Aug. 27, 1929. C. S. RYERSON 1,725,830

DENTAL IMPRESSION TRAY

Original Filed Jan. 14, 1927

Fig. 1.

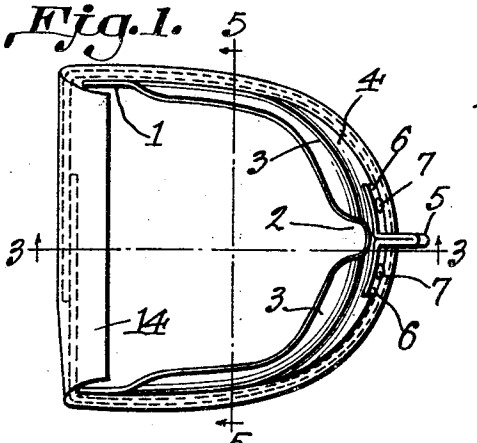


Fig. 3.

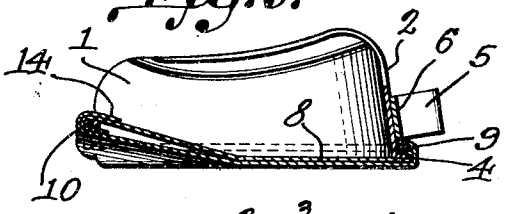


Fig. 4.

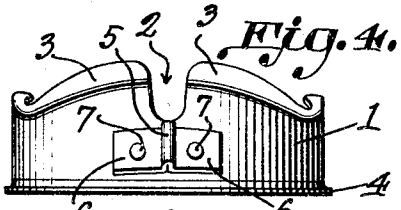


Fig. 2.

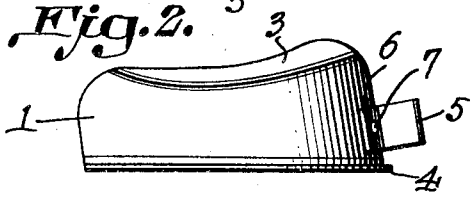


Fig. 5.



Fig. 6.

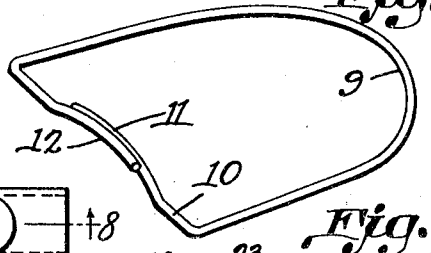


Fig. 7.

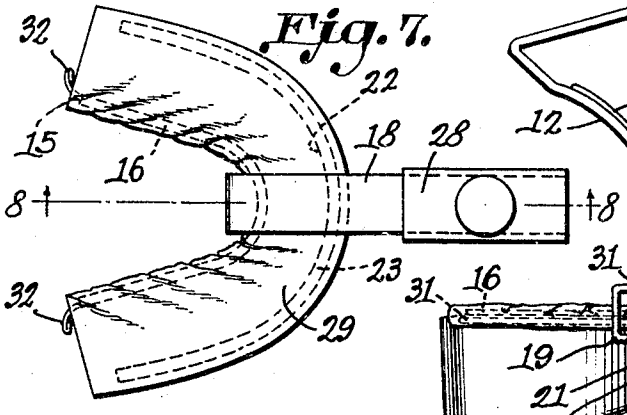


Fig. 8.

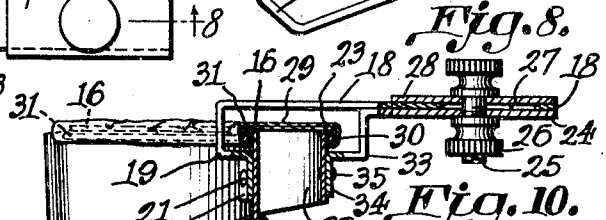


Fig. 10.

