

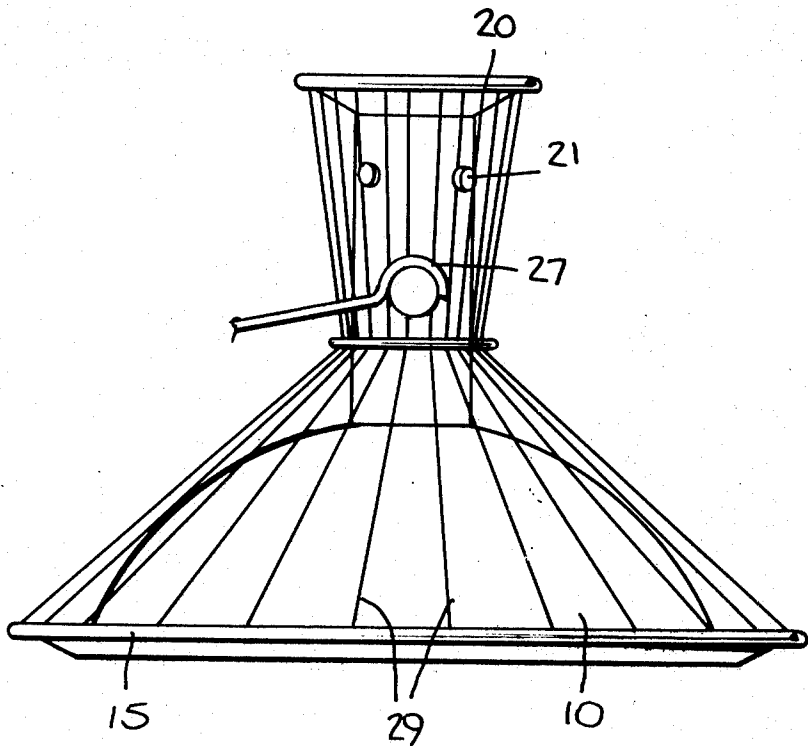
[54] LAMPHEAD FOR TUNGSTEN-HALOGEN LAMPS
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[51] Int. Cl. F21v 13/00
[58] Field of Search.....240/92, 102 B, 54 R

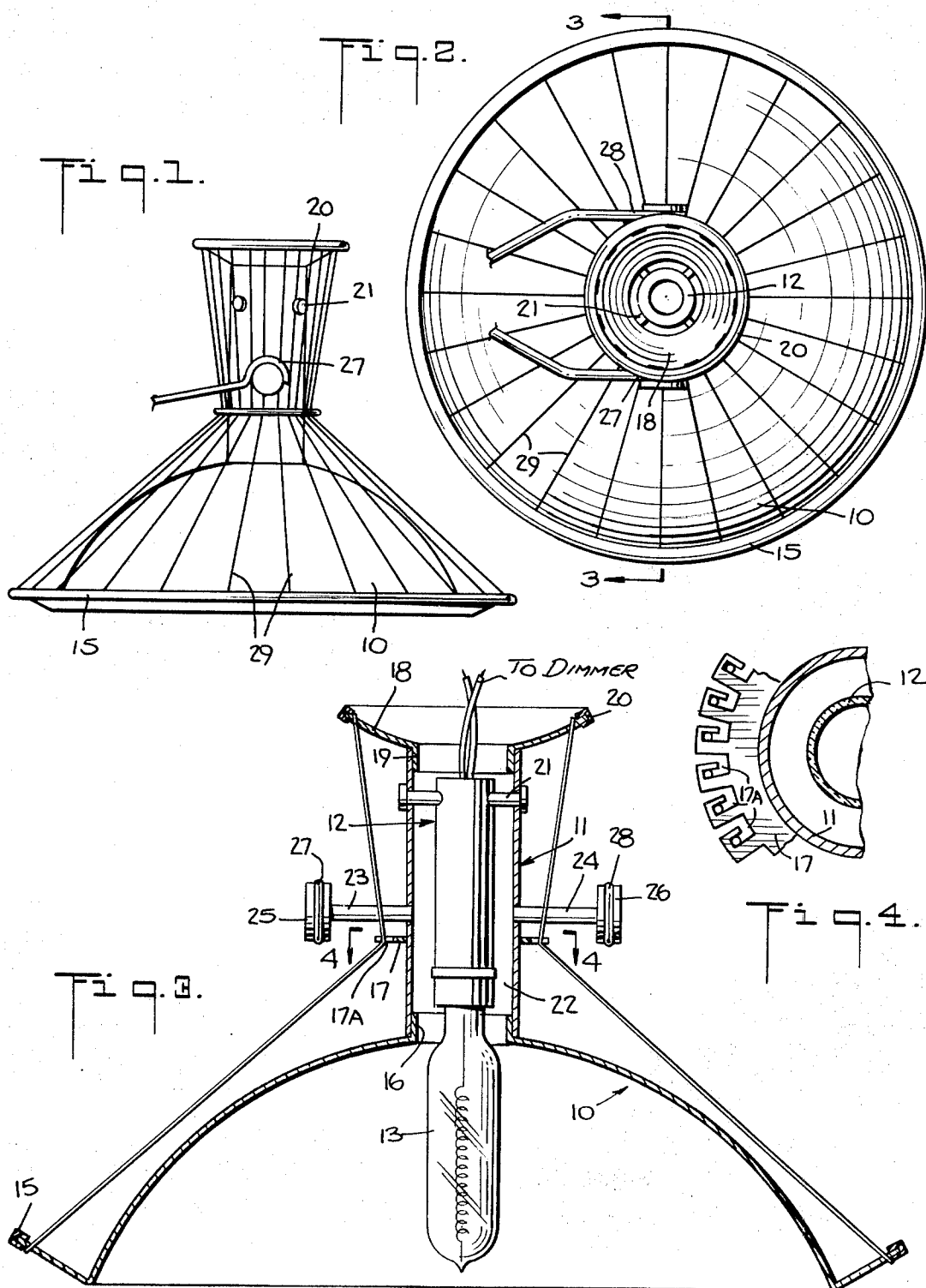
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Primary Examiner—Jerry W. Myracle
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[57] ABSTRACT
A lamphead for a tungsten-halogen bulb, the lamphead being constituted by a convex reflector joined to a cylindrical chimney having a socket concentrically mounted therein for supporting a cylindrical bulb, thereby defining an annular air space within which a draft is created to cool the bulb. Extending between the periphery of a flange at the upper end of the chimney and the outwardly extending rim at the lower end of the reflector is an array of tensile wires that are spaced from the body of the reflector and of the chimney to form a protective cage making it possible to safely handle the hot lamphead.

