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71 Applicant: N.V. Philips' Gloeilampenfabrieken
Groenewoudseweg 1
NL-5621 BA Eindhoven(NL)

72 Inventor: Notelteirs, Victor Rosalie
c/o INT. OCTROOIBUREAU B.V. Prof. Holstlaan 6
NL-5656 AA Eindhoven(NL)

72 Inventor: Janssen, Eduard Josef Philomena
c/o INT. OCTROOIBUREAU B.V. Prof. Holstlaan 6
NL-5656 AA Eindhoven(NL)

74 Representative: Rooda, Hans et al,
INTERNATIONAAL OCTROOIBUREAU B.V. Prof.
Holstlaan 6
NL-5656 AA Eindhoven(NL)

54 Electric lamp.

57 An electric lamp according to the invention has a lamp envelope (1) which is secured at one end (5) to a lamp cap (7). In at least one of the current-supply conductors (2, 3), which extend from the light source (4) to contacts (11) on the lamp cap, a fuse wire (10) is included. The fuse wire (10) is located inside a tube (13) of electrically insulating material which is filled with electrically insulating material and is sealed at its ends by means of a coherent mass (14).

Electric lamp.

The invention relates to an electric lamp provided with a lamp envelope which is sealed in a vacuum-tight manner and which is secured at one end to a lamp cap, current-supply conductors extending from
5 contacts on the lamp cap through the wall of the lamp envelope to a light source arranged inside the lamp envelope and a fuse being included in at least one of the current-supply conductors inside the space limited by the wall of the lamp envelope and the lamp cap, which fuse is
10 located inside a sealed tube of electrically insulating material filled with an electrically insulating material.

Such an electric lamp is known from the British Patent Specification 830,360. In this known lamp, the fuse is included in a glass tube which is filled with glass
15 pellets or sand and which is fused at its end with the current-supply conductor. The fuse is reliable and safe, but is expensive due to the two fusions.

The invention has for its object to provide a lamp which incorporates a reliable and safe fuse of a
20 simple and inexpensive construction.

According to the invention, this is achieved in a lamp of the kind mentioned in the preamble in that the tube is sealed at its ends onto the current-supply conductor by means of a coherent mass.

25 The lamp according to the invention can be manufactured in a simpler and cheaper manner in that, before the lamp cap is mounted on the lamp envelope, a tube, for example, of glass or ceramic material, is slid over the current-supply conductor until it surrounds
30 the fuse and the tube is filled with electrically insulating material and is sealed at its end onto the current-supply conductor by providing a coherent mass.

The coherent mass used can consist of cement which is utilized for securing lamp caps to lamp envelopes. Examples that can be mentioned are mixtures of talcum powder, zinc oxide and potassium silicate as well as
5 mixtures of quartz powder, sodium silicofluoride and sodium silicate. Instead, a lead borate glass may alternatively be used, which is filled, for example, with sand, hard glass powder, quartz powder, aluminium oxide powder, or calcium oxide powder. An example thereof is 3 parts by
10 weight of glass (3 % by weight of SiO_2 , 18 % by weight of B_2O_3 , 68 % by weight of PbO , 8 % by weight of ZnO , 3 % by weight of Al_2O_3) and 1 part by weight of sand.

The tube can be filled between its ends with glass powder, glass pellets, sand and the like. In a
15 favourable embodiment, the tube is filled with the same cement or glass composition as that with which it is closed at its ends.

Numerous constructions of fuses in lamps have been described in literature. Some of these are expensive,
20 whilst others are unreliable or unsafe. Thus, it has been proposed to fill the space limited by the lamp cap and the wall of the lamp envelope for a large part with cement so that the fuse is embedded therein. However, gaps can be formed in the mass of cement through which a discharge
25 arc which has formed during melting of the fuse flashes over to the other current-supply conductor or to metal parts of the lamp cap. Due to the fact that the mass of cement assumes its ultimate form after the lamp cap has been arranged, these gaps are not perceptible in the
30 finished lamp.

In the lamp according to the invention, however, the insulating mass need be provided only very locally to enclose the fuse on all sides. The mass can be provided before the lamp cap is fitted so that the fuse can be
35 enclosed completely in a controlled manner. Due to the fact that the fuse is embedded in an insulating mass, generally no discharge arc is formed during melting of the fuse. In cases in which an arc is formed as yet, it remains

inside the tube and extinguishes rapidly.

The construction of the lamp according to the invention is particularly suitable for heavily loaded lamps, such as halogen mains voltage lamps of high power, but the construction may also be used in other halogen lamps and in lamps which have as a light source both a filament and a discharge arc, for example, a high-pressure mercury vapour discharge arc, the filament acting at the same time as a current limiter.

