Dec. 4, 1951 P. CUNNINGHAM 2,577,513

DENTAL TRAY

Filed March 28, 1949 2 SHEETS—SHEET 1

Fig. 1

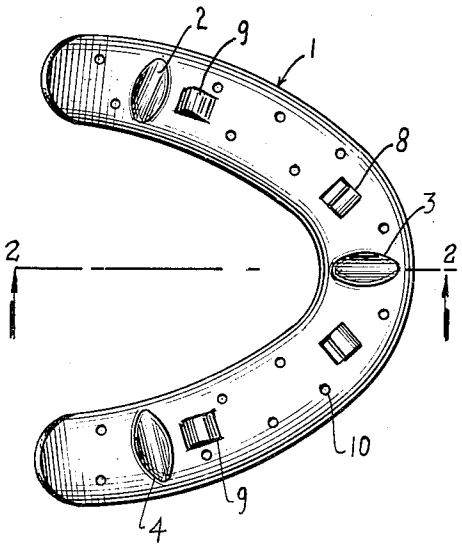


Fig. 3

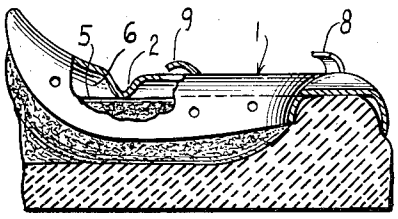


Fig. 5

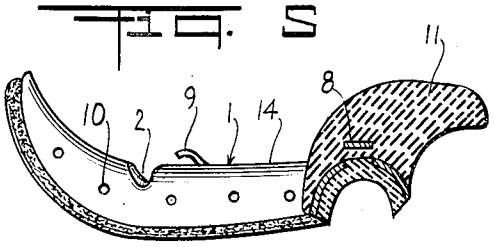


Fig. 2

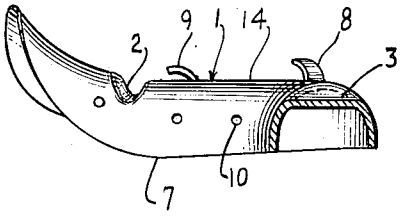


Fig. 4

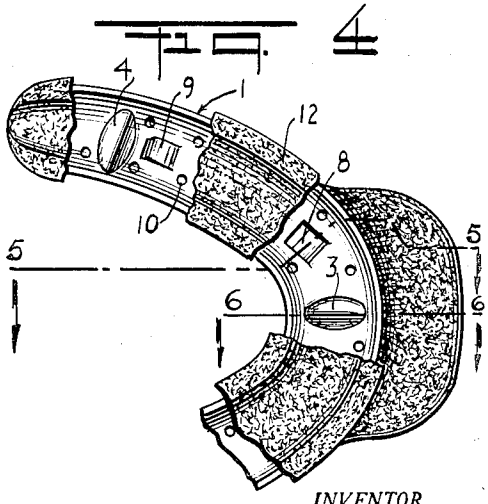
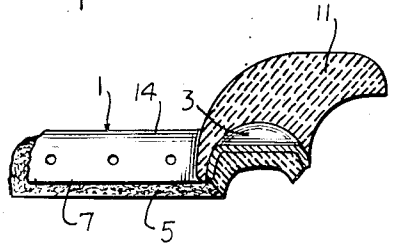


