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

(11) EP 1 182 397 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.02.2002 Bulletin 2002/09

(51) Int Cl.[7]: **F21V 31/00**

(21) Application number: **01610086.9**

(22) Date of filing: **20.08.2001**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **21.08.2000 DK 200001235**

(71) Applicant: **LK A/S**
DK-2750 Ballerup (DK)

(72) Inventor: **Pedersen, Asger Egebak**
3650 Olstykke (DK)

(74) Representative: **Wittrup, Flemming et al**
Hofman-Bang Zacco A/S Hans Bekkevolds Allé 7
2900 Hellerup (DK)

(54) A lamp

(57) A lamp comprising a lamp housing (2) and a lamp glass (3) as well as internal, electric components has an insulating bowl (9) for receiving the internal electric components so that these are arranged water- and moisturetight. In a preferred embodiment, the bowl (9) has an open side which faces toward the lamp glass (3) so that the water- and moisturetight space is formed by the bowl (9), the lamp glass (3) and a sealing ring (18).

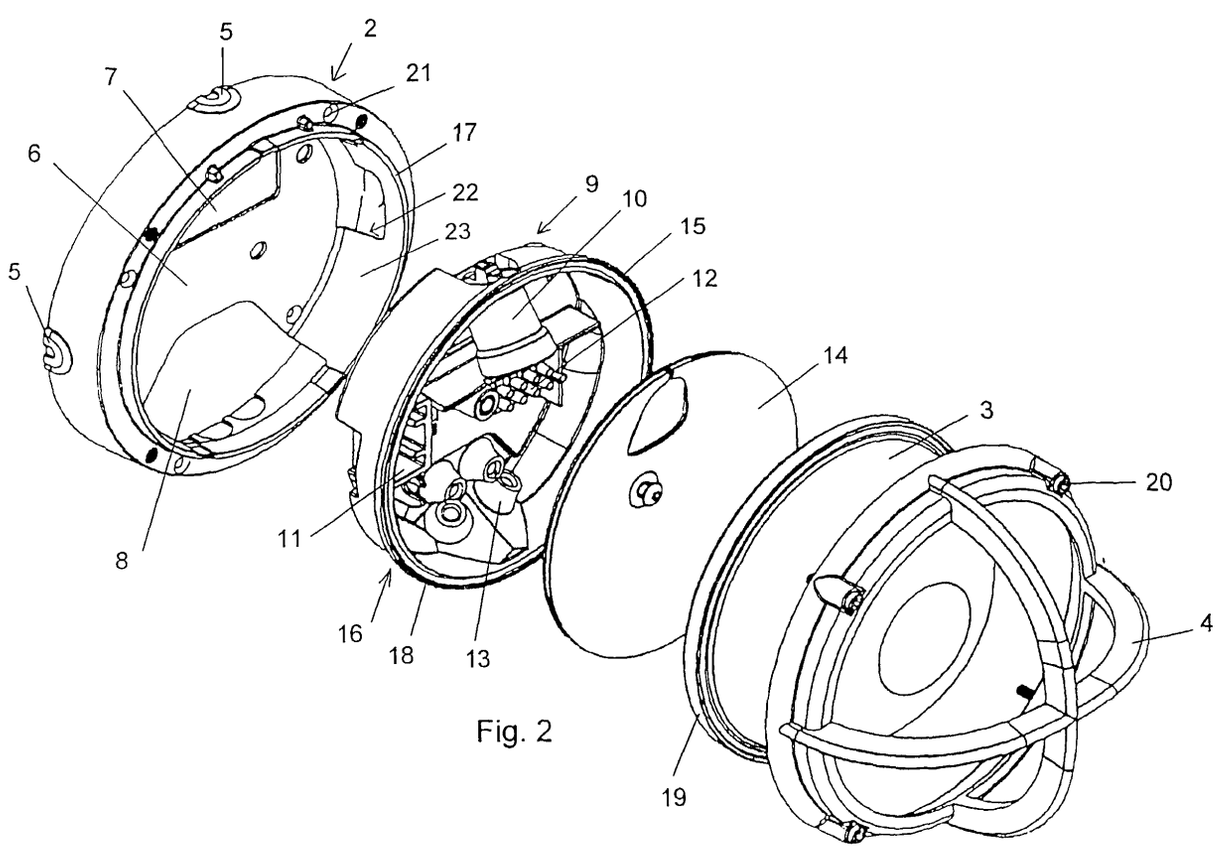

Fig. 2

EP 1 182 397 A2

Description

[0001] The invention relates to a lamp comprising a lamp housing having external metal faces and comprising a lamp glass as well as sealing means for providing a cavity in the housing for the reception of electric components. The sealing means are to ensure that no water or moisture can penetrate into the electric components.