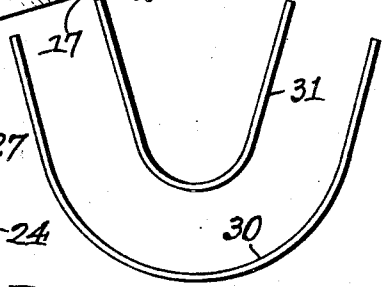
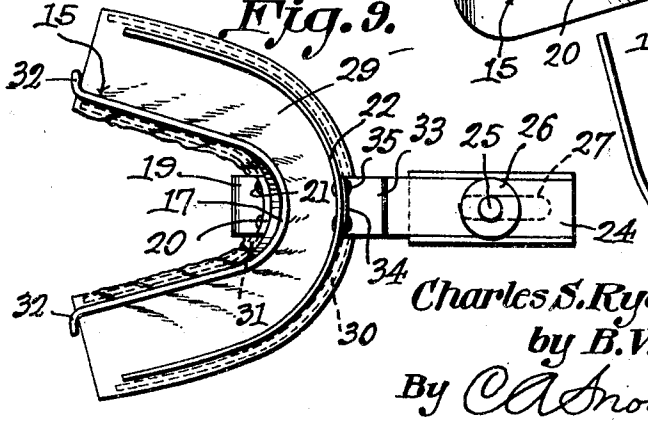


Fig. 9.



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by B. V. Imbrie Exec'r
By C. A. Snow & Co. Attorneys

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UNITED STATES PATENT OFFICE.

CHARLES S. RYERSON, DECEASED, LATE OF PITTSBURGH, PENNSYLVANIA, BY BOYD VINCENT IMBRIE, OF PITTSBURGH, PENNSYLVANIA, EXECUTOR, ASSIGNOR TO RYERSON, INCORPORATED, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF DELAWARE.

DENTAL-IMPRESSION TRAY.

Application filed January 14, 1927, Serial No. 161,207. Renewed July 8, 1929.

This invention relates to dental impression trays adapted to be used for the purpose of taking impressions of the upper jaw, or the lower jaw, or both, in the making of dentures, such as full or partial plates of false teeth, study models, bridges, or anything else that may come under the hand of a doctor of dentistry.

One object of the invention is to provide means whereby the plastic impression-material may be made to exert an equal pressure upon all parts to be copied; and to provide means whereby the aforesaid pressure may be applied at right angles to the parts which are to be copied.

Another object of the invention is to provide a dental tray, made in a plurality of parts, and capable of being set up quickly and taken down quickly, such a construction being desirable, first, in order to permit unobstructed vision in the mouth for the purpose of fitting and adjusting the tray; and second, to make it possible to remove the tray from the cast. This feature is desirable and necessary in many cases of partial impressions, where it is necessary to remove the cast in several pieces, on account of undercuts in the impression. The construction alluded to is desirable, third, because thereby it is possible to construct the rigid parts of the tray of metal, or other suitable material, so that they may be used many times, as a part of the permanent office equipment, the flexible parts being of rubber, or other suitable resilient material, the flexible parts being used once, and then discarded.

A further object of the invention is to provide a tray which will hold the tissues of the mouth, and the tongue, in a natural position whilst the impression is being made, distortion of the tissues being avoided.

Furthermore, the invention aims to provide a tray which may be placed in its final position in the mouth, whilst the plastic material is in a semi-liquid state, means being provided whereby pressure may be applied to the plastic material, and whereby the plastic material may be manipulated, in situ, without shifting the rigid parts of the tray, the rigid parts of the tray being in contact with the tissues of the mouth, to hold the tray in a natural and proper position.

Yet another object in view is to supply a tray which provides room for a thickness of the plastic material reaching to the margins of the impression, the plastic material being permitted to flow over the entire surface to be copied, and thus to flow without friction on the tissue, and without dragging and distorting the tissues from their natural position.

