T. E. MOORE.

CASTING FLASK FOR DENTISTS.

APPLICATION FILED NOV. 8, 1920.

1,369,182. **Patented Feb. 22, 1921.**

2 SHEETS—SHEET 1.

Fig. 1.

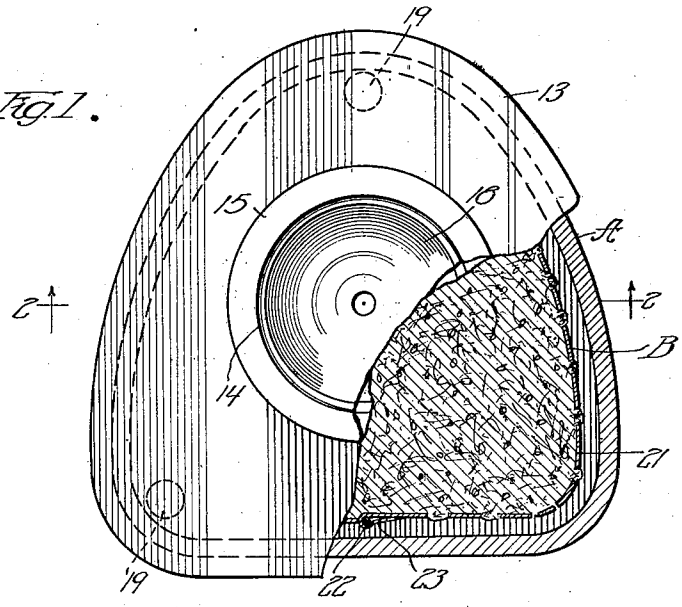
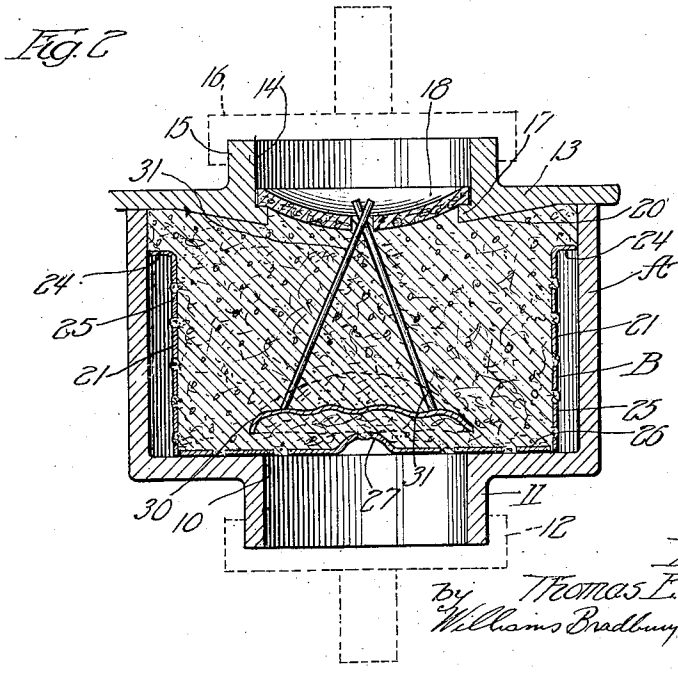


Fig. 2



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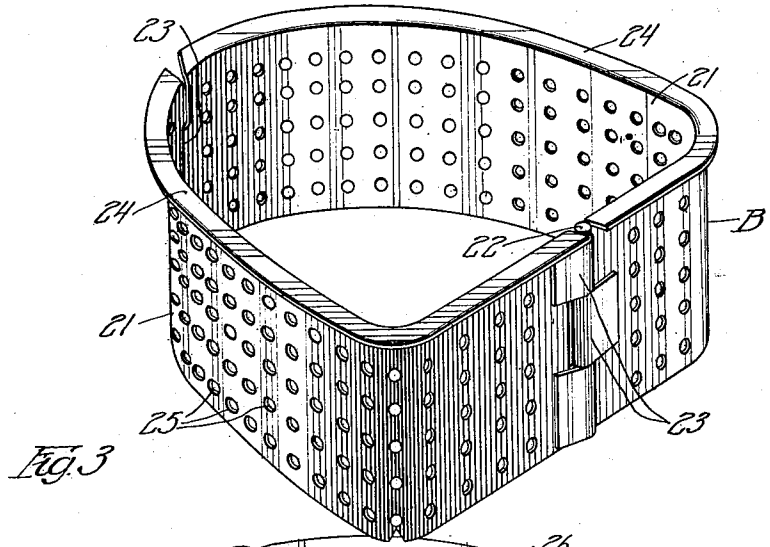