[0002] In particular, the invention relates to such lamps where the lamp housing comprises external metal faces. This is frequently the case with quality lamps where importance is attached to design and durability as well finish. For use out-of-doors lamps having metal housings must be connected to earth, unless the lamp meets special conditions that have been given designations such as "double-insulated" or "class 2". Providing a non-existing earth wire is a very expensive element in the installation of a lamp which is not double-insulated.

[0003] There are plastics copies of the much-desired quality lamps, and these copies have the advantage that their purchase price is lower and that normally they do not require an earth wire because of the plastics housing. Many consumers would like to have quality lamps, but also want to limit the costs. Therefore, there is a need for original lamps which are double-insulated, thereby obviating the additional earth wire cost. However, it is a well-known problem that double-insulation takes up more space so that the lamp gets bigger or perhaps gets another shape. This is undesirable since it must be possible to mount the novel double-insulated lamps of a specific type (without earth wire) at locations where there are also older lamps of the same type, so as to obtain a beautiful overall impression.

[0004] The object of the invention is to provide a double-insulated lamp which satisfies the above-mentioned safety requirements, and which may be made just as compact as a single-insulated lamp of a corresponding type.

[0005] This object is achieved in that the lamp comprises an electrically insulating bowl to be received in the housing and for receiving the electric components, and that the sealing means enclose the bowl for providing said cavity in the bowl.

[0006] Preferably, the bowl is open toward the side facing toward the lamp glass and has a sealing area located along the open rim and adapted to cooperate with the lamp glass via the seal.

[0007] Preferably, the sealing area has a bead which is adapted to engage an annular edge of the lamp housing so that the relatively sturdy lamp housing supports the relatively fragile bowl in the sealing area where the seal is compressed against the bowl.

[0008] The use of a closed insulating bowl means that it is a little more difficult to dispose of the heat which e. g. a bulb or a transformer generates inside the cavity. Lamps with energy saver bulbs contain a transformer that can get rather hot, and therefore the transformers will typically be driven close to their upper limit temperature, and it is therefore particularly important to ensure that the compact structure does not allow other electric wires to get near the transformer. This is ensured in that all cable lead-ins in the bowl are provided at a predetermined location, e.g. at a distance from a transformer or bulb. This, however, may have the drawback that the electrician has a limited choice with respect to the running of cables in the lamp as such. This drawback is obviated in that a channel is provided between the electrically insulating bowl and the lamp housing for receiving an electric cable, so that the cable may be introduced into the lamp housing at several different locations and be run to the lead-in in the bowl via said channel.

[0009] The invention will be explained more fully by the following description of an embodiment with reference to the drawing, in which

figure 1 shows an example of a lamp according to the invention, while

figure 2 shows the lamp of figure 1 in an exploded perspective view.

[0010] The lamp 1 shown in figure 1 comprises a lamp housing 2, a lamp glass 3 and a guard 4 as well as some internal components. The internal components comprise a socket and a bulb and usually also a transformer, as the lamp 1 is frequently used for outdoor lighting where an energy saver bulb is normally used. Also provided are wires and terminal blocks as well as lead-ins. The lamp housing 2 has four possible lead-ins, of which two are visible in figure 1 and are indicated with the reference numeral 5.

[0011] The lamp shown in figure 1 is an example of a lamp which has been on the market for a large number of years and is a well-known design having a high degree of quality and finish. It is a lamp which is much-desired by the consumers, but is also more expensive than a copy of plastics. The lamp was designed many years ago when it was required that all power current equipment was to be connected to earth if it was arranged in a moist atmosphere, e.g. out-of-doors. In the meantime, new rules have been adopted so that the earth wire for the lamp may be omitted if the lamp is double-insulated according to specified regulations, which will not be described in detail. The problem is then that the additional insulation and various distance requirements to the components inside the lamp make it necessary to re-design the lamp in order to make room for complying with the new requirements. This has been found to be a more difficult task than one would believe on the face of it.

[0012] Figure 2 shows an exploded view of an embodiment of the invention which meets the stricter requirements without the lamp having to be re-designed. Thus the consumer cannot tell the difference between the original lamp and the original double-insulated lamp.

