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(54) **Lamp socket with fast connection terminals**

(57) There is described a lamp socket to support and electrically connect a lamp, provided with at least two

connection terminals (3,4,5) made of heat-shrink material for connection to electrical conductors.

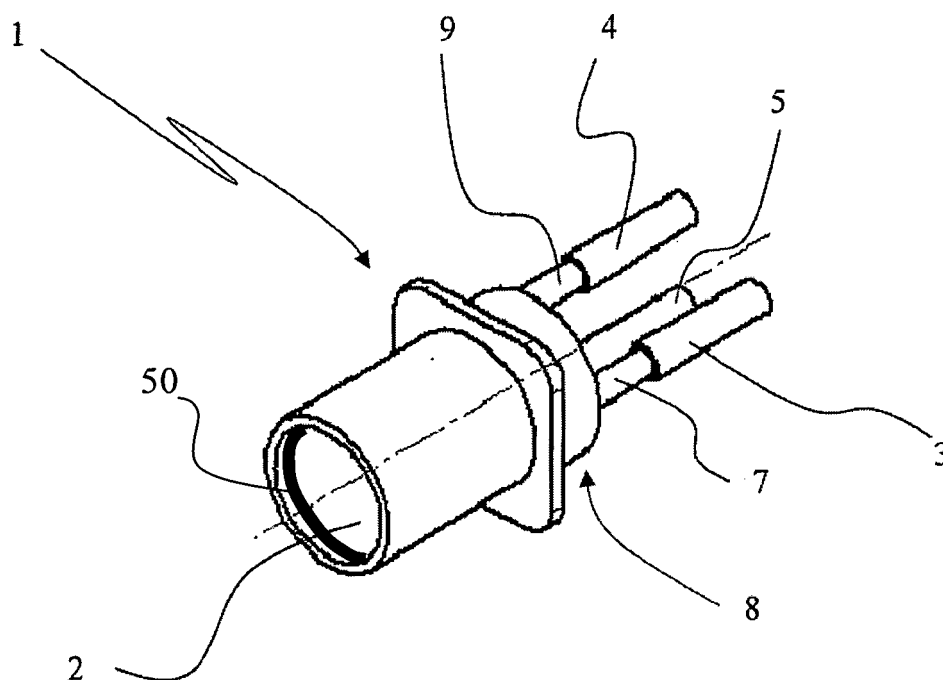


Fig. 1

Description

[0001] The present invention relates to a lamp socket to support and connect lamps to electrical conductor cables and, in particular, to a lamp socket comprising quick coupling connection terminals.

[0002] Prior art lamp sockets must be opened and parts of the lamp socket must be disassembled for connection to the power supply cables. In fact, the electrical contacts are generally found in a position which does not allow access directly from the outside.

[0003] These supports have considerable drawbacks in terms of installation times and quality of the insulation of the electrical connections. In fact, during the installation steps it is necessary to temporarily open part of the lamp socket and clamp the cables in the terminals, acting on screw coupling means or the like.

[0004] Moreover, prior art lamp sockets ensure low levels of protection and insulation of the electrical contact, also in the case in which they are protected by outer covering sheaths. The seal against external agents, such as humidity, dust or dirt in general, is also often somewhat unsatisfactory.

[0005] The object of the present invention is to provide a lamp socket which can be connected to the power supply cables of the power network in a rapid manner and without the need to temporarily disassemble parts of the lamp socket.

[0006] Another object of the present invention is to provide a lamp socket capable of ensuring an excellent level of resistance and of insulation of the electrical connections produced, as well as excellent seal against humidity and dust. A further object of the present invention is to provide a lamp socket which allows electrical connection without the need to use different tools, such as screwdrivers and pliers.

[0007] These and other objects are achieved by the present invention by means of a lamp socket according to the main claim. Specific features of the various embodiments are contained in the dependent claims.

[0008] The present lamp socket for support and electrical connection of a lamp is characterized by comprising two or more connection terminals, made of heat-shrink material to produce the connection with electrical conductor cables.

[0009] In more detail, the present lamp socket is equipped with cylindrical connection terminals made of heat-shrink material and incorporated in the lamp socket.

[0010] This allows permanent connection to electrical conductor cables ensuring a high degree of insulation from external agents. The lamp socket according to the invention is therefore particularly suitable also for installation in outdoor environments.

