



Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number: **0 522 362 A1**

EUROPEAN PATENT APPLICATION

Application number: **92110741.3**

Int. Cl.⁵: **F21M 7/00, H01J 5/48, H01J 61/52**

Date of filing: **25.06.92**

Priority: **02.07.91 HU 223191**

Date of publication of application: **13.01.93 Bulletin 93/02**

Designated Contracting States: **BE DE FR GB IT NL SE**

Applicant: **TUNGSRAM Részvénytársaság**
Váci ut. 77
H-1340 Budapest IV(HU)

Inventor: **Busai, Gyula, Dipl.-Ing.**
Lahner György u. 12
H-1046 Budapest(HU)
Inventor: **Csapo, Ferenc**
Erd sor u. 26

H-1046 Budapest(HU)
Inventor: **Szab , György, Dipl.-Ing.**
Bajza u. 5
H-1046 Budapest(HU)
Inventor: **Pál, Endre, Dipl.-Ing.**
Harangvirág t 10
H-8900 Zalaegerszeg(HU)
Inventor: **Laki, Arpád, Dipl.-Ing.**
Becsali u. 35
H-8900 Zalaegerszeg(HU)

Representative: **Patentanwälte Viering & Jentschura**
Steinsdorfstrasse 6 Postfach 22 14 43
W-8000 München 22(DE)

Electric lamp, particularly for vehicle headlamps.

Electric lamp, particularly for vehicle headlamps, provided with a light source (1), a coupling unit (2) and a member (4) for supporting the light source in the coupling unit; said coupling unit (2) comprising a cap shell (22) provided with an adjusting disc (21) and with a contact holder (23) with contact elements (24); said adjusting disc (21) having positioning profiles (21a), said cap shell (22) being connected to said contact holder (23) by inwardly bent fixing means at its end more distant from the light source (1); and the current lead-in wires of the light source being fixed to the contact elements (24) in a way to conduct electric current. The coupling unit (2) is provided with a tubular insert (25) located along the inner side (22b) of the cap shell (22) and extending beyond the flange (22a) thereof closer to the light source (1); the edge (25d) of the insert (25) more distant from the light source (1) having a fixing portion (3) embedded in the material of the contact holder (23); and the supporting member (4) of the light source (1) is mounted on the free end (25a) of the insert (25).

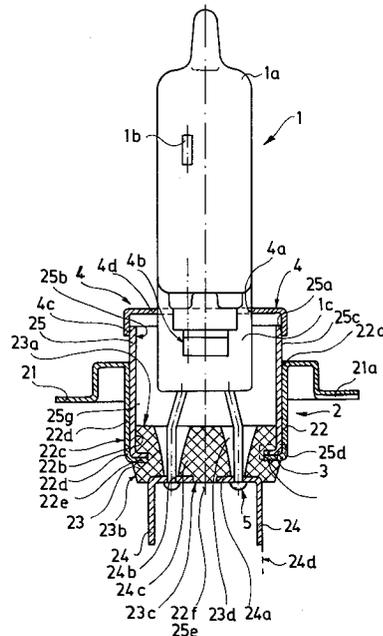


Fig. 1

EP 0 522 362 A1

The present invention relates to an electric lamp, particularly for vehicle headlamps, provided with a light source, a coupling unit and a member for supporting the light source in the coupling unit; said coupling unit comprising a cap shell provided with an adjusting disc and a contact holder with contact elements; said adjusting disc having positioning profiles, said cap shell being connected to said contact holder by inwardly bent fixing means (e.g. a serrated flange) at its end more distant from the light source; and the current lead in wires of the light source being fixed (e. g. by welding) to the contact elements in a way conducting electric current.

Vehicle head-light lamps should be connected with the reflector unit in a way that enables the lamp filament to remain all the time in the focal point of the reflector. Another requirement is the hermetic seal between reflector and the cap assembly supporting the light sources in order to avoid that dust and other contaminations reach the reflector surface and scrape it or burn in it due to the thermal effect of the lamp. This, in turn, will diminish the quantity of reflected light, i.e. the illumination value thus representing a major factor or danger in case of motor vehicles and may even lead to an accident.