6 Claims, 4 Drawing Figures





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LAMPHEAD FOR TUNGSTEN-HALOGEN LAMPS

BACKGROUND OF THE INVENTION

This invention relates generally to lampheads, and more particularly to a lamphead for a tungsten-halogen lamp.

In table, floor and wall lamps for residential and office illumination, it is the usual practice to use incandescent bulbs having tungsten filaments. The bulb is mounted in a socket contained within a lamphead which includes a reflector to concentrate and direct the light.

With standard incandescent bulbs, one must use larger bulbs in order to produce higher levels of illumination. For example, in a 40-watt incandescent bulb, the filament is mounted within a relatively small glass envelope, whereas a 150-watt bulb employs a much larger envelope. Consequently, lampheads intended for incandescent bulbs must take the bulb dimensions into account. It is not possible, when employing a standard bulb of large size, to make use of a highly compact lamphead. Thus the dimensions and form of a conventional lamphead are dictated by the maximum size of the incandescent bulb for which it is designed, and one is not free to use a small lamphead, however well designed and attractive, with a large bulb.

To some extent, this drawback has been overcome by the recently introduced tungsten-halogen lamp, for such lamps, which have relatively small quartz envelopes, are available at exceptionally high wattages and are capable of generating high levels of illumination far more efficiently than conventional tungsten bulbs.

The reason a tungsten-halogen lamp is more efficient than a standard tungsten bulb is because of the halogen cycle. Ordinary incandescent lamps darken in the course of their life due to the evaporation of tungsten particles from the filament onto the relatively cool wall of the glass envelope. The introduction of a halogen (i.e., iodine or bromine) into the atmosphere of the envelope brings about an interception of the tungsten particles by the halogen gas. The tungsten particles are then redeposited back on the filament, and the halogen gas is released to repeat the cycle.

The halogen cycle results in clean bulb walls and more efficient transmission of light over the life of the bulb. Tungsten-halogen lamps of the type commercially available have an average rated life of 2,000 to 4,000 hours, which is a much longer period than is obtainable with ordinary incandescent bulbs. Moreover, at its rated voltage, a tungsten-halogen lamp furnishes a much whiter light than that produced by an ordinary bulb.