Fig. 3

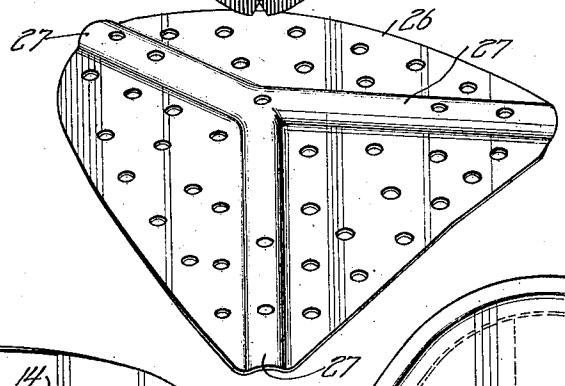


Fig. 4

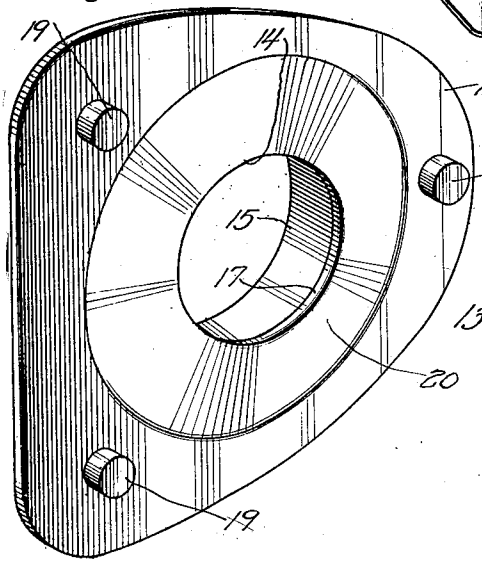
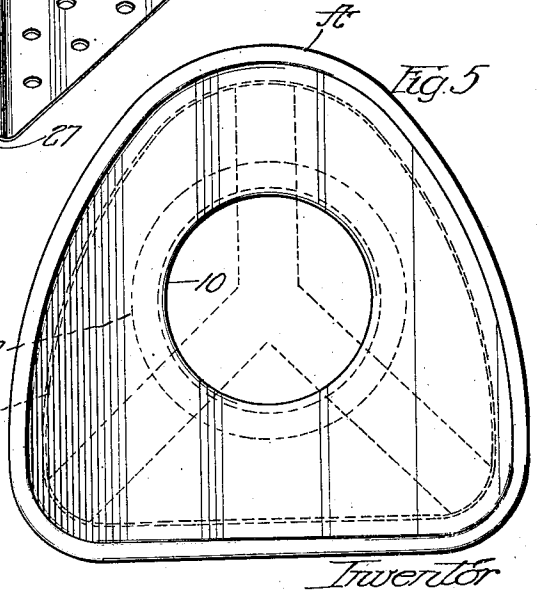


Fig. 5



Inventor

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UNITED STATES PATENT OFFICE.

THOMAS E. MOORE, OF TOLEDO, OHIO, ASSIGNOR TO THE RANSOM & RANDOLPH COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

CASTING-FLASK FOR DENTISTS.

1,369,182. Specification of Letters Patent. Patented Feb. 22, 1921.

Application filed November 8, 1920. Serial No. 422,435.

To all whom it may concern:

Be it known that I, THOMAS E. MOORE, a citizen of the United States, and resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Improvement in Casting-Flasks for Dentists, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to certain improvements in casting flasks of the type employed by dentists in casting plates, bridges, and other restorations.

A dentist in casting a plate, bridge, or other restoration, makes a pattern in wax of the article to be cast, invests this pattern in an initially plastic and quick hardening composition, permits the investment to dry, melts out, or otherwise dissipates, the wax, and then causes molten metal to flow through sprues (gates) to the mold cavity remaining after the wax has been dissipated. This is the well-known "lost wax" or cire perdue casting process that has been used in various arts for centuries.

In dental work, the investment is invariably placed in a flask which serves to confine the investment, and to facilitate the application of the force which is employed to cause the molten metal to flow to the mold cavity. The forces employed are usually centrifugal force, steam, air, or other gas pressure greater than atmospheric pressure, applied to the molten metal to cause the same to be forced into the mold cavity, or suction applied to the investment to cause the molten metal to be forced into the mold cavity, by the pressure of the surrounding air. While the particular embodiment of my invention hereinafter described is particularly adapted for use in connection with a "pressure" casting machine, a "suction" machine or a combined pressure and suction machine, it will nevertheless appear that certain features of my invention are applicable to flasks intended for use in connection with casting machines of the centrifugal or any other type.