Hungarian Patent Specification published under No. T/53246 describes electric lamps for mounting in reflectors. In this lamps, a separate cap insulator is inserted into the cap shell provided with an adjusting disc. The cap insulator is fixed in the cap shell by bending extensions protruding from the cap shell into accepting surfaces or slots formed in the cap insulator for this purpose.

In one of the embodiments, the support element of the light source is connected with the cap shell through an apron portion bent out from a thin sheet.

This has the disadvantage that the thin connecting aprons can hardly withstand the vibration effect to which the reflector is exposed during the travel of the vehicle, or in some cases can even amplify the vibration effect resulting in the displacement or, in the worse case, in the destruction of the light source.

In another embodiment disclosed in the above Patent Specification, the cap shell is connected with the adjusting disc by a collar bent out to the extent of half the height of the cap shell. The light source is fixed to the collar tabs of the cylindrical mantle of the support element supporting the light source. The support element has - unlike the former embodiment - the shape of a full body of rotation.

The disadvantage of a lamp according to this embodiment is that the major part of heat transferred from the support element to the collar

reaches the adjusting disc by heat conduction. The excessive amount of heat reaching the adjusting disc can cause damage to the connecting part of the headlamp and also to the reflection surface.

A typical disadvantage of all the above lamps is that the cap assembly has to be made using many assembling operations and from parts requiring complicated tooling.

Another disadvantage is that the hermetic seal can only be achieved by using a supplementary surface coating that provides a provisional hermetic seal only.

The object of the present invention is therefore to eliminate the above disadvantages and to provide an electric lamp with a cap assembly composed of simple parts which can be easily assembled and to achieve a complete hermetic seal without the need for supplementary steps.

Another object is to reduce the amount of heat reaching the adjusting disc, to fix the light source in a safer way and to improve the mechanical - primarily the vibration resistance - properties of the cap assembly.

These objects can be achieved by placing an insert of suitable geometrical shape into the cap shell and by fixing it to the contact holder. Accordingly, the electric lamp of the kind mentioned in the opening paragraph is made in a manner that the coupling unit is provided with a tubular insert located along the inner side of the cap shell and extending beyond the flange thereof closer to the light source; the edge of the insert more distant from the light source having a fixing portion embedded in the material of the contact holder; and the supporting member of the light source is mounted on the free end of the insert.

A further possible feature of the electric lamp according to the invention is that the fixing portion of the insert is a shoulder forming a full circle and bending towards the inner space of the insert and is embedded in the material of the side portion of the contact holder.

In a possible embodiment the longitudinal axis of the cap shell is coaxial with the longitudinal axis of the insert.

In a preferred embodiment, the insert has the shape of a cylinder mantle and the full inner side of the cap shell is in contact with the outer surface of the insert.

In a still further embodiment, the insert is provided with ribs on its outer surface, and the inner side of the cap shell is in contact with the insert only by means of the ribs.

The electric lamp according to the invention has several advantageous features. The most important of these is that due to the design and connection of its elements, a reduced amount of heat will reach the connection surfaces of the head-

lamp resulting in that the light reflection layer will not suffer from premature "ageing". This is explained by the fact that the insert being fixed to the contact holder only, alters the path of heat current and - unlike the prior art - will reduce the amount of heat reaching the adjusting disc by direct heat conduction.

It is a further advantage that the headlamp and cap assembly are connected with each other to form a hermetic seal, and due to this no isolation of sealing layer is necessary to prevent contaminations from reaching the inner space of the headlamp, a factor that further increases the life of the reflection layer and also the entire headlamp.

It is also an advantage that the cap assembly components can be simply produced and assembled in one step resulting in the reduction of production costs. It is an advantageous feature that, due to the design of cap assembly, the unit has a higher resistance to mechanical impacts, i.e. to the vibration effect induced by the road surface.

In the followings, the invention will be explained more in details by way of examples with reference to the attached drawing, in which

Figure 1 is a side elevation view of the electric lamp with the cap assembly according to the invention, partly in section,

Figure 2 is a side elevational view, partly in section, of another embodiment of the electric lamp and

Figure 3 is a step section of the embodiment of Figure 2, taken along the plane III-III.

