No. 714,938. Patented Dec. 2, 1902.

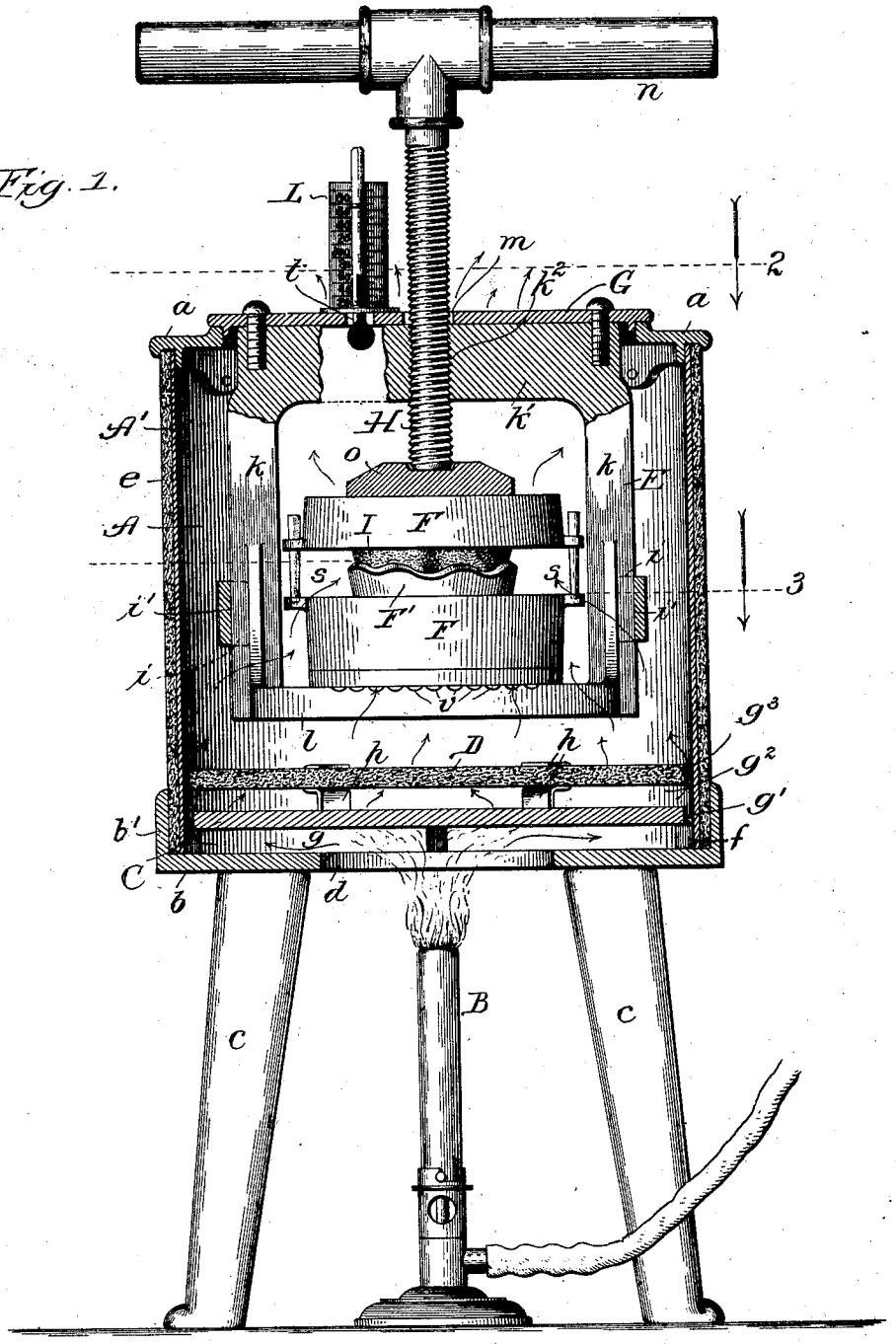
J. A. McCLELLAND.

DENTAL OVEN.