Fig. 6



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Fig. 7

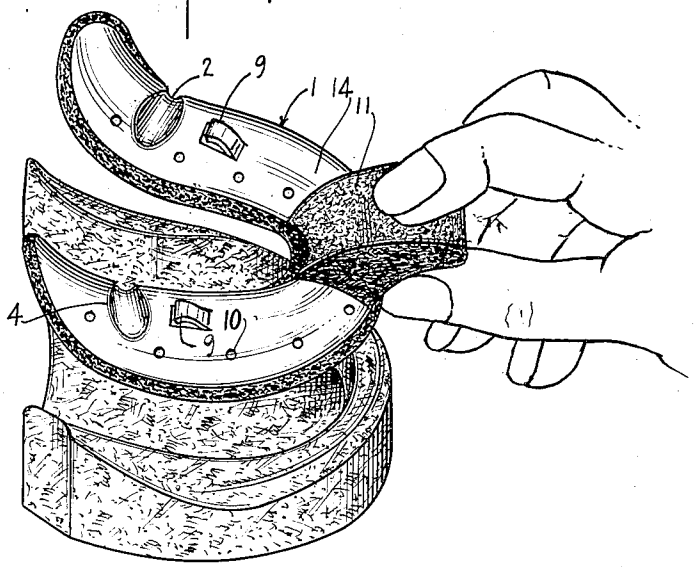


Fig. 8

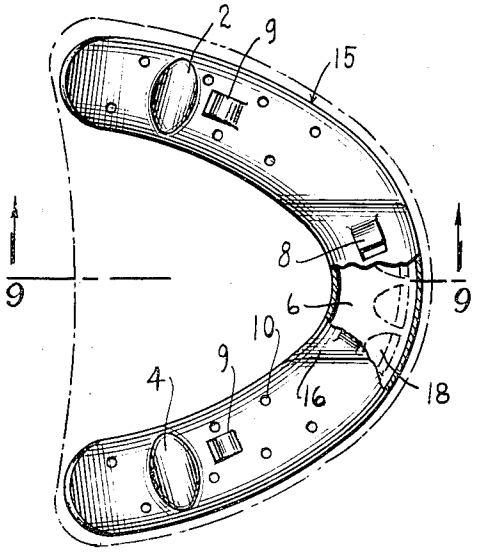
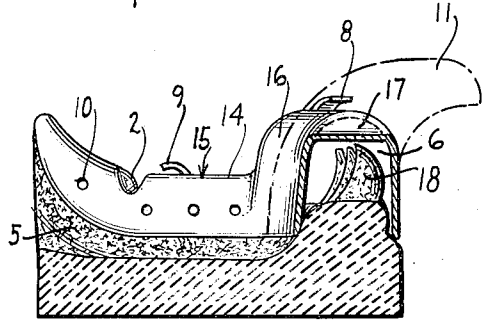


Fig. 9



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UNITED STATES PATENT OFFICE

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DENTAL TRAY

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Application March 28, 1949, Serial No. 83,988

9 Claims. (Cl. 32—17)

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This invention relates to a dental tray and to a method of making dentures which eliminates steps from the conventional denture making methods now employed.

It is an object of this invention to provide a dental tray in sizes just slightly larger than the ridges of patients so that the tray may be filled with impression material and a single impression taken from which a final cast may be made.

It is another object of this invention to provide a tray of this class which is pliable and which may be trimmed from the periphery to fit the ridges of individual patients, so that a single impression may be taken from which a final cast may be made.

It is another object of this invention to provide a tray of this class which may eliminate the conventional step of building trays for individual patients.

It is still a further object of this invention to provide a tray of this class which has three ridge contactors therein so that the tray may rest on the ridges of patients at a minimum number of points.

It is yet another object of this invention to provide a tray of this class having upstanding tabs thereon adapted to provide means to which a temporary handle, preferably of expendable material, may be attached.

It is a still further object of this invention to provide a tray of this class having tabs thereon which may be utilized, after the cast has been made from the single impression, to aid in retaining a means on the tray by which the bite of the patient may be measured.

It is still a further object of this invention to provide a tray of this class in which the tabs for retaining such bite measuring means may be in depressed position when the tray is not being employed in measuring the bite.

Still another object of this invention is to provide trays of this class which may be provided in a plurality of stock sizes.

A still further object of this invention is to provide a tray of this class which may be provided in modified form and in stock sizes for employment where the ridges of patients have some teeth remaining therein.

Another object of this invention is to provide a tray of this class which is easily and inexpensively produced in large quantities.

It is a further object of this invention to provide a tray of this class having thereon means which may be used, after an impression has been taken and a cast has been made, to assist the adherence of a substance or device to the tray so that the bite may be measured.

It is also an object of this invention to provide a tray of this class which in modified form may

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be employed in the process of preparing immediate dentures.

It is also an object of this invention to provide a method of making dentures which eliminates the steps of taking snap impressions and making casts therefrom.

It is yet another object of this invention to provide a method of making partial dentures which is less expensive and more accurate than present methods employed.

It is still a further object of this invention to provide a method of making immediate dentures which is less expensive and more accurate than present methods employed.

Other and furhter objects of this invention will be obvious when the specification is considered in connection with the drawings in which:

Fig. 1 is a plan view of a tray;

Fig. 2 is a sectional elevation taken along line 2—2 of Fig. 1;

Fig. 3 is a sectional elevation of a tray in place in the mouth of a patient;

Fig. 4 is a partial plan view of the tray after an impression has been taken, the tray being shown as having been turned over from its position in Fig. 3;

Fig. 5 is a sectional view taken along line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken along line 6—6 of Fig. 4;

Fig. 7 is a perspective view showing a cast as having been made from the impression in the tray;

Fig. 8 is a plan view of a modified tray which includes a box;

Fig. 9 is a sectional elevation taken along line 9—9 of Fig. 8.

In the conventional method of making dentures a tray of rigid construction and relatively expensive material is provided which has a handle rigidly fixed thereto. This tray is of a large size compared to the space within the mouth of the patient, and is filled with impression material and fitted over the ridge of the patient to obtain a first impression, which of necessity is inaccurate as to the exact delineation of the ridge over which the material is impressed. This is true since the tray itself fills the mouth and does not permit the assistance of the fingers of the operator to firmly control the taking of the impression, which must be accomplished by the manipulation of the handle from the exterior of the mouth.