[0011] Each connection terminal is provided with a hollow cylindrical body containing at least one solder alloy ring and at least one ring made of a material also having heat-shrink properties.

[0012] The presence of cylindrical heat-shrink connec-

tors allows the power supply cables to be clamped in a rapid and safe manner, by inserting the end of the cable manually into one of the connectors and directing a stream of hot air against it.

[0013] Simultaneously to shrinking of the body of the connector subjected to heat, the solder alloy ring melts and the heat-shrink material ring shrinks. Melting of the solder alloy simultaneously produces the electrical connection between the conductor of the cable, inserted in the connection terminal, and the respective metal contact of the lamp socket.

[0014] Shrinking of the heat-shrink material ring, together with that of the entire body of the connection terminal, will clamp the cable and ensure insulation of the electrical connection produced.

[0015] Heat-shrink materials have the characteristic of reducing their original dimensions if subjected to heat sources or infrared rays. Due to this characteristic, these materials are used for numerous applications in various technical fields and products in the form of rings or tubular bands, to insulate and seal electrical cables and fluid ducts of small dimensions, are already known.

[0016] In the electrical field they are used in the form of heat-shrink sheaths for joining the free ends of two or more conductors and are particularly suitable for installations in which connections must be produced very rapidly and which require high levels of insulation from external agents. They are also particularly suitable for installations in which space is limited.

[0017] The advantages of the present invention will be apparent from the description below and from the accompanying drawings, provided by way of non limiting example, wherein:

- Fig. 1 is a perspective view of the lamp socket according to the present invention;
- Fig. 2 is a schematic view of one of the connectors of heat-shrink type arranged on the lamp socket of Fig. 1 and of a conductor cable prepared for installation; and
- Fig. 3 is an enlarged schematic view showing the same components as Fig. 2 after installation.

[0018] With reference to Fig. 1, the lamp socket in its preferred embodiment shown here comprises a main body 1 made of plastic material, provided with a seat 2 to house the base of a lamp and three terminals 3, 4 and 5 made of heat-shrink material.

[0019] The seat 2 can have the conventional dimensions established by the standards and by the type of lamp bases, such as screw bases (i.e. E14, E10, E27, etc.), bayonet bases (i.e. BA9, BA9S, BA15, BA15D, etc.), bi-pin bases (i.e. G4, GU4, GU10, etc.), T-WEDGE bases, T5 bases, or in any case the dimensions of any type of base present on the market.

[0020] A ring 50 made of elastomeric material, for example a silicone O-ring, is advantageously secured in the seat 2, inside the neck of the lamp socket. When a

lamp is inserted in the lamp socket, the glass lamp abuts with pressure against the ring 50 and increases the seal of the assembly formed by lamp and lamp socket

[0021] Cylindrical ducts 7, 8 and 9, suitable to house the metal contacts for connecting the lamp and on each of which the heat-shrink connection terminals 3, 4 and 5 are arranged, are provided at the base of the main body 1.

[0022] The base of the lamp will be housed in the seat 2 in which the two metal contacts, which allow the supply of power, are disposed.

[0023] The presence of a larger number of connection terminals than the two strictly necessary to supply power to the lamp, as in the case, for example, of the embodiment shown in Fig. 1, is subordinate to the need to transmit signals in a plurality of lamps connected in series.

[0024] The metal contacts, not shown, will be placed inside the main body 1, starting from the contact points with the lamp in the seat 2, and extending into the base of each of the heat-shrink connection terminals 3-5 through the rigid ducts 7-9.

[0025] Fig. 2 is a schematic view of one of the heat-shrink connection terminals 3-5, for example the one indicated with the reference 3, together with an electrical cable 10 prepared for installation.

[0026] The terminals 3-5 have a hollow cylindrical shape to receive the end of an electrical connection cable 10, prepared in advance by stripping part of the insulating sheath 11 and uncovering the metallic central conductor 12.

[0027] A solder alloy ring 20 in solid state, typically consisting in a low melting point tin, is inserted at the base of the terminal 3, inside the cylindrical body and in proximity to the metal contact of the lamp socket extending into the duct 7.

[0028] Moreover, a ring 21, also made of heat-shrink material, is provided inside the duct, in the end area of the terminal 3.