(Application filed Aug. 9, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

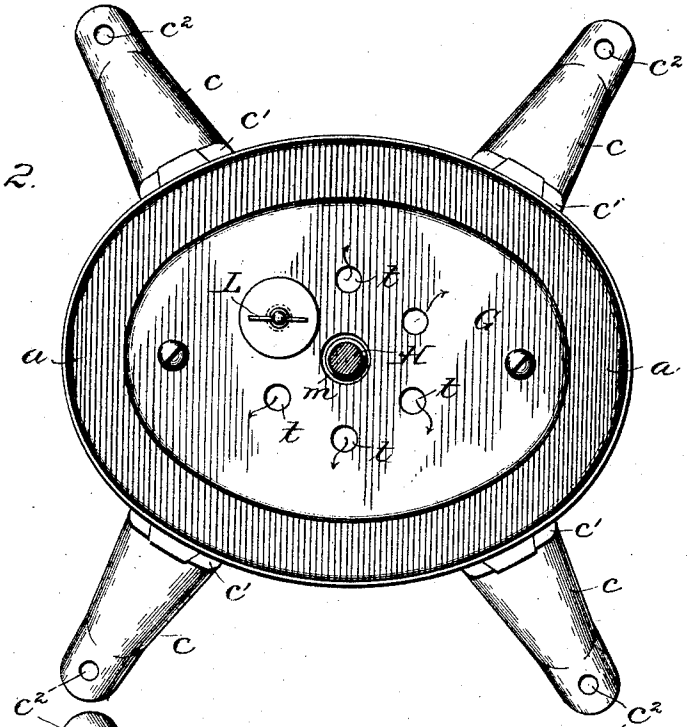
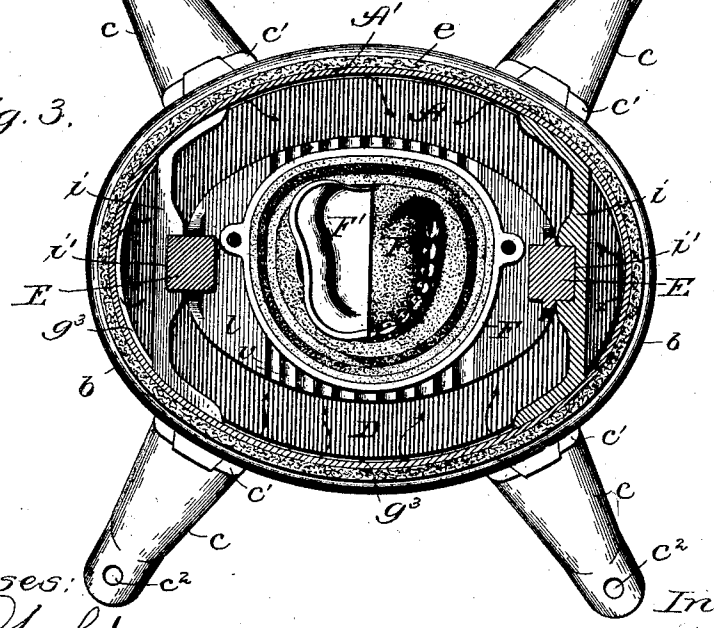


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN A. McCLELLAND, OF CHICAGO, ILLINOIS.

DENTAL OVEN.

SPECIFICATION forming part of Letters Patent No. 714,938, dated December 2, 1902.

Application filed August 9, 1902. Serial No. 119,043. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. McCLELLAND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Dental Ovens, of which the following is a specification.

My invention relates to an improvement in the class of dental ovens for molding, in plaster models of the mouth and around porcelain teeth, dental plates composed of celluloid blanks.

The gum-camphor, which forms about twenty per cent. of the substance of celluloid composing the blank for a dental-plate, renders the latter objectionable if any material quantity of the camphor be allowed to remain therein, because of the taste of camphor it imparts to the mouth and more particularly because of the deleterious action on the plate of the acids in the mouth, which gradually dissolve out of the plate its camphor component, thus eventually disintegrating it and meantime honeycombing it, thereby affording lodgment on the plate to food and impurities in the mouth tending to foul it; otherwise celluloid affords a highly-desirable material for dental plates, because of its cheapness, its lightness, and its durability, and because it may be colored to closely resemble the color of the membranes of the mouth.

The primary object of my invention is to provide a construction of oven for molding celluloid blanks into dental plates by means of which the gum-camphor shall during the molding operation be effectually eliminated from the blank without injury to the latter by burning and without other deleterious effect.

To this end my invention consists in the general and also in the detailed construction of my improved dental hot-air oven hereinafter described and illustrated in the accompanying drawings, in which—

Figure 1 is a view in vertical sectional elevation of my improved dental oven; Fig. 2, a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; and Fig. 3, a section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow.

