J. C. ROBIE.

Apparatus for Filling Molds for Hard Rubber.

No. 51,865

Patented Jan'y 2, 1866.

Fig. 6

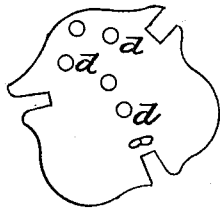


Fig. 1

Fig. 3

Fig. 4

Fig. 2

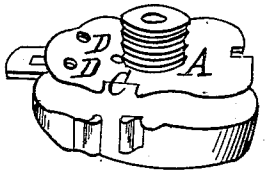
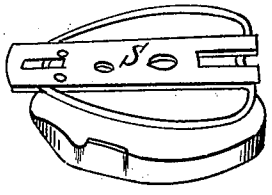


Fig. 5



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UNITED STATES PATENT OFFICE.

JACOB C. ROBIE, OF BINGHAMTON, NEW YORK.

IMPROVED APPARATUS FOR FILLING MOLDS FOR HARD RUBBER.

Specification forming part of Letters Patent No. **51,865**, dated January 2, 1866.

To all whom it may concern:

Be it known that I, JACOB C. ROBIE, of Binghamton, in the county of Broome and State of New York, have invented a new and Improved Mode of Packing or Filling Molds for Vulcanite or Hard-Rubber Work, particularly for the base of artificial denture, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a perspective view of the flask with the cylinder and screw-plug or plunger, and the end of the slide-stopper projecting from under the cover of the flask. Fig. 2 represents the flask with the cylinder and plunger detached. Fig. 3 is the screw-plug or plunger; Fig. 4, the cylinder. Fig. 5 is the slide-stopper in position, the cover of the flask being removed. Fig. 6 is an inverted view of the flask-cover, showing the sprue, safety, and vent openings.

My invention consists in the construction of a flask, with its attachments, in such a manner as to insure a more perfect and compact cast, with less complication in the arrangement, and a more expeditious and safe way of performing the operation.

The principal feature of my invention consists in the manner of filling the mold through the cover of the flask and securing the compressed material in the mold during the process of vulcanization. As the material used is highly elastic and susceptible of being condensed, this obviates all liability of spongy or porous work, giving it more of the compactness of a metallic substance, increasing its strength, and making it more impervious to the juices of the mouth.

I construct my flask in any of the usual forms, and attach to the center of the cover a boss or projection, as represented in Fig. 2, letter A. On the outside of this I cut a screw to fit the one in the caliber of the cylinder, Fig. 4. I then make an opening through this projection or boss for the introduction of the material. I also make two other openings of a much smaller size through the cover, as represented in Fig. 6.

Letter B is the sprue-opening, through which the material passes into the mold.

Letter C is the safety-opening, for the purpose of relieving undue pressure upon the mold and teeth during the operation of filling.

Letters D D are the vent-opening for the escape of air or steam from the mold while it is being filled, and for the purpose of indicating when it is full.

To prevent the material from escaping through the openings in the cover after it has been pressed into the mold, I provide a slide-stopper, as shown in Fig. 5, with openings to correspond with those in the cover. I fit this slide into the edge of the flask, so that when the cover is on it will be flush with the top and in contact with the cover. One end of this slide is slightly wider than the other, so that when it is driven in to close the openings, the plaster being set, its wedge shape allows it to move easily from its bed.

The cylinder, Fig. 4, is bored and a screw chased in it of sufficient size to admit of its being screwed onto the boss, Fig. 2, letter A. The upper end of the cylinder is squared for the application of the wrench.

The screw-plug or plunger, Fig. 3, should be accurately fitted to the thread in the cylinder and the upper end squared to receive the working-wrench E.