In Figure 1, the electric lamp according to the invention is seen. The 12V, 55W light source 1 - being very widespread as a motor vehicle headlight lamp - has a bulb 1a made from a light transmitting material. The pinch-sealed portion 1c of the light source 1 is placed in the opening 4a formed in holder disc 4d of supporting member 4, pressed between clamps 4b indicated by a dashed line in Figure 1. Supporting member 4 is connected with the free end 25a of insert 25 forming a part of coupling unit 2 through skirt 4c surrounding the holder disc 4d. The joint between the free end 25a of the insert 25 and the skirt 4c can be performed in various ways. One of the possible versions is resistance welding and this was used in this case, but other methods can also be used. In order to ensure easy weldability, the material of member 4 may be steel, preferably stainless steel, to eliminate the need for surface protection.

Cap shell 22 forms a part of coupling unit 2. An adjusting disc 21 being perpendicular to the longitudinal axis 22f of the cap shell 22, is arranged as a continuation of the cap shell 22 at rim 22a. On the adjusting disc 21, positioning profiles 21a are formed to make easier the exact location of the lamp in the reflector. In this embodiment the posi-

tioning profiles 21a are produced by corrugation of the adjusting disc 21 in radial direction.

It is also seen in Figure 1 that the end portion 22d of the cap shell 22 is provided with inwardly bent fixing means 22e that can be a serrated flange or a collar without serration and forming a full circle along the end portion 22d of the cap shell 22. Fixing means 22e is connecting the cap shell 22 to the contact holder 23.

Insert 25 is placed along the inner side 22b of the cap shell 22 and the outer surface 25c of the insert 25 contacts the inner side 22b of the cap shell 22. Both cap shell 22 and insert 25 are bodies of rotation, thin cylindrical rings in this case and the longitudinal axis 22f of the cap shell 22 is coaxial with the longitudinal axis 25e of insert 25. The insert 25 and the contact holder 23 are fixed to each other by means of a fixing portion 3 being placed at the edge 25d of the insert 25. Here, the fixing portion 3 is - similarly to fixing means 22e of the cap shell 22 - a shoulder that forms a full circle over the edge 25d of the insert 25 and intrudes into the inner space 25g of the insert 25. It is clearly seen that the fixing means 22e of the cap shell 22 and the fixing portion 3 of the insert 25 are embedded in side portion 23b of the contact holder 23.

The contact holder 23 supports contact elements 24 in addition to the cap shell 22 and the insert 25. The contact elements 24 are strips of rectangular cross-section placed perpendicularly to the outer end plane 23c of the contact holder 23 and each of them is provided with a bent portion 24a perpendicular to the principal plane 24d of the contact elements 24 and a fixing extension 24c protruding from the bent portion 24a. The fixing extensions 24c may have a profile section or a roughened surface. The bent portion 24a of contact elements 24 partly extend into the material of contact holder 23, while the fixing extensions 24c entirely extend into the material of contact holder 23.

The inner end plane of contact holder 23 is in the inner space 25g confined by the inner surface 25b of the insert 25. From here a guiding hole 23d with outwardly decreasing cross-section starts to connect the inner end plane 23a and outer end plane 23c of the contact holder 23. The guiding hole 23d is continued at the outer end plane 23c of the contact holder 23 in a bore 24b passing through the bent portion 24a of contact elements 24.

To assemble the electric lamp with the cap assembly described in Figure 1, the cap shell 22 with the stainless steel adjusting disc 21, the insert 25 and the contact elements 24 are placed in a mould to which a thermosetting insulation material, e.g. bakelite powder is added and then cured. This procedure results in the coupling unit 2 consisting

of the contact elements 24 embedded in and thus fixed by the material of contact holder 23 and of the insert 25 and the cap shell 22 with the adjusting disc 21.

Then, the supporting member 4 supporting the light source 1 is placed at the free end 25a of the insert 25 of the coupling unit 2 in the way that lead wires 1d having passed through the inner space 25g of the insert 25 and pushed through the guiding holes 23d of the contact holder 23 appear at the outer end plane 23c of the contact holder 23.

In the last stage of assembling, the light source 1 is adjusted so that filament 1b takes the desired position relative to the positioning profiles 21a of adjusting disc 21. Then the skirt 4c of the supporting member 4 is welded to the outer surface 25c of the free end 25a of the insert 25, and lead-in wires 1d are welded to the bent portions 24a of contact elements 24.

