) from which two walls (5, 6) rise, said walls being perpendicular to said bottom, said walls of said base having means (13) for retaining said printed circuit.

3. Switching unit according to claim 2, characterized in that said cover (3) has means (27) for snap-together connection to said walls (5, 6) and has head walls (29, 30) provided with recesses (31) through which said terminal strips (22, 23) protrude outward for the connection of the switching unit to the power supply and to the fluorescent lamp.

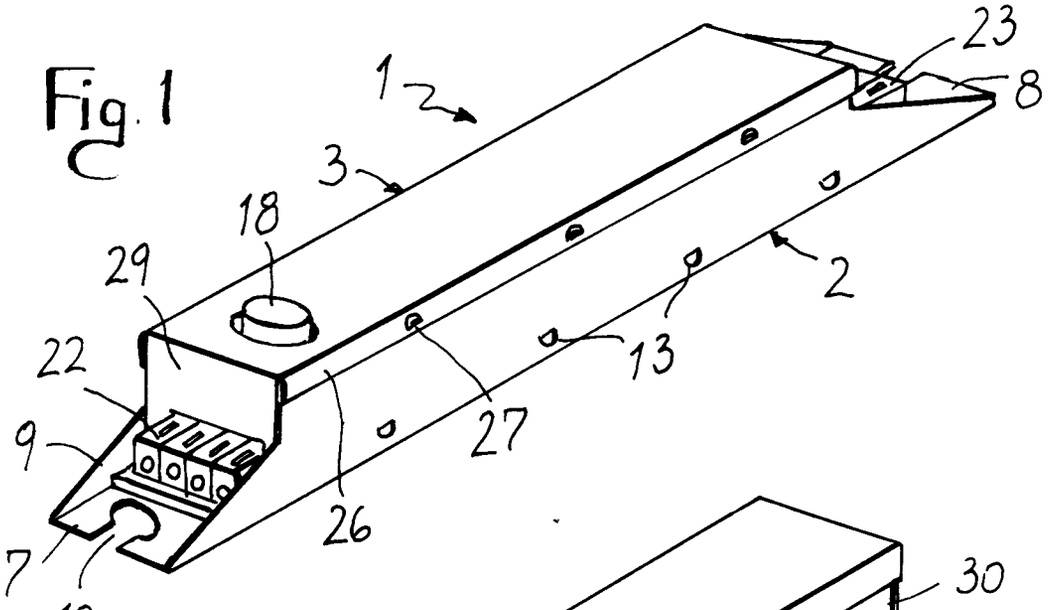
4. Switching unit according to claim 3, character-

ized in that said cover (3) has openings (24) for allowing access to the electric components.

5. Switching unit according to claim 3, characterized in that the bottom (4) of the base (2) comprises two ledges (7, 8) which protrude from its ends and have slots (10) for the passage of fixing screws.

6. Switching unit according to claim 3, characterized in that said bottom (4) has protrusions (11) on which the printed circuit (12) rests with the interposition of an electrically insulating layer (14).