The several types of casting flask now in general use by dentists are universally characterized by two shortcomings. First, it is a difficult matter to remove the invested casting from the flask after the completion of the casting operation. This difficulty in removal is quite serious when the casting is a plate or other comparatively large restoration. Second, the investment when placed in the ordinary flask tends to prevent the ready escape of air from the mold cavity when molten metal is forced into the mold cavity—the sluggish escape of air from the mold cavity seriously detracting from the faithfulness of reproduction of the wax pattern.

The principal objects of the present invention are to overcome the aforesaid shortcomings of the commonly used dental casting flask.

Other objects of this invention will appear as the following description progresses.

In the accompanying drawings illustrating my invention—

Figure 1 is a plan view partially in section illustrating a casting flask construction embodying my invention;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1, looking in the direction indicated by the arrows;

Fig. 3 is a view in perspective of the investment holder, or inner flask, the bottom plate for said investment holder being shown separated from the members which provide the side walls thereof;

Fig. 4 is a view in perspective illustrating the details of the under side of the cover plate for the outer receptacle, and

Fig. 5 is a top plan view which, by dotted lines, indicates the proper positions of the elements of the investment holder within the outer receptacle.

Similar characters of reference refer to similar parts throughout the several views.

The apparatus of my invention consists of two principal parts, namely, the outer receptacle A, and the investment holder B. The receptacle A in its general outline does not differ essentially from plate casting flasks heretofore used by dentists, but does embody certain improvements which render it particularly adaptable for use in the combination of my invention. When viewed in plan, the shape of the receptacle A follows roughly the general outline of a dental plate. Its side wall is imperforate, and its bottom wall is also imperforate, except at its central portion, where it is provided with a comparatively large opening 10. The opening 10 is bounded by an annular flange 11, the lower edge of this flange being preferably

ground so that it will coöperate with the bed plate (indicated in dotted lines at 12) of any satisfactory dental casting machine of the suction or combined suction and pressure type.

Receptacle A is provided with a removable one-piece cover 13, which is imperforate at all points, save its central portion where it is provided with a comparatively large opening 14. Opening 14 is bounded by an annular flange 15, the upper edge of which is preferably ground so that it will coöperate in a well-known manner with the pressure head (indicated by dotted lines at 16) of any approved dental casting machine of the pressure or combined suction and pressure type. The cover is provided with an annular shoulder 17, so that a clay crucible 18 (of the type shown and claimed in Laing Patent No. 1, 307, 299, dated June 17, 1919) may be placed in the opening 14, if desired. The cover is provided on its under surface with three projections 19—19, which serve properly to locate the cover on the receptacle A. The cover is furthermore conformed to provide an annular convex surface 20, the purpose of which will presently appear.

The investment holder B comprises two metal side members 21—21, which when joined together by removable pins 22—22 provide a cage, the general shape of which conforms to the inner contour of the side wall of receptacle A. Pins 22 coöperate with hinge loops 23 formed integral with the ends of the members 21—21, as is clearly shown in Fig. 3. It will be noted that each of the members 21—21 is provided with an outwardly turned integral flange 24 which serves to space the member 21 from the vertical wall of the receptacle A, when the investment holder has been placed in the receptacle A, as shown in Figs. 1 and 2. The members 21—21 of the investment holder are provided with a multiplicity of small apertures 25—25, which collectively afford a path for air from the investment to the space between the investment holder B and receptacle A. The investment holder comprises a bottom plate 26, which is so shaped as to fit snugly within the lower portion of the investment holder when the members 21—21 thereof are assembled as shown in Fig. 3. The plate 26 is perforated similarly to the members 21 and is provided with upwardly projecting ribs 27—27, which are formed by pressing the metal of the plate upwardly along lines diverging from the center of the plate.

In preparing to use the apparatus of my invention, in making a dental casting, for instance, in making a plate the several elements of the investment holder B are properly assembled and placed within the receptacle A, as shown in Fig. 2. A layer of plastic investment is now placed upon the investment holder bottom plate 26, to a depth substantially equal to the height of the ribs 27—27. The wax pattern indicated at 30 is now placed upon this layer of investment, and as many sprue formers 31 as may be required are properly inserted in the pattern in a well-known manner. The investment holder is then filled with investment to substantially the depth shown in Fig. 2. The cover plate 13 of the receptacle A is now placed in position, and, in case the Laing crucible is employed, it is also now placed in the position shown in Fig. 2. Attention is directed to the fact that the annular convex surface 20 of the cover plate 13 aids in spreading the plastic investment out against the wall of the outer receptacle A, when the cover is applied, thereby eliminating air pockets in the investment, and making a good seal between the upper portion of the investment and the wall of receptacle A.

