No. 755,670. PATENTED MAR. 29, 1904.

C. JOANNIDI.

DENTAL IMPRESSION TRAY.

APPLICATION FILED OCT. 13, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

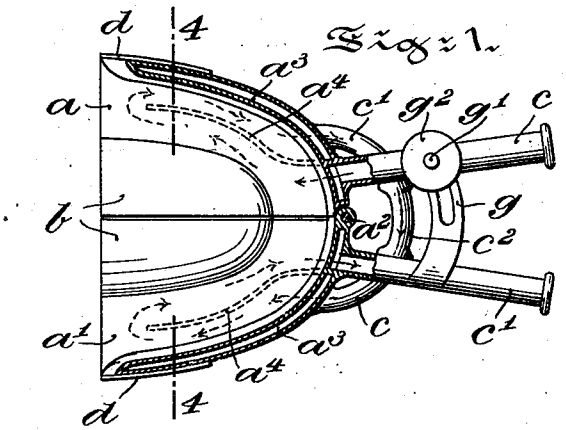


Fig. 2.

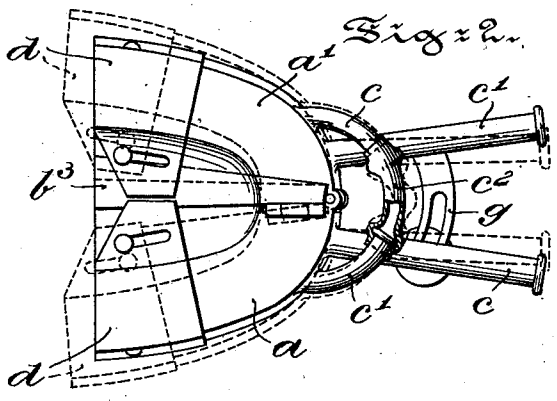


Fig. 3.

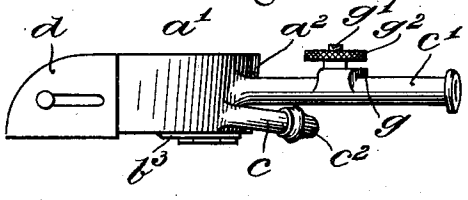
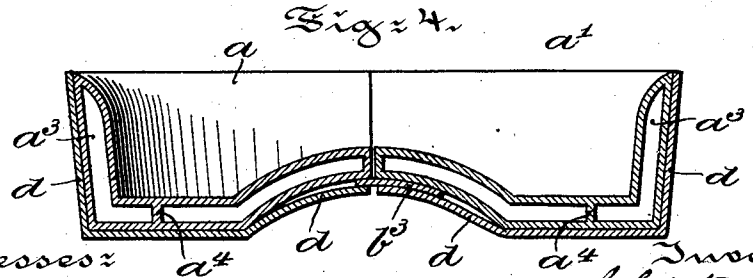


Fig. 4.



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C. JOANNIDI.

DENTAL IMPRESSION TRAY.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

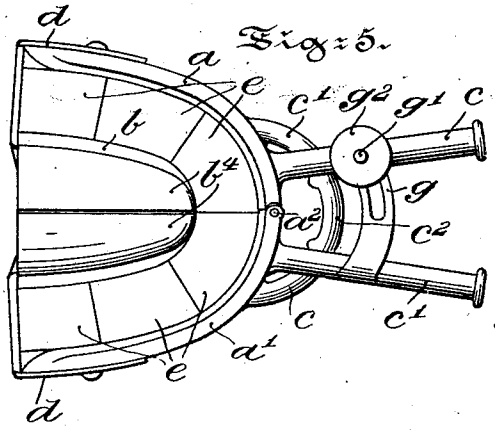


Fig. 6.

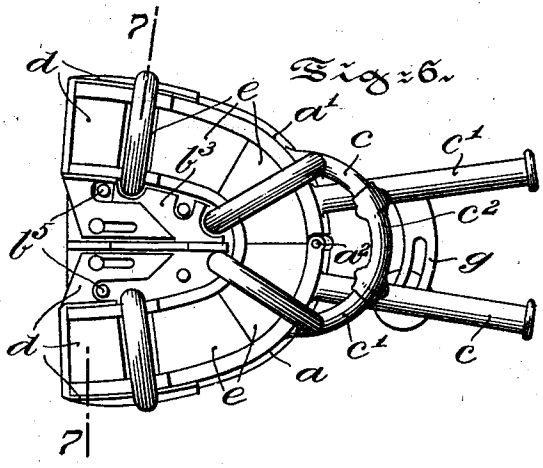


Fig. 7.

