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THERAPEUTIC LAMP ELEMENT AND METHOD OF MAKING SAME

Filed Aug. 25, 1926

Fig. 1.

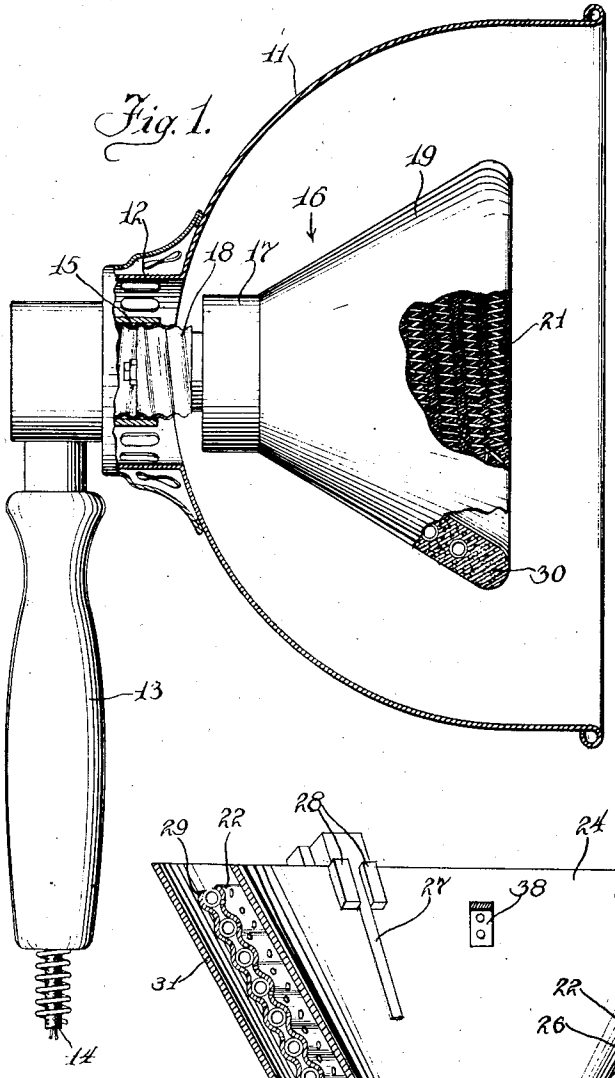
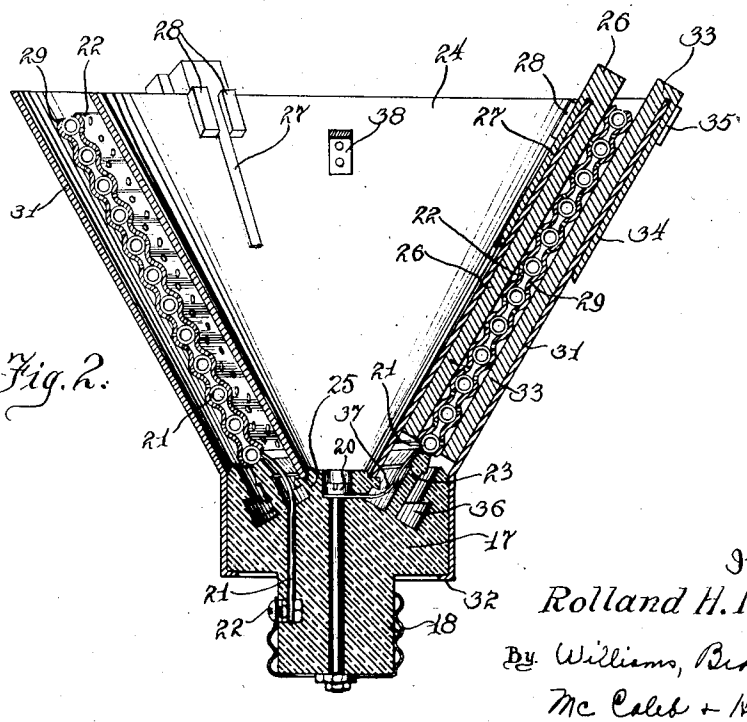


Fig. 2.



