June 24, 1924. 1,499,207

R. L. FOLSOM

METHOD OF AND APPARATUS FOR PREPARING MOLDS FOR CASTING

Filed Aug. 11, 1922 2 Sheets-Sheet 1

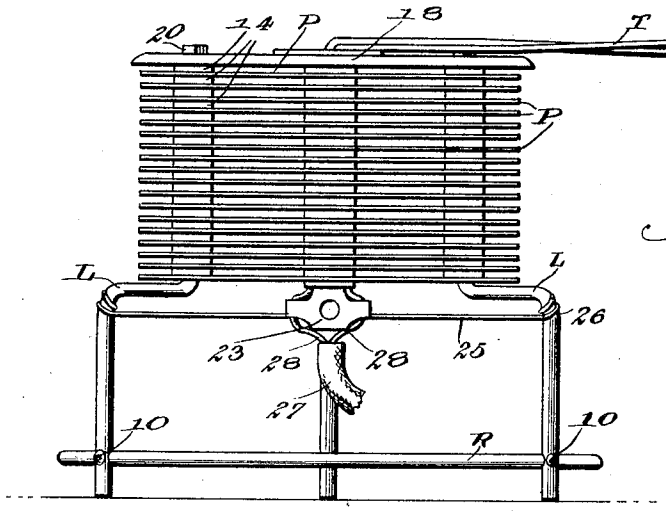


Fig. 1.

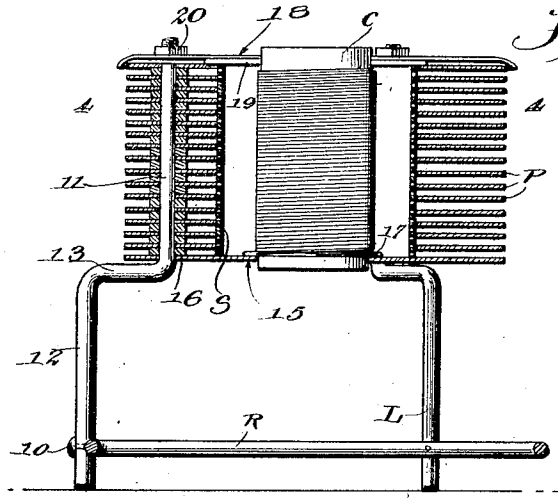


Fig. 2.

Fig. 3.

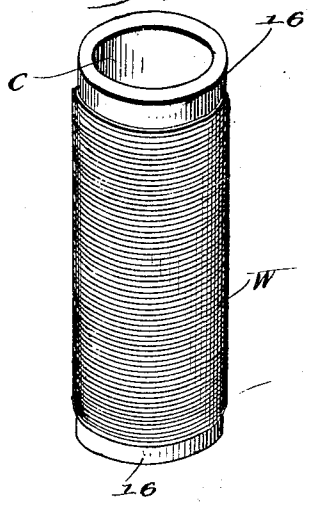
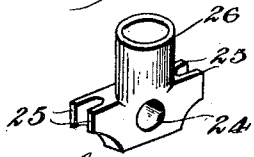


Fig. 8.



WITNESSES

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METHOD OF AND APPARATUS FOR PREPARING MOLDS FOR CASTING

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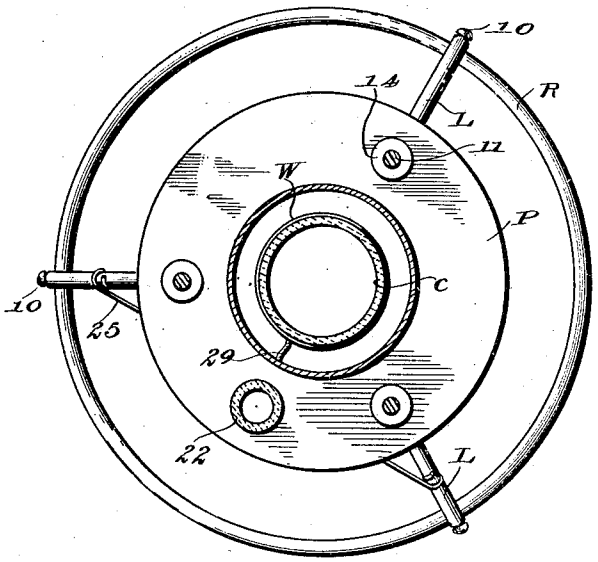


Fig. 4

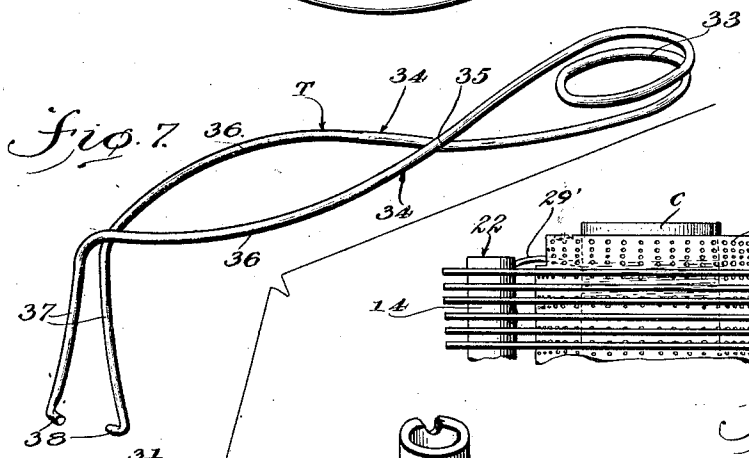


Fig. 7.