[0029] The steps to connect the lamp socket to the power network consist in preparing each of the conductor cables in advance by uncovering the end of the metal conductor 12 and then inserting the ends of the cables into the terminals 3-5.

[0030] The terminals 3-5 are then subjected to a stream of hot air generated at the appropriate temperature by means suitable for this purpose, such as a heat gun or the like.

[0031] The result after installation is represented schematically in Fig. 3 with reference only to the components already represented in Fig. 2 (terminal 3). The heat-shrink material will react to the heat to which it is subjected, and the cylindrical body of each terminal 3-5 will shrink, decreasing the dimensions thereof in terms of diameter and thus causing complete wrapping of the cable.

[0032] Inside each terminal 3-5, the solder alloy ring 20 will melt, producing the electrical connection between the conductor 12 of the cable and the metal contact of the lamp disposed at the base of the heat-shrink terminal. In fact, as soon as the stream of heated air is removed,

the solder alloy ring will solidify, thus forming the seal 20'.

[0033] Moreover, also the heat-shrink ring 21 subjected to heat will decrease its diameter, allowing clamping of the sheath 11 of the cable and producing a seal 21' which seals the space inside the terminal, also making connection of the cables to the lamp socket more solid.

[0034] The hollow cylindrical body of the terminals 3-5 can advantageously be made of transparent material, allowing the operator who makes the electrical connection to verify correct insertion of each cable and, at the end of the operation, that the seal is effective.

[0035] Although reference has been made herein to a lamp socket with a screw base, it is clear that the principles of the present invention can be applied without distinction to all types of lamp socket.

Claims

1. A lamp socket to support and electrically connect a lamp, **characterized by** comprising at least two connection terminals made of heat-shrink material for connection of electrical conductors.
2. The lamp socket according to claim 1, wherein each of said at least two connection terminals is constituted by a hollow cylindrical body made of heat-shrink material.
3. The lamp socket according to claim 1 or 2, wherein said at least two connection terminals internally contain at least one solder alloy ring in solid state.
4. The lamp socket according to any one of the preceding claims, wherein said at least two connection terminals internally contain at least one ring made of heat-shrink material.
5. The lamp socket according to any one of the preceding claims, wherein said at least two connection terminals of the heat-shrink type are transparent.
6. The lamp socket according to any one of the preceding claims, wherein three or more connection terminals are provided.
7. The lamp socket according to any one of the preceding claims, having a seat suitable to receive the base of a lamp, wherein a ring made of elastomeric material is secured inside said seat.

