Jan. 20, 1931. C. H. BOYLES 1,789,301

THERAPEUTIC LAMP UNIT

Filed Feb. 4, 1926

FIG. 1

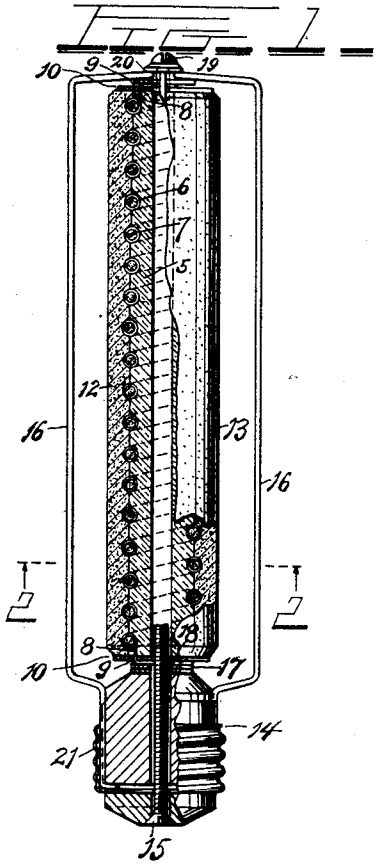
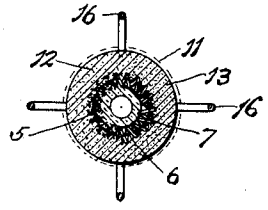


FIG. 2



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UNITED STATES PATENT OFFICE

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THERAPEUTIC LAMP UNIT

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This invention relates to therapeutic lamp units.

It is particularly concerned with lamp units for converting electrical energy into radiant energy largely confined to the visible and infra-red zones of the spectrum.

It has been found that therapeutically the human tissue is greatly benefited when subjected to the rays or waves of infra-red energy radiated from an electric resistance element in which the ultra violet rays are negligible as compared to the invisible infra-red and the longer waves of the visible spectrum; red, orange and yellow. This combination of rays in which the ultra violet rays are practically excluded affords a beneficial therapeutic agent where heat penetration is desired because the longer wave length infra-red rays penetrate the body tissues much deeper than do the shorter visible and ultra-violet rays.

Heretofore resistance elements have been formed of non-metallic material through which the electric current was passed, and in use the elements would heat up at their opposite terminal ends and cause arcing which would decrease the efficiency of the element and finally the element would stop functioning.

One of the objects of this invention is to provide an improved therapeutic lamp unit particularly adapted to produce light rays at the visible and invisible red end of the spectrum, and a method of making the same.

Another object is to provide a unit having a bare non-metallic ray emitting body which does not itself carry the current.

A further object of the invention is to provide such a unit in which terminal arcing is eliminated.

A further object of the invention is to provide such a unit having a predetermined fixed resistance and desired watt and heat capacity.

A further object of the invention is to provide a therapeutic lamp unit and method of producing the same in which the resistance element is formed of a resistance wire wound on a tube or other body of insulating material and embedded and completely enveloped in a material which will emit the longer light rays almost exclusively when properly heated by the electric current flowing through the wire.

A further object of the invention is to provide a unit and method of producing the same in which the resistance wire and its embedding material have approximately the same coefficient of expansion and will intimately engage each other at varying degrees of temperatures.

A further object of the invention is to provide a method for forming a therapeutic lamp unit of simple construction which is very efficient in use.

Other objects and advantages will hereinafter appear.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a side view of one of the elements partly in section to show interior construction; and

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1.