From the first impression a cast is made, which means that the open space defined within the impression material, and representing the rough conformity of the ridge, is filled with a substance which will harden into a cast. After this cast has hardened, a tray is built over it which is slightly larger than the ridge and is of substan-

tial rigidity, and which ordinarily has a rigid handle thereon. This tray is then filled with impression material and a second or final impression is taken, and in this operation the reduced size of the tray as compared to the first tray, and its close approach to the configuration of the ridge, permits the fingers of the operator to manipulate the tray within the mouth so that an accurate impression may be taken.

From this final impression a final cast is made which conforms to the exact ridge contour, and from this cast a plate of false teeth or denture is made to fit over the ridge.

The tray of this invention has a use in the making of full, partial, and immediate dentures, both upper and lower, whereby it reduces the steps of the conventional method, and additionally it may be applied in the measuring of the bite of the patient after the impression has been made and a cast has been made therefrom.

As the advantageous and novel results obtained by the tray of this invention may be most readily understood by comparing its application in making full dentures to the making of full dentures by the conventional method, as has been hereinabove set forth, the shortened steps of such usage will be stated in detail as a basis of comparison of the novel results obtained thereby.

The drawings show a tray 1, and the manner of its use in making the impression for a lower denture. This tray is of substantially semi-elliptical form and of substantially semi-circular cross-section and has indentations or ridge contactors 2, 3 and 4 therein. As shown in Fig. 3 these ridge contactors extend below the top of the tray and rest on the ridge 5 of the patient so as to leave a space 6 between the ridge and the inner surface of the tray, which space in operation contains the impression material, not shown, which takes the impression of the ridge.

The tray is of a pliable metal as soft aluminum, and can be trimmed from the periphery 7 to conform the tray to the ridge of the individual patient. To serve as means for attaching a handle to the tray, tabs or lugs 8 are provided, and additional tabs 9 are also provided to serve with the tabs 8 as means for attaching a bite measuring means as will be hereinafter described. The tray may or may not have holes 10 therein for purposes of retention of impression material in the tray.

The tray of this invention may be provided in stock sizes, as small, medium, or large, to generally conform to ridges of patients which may be grouped in corresponding sizes. The operator selects an appropriate size, places it over the ridge of the patient with his fingers, and judges whether or not it should be trimmed, and at what points if any, so as to properly conform it to the ridge and so as to provide the requisite space between inner surface of tray and ridge for an adequate amount of impression material.

He then affixes a handle 11 to the tabs 8, which preferably consists of some expendable material, such as modeling compound, or other suitable composition. The operator then has a choice of materials and techniques for taking the single impression required, which compares with the taking of the final impression in ordinary dental procedure.

The tray is then placed in the mouth and over the ridge until the indentation or ridge contactors touch the ridge tissue lightly. This indicates to the operator that the tray is in correct position to assure that the exact configuration of the ridge will be impressed in the impression material as it proceeds to harden.

The tray, and the impression 12, are then removed and a cast is made therefrom by pouring a cast material into the impression, such material being a substance which will harden to form a cast.

The steps hereinabove described, which the drawings apply to the making of a lower cast, also apply to the making of an upper cast. When these casts have been completed, the trays, with the impressed and hardened impression material therein, are removed from the cast and the handles 11 are removed from the trays.

Bite rims, or any other suitable appliances, are then mounted on the convex surfaces 14 of both upper and lower trays, and the retention of such rims or appliances on the trays is assisted and established by means of the tabs 8 and 9. The trays, with the impression material therein, and with suitable appliances or substances for establishing the bite installed thereon, are then placed in the mouth and the bite determined.

When the bite is determined, the upper and lower trays are sealed or joined together while still in the mouth of the patient, and this subassembly is then removed. The upper and lower casts are then fitted back into the impression and the final assembly thereof is then mounted on an articulator from which the dentures are made.

The technique or method of employing the tray of this invention is not limited to the exact procedure which has been set forth herein immediately above but other methods and technique may be employed with the tray as well. One obvious variation consists in the employment of a handle, as of wire, which may be attached to the tabs and the tray. No specific structure is shown as only mechanical skill would be required to construct and apply any number of conventional handles in this manner. However, the employment of such a handle in combination with the tray would result in as novel a combination of elements for achieving the results of this invention as is shown being achieved by the combination of the tray with the handle shown in Figs. 4, 5, 6, 7, and 9.

In the conventional way of taking impressions for partial dentures, the impression of the serviceable teeth to be retained and the ridge on which the partial denture is to be placed, is taken with the conventional type, large, rigid tray as is used for taking the "snap" impression hereinabove described. Obviously such impressions cannot conform with any high degree of accuracy to the configuration of the remaining teeth of the ridge.