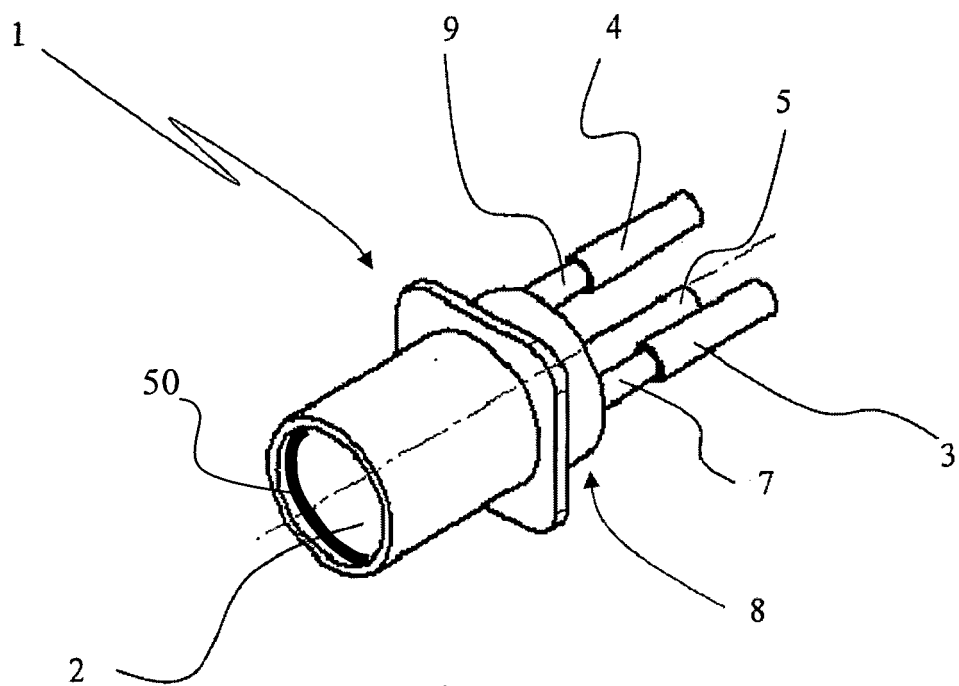


Fig. 1

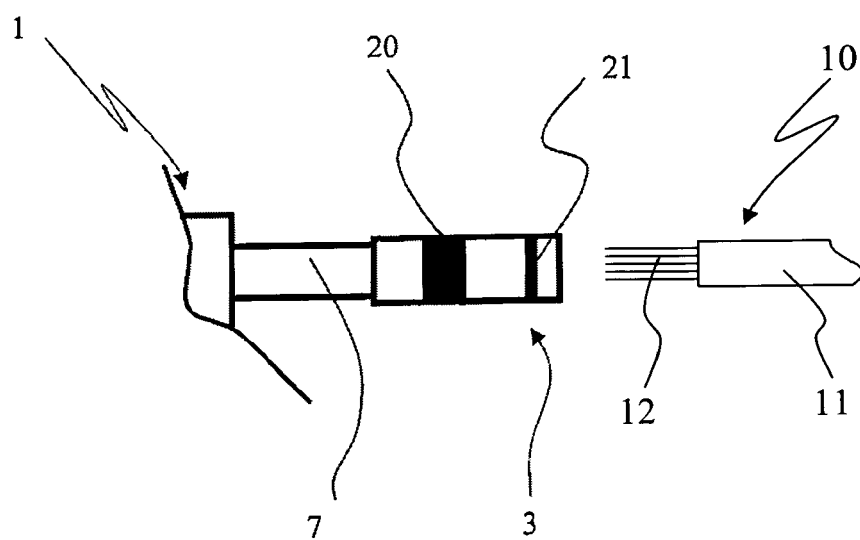


Fig. 2

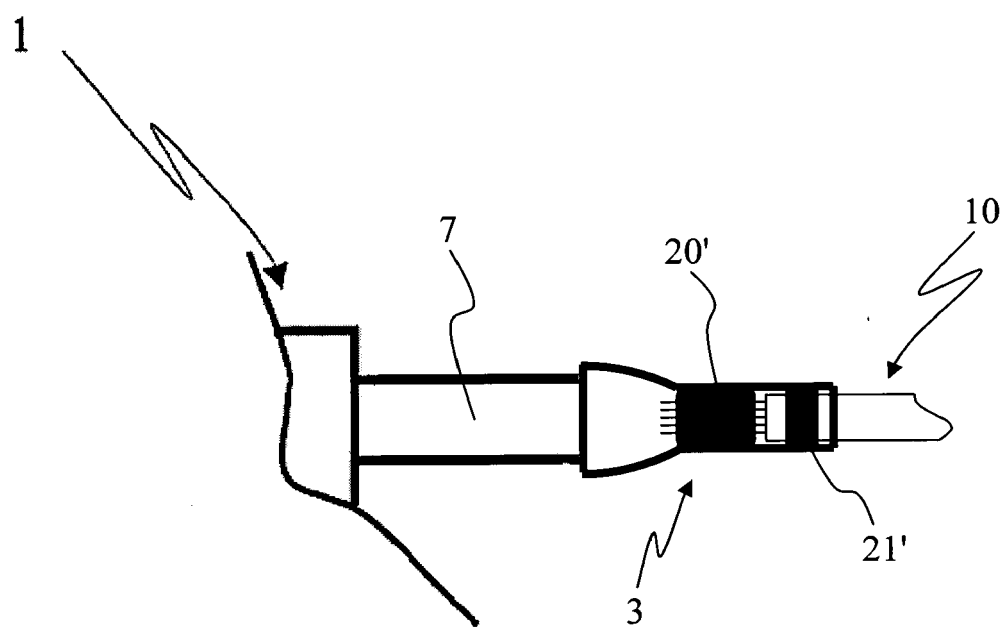


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 09 00 9070

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 October 2009	Examiner Chelbosu, Liviu
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 09 00 9070

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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