[0013] Figure 2 shows the lamp housing 2 which may

be made of moulded aluminium. The rear side of the lamp housing comprises a rear wall 6 and recesses 7 and 8 for receiving the bottom of an electrically insulating bowl 9. The bowl 9 contains a plurality of electric components, viz. a socket 10 for receiving a bulb (not shown). The transformer for the supply of the bulb is not shown either, but the bowl 9 is shown to have a holder 11 for such a transformer. Also shown are a block of terminals 12 and four lead-in bushes 13. Figure 2 moreover shows a reflector 14 as well as the lamp glass 3 and the guard 4.

[0014] To seal the lamp against water or moisture, a rubber gasket has previously been arranged between the lamp glass 3 and the lamp housing 2. According to the invention, the double insulation is achieved by means of a separate insulating bowl 9 which has a sealing area positioned along its open rim 15. The rim 15 comprises a bead 16 which is arranged to engage an annular rim 17 of the lamp housing 2, and on the opposite side of the rim 16 there is the sealing ring 18 known per se which is adapted to cooperate with an engagement area 19 on the lamp glass 3. The guard 4 has a plurality of screws 20 to be received in holes 21 in the lamp housing 2, so that the lamp glass 3 is clamped against the sealing ring 18 when the screws 20 are tightened. This results in a water- and moisturetight space which is defined by the bowl 9 and the lamp glass 3. According to the invention, the interior of the lamp housing 2 itself is no longer watertight relative to the surroundings, but this is not a problem since the electric cables to the lamp are introduced from behind or through the side in the lamp housing 2 and are run from there in a fully insulated state to the lead-in bushes 13 which seal against the cable. The lead-in bushes are arranged so that in practice the internal wiring cannot get too close to the socket or to the transformer. If the cables get too close to these very hot parts, the insulation may melt. Both the risk of melting and the restricted space mean that the lead-in bushes 13 are concentrated at a specific place in the lamp housing 9, and this might perhaps result in a restriction in the flexibility with respect to the introduction of cables in the lamp. This has been solved in that the lamp housing has channels 22 between the external wall of the lamp housing and an internal wall 23 which connect the rear plate 6 with the external wall.

[0015] In the described, preferred embodiment the bowl opens toward the lamp glass so that the tight cavity is achieved by means of a sealing ring between the bowl and the lamp glass. In another embodiment, the bowl may also be open toward the rear side of the lamp and engage an insulating rear side via sealing means. Alternatively, the bowl may be open toward both sides where respective sealing means are provided. The decisive point is that a protected cavity for the reception of the electric components is obtained by means of an electrically insulating bowl which is sealed toward the surroundings.

[0016] By means of the features described above it is possible to convert an already compact lamp into a double-insulated version.

Claims

1. A lamp comprising a lamp housing having external metal faces and comprising a lamp glass as well as sealing means for providing a cavity in the housing for the reception of electric components, **characterized in that** an electrically insulating bowl is provided to be received in the housing and for receiving the electric components, and that the sealing means enclose the bowl for providing said cavity in the bowl.

2. A lamp according to claim 1, **characterized in that** the bowl is open toward the side facing toward the lamp glass, and that a sealing area is provided along the open rim of the bowl, said sealing area being adapted to cooperate with the lamp glass via a seal.

3. A lamp according to claim 2, **characterized in that** the sealing area comprises a bead which is adapted to engage an annular edge of the lamp housing, and tightening means are provided for clamping the glass against the housing so that the space inside the glass and the bowl is water- and moisturetight.

4. A lamp according to claim 1 or 2, **characterized in that** the bowl has cable lead-ins which are concentrated in a specific area of the bowl relative to the electric components.

5. A lamp according to claim 4, **characterized in that** space is provided between the bowl and the housing for receiving an electric cable.