A further object is to supply a tray which is so constructed that the operator can feel the changing texture or hardness of the plastic material as it sets in the mouth: thereby making it possible for the operator to apply pressure to the plastic material at the proper time.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view which will appear as the description proceeds the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawings:—

Figure 1 shows in top plan, an impression tray constructed in accordance with the invention, and adapted to be used in the making of an upper denture; Figure 2 is a side elevation of the tray which is shown in Figure 1; Figure 3 is a longitudinal section, taken upon the line 3—3 of Figure 1; Figure 4 is an end elevation of the tray disclosed in Figures 1, 2 and 3; Figure 5 is a cross section, taken on the line 5—5 of Figure 1; Figure 6 is a perspective view disclosing the retainer which holds the yieldable resilient member, or bottom, on the body of the tray, as disclosed, for instance, in Figures 3 and 1. Figure 7 is a top plan of a tray embodying the invention and adapted to be used in the making of a lower denture; Figure 8 is a sectional view, taken on the line 8—8 of Figure 7, sundry parts remaining in elevation; Figure 9 is a bottom plan of the tray depicted in Figure 7; Figure 10 is a perspective view wherein ap-

pear the resilient retainers employed in connection with the tray which is delineated in Figures 7, 8 and 9.

Considering, first, the device disclosed in Figures 1, 2, 3, 4, 5, and 6 of the drawings, it may be stated that this tray is adapted to be used in the making of an upper denture. The tray comprises an arched body 1, formed of any suitable material, Monel metal being suggested, because that substance, although having the necessary rigidity, may, nevertheless, be bent readily into any shape desired, to conform to the configuration of the maxilla. A notch 2 is fashioned in the upper edge of the body 2, at the front thereof, and on either side of the notch 2, or elsewhere, there are located stop flanges 3 which project inwardly from the upper edge of the body 1. The body 1 is provided at its lower edge with an outstanding lip 4. A forwardly extended gage 5 is located in the median longitudinal plane of the body 1 and may be used to place the body of the tray properly in the mouth of the patient, with the nose of the patient as a reference point. The gage 5 may conveniently consist of a U-shaped piece of material, the sides of which are closed together and provided with outstanding feet 6 held upon the forward portion of the body 1 by securing elements 7.

The bottom of the upper tray comprises a yieldable resilient member 8, which may be a rubber bag, fashioned from dam stock, or the like, and open at the back only. In Figure 6 of the drawings there is shown a resilient loop-shaped metal retainer 9 provided at its rear end with arms 10 which are overlapped on each other, as at 11, and arched upwardly as at 12 to conform in a general way to the curvature of the roof of the mouth. The retainer 9 is inserted into the bag-like resilient member 8, the rear portions of the member 8 being folded over the arms 10, to form flaps 14, the member 8 being engaged across the edge of the lip 4, and the retainer 9 gripping the body 1, above the lip 4, the lip, of course, cooperating with the retainer 9 to hold the resilient bottom-forming member 8 in place on the body 1, as shown in Figure 6 of the drawing.

The plastic material is placed in the tray, and the tray is located properly in the mouth, by means of the gage 5, the stop flanges 3 spacing the body 1 from the gum, so that the plastic material can work up about the gum. Owing to the fact that the member 8 is yieldable and resilient, the operator can manipulate the plastic material, exerting the necessary pressure, and noting the stage to which the set of the plastic material has progressed. The construction of the device is such that the resilient bottom-forming member 8 and the retainer 9 may be detached from the body 1 under any conditions dictated by the exigencies of the particular case, or by the mode of procedure which the practitioner desires to follow.

The tray which forms the subject matter of illustration in Figures 7, 8, 9 and 10 of the accompanying drawings, is adapted to be used upon the mandible, in the making of a lower denture. The tray embodies a U-shaped or arched inner member 15, and a correspondingly shaped outer member 22, and in the making of these parts, the use of Monel metal suggested, for the reasons hereinbefore set forth in the description of the upper tray. The inner member 15 may be supplied at its ends with outwardly extended projections 32. Figure 8 of the drawings shows that at its upper edge, the inner member 15 has a laterally projecting lip 16, corresponding in function to the lip 4 of Figure 5. At its lower edge, the inner member 15 has a laterally projecting stop flange 17, the function of which is the same as that of the stop flanges 3 of Figure 5, namely, to hold the tray in spaced relation to the gum, thereby enabling the operator to work the plastic material along the gum, since, owing to the provision of the flange 17, a space exists between the said flange and the gum. The outer member 22, hereinbefore alluded to, has a lip 23 that extends laterally, as shown in Figure 8.