When I use my improvement I first arrange the plaster-impression with the wax pattern attached in the usual way; then put on the upper or cope part of the flask, fill it, place in position the slide-stopper, Fig. 5. I then put on the cover, Fig. 6, taking care that the openings correspond with those in the slide. I then insert the sprue-pin through the projection or boss into the plaster until it reaches the wax pattern. I also insert the safety and vent pins in the same manner through the openings in the cover, letters C D D. After the plaster has hardened I remove the pins, warm and separate the flask, remove the wax pattern, and if the mold is delicate I partially pack it in the ordinary manner, taking care not to fill it so full as to produce much, if any, pressure. I then close the flask, attach the cylinder, charge it with the material, enter the plunger or screw-plug, then place the entire apparatus in the heater, as shown in the original drawings, Fig. 2; or the heater may be dispensed with and a dish of boiling water substituted, or it may be placed upon the stove. When the material becomes sufficiently plas-

tic, which will require some 212° of heat, I clasp the cylinder-wrench with the left hand for the purpose of holding the apparatus steady, while with the right hand I gently turn down the screw-plug or plunger by means of the wrench E. When the mold is filled it is indicated by the appearance of the material through the vent-openings D D, Fig. 2. If the plunger is screwed down too fast the material will make its appearance through the safety-opening, letter C. In this case, were it not for this provision, the work would be injured, either by crowding the teeth from their places or breaking down the mold. After the mold is filled I drive in the slide-stopper far enough to close the vent and safety openings, while the opening through which the material passes into the mold, being larger than the others, is still partially open. I then, for the purpose of condensing the material more than could be done with the openings unclosed, give it a slight additional pressure. I then drive home the slide, letter S, thus hermetically securing the material under pressure until the work is set or vulcanized. The cylinder is then detached from the flask and the work is ready for the vulcanizer.

In some respects my method of introducing the material into the mold is similar to the one patented August 11, 1863, by Joseph Charles Howell, consequently I disclaim his arrangement for performing the operation. He uses a syringe with a nut or jacket screwed upon the outside of the cylinder in such a manner as to work the piston or plunger. The nib end of this syringe has a screw cut upon it to fit a female screw in the side of the flask, while I use no syringe, but merely a plain cylinder of the same caliber from end to end, with an inside thread to receive the screw-plug. This thread extends through the entire length of the tube, so that it is attached to the flask by screwing it onto the boss or projection, letter A, as described. Howell's syringe is attached to the side of the flask by means of the screw-nib. This is prevented from being twisted off by a square collar fitted into a cast-iron boiler. I use two wrenches, which have a counteracting effect. This obviates the necessity of securing the whole apparatus to the table or bench. This he has to do, while my improvement can be used with the same facility in any place where sufficient heat can be applied. He (Howell) cuts grooves at various points in the plaster between the two parts of the flask to facilitate the escape of the air or steam from the mold and to ascertain when it is filled, but provides no way to prevent the material from oozing out from these grooves as the heat increases in the vulcanizer, and thus relieving the pressure in the mold before the material is set or vulcanized. The inevitable result of this is porous or spongy work. I obviate all this by means of the slide-stopper, Fig. 5. Howell's arrangement makes it necessary to remove the flask and cylinder several times during the operation of filling to examine the grooves and ascertain if the mold is filled. In my improvement this is not necessary, as the openings in the top of the flask are constantly in sight.

The apparatus can be manufactured at a much less expense than the Howell patent, is not as liable to get out of order, and can be more economically and beneficially enjoyed by the public.

I claim—

1. The peculiar construction of the cylinder, Fig. 4, with the screw plug or plunger, Fig. 3, and the mode of attaching the cylinder to the flask, Fig. 2, as herein described, for the purpose set forth.

2. The openings through the cover and top of the flask, for the purposes herein described.

3. The slide-stopper, Fig. 5, letter S.

4. Retaining the material to be vulcanized in a condensed state during the process of vulcanization, for the purpose set forth.

5. The combination of the cylinder, Fig. 4, screw-plug, Fig. 3, wrenches R and E, Fig. 1, flask with vent-openings D D C in its cover, and slide-stopper S, constructed substantially as herein described, for the purpose set forth.

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Witnesses:
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