Feb. 23, 1943. L. JONES 2,311,836

MEANS FOR MAKING ARTIFICIAL DENTURES AND APPARATUS THEREFOR

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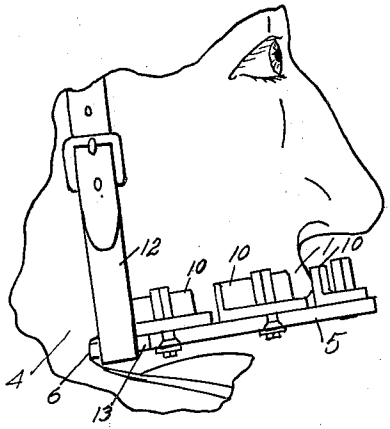


FIG. 1.

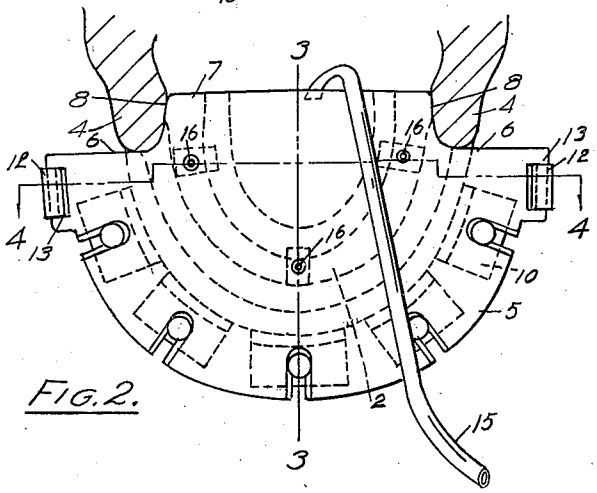


FIG. 2.

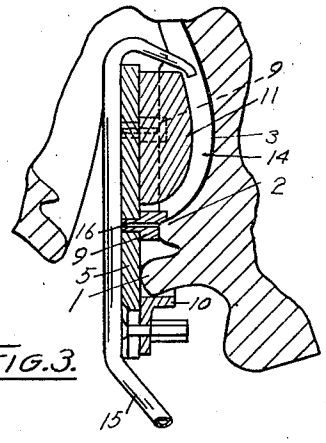


FIG. 3.

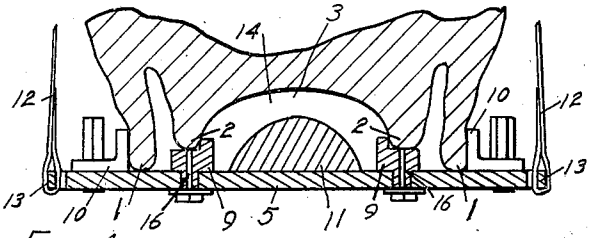


FIG. 4.

INVENTOR.
LLOYD JONES

BY

Florian G. Miller Atty.

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MEANS FOR MAKING ARTIFICIAL DENTURES AND APPARATUS THEREFOR

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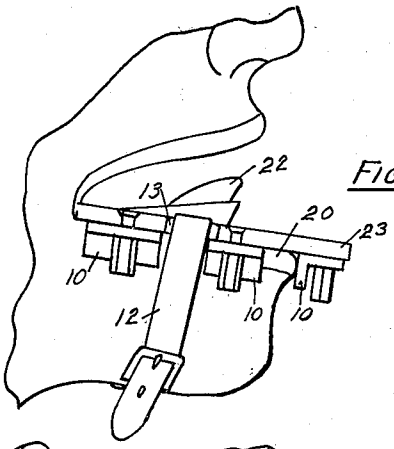


FIG. 5.

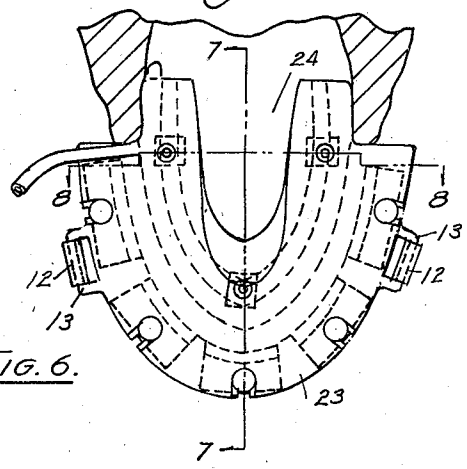


FIG. 6.