After the investment material has sufficiently dried, the sprue formers are removed, and heat is applied to drive the wax out of the investment.

The flask is now placed in a suitable casting machine, metal is melted in the crucible 18, and the metal is forced downwardly through the sprues to the mold cavity by proper manipulation of the casting machine.

Regardless of the type of machine that is employed it is necessary that the air within the mold cavity be permitted to escape quickly when the molten metal goes down through the sprues to take its place. The numerous apertures in the investment holder B, forming part of the device of my invention, permit ready escape of the air from the mold cavity to the opening 10, and to the space between the investment holder and the outer receptacle. It will be seen that the channels caused by the formation of the ribs 27—27 of the investment holder bottom plate 26 afford direct communication between opening 10 and the open space between the investment holder and the receptacle A. This arrangement is particularly advantageous when the apparatus of my present invention is used in connection with a casting machine of the suction type or of the combined suction and pressure type, because in either of these cases, suction applied through the opening 10 in the receptacle A not only acts positively to draw the molten metal down into the mold cavity, but also acts positively to draw the molten metal out against the lateral margins of the mold cavity. After the casting operation has been completed, it is a simple matter to remove the investment from the flask and the casting from the investment without in any way injuring the casting. The investment holder B is taken out of the receptacle

A and one or both of the hinge pins 22 are removed. When this has been done, it is a simple matter to remove the investment holder from the investment. The investment is now broken open and the casting removed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. Apparatus of the class described comprising in combination a receptacle provided with an imperforate vertical wall and a bottom having a central aperture therein, an investment holder comprising a perforated bottom plate and a vertical wall consisting of two perforated metal members detachably connected together, the vertical wall and bottom plate of the investment holder resting upon the bottom of the receptacle, the members constituting the vertical wall of the investment holder being provided at their upper edges with outwardy turned flanges which space the vertical wall of the investment holder from the receptacle and provide an air space between them.

2. Apparatus of the class described comprising in combination a receptacle provided with an imperforate vertical wall and a bottom having a central aperture therein, an investment holder comprising a perforated bottom plate and a vertical wall consisting of two perforated metal members detachably connected together, the vertical wall and bottom plate of the investment holder resting upon the bottom of the receptacle, the members constituting the vertical wall of the investment holder being provided at their upper edges with outwardly turned flanges which space the vertical wall of the investment holder from the receptacle and provide an air space between them, the bottom plate of the investment holder being conformed to provide upwardly projecting ribs and passages affording direct communication between the opening in the receptacle bottom and the air space between the receptacle and investment holder.

3. Apparatus of the class described comprising an investment holder consisting of a perforated bottom plate and a vertical wall comprising two detachably connected perforated metal members each of which is provided at its upper edge with an outwardy turned flange.

4. Apparatus of the class described comprising an investment holder having a vertical wall consisting of a plurality of detachably connected perforated sheet metal members, each of which is provided at its upper edge with an outwardly turned flange.

5. Apparatus of the class described comprising an investment holder consisting of a perforated bottom plate and a perforated vertical wall outwardly flanged at its upper margin to space said vertical wall from a receptacle within which the investment holder may be placed.

6. Apparatus of the class described comprising an investment holder having a vertical wall consisting of a pair of perforated metal members, each of said members provided at its ends with hinge loops and removable pins coöperating with said loops, and securing said members together.

7. Apparatus of the class described including an investment holder comprising a perforated vertical wall outwardly flanged at its upper margin and a bottom plate conformed to provide ridges on its upper surface and grooves in its lower surface which extend from the margins of the bottom plate to the central portion thereof.

8. Apparatus of the class described comprising a receptacle consisting of an imperforate vertical wall and an apertured bottom, and an investment holder disposed in said receptacle and resting upon the bottom thereof, said investment holder comprising a perforated bottom and a perforated vertical wall comprising means for spacing it from the imperforate vertical wall of the receptacle.

In witness whereof I hereunto subscribe my name this 25th day of October, 1920.

THOMAS E. MOORE.

Witnesses:
Z. O. Rarrick,
Guy T. Fatner.