

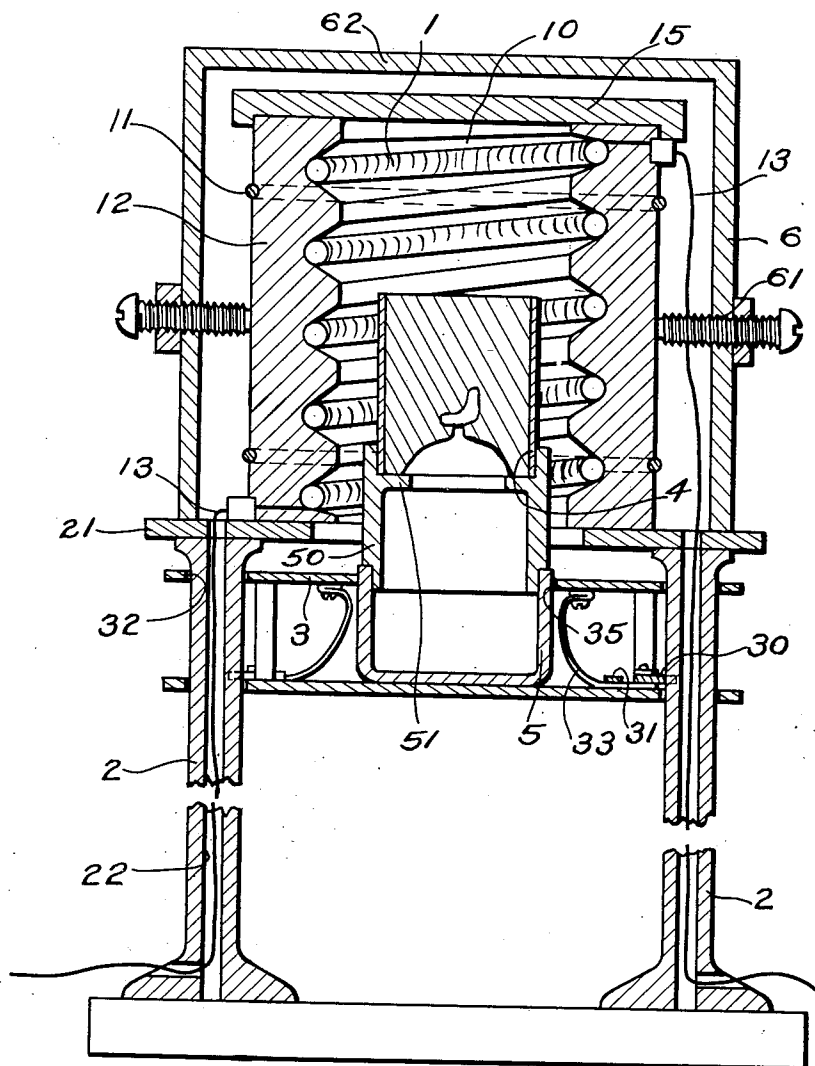
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H. C. HOUCK

DENTAL OVEN

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UNITED STATES PATENT OFFICE.

HENRY C. HOUCK, OF SEATTLE, WASHINGTON.

DENTAL OVEN.

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To all whom it may concern:

Be it known that I, HENRY C. HOUCK, a citizen of the United States of America, and resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Dental Ovens, of which the following is a specification.

My invention relates to an oven or furnace which is particularly intended for dentists' use, for example in burning out inlay investments.

Such work has generally required considerable time in order to get most satisfactory results, for it has been found, if the investment is heated rapidly while still containing free water, with furnaces heretofore in use, that it will tend to form steam throughout the investment so rapidly that, in escaping, this steam will break down the investment, to such an extent as to render it unsuitable for the casting of the gold inlay. Yet it is highly desirable that some means be found for reducing the time required for burning out such investments, for with dental laboratories and dentists making a number of such inlays, the volume of work is often such that it would require a considerable number of furnaces to permit each investment ring the twelve minutes or more which has heretofore been considered necessary for burning them out.

My invention, therefore, has for its object the provision of a furnace in which the investment may be baked more rapidly and more perfectly than in previous furnaces, reducing the time to four minutes or less.

A further object is the provision of convenient and simple means whereby the investment ring may be perfectly centered and inserted into the furnace and conveniently handled in connection therewith.

A further object is the provision of means for supporting the investment cup and for collecting the water and wax which run therefrom during the baking process, thus to avoid dirtying the surroundings of the furnace.

A further object is the provision of a simple, convenient, and highly effective furnace and heating element therefor.

My invention comprises those novel parts and combinations thereof which are shown in the accompanying drawing, described in

the specification and particularly defined by the claims terminating the same.

The accompanying drawing, wherein my invention is shown in a preferred form, represents a vertical axial section through the furnace.

I have found that the most satisfactory method of burning out such investments consists in the application of radiant energy to produce heat concentrated in the investment ring itself. This may most conveniently be done by inserting the investment ring into a ring formed by an electric heating element so that it is heated by the radiant heat therefrom upon all sides at once, and equally at all points.

Such a heating element may conveniently be formed by a helical coil 1 of coiled resistance wire, supported suitably in a ring 12 of refractory material, for example, fire clay. Preferably the ring is formed of two like halves, the two halves being suitably connected, as by encircling bands 11. Preferably this ring is interiorly helically grooved, the grooves 10 receiving the resistance wire 1, and the coils thereof lying wholly beneath the inner grooved surface of the ring. Leads 13 from the ends of the resistance element 1 connect the latter with a source of current.