Fig. 5.

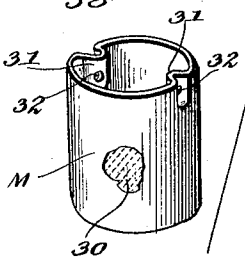




Fig. 6.

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UNITED STATES PATENT OFFICE.

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METHOD OF AND APPARATUS FOR PREPARING MOLDS FOR CASTING.

Application filed August 11, 1922. Serial No. 581,211.

To all whom it may concern:

Be it known that I, RALPH L. FOLSOM, a citizen of the United States, and a resident of Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Methods of and Apparatus for Preparing Molds for Casting, of which the following is a specification.

This invention relates to a method of and apparatus for preparing molds for casting.

The present invention is particularly adapted for preparing molds utilized for casting porcelain or metal teeth or pieces thereof used in the profession of dentistry. The invention has for its object to provide a method and apparatus for the character specified whereby the wax usually employed for forming the pattern of the object to be cast may be washed or dissipated from the mold in which the same is invested in such a manner that the carbonization, contraction or disintegration of the mold is obviated and thereby produce a mold with a cavity for casting purposes which truly conforms to the outline and dimensions of the wax pattern.

Other objects will hereinafter appear.

In carrying out the present invention a heater is provided which includes an enclosure in which a high and substantially constant temperature may be maintained. A wax pattern is inserted in a mold made of investment material and water and permitted to stand approximately four minutes. The mold is then placed in the enclosure of the heater and the heat causes the moisture in the material forming the mold to wash out the wax pattern in approximately two or three minutes. The mold is now ready for casting and may be removed from the heater and the cavity within the mold is absolutely clean, that is, no carbonization of the walls thereof has taken place and neither has the mold expanded or contracted.

A form of heater which may be utilized in practicing the present invention is shown in the accompanying drawings, in which:

Figure 1 is a view in side elevation of the heating apparatus or unit.

Figure 2 is a vertical transverse sectional view of the same.

Figure 3 is a perspective view of the heating element employed in the heating apparatus.

Figure 4 is a horizontal sectional view of the heating apparatus taken substantially on the line 4—4 of Figure 2.

Figure 5 is an enlarged fragmentary view in side elevation of the upper portion of the heating unit or apparatus.

Figure 6 is a perspective view of an insulating tube employed for protecting the wires extending within the apparatus to the heating element.

Figure 7 is a group view showing in perspective the mold support and prongs for lifting the same.

Figure 8 is a detailed perspective view of a supporting means for the insulating tube protecting the conductor wires shown in Figure 6.

Referring to the drawings more particularly, the apparatus may consist in a supporting frame, comprising a plurality of uprights or legs L, preferably three in number, each of which is secured at a point adjacent its lower end to a ring R. The legs L may be secured to a ring R in each instance by means of a screw as at 10. Each leg L is bent to provide the upper portion 11, the lower portion 12, and an intermediate portion 13, the upper and lower portions being disposed vertically, while the intermediate portion is disposed substantially horizontally. The upper portions 11 of the legs L have arranged thereon in superposed relation a multiplicity of annular plates P, each plate P being made of sheet metal. The upper portions of the legs 12 are extended through the sheets and the annular plates P are held in spaced relation with each other by means of washers 15, said washers encircling the different leg portions 11, and a washer being interposed between each of the annular plate members P. The inner peripheries of the annular plate members P will provide a tubular opening adapted to accommodate the cylindrical perforated member S. The member S is seated upon the supporting plate 15, said supporting plate being spaced from the annular plate members P by suitable washers 16, Figure 2. The leg portions 11 extend through suitable openings provided in the plate 15. This plate is held from downward movement by the horizontal sections or portions 13 of the legs L.