Nevertheless, while tungsten-halogen lamps of high wattage are available in small bulb sizes, their use has heretofore been limited to commercial and industrial installations, such as for floodlighting of signs, service stations and loading platforms. The practical reason for this is that despite the excellent color rendition and shock resistance of tungsten-halogen lamps, since they are generally of high wattage and run at elevated temperatures, it has been considered hazardous to make use of them in lampheads for table, wall and floor lamps intended for residential and office use, or in other exposed situations in which one may run the risk of touching the lamphead.

The heat produced by a tungsten-halogen lamp is usually so great, particularly after prolonged use, that if the lamp were placed in a lamphead of conventional design, a person making physical contact with the lamphead might be severely burned. Since in many lamps, the lamphead is adjustably mounted in order to enable the user to direct the light as desired, one must anticipate that the user would at some time touch the lamphead. Thus the use of tungsten-halogen lamps in conventional lampheads has heretofore been precluded because of the danger involved.

SUMMARY OF THE INVENTION

In view of the foregoing, it is the main object of this invention to provide a lamphead for a tungsten-halogen bulb, which lamphead, while the bulb is burning, may be handled comfortably and directed at will, without in any way endangering personnel.

It is to be noted that the term "tungsten-halogen bulb" is interchangeable with the term "quartz-halogen bulb," the latter term bringing in the fact that the envelope is of quartz. The term "tungsten-halogen" has supplanted the designation "iodine-quartz" in describing this type of light source, for modern halogen bulbs are not limited to iodine for the atmosphere.

More specifically, it is an object of the invention to provide a lamphead for a tungsten-halogen lamp, which head includes a protective tensile wire cage or cradle to permit the user to touch and move the lamphead without burning his fingers.

Also an object of the invention is to provide a lamphead of the above-noted type which incorporates a chimney to effect rapid dissipation of heat from the lamp.

Yet another object of the invention is to provide a lamphead for a tungsten-halogen bulb operating in conjunction with a solid-state dimmer whereby the light from the head may be progressively changed in color as well as in intensity.

Briefly stated, these objects are accomplished in a lamphead constituted by a convex reflector joined to a cylindrical chimney within which is concentrically mounted a socket for supporting a tungsten-halogen lamp whose bulb is cylindrical, whereby an annular air space is defined in the chimney between the inner wall thereof and the surface of the socket and bulb. The up-draft created in this space when the lamp is burning serves to cool the bulb. Extending between the periphery of a flange secured to the upper end of the chimney and the outwardly extending rim at the lower end of the reflector is an array of tensile wires, spaced from the body of the reflector and of the chimney to form a protective cage, making it possible to safely handle the hot lamphead.

OUTLINE OF THE DRAWING

For a better understanding of the invention, as well as other objects and further features thereof, reference is made to the following detailed description to be read in conjunction with the accompanying drawings, in which:

FIG. 1 is a side elevational view of a lamphead in accordance with the invention;

FIG. 2 is a plan view of the lamphead;

FIG. 3 is a longitudinal section taken through the lamphead in the plane indicated by line 3—3 in FIG. 2; and

FIG. 4 is a transverse section taken through the lamphead in the plane indicated by line 4—4 in FIG. 3.

DESCRIPTION OF THE INVENTION

Referring now to the drawings, the main components of a lamphead in accordance with the invention are a reflector 10, a chimney 11 joined to the reflector, and a lamp socket 12 mounted within the chimney. Supported by lamp socket 12 is a tungsten-halogen bulb 13.

Reflector 10, which is preferably fabricated of high-purity aluminum, is dome-shaped to define a convex reflecting surface. Reflector 10 is provided with an outwardly extending circular rim 14 whose periphery is protected by an annular bead 15 of heat-stabilized Nylon 103 or other suitable plastic material.

Reflector 10 is provided with a central opening surrounded by a collar 16 which telescopes within the lower end of chimney 11. Chimney 11 is in the form of an elongated tube of the same material as reflector 10. Secured at an intermediate position to the chimney is an annular apron 17 which, as best seen in FIG. 4, is provided with a circular series of slots 17A forming retaining hooks for engaging wires passing therethrough. Mounted on top of the chimney is a bowl-shaped flange 18 having a collar 19 which telescopes into the upper end of the chimney. The periphery of the flange is protected by a circular bead 20.