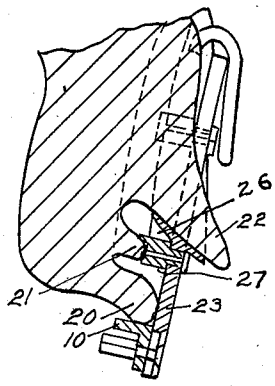


FIG. 7.

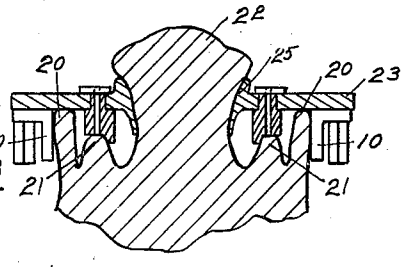


FIG. 8

INVENTOR.
LLOYD JONES

BY
Florian G. Miller
Atty.

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MEANS FOR MAKING ARTIFICIAL DENTURES AND APPARATUS THEREFOR

Lloyd Jones, Greenfield Township, Erie County, Pa.

Application July 14, 1941, Serial No. 402,323

4 Claims. (Cl. 32—17)

This invention relates generally to artificial dentures and has for its object the improvement of the method of obtaining impressions for their manufacture as well as the means for carrying out this method.

All devices and methods made and used in accordance with the teachings of the prior art, and with which I am familiar, use various modeling compounds which substances are placed on trays or the like and forced against the upper or the lower gums with sufficient pressure for the compounds to flow and assume a shape approximating an impression which is used as a model for shaping the denture. This method appears simple but hundreds of thousands of people are using dentures which cause misery and untold annoyance due to errors which accompany the present method of taking impressions. The gums consist of the jaw bones with a covering of thin flesh to which are attached various muscles and membranes for manipulating the jaws, the cheeks, the lips and the tongue. In order to maintain the dentures in position in the mouth, it is essential that a good fit exists between the gums and the denture plate and in addition the plate must also contact the palate or roof of the mouth in the case of upper dentures, and also the muscles which operate the jaws and the lips, and also the tongue in the case of lower dentures. This fit must be such as to assist in creating a suction between the denture plate and the portion of the mouth in which it is in contact without interfering with the free movement of the moving muscles or the flow of blood to all such parts. Furthermore, the pressure of the plate on the gums and adjacent parts must be evenly distributed over as much area as possible because localized pressures cause sores and swellings.

There are no two mouths alike. The amount of modeling compound must differ for each one as well as the pressure required to secure an exact impression. Pressure may vary because of differences in amount of compound used and because of plasticity of the compound and its evenness of distribution. There are differences in the firmness of the gums in different mouths and between various parts of the same mouth. Furthermore, dentists vary in their capacity to use and judge pressure and also in their experience in determining the value the different factors require. It is apparent from the above that with all of the variables present in obtaining a perfect fitting denture, it is practically impossible to obtain good results with present methods.

It is, accordingly, an object of my invention to overcome all of the difficulties set forth above as well as other difficulties in obtaining a perfect fitting denture, and it is more particularly an object of my invention to provide means for obtaining impressions for making an artificial denture which is simple in construction and application, economical in cost, and economical in manufacture.

Another object of my invention is to provide a novel method of forming impressions for making artificial dentures.

Other and further objects and advantages of my invention will appear from the following detailed description, taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevational view of my novel invention in position for taking an impression of the upper part of the mouth.

Fig. 2 is a plan view in cross-section of my novel invention in place for an upper impression.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a view taken on the line 4—4 of Fig. 2.

Fig. 5 is a side elevation view showing my novel invention in position for obtaining an impression of the lower part of the mouth.

Fig. 6 is a plan view partly in section of my novel invention shown in Fig. 5.