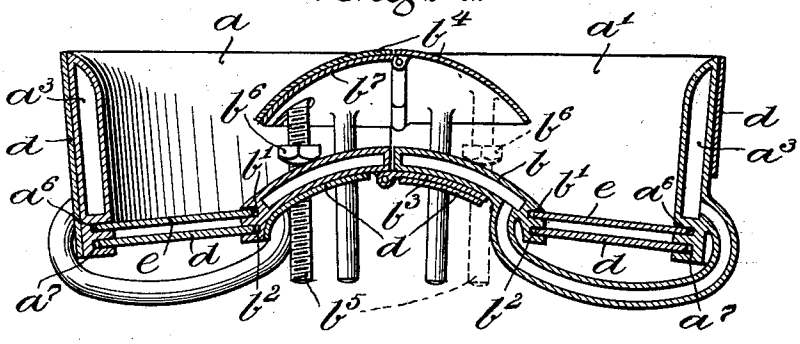


Fig. 8.

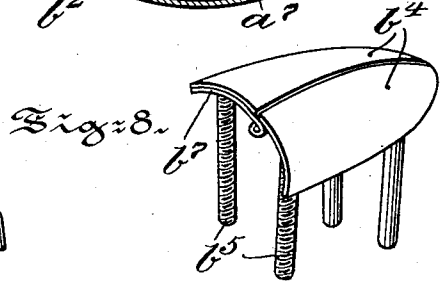


Fig. 9.

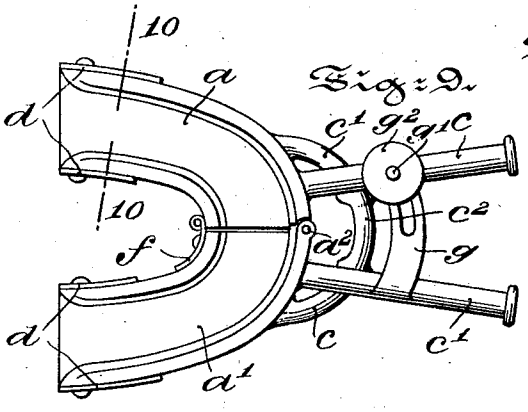
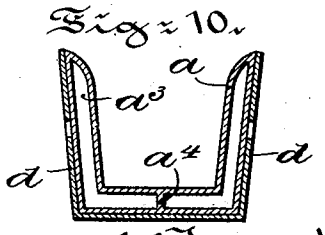


Fig. 10.



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No. 755,670. Patented March 29, 1904.

UNITED STATES PATENT OFFICE.

CHRISTOS JOANNIDI, OF CONSTANTINOPLE, TURKEY.

DENTAL IMPRESSION-TRAY.

SPECIFICATION forming part of Letters Patent No. 755,670, dated March 29, 1904.

Application filed October 13, 1903. Serial No. 176,841. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOS JOANNIDI, a subject of the Sultan of Turkey, residing at Constantinople, Turkey, have invented certain new and useful Improvements in Dentists' Impression-Trays, of which the following is a specification.

My invention has relation to a tray for dentists' use in the taking of an impression of the teeth and gums of a patient in suitable composition, which impression may thereafter be utilized in making dental plates for artificial teeth and other purposes of dentistry, and in such connection it relates to the construction and arrangement of such an impression-tray. Heretofore trays of this character were rigid and neither extensible nor adjustable. It follows, therefore, that it was necessary for each dentist to have in stock a series of trays of varying shapes and sizes from which a particular tray best adapted for the purpose in hand was selected as occasion required. Again, in trays of this character as heretofore constructed the bottoms were fixed, and against such fixed bottoms or resistance-faces the teeth impacted when biting into the impression-composition. If the patient had one or more protruding teeth, it became necessary in such cases to secure a perfect impression of the gums to cut away a portion or portions of the fixed bottoms to allow the tooth or teeth to pass therethrough. This cutting away of a portion of the tray frequently rendered the tray unfit for use in securing impressions of teeth from other patients.