Socket 12 is preferably fabricated of solid carbon tetrafluoride or other heat-resistant material of low thermal conductivity and is supported concentrically within the chimney by four equi-spaced radial pins 21 of similar material. Bulb 13, which is a tungsten-halogen lamp, such as one rated at 250 watts of the type currently manufactured by General Electric or Sylvania, is provided with a screw base. The bulb has a generally cylindrical envelope, so that when it is seated in the round socket, an annular air space exists within the chimney in the region between the bulb and socket and the interior wall of the chimney.

Extending outwardly from diametrically opposed positions on the chimney are a pair of rods 23 and 24, each of which terminates in a small pulley 25 and 26, respectively, the pulleys being also made of a material of low thermal conductivity. Pulleys 25 and 26 are frictionally engaged by a pair of crook-shaped resilient wires 27 and 28 whereby the lamphead is rotatable about the common axis of rods 23 and 24 to assume any desired angular position with respect to this axis.

Threaded between the periphery of flange 18 and the periphery of rim 14 is a uniform array of tensile wires 29, the wires passing through the slots 17A in apron 17. Thus the wires, which are spaced both from the body of the chimney and the reflector, form a protective cage or cradle therefor.

In practice, the wires, whose extremities are covered by the beads 15 and 20, are preferably constituted by a seven-wire stainless steel strand, each wire being about 1 mil in diameter. The wire cage enables one to safely handle the lamphead while it is burning. It will be seen that the wires, being attached only to the peripheral

parts of the reflector and upper cone which are relatively cool, and being of very small cross-section and of material of low thermal conductivity, remain effectively at the temperature of the ambient air.

It will also be evident that bulb 13 is partially within the chimney and partially within the reflector. Because of its high operating temperature, bulb 13 heats the air within the reflector 10 and the chimney. As is well known, a chimney produces a draft by virtue of a simple principle of thermodynamics. When air is heated, it expands in volume and decreases in density, in which condition it may be displaced by a denser gas. The light, hot gas is confined by the chimney and its tendency to move up the chimney is proportional to the height of the stack.

Because of the up-draft created by chimney 11, the hot air in the reflector and in the chimney is drawn upwardly in the annular air space 22 and discharged through the opening in flange 18, thereby preventing excessive heating of the lamphead, despite its close proximity to the lamp.

In practice, the tungsten-halogen lamp is supplied with power through a solid-state dimmer (not shown) which acts to progressively lower the operating voltage and thereby reduce the intensity of illumination. The dimmer may be of the standard type using SCR devices. However, because of the fact that a tungsten-halogen lamp, when operating at its rated voltage, generates light of almost solar whiteness (3,000° K), it becomes possible, by means of the dimmer action, to change the color of the light, for as the intensity is diminished, the radiated color of the lamp goes from white down through shades of gold and orange before it is extinguished.

While there has been shown and described a preferred embodiment of lamphead for a tungsten-halogen lamp in accordance with the invention, it will be appreciated that many changes and modifications may be made therein without, however, departing from the essential spirit thereof.

I claim:

1. A lamphead for a tungsten-halogen lamp having a cylindrical bulb, said lamphead comprising:

A. a reflector having an outwardly extending rim, B. a cylindrical chimney joined at its lower end to said reflector and communicating therewith, said chimney having an outwardly extending flange at its upper end, said chimney having a circular apron at an intermediate position thereon,

C. a socket concentrically mounted within said chimney to support said lamp, thereby defining an annular air space within which a draft is created to cool said bulb, and

D. an array of wires threaded through said apron and extending between the periphery of said flange and the periphery of said rim, said wires being spaced from the body of said chimney and said reflector to define a protective cage permitting safe handling of the lamphead.

2. A lamphead as set forth in claim 1, wherein said reflector and chimney are fabricated of aluminum of high purity.

3. A lamphead as set forth in claim 1, wherein the periphery of said flange and said rim are protectively ensheathed in a plastic bead.

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4. A lamphead as set forth in claim 1, further including a dimmer connected between said lamp and a power source to vary both the intensity and color of the light produced thereby.

5. A lamphead as set forth in claim 1, wherein said reflector has a concave form.

6. A lamphead as set forth in claim 1, further includ-

ing a pair of pulleys mounted on said chimney at diametrically opposed positions, and a pair of resilient wires for supporting said lamphead, said wires having crook-shaped ends engaging said pulleys whereby said lamphead may be angularly adjusted.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,684,883 Dated August 15, 1972

Inventor(s) CLIVE ENTWISTLE

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

The name of the inventor should have
read

-- CLIVE ENTWISTLE --

Signed and sealed this 30th day of January 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents