April 20, 1926. 1,581,259

G. A. WIECHERT ET AL.

ELECTRIC HEATER

Original Filed Jan. 29, 1923

FIGURE 1

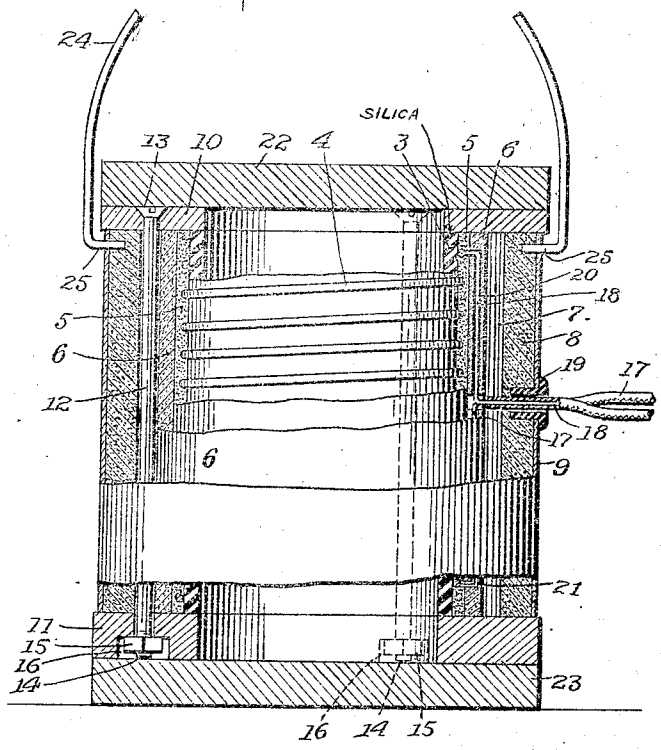
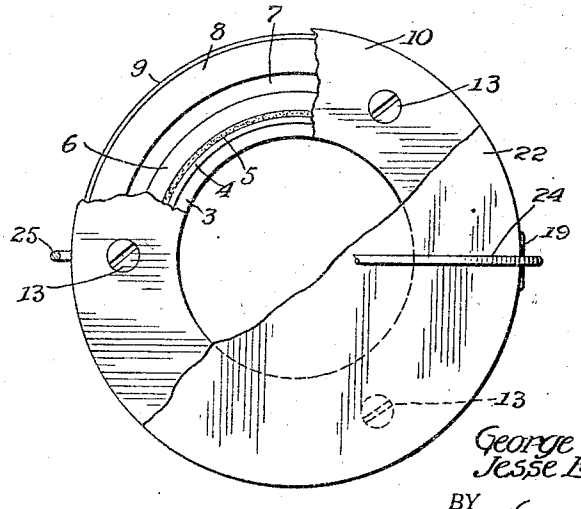


FIGURE 2



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Patented Apr. 20, 1926. 1,581,259

UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER.

Application filed January 29, 1923, Serial No. 615,529. Renewed September 5, 1925.

To all whom it may concern:

Be it known that we, GEORGE A. WIECHERT and JESSE E. JUDD, both citizens of the United States, residing in New York State, the former in Howard Beach, in the county of Queens, and the latter in the city of New York and county of New York, have invented certain new and useful Improvements in Electric Heaters, of which the following is a full, clear, and concise description.

Our invention relates to electrical heaters, our more particular purpose being to produce an electric heater suitable for general use and particularly adapted for service in connection with the preparation of investitures for dental castings.

Stated more in detail, our invention contemplates an electric heater of simple form, easily and cheaply constructed, not likely to get out of order, and possessing a number of advantages, including convenience and ease of operation.

Our invention further contemplates an electric heater so constructed and arranged as to facilitate the concentration of heat within a cylindrical member carried by and forming a part of the heater, and to prevent the undue escape of heat by radiation from the outer surface of the device.

Our invention further contemplates an electric heater of such construction and arrangement as to be easily controlled while in action, and adapted for performing a considerable variety of heating operations.

Reference is made to the accompanying drawing forming a part of this specification, and in which like reference characters indicate like parts throughout the several figures.

Figure 1 is a side view, partly in elevation and partly in section, of our improved electric heater.

Figure 2 is a plan view of the device, certain parts being broken away.

A cylindrical member 3 serves as an inner lining for the electric heater, and is made of silica, as indicated by an appropriate legend upon the drawing. A resistance wire 4 is wound upon the cylindrical member 3. This resistance wire is a heating wire, and may be made of German silver or of any of the various alloys used in the construction for wire employed for purposes of heating. A cylindrical member 5, made of heat-resisting cement or of any other suitable composition capable of withstanding a high degree of heat, is formed upon the heating wire 4 and upon the cylindrical member 3. In other words the cylindrical member 5 may be made up in a plastic form, and in this form fitted or molded around the cylindrical member 3 and the heating wire 4, so that the heating wire 4 is embedded in the cylindrical member 5; and the latter is thereupon allowed to dry, harden or set.

There are quite a number of well known compositions which may be used in forming the cylindrical member 5. Any such composition, to be suitable for our purpose, must be capable of becoming hard when it dries out or sets, and must be capable of remaining uninjured by heat while in direct contact with the heating wire. Fitting closely around the cylindrical member 5 is a cylindrical member 6, made of asbestos. Around this cylindrical member is an air space 7 of cylindrical form, and around this air space is a thick lining 8, having the general form of a cylinder and made of asbestos.

Fitting tightly around the cylindrical member 8 of asbestos is a jacket 9 of sheet metal, preferably brass or steel, and highly polished.

A pair of clamping rings are shown at 10 and 11, and are made of any suitable material such as will give them sufficient mechanical strength and enable them to stand a high degree of heat. For this purpose lava, slate and various kinds of rock heretofore known as adapted to resist the effects of heat, can be employed for this purpose.

Extending through holes in the clamping rings 10 and 11 are a number of tension bolts 12, each provided with a head 13 sunken into the clamping ring 10. Each of these tension bolts is further provided with a threaded end portion 14, and fitted upon each threaded end portion 14 is a nut 15. The clamping ring 11 is provided with counter-sink holes 15, for accommodating the nuts 15 and the adjacent threaded end portions of the tension bolts.

A pair of conducting wires 17 and 18 extend through an insulator 19 and through passages 20 and 21 in the wall of the cylindrical member 6. These wires are con-

nected with the heating wire 4, in order to send electric heating currents through this wire.

The tension bolts 12 draw the clamping rings 10, 11, tightly against the adjacent ends of the various cylindrical members above described, and thus hold firmly together the parts thus far described.

The device as a whole has the general form of a cylinder, as may be understood from Figure 1. We provide a cap plate 22 for resting upon this cylinder, and a base plate 23 upon which may be rested the cylinder and also the article to be heated. The cap plate 22 and the base plate 23 may be made of any of the materials above mentioned in connection with the parts 10 and 11, or of any other suitable material adapted to stand considerable heat. These plates may be made of artificial stone, and if so made are each of such form as to render them readily adaptable to be made up of plastic material and then allowed to dry or harden.

A handle 24, made of wire, is provided with a pair of end portions 25 turned inwardly and extending through holes in the jacket 9, these holes reaching about half way through the wall of the cylindrical member 8, as may be understood from Figure 1. The handle 24 thus has the form of a bail, which enables the device to be handled easily and safely after the maner of a pail or bucket.

The location of the cylindrical air space 7 is such as to practically separate the heater into two cylindrical members concentric with each other, the inner of these two cylindrical members being the one in which the heat is produced by the heating wire.

It will be noted that while the heat from the heating wire is free to pass inwardly through the wall of the cylindrical member 3, the heat cannot pass freely outward because it cannot readily get across the air space 7. The small quantity of heat that does succeed in getting across this air space is for the most part stopped by the cylindrical member 8 of asbestos.

In consequence of the arragement just described the cylindrical member 3 of silica, and any article or substance located within, it may be readily and quickly heated to a high temperature, while the outer surface of the heater can be maintained at a relatively low temperature. Moreover the high temperature attained by the use of our electric heater may be maintained comparatively uniform for long periods of time, by simply regulating the electric current in the manner well understood in this art.

The operation of our device is as follows: The operator places the base plate 23 upon a table or a suitable supporting surface, and rests upon it the article to be heated. He next grasps the handle 24 and lifts the heater, setting it down upon the base plate 23 so as to enclose or encircle the article to be heated. He next places the cap plate 22 upon the top of the heater, and then turns on the electric current for a suitable length of time. If he so desires, he can from time to time remove the cap plate 22 in order to inspect the article being heated, or he can simply displace the cap 22 slightly in order to glance down into the heater.

In using our electric heater in connection with the preparation of dental investitures, the molding flask is first filled with the investiture in the usual manner so that the investiture is provided with channels, sprue holes, etc., containing wax threads. When the molding flask with its investiture is ready for the wax threads to be removed, the flask with its contents is simply rested, bottom upward, upon the base plate 23, and the heater is lifted into position as above described, by resting it upon the base plate 23 in such manner as to enclose the flask. The electric current being now turned on, the flask and its contents are heated so as to melt the wax threads, and drain off the resulting wax in the form of a liquid. After the bulk of the wax is thus melted out of the investiture, any small quantity remaining is readily dried out, or absorbed in the pores of the investiture. Thus no residue from the wax is left in the investiture.

We do not limit ourselves to the precise mechanism shown, as variations may be made therein without departing from our invention, the scope of which is commensurate with our claims.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is as follows:

1. An electric heater comprising a cylindrical member made of silica, a heating coil wound thereupon, a cylindrical member of plastic material enclosing said first mentioned cylindrical member and enveloping said heating coil, a cylindrical member of heat-insulating material enclosing said last mentioned cylindrical member and separated therefrom by an air space of cylindrical form, and means for holding all of said cylindrical members together, in order to enable them to be handled as a unit.

2. A device of the character described comprising a pair of hollow members separated by an air space and one located within the other, a heating coil carried by one of said hollow members, a pair of clamping members each engaging both of said hollow members, said clamping members being disposed upon opposite sides of said hollow members, and means for forcing said clamping members tightly against said hollow members, for the purpose of holding said hollow members firmly together as a unit.

3. A device of the character described

comprising a pair of open-ended hollow members one located within the other and separated therefrom by an air space, a heating coil carried by one of said hollow members, a pair of clamping members disposed oppositely to each other and engaging said hollow members, and tension bolts engaging said clamping members for causing them to press tightly against said hollow members in order to hold said hollow members firmly in fixed positions relatively to each other.

4. A device of the character described comprising an inner cylindrical member made of material capable of withstanding a high temperature, a second cylindrical member encircling said inner cylindrical member, an electric heating element carried by said second mentioned cylindrical member, another cylindrical member enveloping said last mentioned cylindrical member and made of heat insulating material, another cylindrical member made of heat insulating material and separated from said last mentioned cylindrical member by an air space and means for holding all of said cylindrical members together as a unit.

5. A device of the character described comprising a substantially cylindrical member, a heating coil located within the wall of said substantially cylindrical member, another substantially cylindrical member, said last mentioned member being made of heat-insulating material and separated by an air space from said first mentioned substantially cylindrical member, a pair of clamping rings each engaging both of said substantially cylindrical members and located at the opposite ends thereof, and a plurality of tension bolts each extending through said air space and engaging both of said clamping rings, for the purpose of pressing said clamping rings tightly against the adjacent ends of said substantially cylindrical members.

6. A device of the character described comprising a base plate made of heat insulating material, an electric heating element having the general form of a cylinder with open ends and adapted to be rested with one of its ends upon said base plate, and a cap plate resting upon the other of said open ends.

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