An embodiment of a lamp according to the invention is shown in the drawing, the lamp envelope being shown in side elevation and the lamp cap in longitudinal sectional view.

The lamp envelope 1 is closed at one end by a pinch 5 and is secured by means of cement 6 to a lamp cap 7. Current-supply conductors 2 and 3 extend from contacts 11 on the lamp cap 7 through the wall of the lamp envelope 1 to a filament 4 arranged as a light source inside this envelope. The lamp cap 7 has a ceramic moulding 8 which is fixed in a metal sheath 9. In the space 12 limited by the pinch 5 and the lamp cap 7, a fuse wire 10 is included in the current-supply conductor 3, which fuse wire is located inside a tube 13 of electrically insulating material (in the drawing, glass), which tube 13 is sealed at its ends onto the current-supply conductor 3 and is filled between its ends with a coherent electrically insulating mass 14. In the lamp shown, the mass 14 is identical with the cement 6 and consists mainly of quartz powder, zinc oxide and sodium silicate.

The lamp shown is a halogen incandescent lamp with a gas filling consisting of krypton and methylene bromide.

When it is operated at 225 V, the lamp consumes a power of 150 W and is intended to be used as a projection lamp.

The lamp was operated at normal voltage and was then loaded with an overvoltage of 60 %. The fuse inter-

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rupted the current through the lamp 5 msec after the overvoltage was applied. Apart from the fuse wire 10 and the filament 4, the lamp was still completely intact.

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CLAIMS

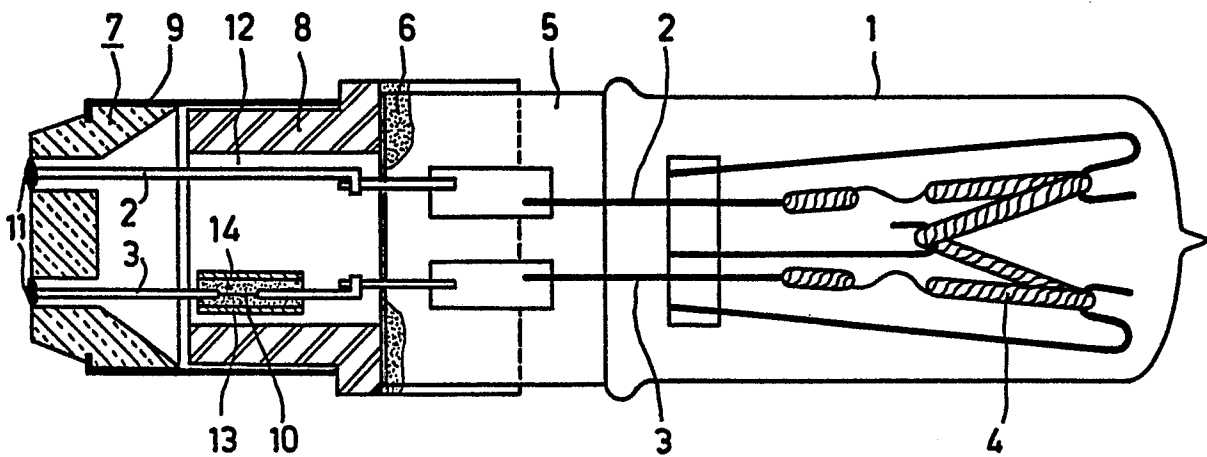
1. An electric lamp provided with a lamp envelope which is sealed in a vacuum-tight manner and which is secured at one end to a lamp cap, current-supply conductors extending from contacts on the lamp cap through
5 the wall of the lamp envelope to a light source arranged inside the lamp envelope, a fuse being included in at least one of the current-supply conductors inside the space limited by the wall of the lamp envelope and the lamp cap, which fuse is located inside a sealed tube of
10 electrically insulating material filled with an electrically insulating material, characterized in that the tube is sealed at its ends onto the current-supply conductor by means of a coherent mass.
2. An electric lamp as claimed in Claim 1, characterized in that the coherent mass fills the whole tube.
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EUROPEAN SEARCH REPORT

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Application number

EP 83 20 1546

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. 3)
A, D	GB-A- 830 360 (CROMPTON PARKINSON LTD.) * Page 1, line 86 - page 2, line 33; figure *	1, 2	H 01 K 1/66 H 01 J 7/44
A	US-A-3 727 091 (A.R. DECARO) * Column 3, lines 14-32; figures 1, 2 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			H 01 K 1/00 H 01 J 7/00
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 06-02-1984	Examiner SARNEEL A.P.T.
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	