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THERAPEUTIC-LAMP ELEMENT AND METHOD OF MAKING SAME.

Application filed August 25, 1926. Serial No. 131,450.

My invention relates to therapeutic lamps. It relates particularly to an improved radiant energy generating element or unit for such lamps and to an improved process for making the same.

One of the objects of my invention is to provide an improved and more efficient therapeutic lamp.

Another object is to provide a lamp which, in use, is particularly prolific in the generation of infra-red rays.

Another object is to increase the effective ray-radiating surface of the generating unit or element without increasing its size.

A further object is to provide an improved method of making generating units for therapeutic lamps.

Other objects and advantages will hereinafter appear.

In the drawing:

Fig. 1 is a fragmentary elevation of a complete therapeutic lamp, and

Fig. 2 is a transverse sectional view of the parts of the ray-generating element or unit illustrating its construction and the method of its manufacture.

Referring to Fig. 1 the therapeutic lamp consists generally of a curved reflector 11 carried by a suitable receptacle housing 12 which in turn is attached to and carried by a handle 13. The electrical connection is made to a conducting cord 14 which passes through the handle and the terminals of which are attached to the usual screw plug-receptacle 15 located in housing 12. The lamp generally may be of any suitable construction designed to hold a radiant energy generating unit 16, supply electric current to it and to reflect the generated rays.

The generating unit 16, comprises a porcelain or lava base 17 carrying a threaded brass ferrule or shell 18 which forms the outer plug contact of the unit. This base is merely the support for the energy converting or generating element 19 which, generally speaking, consists of coils of resistance wire imbedded in a refractory material which upon being heated emits a large proportion of infra-red rays.

Base 17 has an axial bore to receive a bolt 20 which makes electrical contact with one end of resistance wire 21 and forms the inner plug contact of the unit. The other end of the wire is electrically connected to the screw shell 18 by bolt 22. The resistance wire 21 is helically coiled and the coils wound in a double spiral helix in a manner similar to that employed in winding non-inductive resistances, as best shown in fragmentary section in Fig. 1.

In the manufacture of the unit, a spirally corrugated inner paper cone 22 is first placed upon an inner metallic cone shaped mold 24. A plurality of spacing bars 26 are inserted between the inner mold 24 and paper cone 22 so as to properly position the paper cone and aid in holding it in shape. Spacing bars 26 have guide fingers 27 formed integrally therewith. These guide fingers are adapted to slide between pairs of guide lugs 28 secured to the inner surface of mold 24. The coiled resistance wire 21 is then wound in the previously formed grooves in the paper cone form 22 and the outer paper cone 29 is then positioned so as to cover the outer surface of the coils and aid in holding them in proper position. Paper cones 22 and 29 are profusely perforated for a purpose as will hereinafter appear.

The inner mold 24 bearing the two paper cones 22 and 29 which retain the coiled resistance wire 21 is then placed on the insulating base 17, the lower edge of the inner mold fitting into an annular recess 25. The respective ends of the wire 21 are then secured by bolts 19 and 22. It will be noted that the lowest spiral coil of resistance wire 21 will rest upon the spiral projection 23 which in cross section is shaped like a blunt arrow head. An outer metallic conical mold 31 is then passed over the plug and held in position as shown in Fig. 2. The annular inwardly bent flange 32 of mold 31 serves to properly position this mold relative to base 17, and suitable spacing bars 33, similar to bars 26, are inserted at intervals along the periphery to centrally position the paper cones and coil of wire between the two metallic molds. These bars 33 have guiding fingers 34 formed integral therewith which fingers are arranged to be guided by suitable guide lugs 35, similar to the lugs 28.