A means is provided for handling the tray and for keeping the members 22 and 15 at the desired distance from each other. Having this consideration in mind, an arm 18 is provided, the arm including an extension 19 prolonged downwardly around the lip 16, in spaced relation thereto, the part 19 having an end piece 20 disposed at right angles to the arm 18 and attached to the inner member 15 by means of a securing element 21. The arm 18 is supplied, near to its outer end, with an elongated slot 27. An arm 24 is provided and has an off-set extension 33 extended around the lip 23 of the outer member 22, as shown in Figure 8, the part 33 having an end 34 located at right angles to the arm 24 and connected by a securing element 35 to the outer member 22. A securing device is shown, the same embodying a bolt 25 and a nut 26. A U-shaped retaining trough 28 is inverted over the arms 18 and 24; and prevents them from swinging out of alinement horizontally, that is, in a horizontal direction, an observation which will be understood readily when Figure 9 is noted. The bolt 25 is mounted in the yoke 28 and in the arm 24 and is received in the slot 27 of the arm 18. The construction is such that the arms 18 and 24 may be shifted longitudinally with respect to each other, thereby to vary the space between the inner member 15 and the outer member 22, and when the desired adjustment has been obtained, the parts may be retained in adjusted positions by tightening up the nut 26.

The top of the tray embodies a yieldable re-

silient member 29, constructed of rubber or other material, like the member 8, and of tubular form. Resilient U-shaped metal retainers 30 and 31 are slipped into the double-walled member 29, the member 29 being extended between the parts 15 and 22, as shown in Figures 7, 8 and 9, the retainer 31 being engaged beneath the lip 16 of the member 15, and the retainer 30 being engaged beneath the lip 23 of the outer member 22. By slacking away the nut 26, the parts 15 and 22 may be shifted to tighten the part 29, if desired, the nut 26 then being set up into clamping position.

Owing to the fact that the yieldable resilient member 29 is provided, the plastic material may be manipulated and controlled, in a way which will be understood readily from what has been stated hereinbefore, in connection with the form shown in Figure 1. The member 29 may be referred to as a "closure" because it closes the space between the parts 22 and 15; and the same term may be applied to the member 8, because it closes the space within the arched body 1. Any of the parts 1, 15 or 22 may be described as an arched body.

What is claimed is:—

1. A dental impression tray comprising an arched body having a lateral lip, a resilient closure extended around the lip and a retainer engaged with the lip and holding the closure thereon.

2. A dental impression tray comprising an arched body provided with a gum-engaging stop, and with a lip, the stop and the lip projecting in opposite directions, a resilient closure, and a retainer cooperating with the lip to hold the closure thereon.

3. A dental impression tray embodying inner and outer members, a closure bridging the space between said members and of sufficient elasticity to permit kneading of plastic material under hand pressure exerted through the closure, and means for holding the closure releasably on said members.

4. A dental impression tray embodying inner and outer members, a resilient closure bridging the space between said members, means for holding the closure releasably on said members, and mechanism for holding the inner and outer members at adjusted distances apart.

5. A dental impression tray embodying inner and outer members having lateral lips, retainers engaged with the lips, and a resilient closure bridging the space between said members, and held on the lips by the retainers.

6. A dental impression tray embodying inner and outer members, one of said members having a gum-engaging stop, a resilient closure bridging the space between said members, and means for holding the closure releasably on said members.

7. A dental impression tray comprising an arched body, a double-walled resilient closure, and a retainer between the walls of the closure and extended about the body.

In testimony that I claim the foregoing as the invention of the said CHARLES S. RYERSON, I hereunto set my hand.

BOYD VINCENT IMBRIE,
Executor of the last will and testament of Charles S. Ryerson, aforesaid, deceased.