Referring to the drawing the numeral 5 indicates a tube or rod member formed of insulating material and provided with a groove 6 which trends spirally from one end to the other. A coiled length of resistance wire 7 is wound around the insulating member within the spiral groove and the opposite terminal tends 8 are extended through small openings 9 formed in metal washers or end members 10 mounted on the opposite end portions of the insulating member 5. The insulating member with the coiled resistance wire thereon is then placed and centered in a paper tube 11 as indicated by dotted lines in Fig. 2. A black non-metallic embedding envelope material 12 of silicon carbide in a liquid state and mixed with a suitable binder is then poured into the paper tube and will flow all around insulating member and the resistance wire and between the convolutions thereof to imbed the wire therewithin. The combined element 13 is then placed within a drying oven having a temperature of about 175 degrees F. to have the screen material set and become thoroughly dry. The set and dried

element is then placed in an oven having a temperature of about 1000 degrees F. to burn off the paper tube and to thoroughly cure the screen material.

The embedding envelope material is formed of silicon carbide ground to a fine powder to pass through a 180 to 200 mesh screen while still maintaining its crystal formation and is mixed with a binder of non-conducting material, such for instance as silicate of soda, sufficient to form a paste which may be easily poured.

When the element 13 is set and cured, it may be mounted on the end of a plug 14 and connected thereto by a screw 15 and by supporting rods 16. Metal washers 17 are interposed between the element and the plug and the screw 15 extends through the washers and is connected to one end of the resistance wire 7 as indicated by the numeral 18 to form the electrical terminal thereof. Said terminal screw extends to the lower end of the plug, to form an electrical connection when the plug is placed in an electric lamp socket.

The supporting rods 16 at their upper portions are connected to the upper end of the element and the wire 7 by means of a screw 19 and washers 20. Said supporting rods extend downwardly in spaced relation from the element and each other and at their lower ends are connected to the threaded metal member 21 which forms the other electrical terminal of the plug.

It is to be understood that the resistance unit may be made in various shapes and mounted for use in a manner other than shown without departing from the spirit and scope of the invention.

In use the plug is threaded into a lamp socket and the current turned on. The resistance wire will become heated and also heat the screen material and cause it to glow medially of its terminal ends.

The black silicon carbide wire-embedding envelope serves to increase the light radiating surface and to give a substantially uniform distribution and emission of light rays from the radiating surface. The rays thus emitted are of the longer wave lengths toward the red end of the visible spectrum and into the still longer wave length infra-red rays and since the non-metallic embedding envelope is hard and rigid it may be used without any protective cover and in consequence there is nothing to obstruct the free passage of the rays from the unit to the point of application.

Particular attention is directed to the fact that in the use of the element the portion medial of the terminal ends of the element will become hot and glow while the terminal end portions will remain at a lower temperature as compared to the ordinary elements which are and become very hot at their terminal ends while medial portions remain comparatively cool.

From the foregoing description it will be seen that the resistance element and embedding envelope and method of making same is of simple construction and may be easily manufactured.

What I claim as my invention is:

1. The method of forming a resistance element for producing infra-red energy, which consists in mounting a resistance element upon an insulating member, and then coating the resistance element with a compound formed of non-metallic heat conducting material and a suitable binder while in a semi-liquid state, then placing the element in an oven to set and dry, and then subjecting the element to a high degree of heat to cure the same.

2. The method of forming a resistance element and embedding material for producing infra-red energy, which consists in providing an insulating member, winding coiled wire around the insulating member and then coating the insulating member and the resistance wire with a compound formed of non-metallic heat conducting material and a suitable binder while in a liquid state, then placing the element in an oven having a temperature of approximately 175 degrees F. to set and dry and then subjecting the element to a temperature of approximately 1000 degrees F. to cure the same.

3. The method of forming a resistance element and embedding material for producing infra-red energy, which consists in providing an insulating member, winding coiled wire around the insulating member and then inserting the element in an inflammable tube, pouring a compound formed of non-metallic heat conducting material and a suitable binder into the tube and around the wire while in a liquid state, placing the element in an oven to set and dry, and then subjecting the element to a high temperature to burn off the inflammable tube and cure the element.

In testimony whereof, I affix my signature.

CARROLL H. BOYLES.