The latter welding is performed so, that the material of welded spot 5 seals the entire bore 24b in a gastight manner.

The lamp made in this way when viewed from the outer side 22c of the cap shell 22 is, considering the coupling units, hermetically sealed and after fixing it in the headlamps housing it insulates the inner space of the headlamp from the ambient.

In Figure 2, an electric lamp with a cap assembly of another embodiment is shown. The cap shell 22 of the coupling unit 2 and the insert 25 are connected to side 23b of the contact holder 23 in the same way as described in the case of Figure 1 and the same is valid for the connection between contact elements 24 and the contact holder 23.

In this embodiment the positioning profiles 21a of the adjusting disc 21 are hemisphere-shaped bossages protruding from the adjusting disc 21 towards the light source 1.

Of course, the positioning profiles 21a and contact elements 24 may have shapings different from those described. However, as regards the contact elements 24, it is advisable to consider that they should have a surface being able to fix the contact elements 24 embedded in the material of contact holder 23.

The essential difference from the embodiment of Figure 1 is that the outer surface 25c of insert 25 is provided with longitudinal ribs 25f enabling that the insert 25 contacts the inner side 22b of cap shell 22 through these ribs 25f only. Due to this design, even less heat will reach the surfaces of the coupling unit being in contact with the headlamp such as the adjusting disc 21 and the outer side 22c of the cap shell 22.

Figure 3 is a cross-sectional view of the coupling unit 2. It is seen that the ribs 25f are located equally distributed over the outer surface 25c of the insert 25, in this way, the longitudinal axis 25e

of the insert 25 is coaxial with the longitudinal axis 22f of cap shell 22 in this embodiment too.

The electric lamp provided with the cap assembly according to the invention can be used with benefit in all cases where the prefocussed design is an important requirement, but first of all as a headlight lamp for motor vehicles.

Claims

1. An electric lamp, particularly for vehicle headlamps, provided with a light source (1), a coupling unit (2) and a member (4) for supporting the light source in the coupling unit; said coupling unit (2) comprising a cap shell (22) provided with an adjusting disc (21) and with a contact holder (23) with contact elements (24); said adjusting disc (21) having positioning profiles (21a), said cap shell (22) being connected to said contact holder (23) by inwardly bent fixing means (e.g. a serrated flange) at its end more distant from the light source (1); and the current lead-in wires of the light source being fixed (e.g. by welding) to the contact elements (24) in a way to conduct electric current, characterized in that the coupling unit (2) is provided with a tubular insert (25) located along the inner side (22b) of the cap shell (22) and extending beyond the flange (22a) thereof closer to the light source (1); the edge (25d) of the insert (25) more distant from the light source (1) having a fixing portion (3) embedded in the material of the contact holder (23); and the supporting member (4) of the light source (1) is mounted on the free end (25a) of the insert (25).
2. The electric lamp according to claim 1, characterized in that the fixing portion (3) of the insert (25) is a shoulder forming a full circle and bending towards the inner space (25g) of the insert (25) and being embedded in the material of the side portion (23b) of the contact holder (23).
3. The electric lamp according to claims 1 or 2, characterized in that the longitudinal axis (22f) of the cap shell (22) is coaxial with the longitudinal axis (25e) of the insert (25).
4. The electric lamp according to any of claims 1 to 3, characterized in that the insert (25) has the shape of a cylinder mantle and the full inner side (22b) of the cap shell (22) is in contact with the outer surface (25c) of insert (25).
5. The electric lamp according to any of claims 1

to 3, characterized in that the insert (25) is provided with ribs (25f) on its outer surface (25c), and the inner side (22b) of the cup shell (22) is in contact with the insert (25) only by means of the ribs (25f).

5

10

15

20

25

30

35

40

45

50

55

5

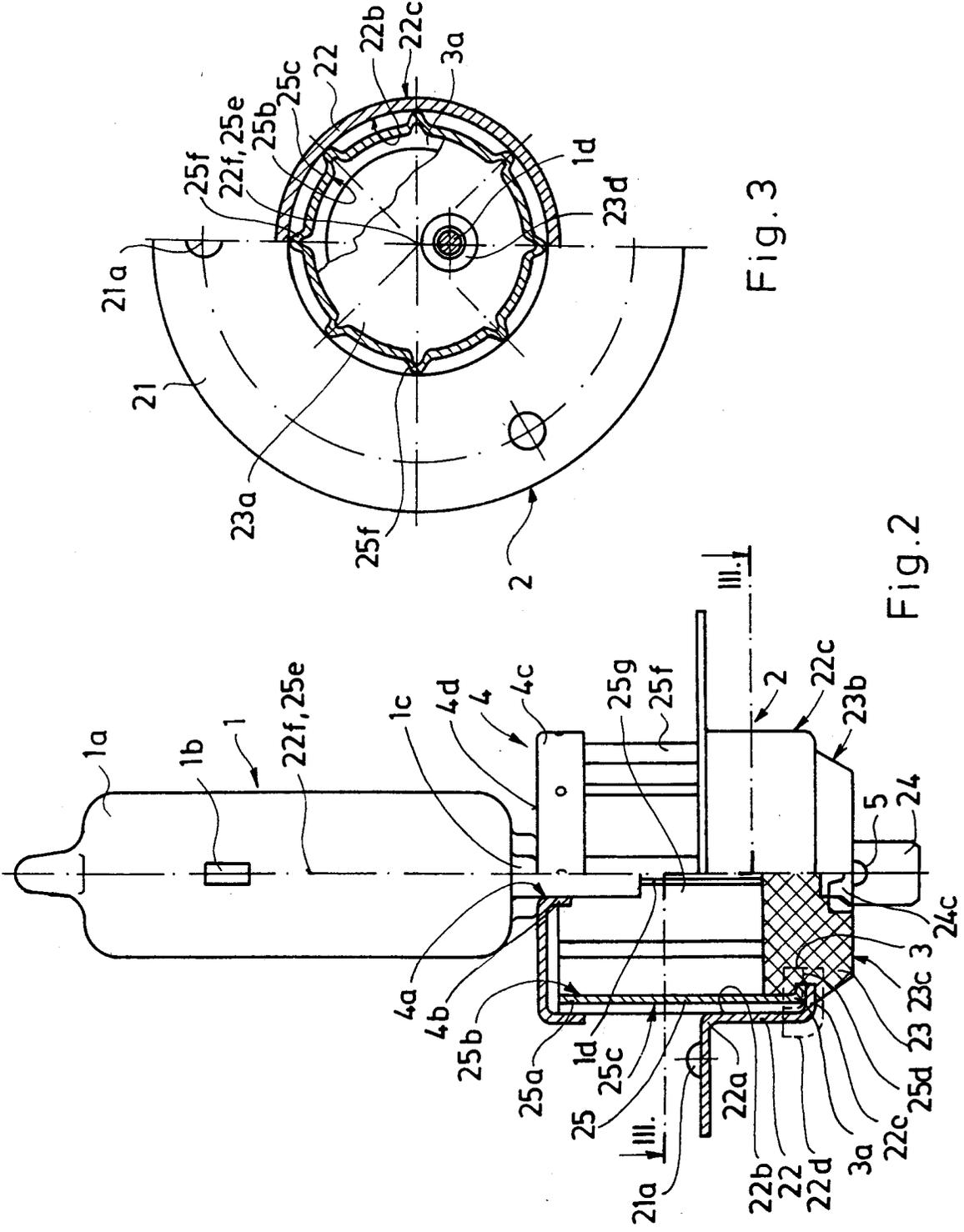


Fig. 3

Fig. 2



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)
Y	DE-A-2 246 333 (PATENT-TREUHAND-GESELLSCHAFT FUR ELEKTRISCHE GLUHLAMPEN MBH) * page 3, line 16 - page 4, line 4 ; figure *	1,3,4	F21M7/00 H01J5/48 H01J61/52
Y	EP-A-0 152 649 (N.V. PHILIPS' GLOEILAMPENFABRIEKEN) * page 3, line 12 - 38 ; figure *	1,3,4	
A	EP-A-0 070 548 (PATENT-TREUHAND-GESELLSCHAFT FUR ELEKTRISCHE GLUHLAMPEN MBH) * page 2, line 15 - line 31; figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F21M H01J H01K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07 OCTOBER 1992	Examiner MARTIN C.P.A.
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			