Such a ring-shaped heating element is suitably supported in an elevated position as, for example, by a stand which may consist of legs 2 and a ring 21 supported thereon, the ring 21 directly supporting the ring 12 of the heating element. The center of the ring 21, beneath the vertically disposed axial opening through the ring 12, is likewise open. The legs 2 may be as many in number as are deemed necessary, and preferably certain thereof are hollow, as indicated in the drawings, to permit the passage through their central bores 22 of the lead wires 13.

I provide a platform 3 which is vertically movable beneath the ring 12 and which is provided with means for centering and supporting an investment ring, as 4, to insert it into the central opening of the ring 12. Such means may conveniently comprise a central depression provided with supporting flanges 51, the flanges supporting the investment ring 4 and the sides of the depression centering it. I have shown the flanges 51

formed as part of an adapter ring 50, this adapter being of a shape to receive and hold the particular investment ring employed, and having an outwardly directed shoulder by means of which it is supported within a central opening 35 of the platform 3, or within the edge of a cup 5 received therein. The flanges 51 are positioned between the top of the adapter 50 and bottom of the cup 5. The adapter and the cup, it is thus seen, are both easily removable and yet are held substantially in an extension of the axis of the ring 12. For all practical purposes, except to accommodate investment rings of varying shapes, the cup 5 and adapter 50 might be made integral. The cup 5 serves to catch the water and melted wax which run from the investment material and the wax model within the investment ring 4, as the latter is heated. If the investment ring is not properly centered, or if it is accidentally tipped while in the furnace, no harm will result, as it cannot touch the wires 1, but will contact only with the ridges between grooves 10.

Preferably means are provided for supporting the platform 3 at any elevation within its limitation of movement relative to the ring 12. Such means are conveniently frictional. I have shown the platform as having holes 32 about its periphery, through which the legs 2 may pass to guide the platform for vertical movement. Leaf springs 33 secured at one end to the platform 3 and guided at 31 for horizontal movement, may carry slippers 30 which will engage the sides of the legs 2 to frictionally support the platform 3. Two such springs 33 may be provided and these will be engageable by the thumb and finger of an operator to withdraw them from engagement and to permit vertical movement of the platform 3. By employing an elevated adapter 50, the ring 4 is positioned in the most intense heat. It will generally be found desirable to encase the ring 12, and to this end I have shown an inverted cup-shaped casing 6 suitably spaced from the ring 12, as by set screws 61. I have also shown a cap 15 of refractory material which is placed over the upper end of the ring 12. This may be employed or not as may be desired, and it may be desirable at times to omit the upper portion 62 of the casing 6, as I have found that the amount of heat retained by such covers does not, by its presence or absence, greatly affect the action of the furnace.

What I claim as my invention is:

1. A dental furnace comprising a circular heating element with its axis vertically disposed, a stand supporting said heating element, a platform guided for vertical movement upon said stand beneath the heating element, a cup positioned upon but not secured to said platform, and means for sup-

porting an investment cup above said platform and cup to drain into the latter.

2. A dental furnace comprising a circular heating element with its axis vertically disposed, a stand supporting said heating element, a platform guided for vertical movement upon said stand beneath the heating element, a cup positioned upon but not secured to said platform, and means associated with said cup for supporting an investment cup above the bottom of the first cup.

3. A dental furnace comprising a circular heating element with its axis vertically disposed, a stand supporting said heating element, a platform guided for vertical movement upon said stand beneath the heating element, a cup positioned upon but not secured to said platform, a flange projecting inward about said cup above its bottom to support an investment cup, and means for positioning said first cup and said investment cup to enter the heating element when the platform is raised.

4. A dental furnace comprising a circular heating element with its axis vertically disposed, a stand supporting said heating element, a platform guided for vertical movement upon said stand beneath the heating element, a cup removably supported upon said platform, means for supporting an investment cup above said platform and cap to drain into the latter, and means frictionally engageable between the platform and stand to support the platform at a desired elevation.

5. A dental furnace comprising two half-rings of refractory material and means for securing them together to form a complete ring, said ring being internally helically grooved, an electric resistance element supported in said groove, a stand supporting said ring with its axis vertical, a platform vertically movable upon said stand, and means for supporting an investment cup upon said platform and for centering it to enter said ring.

6. A dental furnace comprising two half-rings of refractory material and means for securing them together to form a complete ring, said ring being internally helically grooved, an electric resistance element supported in said groove, a cap of refractory material covering the top opening of said ring, a casing surrounding and spaced from said ring except at its bottom, a stand supporting said ring with its axis vertical, a platform vertically movable upon said stand, and means for supporting an investment ring upon said platform and for centering it to enter said ring.

7. A dental oven comprising a heating element having a downwardly opening recess adapted to receive an investment ring, a platform vertically movable beneath said

recess and having a hole centered beneath said recess, a cup supported in said hole, an adapter ring supported above said cup, and inwardly directed supports on said adapter

5 to receive and support the investment ring.

8. A dental oven comprising a heating element having a downwardly opening recess adapted to receive an investment ring, vertical legs supporting said heating element, a platform guided on said legs for vertical movement towards and from the heating element, a pair of laterally yieldable members at opposite sides of said platform, and frictional shoes connected to said yieldable members and normally engaging the legs to support the platform therefrom, said yieldable members affording means for engagement by a thumb and finger to release said shoes.

9. A dental oven comprising a heating element having a downwardly opening recess adapted to receive an investment ring, vertical legs supporting said heating element, a platform guided on said legs for vertical movement towards and from the heating element, a pair of spring leaves each connected by one end beneath opposite sides of said platform, and extending thence downwardly and outwardly, guides carried by said platform securing their outer ends for lateral movement, and a shoe connected to the outer end of each spring and normally frictionally with a leg by the outward pressure of its spring to maintain the platform at a fixed elevation.

Signed at Seattle, King County, Washington, this 17th day of December 1923.

HENRY C. HOUCK.