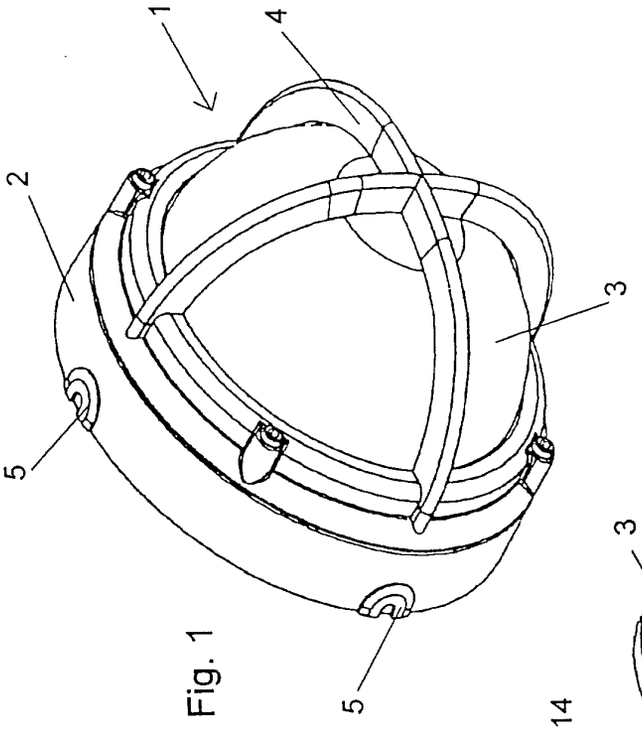

Fig. 1

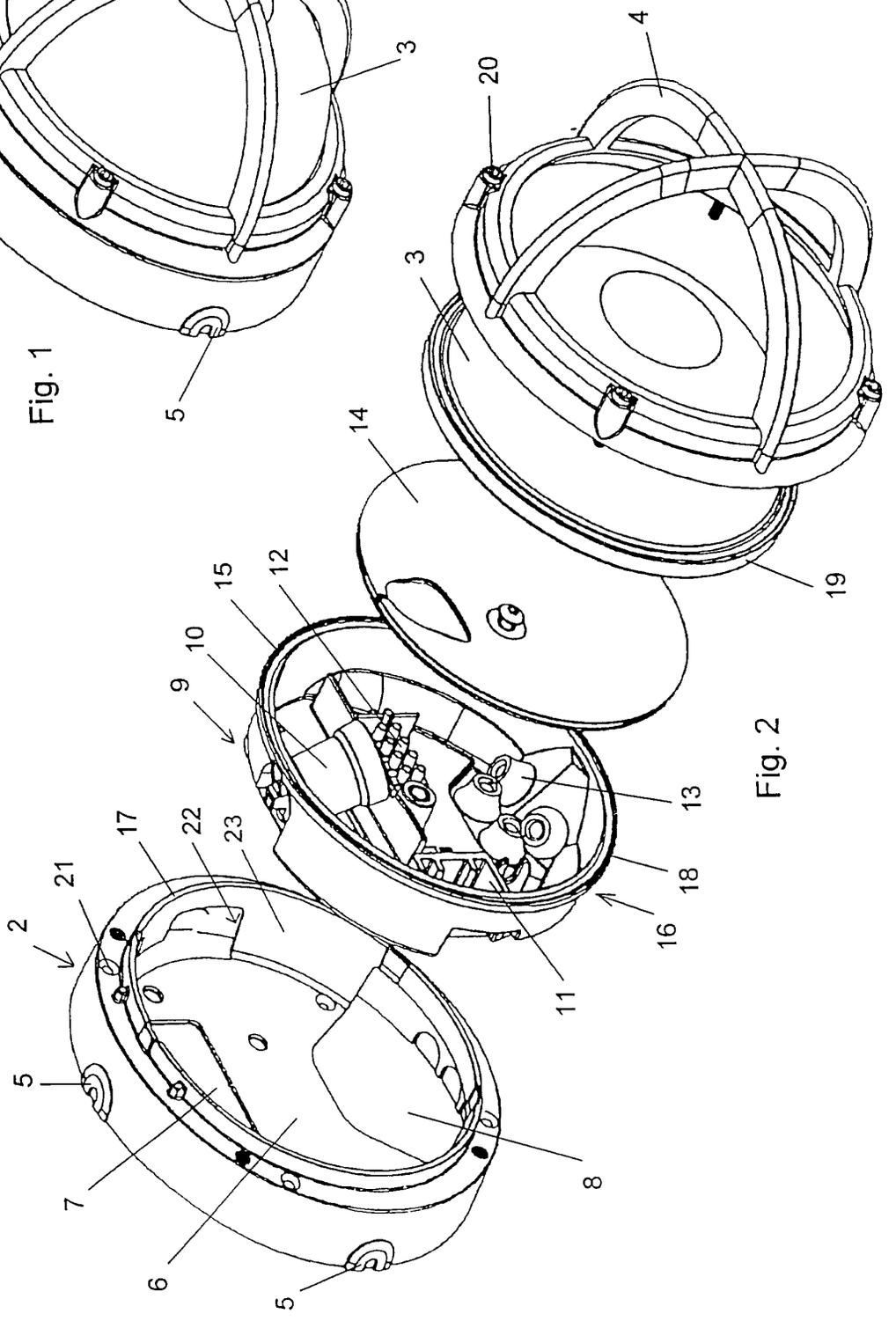

Fig. 2