The next operation is that of applying the refractory material 30 between the molds. The material generally employed is a mixture of powdered or granulated carborundum and carbon, using sodium silicate as a binder. This mixture is poured in gradually and will first fill the annular recesses 36 and 37 in the base to securely anchor the generating

element to the base. Since the mixture is of a relatively soft consistency, it will flow easily through the perforations in the paper cones and will surround and fill in the voids between the coils of the resistance wire. The spacing bars 26 and 33 are withdrawn as the space between the molds is filled. These bars may conveniently be used as tamping means to insure a compact body of the embedding material. After the space between the molds has been completely filled and the refractory material tamped down, the spacing bars 26 and 33 are entirely removed and the unit placed in an oven to bake. The baking will, of course, harden the carborundum mixture so that thereafter the molds 24 and 31 may be removed, a handle 38 being secured in the inner mold 24 so that the latter may be easily withdrawn.

During the baking operation the paper cone will not be appreciably changed since this operation is conducted at a temperature just high enough to dry out and cause the setting of the carborundum mixture. Upon removal of the molds the unit may be screwed into a suitable plug receptacle and subjected to a high potential current which will heat the resistance wire 21 to a sufficiently high temperature to cause the paper cones to become charred, the gases being driven off through the slightly porous carborundum mixture. The unit is subjected to this current for a considerable length of time so as to thoroughly dry out and bake the carborundum mixture. Of course, if desired, this drying and baking operation may be completely carried out by baking or firing in a suitable kiln or oven, although I have found that by first removing the molds and then heating by passing an electric current through the resistance wire, I obtain a more uniform product.

My improved unit provides a double ray-radiating surface, or rather two surfaces, one on the outside and the other on the inside of the cone, operating at substantially the same surface temperature, and both emitting infra-red rays in relatively great and equal quantities. The rays from the inside surface may be applied directly while those from the outside surface are to a large extent reflected to the region of application. It will be apparent that by using the method of my invention a generating unit is constructed in which the supports for the generating element are limited merely to the base plug and that all the connections, with the exception of the inner and outer contacts, are covered by the layer of refractory material. In this way practically all of the electrical energy is utilized in the emission of infra-red and heat rays from the surfaces of the refractory material.

While I have shown and described but a single embodiment of my invention and have described but a single method of making the unit, it will be apparent to those skilled in the art that variations in the construction and method may be made without departure from the basic principles of the invention. I therefore do not wish to limit the scope of my invention, except by the claims which follow:

1. The method of making infra-red and heat generating units for use in therapeutic lamps which consists in winding coils of resistance wire in a perforated paper cone, placing said cone between a pair of conical molds, pouring a plastic-refractory composition in said mold so as to completely surround resistance wire and paper cone, baking said material at a relatively low temperature to cause said material to set, removing the molds, and heating the unit to burn said paper cone and harden said material.

2. The method of making a conical heat and infra-red generating unit which consists in holding a coiled resistance wire between a pair of combustible perforated forms, pouring a plastic refractory composition in and around said forms, heating said composition to cause it to set, and passing an electric current through said wire to dry and harden the composition.

3. A therapeutic lamp generating unit comprising an insulating base, a hollow conical heat generating element secured to said base, said element having a conical surface for emitting rays directly toward the body of the patient and a second conical surface for directing rays adapted to be reflected toward the patient's body, and an electrical resistance wire embedded in said element and spaced equally from said surfaces, said resistance wire having terminals secured to said base.

4. In a therapeutic lamp, the combination of a parabolic reflector, a plug receptacle secured thereto, and an infra-red and heat ray generating unit adapted to be inserted in said receptacle and thereby be electrically connected to a source of electric current, said unit comprising a base plug, a flaring element of refractory material mounted thereon and presenting two independent ray emitting surfaces, and an electrical resistance within said element and spaced between said surfaces.

In witness whereof, I hereunto subscribe my name this 5 day of August, 1926.

ROLLAND H. MAXSON.