

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

(11) Publication number:

**0 280 475**  
**A2**

(12)

# EUROPEAN PATENT APPLICATION

(21) Application number: 88301412.8

(51) Int. Cl. 4: H01K 9/02

(22) Date of filing: 19.02.88

(30) Priority: 24.02.87 GB 8704263

(43) Date of publication of application:  
31.08.88 Bulletin 88/35(84) Designated Contracting States:  
AT BE CH DE ES FR GB GR IT LI LU NL SE(71) Applicant: Yang, Tai-Her  
5-1 Taipin Street  
Si-Hu Town Dzan-Hwa(TW)(72) Inventor: Yang, Tai-Her  
5-1 Taipin Street  
Si-Hu Town Dzan-Hwa(TW)(74) Representative: Arthur, Bryan Edward et al  
Withers & Rogers 4 Dyer's Buildings Holborn  
London EC1N 2JT(GB)

(54) The bulb with residual lighting function on burning out of the filament.

(57) An electric filament lamp has two or more filaments or filament sections connected in parallel with each other and designed to have different lifetimes before the lamp fails by one of the filaments burning out.

The filaments may differ from one another in length, cross-sectional area, coiling pitch or composition and figure 1-1 shows an arrangement in which one of the filaments 130 has a section 131 of different coiling pitch from the remainder of the filament and from the parallel filament.

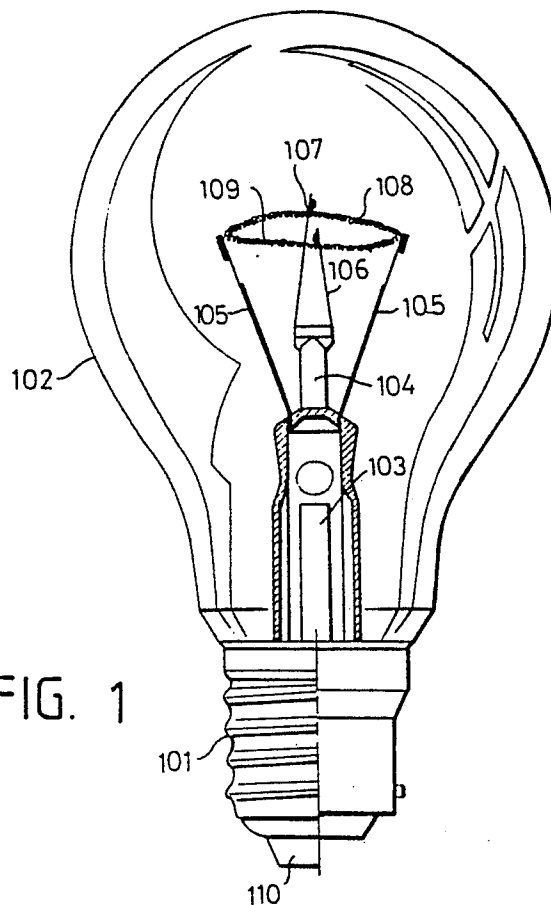


FIG. 1

EP 0 280 475 A2

## ELECTRIC FILAMENT LAMP

THE INVENTION RELATES TO ELECTRIC FILAMENT LAMPS.

Electric filament lamps have a limited lifetime before they fail by rupture of the filament. The lifetime of the lamp depends largely on the filament itself. In particular on such factors as its length, cross-sectional area, coiling pitch and the composition of the wire from which it is made. Lamps for use in general service are usually designed to have a burning lifetime of one thousand hours.

It frequently happens that an area is lighted by a single lamp so that failure of the lamp at the end of its life suddenly plunges the area into darkness causing inconvenience and possibly even danger and it is an object of the present invention, to overcome this difficulty.

It has been proposed in Patent GB426477 to provide a lamp in which the filament is electrically divided into parts so that the burning out of one part does not cause entire cessation of current through the other or others and the lamp continues to burn, although with reduced intensity. There is in that patent no suggestion that the filament part should be in any way different from one another so that they will have the same expected lifetime and it is highly probable that when failure occurs they will burn out in rapid succession. The present invention as defined in the claims appended hereto provides that one of the filaments is so designed as to burn out before the other or others so that in general there will be an extended period during which the lamp will continue to glow at a reduced intensity, thus avoiding the danger of plunging an area into sudden darkness but giving an indication that the lamp requires prompt replacement.

The invention will be further described with reference to the accompanying drawings in which figure 1 is a part-sectional view of a lamp according to the invention and figures 1-1 and 1-2 are diagrams illustrating constructions of filaments for such a lamp.

Figure 1 is a part-sectional and diagrammatic view of a lamp according to the invention. The lamp has an end cap which may be of the Edison screw type having a screw thread 101 and an end contact 110 or may be of the bayonet type and on which is mounted a bulb 102 containing the filament and its supports.

A central support 103 carries a post 104 and a pair of electrodes 105 for leading current into and out of the filaments. The post 104 which is of glass has fused into it a pair of pigtail supports 106, 107 for supporting the filaments 108, 109 midway between their electrodes 105.

The two filaments 108, 109 are electrically in

parallel between the electrodes 105 and are slightly dissimilar being made of wire of slightly different diameter length and coiling pitch. They are designed so that one of them 108 has a standard expected burning lifetime of approximately one thousand hours, whereas the other 109 is designed to a longer life, for example one thousand, five hundred hours.

When the lamp ultimately fails at the end of its life, the filament 108 will fail first, leaving the second filament 109 still functioning although, of course, giving out light at a much lower level than when both filaments were simultaneously effective.

Figure 1-1 is a diagram of an alternative construction of filaments in which the filaments are of identical material diameter and length but one of them, 130 has a section 131 of slightly closer coiling pitch than the other. In operation this section is likely to fail at the end of its life before the other filament, thus ensuring a difference in design lifetimes between the two filaments. This construction has the advantage of simplicity in manufacture since both filaments may be of identical wire and of the same overall length.

Figure 1-2 shows an alternative construction. In this arrangement the filament assembly comprises a first section 123 between an electrode and an intermediate support 124 and a second section in series with the first section comprising two filaments 121 and 122 in parallel. These two filaments are designed to have different lifetimes, the life of filament 121 being the shorter, filament 123 is designed to have a longer life than either of them.

In normal operation all three sections of the filament give light during the lifetime of the lamp. When the lamp fails at the end of its life it will be by the burning out of filament 121, leaving the filaments 122 and 123 in series with each other and still giving light at a reduced level.

The embodiments described above have each had two filaments or filament sections in parallel with one another but of course three or more parallel connected filaments or filament sections may be used giving an even longer period of warning after the initial failure has occurred.

### Claims

1. An electric filament lamp having a plurality of parallel-connected filaments, characterised in that the filaments are designed so that one of them will burn out before the other or others and the

remaining filament or filaments will continue to glow, so that the lamp continues to burn at a reduced brightness.

2. An electric filament lamp according to claim 1 having two separate filaments.

5

3. An electric filament lamp according to claim 1 or claim 2 in which one filament differs from the other or others in length, cross-sectional area coil-  
ing pitch or composition.

4. An electric filament lamp according to claim 1 or claim 2 in which one filament has a closer-coiled section.

10

5. An electric filament lamp according to claim 1 in which the filament structure comprises a long-life filament section and a pair of shorter-life sections connected in parallel with each other and in series with the long-life section.

15

20

25

30

35

40

45

50

55