A is the oven-chamber, which I prefer to form of oval shape in cross-section of a sheet-iron shell A′, reinforced at its upper end by an inward-projecting cast-metal flange *a* and at its lower end by a base *b* of similar material, having a flange *b′* extending upward about the shell to reinforce it and provided at intervals about its circumference with sockets *c′* to confine the upper ends of the legs *c* on which the oven is supported, as upon a bench or table, (not shown,) to which the legs may be screwed through holes c^2 in the feet shown to be provided on the lower ends of the legs. About the center of the base *b* is formed an elongated opening *d*, directly below which is the position of the burner B for supplying the heat to the oven and which may be a gas-burner of any known or desired variety or construction. For the purpose of reducing to the minimum loss of heat by radiation from the shell A′, I surround it with a non-conducting jacket, such as that shown at *e*, which may be formed of asbestos paper.

Within the chamber A and supported on legs *f*, rising from the base *b*, is centered a false bottom C, covering the opening *d* and forming between itself and the base the air-space *g*, having its outlet in the space or passage *g′* about the false bottom produced by providing it of less diameter than the interior diameter of the shell. A plate D, of asbestos board of about the same diameter as the false bottom, is supported at intervals about its edge on the false bottom, as by clips *h*, to form an intervening air-space g^2 and the circumferential passage g^3.

On opposite sides of the inner surface of the shell A′ about midway between its ends are rigidly secured substantial metal brackets *i i*, each containing a guide-socket *i′* to receive a side of the skeleton-frame mold-press E. This press, which may be formed in one piece of cast metal, comprises the sides *k k*, connected at their upper ends by a cross-piece *k′*, containing centrally a threaded opening k^2, and at their lower ends by a bed *l* for supporting the mold-flask F, which bed should be transversely grooved on its upper side, as shown at *v*, for a purpose hereinafter described. On the cross-piece *k′* is fastened the oven-cover G, containing a plurality of perforations *t* and a central orifice *m*, registering with the threaded orifice k^2, in which works the screw H, provided at its outer end

with an operating-handle *n* and bearing at its lower end, through the medium of an interposed follower-plate *o*, against the upper section of the flask F.

The operation is as follows: The mold-press may be readily lifted out of the chamber A at all times. When thus removed from the oven, the sections of the flask containing the plaster sections of the mold F′, having porcelain teeth F^2 embedded in one of the sections, are disposed one flask-section upon the other upon the bed *l* of the press. The follower *o* is placed in position and the screw H is turned down upon it. In this condition of the parts carried by the mold-press the latter is introduced into the chamber A by passing the frame sides *k* into the guide-sockets *i*′, wherein the press is confined against turning. When in thus lowering the press into place the cover G abuts against the cover-seating portion of the flange *a*, it suspends the press in the chamber A. Then the heat generated by the lighted burner B induces through the oven-chamber circulation of air which becomes intensely heated—say up to 300° Fahrenheit—as may be indicated on a suitable thermometer L, seated at its bulb in one of the perforations *t* in the cover. The current of hot air is uniformly diffused throughout the chamber A, being distributed through the passages *g*′ g^3 by the false bottom C, which is prevented from radiating the intensity of its heat against the press by the effect of the asbestos shield D. The hot air which circulates freely in the chamber A about the press E and flasks, even underneath the latter through the bed-grooves *v*, escapes through the perforations in the cover G, and in circulating it acts freely through the space *s* upon the plaster-mold sections, thoroughly drying them and enhancing their porosity. When the heat thus uniformly circulated through the chamber A has thoroughly dried the plaster mold and heated it sufficiently to mold a blank I into conformance to the model and teeth, the press is lifted out of the oven-chamber and such a celluloid blank is introduced between the mold-sections in the flask, and thus separates them to form the space shown at *s* in Fig. 1, through which the blank is exposed to the surrounding atmosphere. Thereupon the press is again introduced in the manner described into place in the oven. The heat diffused through the chamber A vaporizes the gum-camphor in the blank I, and the vapors are carried off mainly by way of the space *s*, through the cover, with the air-currents thus laden with them. From time to time as the substance of the blank softens and becomes more and more freed from the camphor under the influence of the uniformly-distributed currents of hot air the screw H is turned to gradually mold the blank into a dental plate between the mold-sections until the latter are brought closely together. Meantime some of the camphor, eliminated as fumes by the heat, will escape through the pores of the mold-sections. Then the mold-press may be withdrawn and immersed with its contents in cold water to cool them, whereupon the finished dental plate may be taken out freed from its camphor constituent.