Fig. 7 is a view on the line 7—7 of Fig. 6.

Fig. 8 is a view on the line 8—8 of Fig. 6.

Like reference characters refer to like parts in the different figures.

Referring to Figures 1, 2, 3, and 4, the parts shown refer more particularly to the upper part of the mouth. 1 represents the upper lip, 2 the upper gum, 3 the palate, and 4 the cheeks. A tray 5 of proper shape and size, preferably semi-circular in shape, and made of one or several pieces as desired, is disposed in the upper part of the mouth with the shoulders 6 in contact with the joint of the upper and lower lips. An extension 7 of tray 5 extends into the mouth as far back as the upper teeth had extended and also closely contacts the inside of the cheeks at 8. The upper lip 1 contacts the flat surface of the tray 5 in a natural slightly pressing manner. In the normal mouth there will now be some space between the surface of the tray 5 and the gum 2 when all of the teeth have been withdrawn. This distance is determined and blocks 9 are used instead of the teeth. The blocks 9 are preferably adjustable, and are spaced on the tray 5 in the form of a semi-circle so as to contact the gum 2, this contact being made

preferably at the front and two sides. As no lips are alike, adjustable supports 10 are disposed on the tray 5 to maintain the lip in position. A shape member 11 is formed or attached to tray 5 which extends up toward the palate 3 by means of straps 12 or the like attached to the fasteners 13. The tray 5 may be held in a predetermined position without distorting the lips 1 or cheeks 4 because blocks 9 are interposed between the firm portions of the gum 2 and the tray 5. A space 14 is formed between the inside of the upper part of the mouth and the surface of the tray 5 which is closed on all sides by the lip 1 and the cheeks 4 except the side towards the throat. With the head of the patient in a downward horizontal position, the space 14 assumes a vertical position with the back opening now being at the top. Space 14 therefore forms a receptacle or mold into which is injected or poured by means of a conduit 15 or the like, a flowing material capable of congealing or hardening or setting. This material will descend to the bottom of the space 14 which is the front of the mouth, fill up the space between the lip and gum 2 and gradually ascend filling up the side spaces between the lip and gum and also the palate driving out the air through the top opening. When the material reaches the proper level, the supply is cut off and a predetermined interval of time is allowed to elapse to permit the material to set or harden or to assume a plastic state. Upon removal from the mouth, lip supports 10 are removed to give the lips freedom of movement and the impression which now occupies space 14 is removed with or without the assistance of tray 5.

It will be evident from the foregoing description that impressions of the mouth may be taken under various conditions, as, for example, in a case where all of the teeth have been drawn from the upper jaw and a new set of dentures are required, three blocks 9 would be needed in order to adjust the tray to a proper relationship with the jaw. In a case where the front teeth only were removed, the teeth on each side could be used as spacing members and only one block 9 at the front of the gums would be necessary in order to locate the tray 5. Another example would be where practically all of the teeth are in place, and it is desired to take an impression of the mouth before the teeth are drawn. In such an event, the teeth themselves can be used for locating the tray in correct relationship with the jaw. In all of these examples, the tray is placed in proper relationship with the lips and cheeks so as to have the lips and cheeks in as nearly a state of repose as possible while still acting as seals against the escape of fluid.

As the impressions will closely conform to the upper and/or lower portions of the mouth, difficulty may be experienced in the removal of the impression due to atmospheric pressure. Apertures 16 in blocks 9 are therefore provided so that air under pressure may be introduced between the solidified impression and the adjacent portions of the mouth to break the vacuum after the holding straps are released. Blocks 9 when removed from the impression will leave small holes which may be filled in before the impression is used for moulding the denture.

Figs. 5, 6, 7 and 8 show means for taking an impression of the lower jaw wherein 20 represents the lower lip, 21 the lower gum, 22 the tongue, 23 the tray, with all parts similar to those of the above described device for the upper jaw. For the lower jaw, the setting up process is similar to that for the upper jaw except that instead of a palate, we have a tongue 22 to deal with. The tray 23 differs from tray 5 for the upper jaw in that the central portion 24 is cut away and given a special contact 25 for forming a joint or seal between the tray 23 and the tongue 22. Space 26 differs from space 14 in the upper jaw in shape only. Space 26 assumes a vertical position open at the throat when the head of the patient is in a downward horizontal position in the same manner as before mentioned for the upper jaw. The blocks 27 serve same function as blocks 9 in Fig. 4.