The principal objects of my invention are, first, to provide a tray adjustable to suit variations of form and size of patients' jaws; second, to provide a tray wherein the parts holding the composition are jacketed to permit of the entrance and circulation of cooling liquid within said parts; third, to provide a tray wherein the bottom or face against which the teeth are to impact is made in sections, each removable from the tray to form an aperture in said bottom or face as occasion requires, and, fourth, to provide a tray wherein the bridge upon which the patient's palate rests during the taking of the impression may be raised or lowered with respect to the bottom of the tray and adjustable lengthwise to compensate for varying depths and sizes of palates found in different mouths.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a plan view, partly in section, of a tray embodying main features of my invention and especially adapted for use in taking the impression of the upper gums and teeth. Fig. 2 is an underneath plan view of Fig. 1. Fig. 3 is a side elevational view of the tray. Fig. 4 is a cross-sectional view, enlarged, taken on line 4 4 of Fig. 1. Fig. 5 is a top or plan view illustrating a tray, wherein the bottom or biting-face of the tray is formed of removable sections and the bridge is adjustable to compensate for varying palates. Fig. 6 is an underneath plan view of Fig. 5. Fig. 7 is a cross-sectional view, enlarged, taken on the line 7 7 of Fig. 6. Fig. 8 is a perspective view of the palate-bridge detached from the tray. Fig. 9 is a plan view of a tray embodying my invention, and especially designed for taking impressions of the lower jaw; and Fig. 10 is a cross-sectional view, enlarged, taken on the line 10 10 of Fig. 9.

Referring to the drawings, the tray consists of two wings or members a a', hinged together at the front, as at a^2, so as to swing upon the hinge a^2 to form a tray of greater or less width and of corresponding curvature, as indicated in full and dotted lines in Fig. 2. Each wing a or a' has by preference its base and side wall doubled to form chambers or jackets a^3, as illustrated in Figs. 1 and 4. These chambers or jackets a^3 are so arranged as to permit of a ready circulation of cooling liquid around the side walls and the bases of the two wings a and a'. For this purpose a preferred construction is shown, wherein the chamber of each wing a or a' has a partition a^4, and the compartment on one side of said partition in one wing is supplied with fluid entering through a nozzle c and passes from said compartment around the partition into the second compartment of said wing, from which it escapes through a nozzle c'. The course of the water through each wing a

and a' is indicated by dotted arrows in Fig. 1. The two nozzles c and c' of the respective wings a and a' are connected, preferably, by a flexible hose c^2. When water or other cooling liquid is forced into the nozzle c of the first wing a, it passes under pressure through compartments or jackets under the base and adjacent to the side wall of said wing a and then passes through the hose c^2 into and through corresponding parts of the second wing a' and escapes through nozzle c' into a receptacle or sink. The cooling liquid is forced through the wings a and a' when the tray is in the patient's mouth and the patient's jaw is embedded in the impression compound in the trough or mold formed by the wings. Hence a rapid cooling of said compound is secured and the time of taking the impression is materially reduced to secure the greater comfort of the patient.

In the forms of tray shown in Figs. 1 to 8, inclusive, the base of the two wings a and a' are upwardly curved, as at b, to form a hard palate bridge or rest. These forms are for taking an impression of the upper jaw. In these forms the portions b of the wings a are also jacketed to permit of circulation of the water adjacent to the hard palate-support. In each of the forms illustrated in Figs. 1 to 8 each wing a and a' has at its near end an adjustable telescoping extension d. These extensions d are projected beyond the wings a a' proper when said wings a a' are turned away from each other upon the hinge a^2, as indicated by dotted lines in Fig. 2, and are slid inward upon said wings when said wings are in closed position, as indicated in full lines in Figs. 1, 2, and 3. These telescoping extensions d compensate for the circumferential travel of the two wings when said wings are opened or extended and increase the length or extent of reach of the tray when its width is correspondingly increased. In the form of tray illustrated, for instance, in Figs. 1 to 4 of the drawings the base of each wing a and a' is solid. These bases form the bottom or face against which the teeth impact during the taking of an impression. In the form shown in Figs. 5 to 7 of the drawings this bottom or face is made in sections removable from grooves in the side wall and palate-rest b of each wing a or a'. For this purpose in the upper grooves a^6 and b', formed in said side wall and rest b, are arranged the series of plates e, forming when all are inserted a solid biting-face for each wing. Each plate e may be removed as desired from said grooves a^6 and b' to leave an aperture in said biting-face, through which aperture a protruding tooth or teeth may extend to take a proper impression of the gums and other soft parts of the mouth. In the lower grooves a^7 b^2 of the side wall and palate-rest b the telescoping extensions d are arranged to slide.

In the separation of the wings a a' in the form of tray illustrated in Figs. 1 to 8 there would normally remain an opening between the diverging palate-rest portions b of the wings. To overcome this defect, a bridging-plate b^3, secured to one wing underneath its rest portion b, is arranged to overlap underneath the rest portion b of the other wing and to fill out the space between said portions b when the wings are extended, as clearly illustrated in Fig. 4. The plate b^3 slides between the lower face of a rest portion b and the main bottom wall a^8 of the tray. In the form illustrated in Figs. 5 to 8 the palate-rest b is made adjustable in height by placing above the same an extensible bridge b^4, formed of two members arranged to be separated laterally and divergently. Each member of the bridge b^4 has two posts projecting downward through the corresponding palate-rest b of the wing a or a'. One of these posts, a^5, to the rear of the tray is screw-threaded and has a set-nut b^6, which when turned elevates the rear of the bridge b^4. The other posts, b^7, of the bridge b^4 slide loosely up and down in the bridge-rests b. By manipulating the nuts b^6 the required angularity of the extensible bridge b^4 may secured. When the members of the bridge b^4 are extended circumferentially of the tray, the space between the diverging members is filled in by a plate b^7, fixed to one member and sliding under the other member of the bridge b^4 in a manner similar to the plate b^3 of the palate-rest b.

In the form illustrated in Figs. 9 and 10 the tray is designed for use in taking impressions of the lower jaw. In this form the palate-rests are of course omitted. When the wings a and a' are extended, the space on the inner circumference of the wings is protected by an overlapping plate f, secured to one member or wing and sliding on the other member or wing.

In all the forms, if desired, the pintle of the hinge a^2 may be removed and the two wings separated for use in securing an impression of half the jaw of the patient. In all the forms the wings when moved divergently to increase the width of the tray may be locked in their extended position by any well-known means. In a simple form of such means illustrated in the drawings upon one nozzle c' is secured a slotted plate g and on the other corresponding nozzle c is formed a screw-threaded pin g'. The pin g' traverses the slot of the plate g, and this plate g is clamped to the nozzle c to form an immovable lock for the wings a and a' by advancing a thumb-nut g^2 upon the pin g' until the slotted plate g is tightly clamped down upon the nozzle c.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A dental impression-tray, comprising two hinged double-walled or jacketed wings arranged so as to be adapted to diverge, means

for extending the free ends of said wings, and means for circulating a cooling fluid through the jacketed wings of said tray.

2. A dental impression-tray having members adapted to be adjustably separated to form, as required, a tray of varying width and circumference and having portions adapted to support an impression compound double-walled to form jackets, means for connecting the jackets with each other, and means for circulating a cooling fluid through said jackets.

3. A dental impression-tray, comprising two wings hinged together at one end so as to be adapted to diverge, the base or biting-surface of each wing consisting of a series of removable plates separable from each other and from the body of the tray, combined with means for extending the free ends of each wing.

4. An adjustable dental impression-tray, comprising two wings hinged together at their forward ends and arranged to diverge at said hinge, combined with means for extending the free ends of each wing to extend the reach of the wings when moved to a divergent position with respect to each other.

5. An adjustable impression-tray, comprising two wings hinged together at their forward ends and arranged to diverge at said hinge, each wing having an inner portion, said portions forming in conjunction a palate-rest, in combination with means for adjusting the height of said palate-rest.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

CHRISTOS JOANNIDI.

Witnesses:
THEODORE POURNAROS,
ANTOINE ROSSI.