During the molding operation the press may be conveniently lifted out as often as desired to enable the condition of the work to be examined and controlled.

The more important advantages attributable to my improvement over apparatus hitherto employed for molding dental plates from celluloid blanks may be enumerated as follows: First, it permits the production of dry hot plaster molds which enhance the escape of camphor from the dental plate while under pressure; second, it induces a free and uniform circulation of hot-air currents through the oven in immediate contact with the celluloid, thus by a rapid drying process carrying off the camphor as vapor, both by the pressure on the blank and the suction effect of the air-currents; third, it enables the operator conveniently to inspect the progress of the work by lifting the press out at the top of the oven and to manipulate the work, as for making changes in it or for other purposes, to the end of assuring a satisfactory result.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an oven for molding dental plates from celluloid blanks, the combination with the oven-chamber having a hot-air-inlet opening in its base and provided with a perforated removable cover, of a false bottom covering said opening and forming in the chamber an air-space and a circumferential air-passage, and a mold-press removably suspended in said chamber in the path of the hot-air currents through it, substantially as and for the purpose set forth.

2. In an oven for molding dental plates from celluloid blanks, the combination with the oven-chamber having a hot-air-inlet opening in its base and provided with a perforated removable cover, of a false bottom covering said opening and forming in the chamber an air-space and a circumferential air-passage, an asbestos shield surmounting said false bottom and forming an air-space therewith and a circumferential air-passage, and a mold-press removably suspended in said chamber in the path of the hot-air currents through it, substantially as and for the purpose set forth.

3. In an oven for molding dental plates from celluloid blanks, the combination with the oven-chamber having a hot-air-inlet opening in its base, of a false bottom covering said opening and forming in the chamber an air-space and a circumferential air-passage, and a mold-press carrying a perforated cover for the chamber and removably suspended by the cover therein in the path of the hot-air currents through said chamber, substantially as and for the purpose set forth.

4. In an oven for molding dental plates from celluloid blanks, the combination with the

oven-chamber having a hot-air-inlet opening in its base, of a false bottom covering said opening and forming in the chamber an air-space and a circumferential air-passage, an asbestos shield surmounting said false bottom and forming an air-space therewith and a circumferential air-passage, and a mold-press carrying a perforated cover for the chamber and removably suspended by the cover therein in the path of the hot-air currents through said chamber, substantially as and for the purpose set forth.

5. In an oven for molding dental plates from celluloid blanks, the combination with the oven-chamber having a hot-air-inlet opening in its base, of a false bottom covering said opening and forming in the chamber an air-space and a circumferential air-passage, an asbestos shield surmounting said false bottom and forming an air-space therewith and a circumferential air-passage, a mold-press comprising a skeleton frame provided with a mold-supporting bed and having a screw working in its upper end and a perforated cover for said chamber carried by said frame and by which it is removably suspended therein in the path of the hot-air currents through said chamber, substantially as and for the purpose set forth.

6. In an oven for molding dental plates from celluloid blanks, the combination with the oven-chamber having a hot-air-inlet opening in its base, of a false bottom covering said opening and forming in the chamber an air-space and a circumferential air-passage, an asbestos shield surmounting said false bottom and forming an air-space therewith and a circumferential air-passage, a mold-press comprising a skeleton frame provided with a grooved mold-supporting bed and having a screw working in its upper end, a perforated cover for said chamber carried by said frame and by which it is removably suspended therein in the path of the hot-air currents through said chamber, and brackets in the chamber having guide-sockets for confining the sides of said frame, substantially as and for the purpose set forth.

7. An oven for molding dental plates from celluloid blanks, comprising, in combination, a chamber supported on legs forming the space underneath it for a burner, said chamber having a hot-air-inlet opening in its base, a false bottom in the chamber covering said opening and forming an air-space and a circumferential air-passage, an asbestos shield surmounting said false bottom and forming an air-space therewith and a circumferential air-passage, a mold-press comprising a skeleton frame provided with a mold-supporting bed and having a screw working in its upper end, a perforated cover for said chamber carried by said frame and by which it is removably suspended therein in the path of the hot-air currents through said chamber, and guides on opposite sides of the chamber-wall for confining said frame at its sides, substantially as and for the purpose set forth.

JOHN A. McCLELLAND.

In presence of—
L. HEISLAR,
ALBERT D. BACCI.