During the molding of the impression, it will be evident that there is no pressure distortion of muscles or membranes as these members are in a stationary position slightly set due to their seal forming action. No pressure is utilized except the hydraulic force due to the weight of the liquid.

As liquid materials exert even pressures governed by the height thereof, regardless of the shape of the container or mold, the pressures are exactly the same on both sides of the mouth. As the height of the mold is only a matter of between two and three inches, the difference in pressure between the bottom and the top of the mold is negligible. Any slight outward force due to the weight of the liquid acting on the lip and cheek may be counteracted by supports 10. As the cheeks and lips and muscles are at rest during the molding operation, an exact impression can be made especially of those softer portions of the mouth which play such an important part in the suction holding action on the denture. Furthermore, dentures made by this process will be evenly supported over the entire contact area, but where pressure is applied during the process of chewing and the flesh compresses, then the load is automatically transferred to the firm or more solid portions of the mouth. The softer portions naturally tend to yield more freely thereby causing the jaws to carry the load without interfering with the muscular action and suction contact in the mouth. After the impressions are made, the dentures may be made therefrom in the conventional manner.

It will be evident from the foregoing that I have provided a novel method of forming impressions of a mouth for the manufacture of dentures which is simple, absolutely accurate, and which may be manipulated by one with very little experience. Further, I have provided the means for carrying out the above mentioned method.

Various changes may be made in the specific embodiment of the present invention without departing from the spirit thereof or from the scope of the appended claims.

What I claim is:

1. The method of making impressions of the teeth, gums, cheeks, lip, and adjacent tissues of portions of the mouth while in an undistorted state of repose, comprising the formation of an open mold with a comparatively flat tray adapted to have a sealed relationship with the cheeks and one lip, disposing said tray in a vertical position, and introducing flowing, initially plastic composition into said mold with a force equal to the hydrostatic pressure resulting from a column of liquid approximately the same height as the vertical mold and allowing the material to solidify while the gums, cheeks, lip and adjacent tissues are in an undistorted state of repose.

2. The method of making impressions of the teeth, gums, cheeks, lip and adjacent tissues of the mouth, comprising the formation of an open mold with a tray adapted to have a sealed relationship with the cheeks, tongue and one lip; disposing said tray in a substantially vertical position; and introducing a flowing, initially-plastic composition into said mold with a force equal to the hydrostatic pressure resulting from a column of liquid approximately the same height as the vertical mold, and allowing the material to solidify.

3. A dental tray for forming an open mold in the mouth, adapted to receive flowing, initially-plastic material under a pressure approximately equal to that caused by the force of gravity of the composition in the mold, for taking impressions of the teeth, gums, cheeks, lip and adjacent tissues in an undistorted state of repose, comprising a comparatively flat member, marginal edges on said member adapted to engage the cheeks and an exposed lip of the mouth in sealing relationship, a portion of said marginal edge adapted to engage said exposed lip extending outwardly from the mouth, and adjustable and removable members on the outward marginal edge of said tray for securing the lip of the patient against outward movement when said tray is in a substantially vertical position.

4. A dental tray for forming an open mold in the mouth, adapted to receive flowing, initially-plastic material under a pressure approximately equal to that caused by the force of gravity of the composition in the mold, for taking impressions of the teeth, gums, cheeks, lip, tongue and adjacent tissues in an undistorted state of repose, comprising a comparatively flat member having a tongue-engaging portion, marginal edges on said member adapted to engage the cheeks and an exposed lip of the mouth in sealing relationship, a portion of said marginal edge adapted to engage said exposed lip extending outwardly from the mouth, and adjustable and removable members on said outwardly extending marginal edge for securing the lip of the patient against outward movement when said tray is in a substantially vertical position.

LLOYD JONES.