The tray of this invention may be modified for taking impressions for partial dentures by providing a stock of modified trays in sizes and in patterns to conform with ridge conditions generally encountered which require the construction of partial dentures. These trays 15 resemble the general contour of the tray 1, with the exception that a box 16 is formed by pressing out or moulding the metal to cover both the teeth and ridge. The tabs 8 in this construction are installed on top of the box 16, and an indentation or contactor 17 is provided to locate the tray 15 upon the remaining teeth 18, and to insure that sufficient space remains around the teeth for impression material. The tap 9 may or may not be required, dependent upon whether or not the bite is to be established in the individual case considered. The successive steps of making a partial denture

with the tray 15 correspond in sequence to the steps of making full dentures.

If the posterior teeth have been extracted for immediate denture construction, the front teeth remaining, the bite may be established in the posterior ridges in the following manner:

A tray, not shown, which is a modification of the tray 1, may be employed, which tray has the top or arched portion cut away in front so as not to interfere with the front teeth left remaining. The bite is then established in the tray in the posterior area thereof, as hereinabove generally described for measuring the bite with the tray.

Broadly this invention considers a dental tray, and methods of employing such tray, so as to shorten, cheapen, and improve dental techniques presently employed in making dentures.

What is claimed is:

1. A dental tray of pliable and easily trimmed metal, said tray being of substantially semi-elliptical form and of substantially semi-circular cross-section to confine impression material between the tray and the ridge of a patient, upstanding means on said tray to assist and complete the attachment of a handle to the tray, additional means on said tray, normally depressed, to be forced into upstanding position so that said first and second means may serve together to assist and complete the connection of bite measuring means to said tray, holes in said tray to aid the adherence of the impression material and the bite measuring means thereto, and a plurality of indentations formed integrally with said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge.

2. A dental tray of substantially semi-elliptical form and of substantially semi-circular cross-section and composed of pliable and easily trimmed metal, upstanding means on said tray to assist and complete the attachment of a handle to the tray, additional means on said tray, normally depressed, to be forced into upstanding position so that said first and second means may serve together to assist and complete the connection of bite measuring means to said tray, and a plurality of indentations formed integrally with said tray to contact the ridge of a patient at a minimum number of points to maintain the tray in spaced relation from the ridge.

3. A dental tray of pliable and easily trimmed material and comparing in shape and cross-section to the ridge of a patient so as to confine impression material between the tray and ridge, upstanding means on said tray to assist and complete the attachment of a handle to the tray, additional means on said tray, normally depressed, to be forced into upstanding position so that said first and second means may serve together to assist and complete the connection of bite measuring means to said tray, and a plurality of indentations formed integrally with said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge.

4. A dental tray of pliable and easily trimmed material and comparing in shape and cross-section to the ridge of a patient so as to confine impression material between the tray and ridge, upstanding means on said tray to assist and complete the attachment of a handle to the tray, and a plurality of indentations formed integrally with said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge.

5. A dental tray consisting of pliable and easily trimmed metal of a shape to fit over the partially edentulous ridge of a patient, indentations formed integrally with said tray to contact the ridge and teeth at a minimum number of points to permit an impression material to be confined between said tray and said ridge, and upstanding means on said tray to assist and complete the attachment of a handle to the tray.

6. A dental tray of pliable and easily trimmed material and comparing in shape and cross-section to the ridge of a patient so as to confine impression material between the tray and ridge, upstanding means on said tray to assist and complete the attachment of a handle to the tray, a plurality of identations formed integrally with said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge, and a handle for attachment to said upstanding means and tray.

7. A dental tray of pliable and easily trimmed material and comparing in shape and cross-section to the ridge of a patient so as to confine impression material between the tray and ridge, upstanding means on said tray to assist and complete the attachment of a handle to the tray, a plurality of identations in said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge, and a flexible handle for attachment to said upstanding means and tray.

8. A dental tray of pliable and easily trimmed material and comparing in shape and cross-section to the ridge of a patient so as to confine impression material between the tray and ridge, upstanding means on said tray to assist and complete the attachment of a handle to the tray, a plurality of indentations formed integrally with said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge, and a mouldable handle for attachment to said upstanding means and tray.

9. A dental tray of pliable and easily trimmed material and comparing in shape and cross-section to the ridge of a patient so as to confine impression material between the tray and ridge, and a plurality of indentations formed integrally with said tray to contact the ridge at a minimum number of points to maintain the tray in spaced relation from the ridge, said tray having a portion thereof cut away to permit the tray to be fitted over teeth remaining in said ridge.

PAUL CUNNINGHAM.

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