Fig. 1



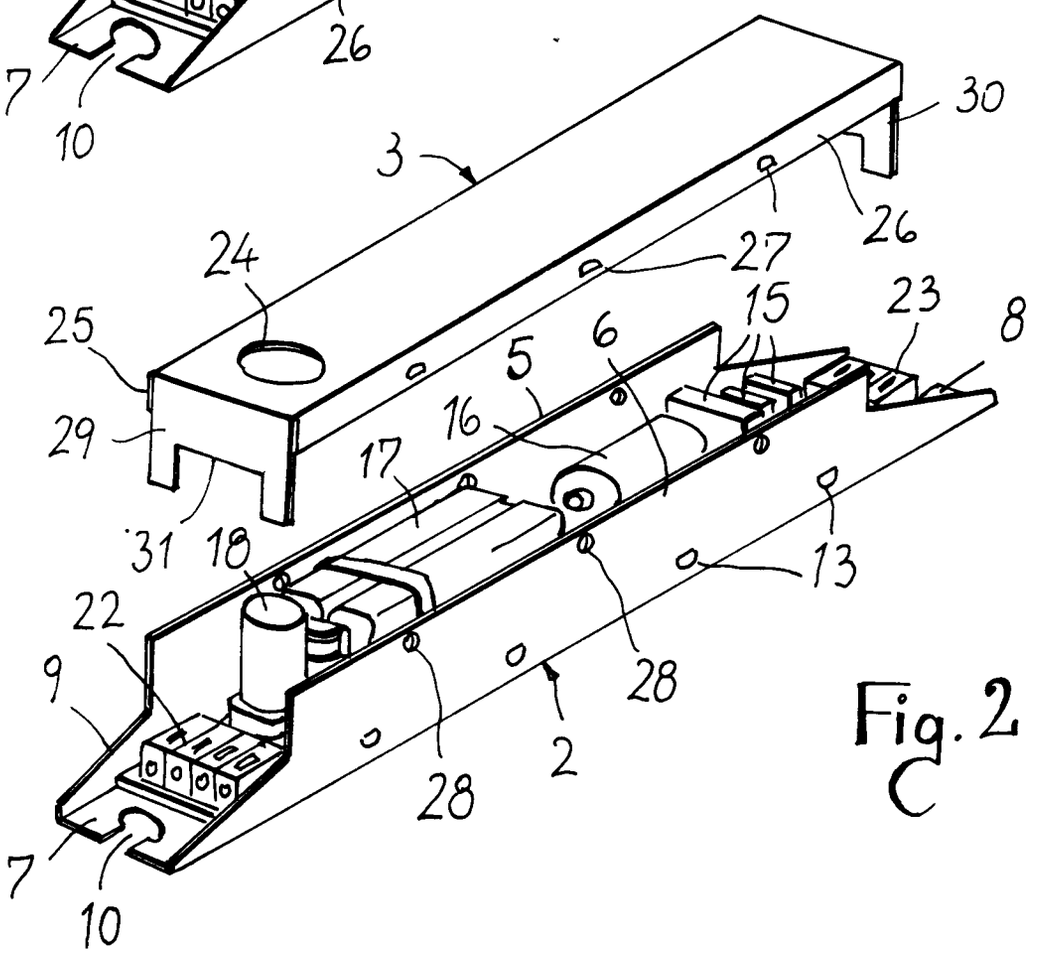
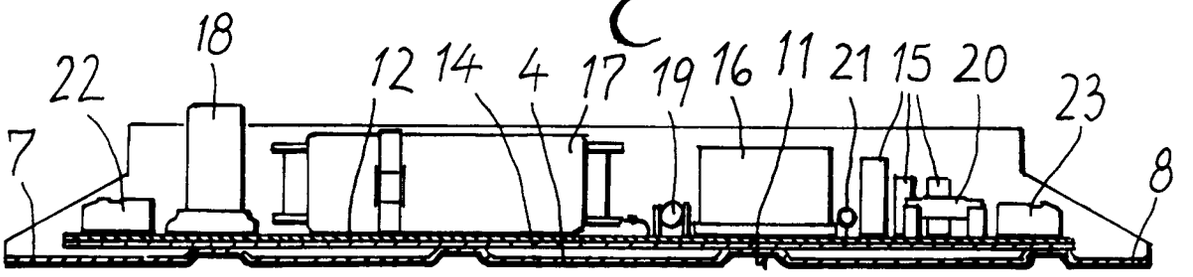


Fig. 2

Fig. 3



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EUROPEAN SEARCH REPORT

Application Number

EP 91117505.7

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.5)
X	US - A - 4 924 152 (FLICKINGER) * Column 3, line 41 - column 6, line 60; fig. 1-15 *	1	H 05 B 41/02
A	US - A - 3 302 017 (R.E. HAUSON) * Column 2, line 58 - column 3, line 46; fig. 1-7 *	1-3,5	
A	US - A - 3 851 225 (LUCHETTA) * Column 4, line 9 - column 5, line 8; fig. 1 *	1-4	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

H 05 B 41/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	29-11-1991	TSILIDIS

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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