The heating element, shown in Figure 3, consists in a tubular casing C which is made of suitable insulating material, such as porcelain or the like, and upon which there

is positioned a winding or resistance wire W. The winding W terminates at each end to provide a bare exterior space 16 at each end of the tube C. The supporting plate 15 is provided with a central opening adapted to receive the lower end portion of the tube C, and suitable insulating means is interposed between the winding W and the plate 15 as at 17. A cap plate 18 is provided having a central opening adapted to receive the upper end portion 16 of the tube C. A sheet of insulating material 19 is interposed between the cap plate 18 and upper end of the resistance wire winding W. The cap plate 18 is also provided with suitable openings to receive the upper ends of the legs L, and upon the upper end of each leg L there is threaded a nut 20 whereby the different elements carried by said legs may be clamped and secured together. Preferably the outer edge of the cap plate 18 is turned downwardly as at 21. The cap plate 18 is preferably nickel plated in order to lend to the appearance of the apparatus.

The different annular plates P are also provided with registering openings adapted to receive a tube 22, said tube being specifically shown in Figure 6 and made of insulating material such as porcelain or the like. This tube is supported by a block 23, said block being specifically shown in Figure 8 of the drawings and as shown is formed with a transverse bore or opening 24 and with a pair of prongs or extensions 25 upon each side thereof. The block is also formed with a nipple 26 adapted to be received within the tube 22. The block 23 is supported by a wire or the like as at 25, said wire having its ends secured to a pair of legs L as at 26. The block 23 may be secured to the wire 26 in any suitable manner, not shown. A flexible cord 27 may be extended through the block 23 and the conductor wires 28 of said cord passed upwardly and into the tube 22, the nipple 26 being of a diameter to permit the passage of these wires. Also each wire 28 may be passed between a pair of the extensions 25 in order to hold the same in its position. One of the wires may be connected with the lower terminal of the resistance winding W as at 29, while the other wire may be connected with the upper terminal of the resistance wire W as at 29′, Figure 5.

In Figure 6, M indicates generally a mold retainer or support which consists in a cylindrical shell having its lower end portion filled with plaster of Paris or the like as at 30. Adjacent the upper end of the shell there is formed a pair of diametrically opposed depressions 31, and each depression being provided with an opening 32. For suspending the mold retainer or holder M within the heating element is provided a pair of tongs generally indicated by the reference character T, said tongs preferably consisting in a continuous strand of resilient wire bent to provide one or more convolutions 33 at a point central to the length of the wire, and then the portions 34 existing upon each side of the convolution 33 being crossed as at 35 and provided with a bow portion 36 forward to the point of crossing each other. Each bow portion 36 terminates in a downwardly extending portion 37 which in turn terminates in an inwardly extending section or portion 38 adapted to form a tooth or projections which will extend into an opening 32 of the mold container or holder M.

In the practise of the present invention, the pattern is made of wax in the usual manner and properly invested in a mold. The mold should be made of moldine, or a like material, and a predetermined amount of water, the quantity of water being sufficient to give the mold the desired plasticity for easy forming. The mold and pattern are now permitted to set three or four minutes and then may be placed in the top of the mold carrier M. Previous to this the electric current should be permitted to pass through the resistance winding W of the heating elements so that the interior of the core C is heated to a high degree. The tongs T may now be used for lifting the mold container M for lowering the same into the top of the tubular core C, as illustrated in Figure 1 of the drawings. When inserting a mold, the same has yet a certain amount of moisture therein and when the mold is brought within the tube C the moisture will be driven from the mold and will wash out the wax pattern in a thorough manner and leave the cavity formed by the pattern clean and ready for receiving metal or porcelain to form a casting. The purpose of the annular plates P is to provide a radiating means for the heating element and thus maintain a uniform maximum temperature. The perforated member S also aids in this purpose and further enables a compact and durable structure. During the time of heating the mold the tongs T may be laid upon the heating apparatus, as illustrated in Figure 1, and then the mold retained in its suspended position within the tubular core C.

The mold should be formed of a material which will not contract or expand under heat to any appreciable extent, and by removing the wax pattern through the washing method heretofore described a cavity is left which agrees closely to the dimensions of the original pattern.

While I have shown the particular apparatus by which my invention may be practised, it is to be understood that I am aware of the fact that the construction, combination and arrangement of parts may be changed by those skilled in the art without

departing from the spirit of the invention as indicated by the appended claims.

I claim:

1. A method of forming molds of the character specified which consists in investing a pattern or mold adapted to be dissipated by the action of moisture and heat in a mold and then subjecting the pattern to a high heat with moisture therein.

2. A method of forming molds of the character specified which consists in investing a pattern or mold adapted to be dissipated by the action of moisture and heat in a mold and then subjecting the pattern to a high heat with moisture therein for a predetermined interval.

3. A method for producing molds which comprises the investing of a pattern and an expansive fluid in a mold, and then submitting the same to heat whereby to permit the expansive fluid to wash the pattern from said mold.

4. A method of forming molds of the character described consisting in forming a mold made of material adapted to retain moisture then investing in the mold a pattern of wax and then placing the mold in a heated chamber for a predetermined interval.

5. A method of forming molds of the character described which consists in forming a mold of moldine mixed with water then investing in said mold a pattern of wax and then placing the mold and pattern in a highly heated chamber.

RALPH L. FOLSOM.