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TRIAL DENTURE BASE PLATES
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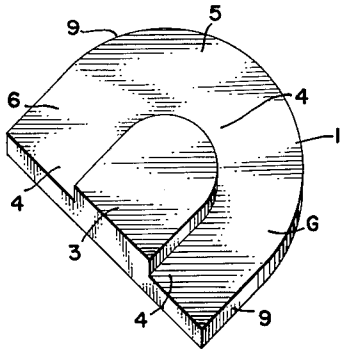


Fig. 1

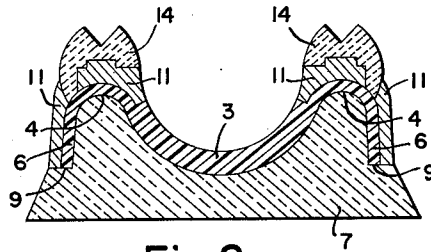


Fig. 2

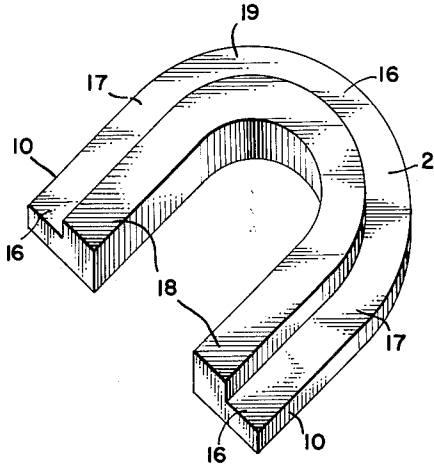


Fig. 3

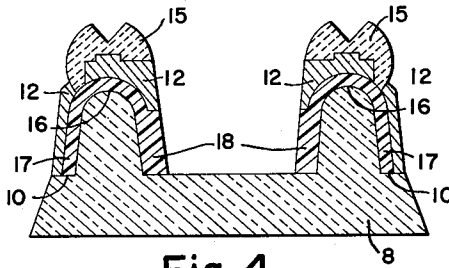


Fig. 4

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TRIAL DENTURE BASE PLATES

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6 Claims. (Cl. 32-2)

This invention relates in general to construction of artificial dentures in wax form. They are called trial dentures and are subsequently processed into permanent resin dentures, and particularly to the thermoplastic base thereof, which is called the trial denture base, or the base plate and is formed of a plate of thermoplastic material which is rigid at mouth temperatures and moldable at temperatures somewhat above that, but below 212 degrees Fahrenheit.

Trial denture base plates, in general use today, are usually made with shellac as their principal ingredient, in thicknesses of approximately one-sixteenth of an inch, these thicknesses are called single thickness, and are reasonably rigid at mouth temperatures, nevertheless, they bend under pressures and temperatures such as are encountered when bite registrations and other operations incident to forming the wax denture are performed. The magnitude of this distortion, which is ultimately reflected in the finished denture, is sufficient to greatly impair its fit and function and cause the patient great discomfort.

With this knowledge of bending of base plates in mind, various methods and materials are employed to strengthen the palatal portion of the base of an upper trial denture or the lingual flange of a lower, where most bending occurs. One method is to reinforce the palatal portion or lingual portion of the base plate with a piece of steel wire which has been contoured to the necessary shape and anchored thereto by heat. This method affords adequate strength against bending, but at the same time it is quite costly because of the great time necessary to carry the operation through.

Another method employed is to use a base plate having twice the usual thickness. Here again is another costly operation. A double thickness base plate, for example, is easily and readily adapted to the palatal portion of a gypsum cast of an upper jaw by heat softening the same, however, adapting it to the ridges of said cast is time consuming and difficult to perform. Furthermore, when attachment of the necessary artificial teeth to the thick base plate is attempted, it will invariably be found that these teeth are positioned too far away from the ridges of the jaw cast, because of said double thickness. Thus, it becomes necessary to cut away sufficient thickness of the base plate on the ridge, for correctly positioning said teeth. Needless to say this is also a tedious and time consuming operation.

It is therefore the principal object of the present invention to provide a thermoplastic base plate of such form and construction which will greatly increase its resistance to bending when used in the mouth, and at the same time be easily and readily adapted to a gypsum cast, on the palatal areas as well as on the ridges and flanges, and also provide a relatively thin layer on the ridges to expedite proper positioning of artificial teeth thereto.

This and other objects will be readily apparent in the following description and drawing in which like reference characters in the various views represent the same things

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and in which Figure 1 is a perspective top-view of an upper trial denture base plate, Figure 2 is a cross-sectional view of a wax upper trial denture positioned on a gypsum cast, using the base plate provided in the present invention, Figure 3 is a perspective top-view of a lower trial denture base plate and Figure 4 is a cross-sectional view of a wax lower trial denture positioned on a gypsum cast, using the base plate provided in the present invention. In the dental art, the form of gypsum used for casts of the jaws is known as artificial stone, its composition is identical with plaster of Paris, but is much harder due to a particular method of manufacturing it. Also, the expression, the tissue surface of the cast, means the surface of the cast which represents or duplicates in shape the tissues of the jaws.

Generally speaking, the present invention overcomes the difficulties of bending, as experienced when single thickness base plates of standard type are used, and the difficulties of molding a double thickness base plate to the ridge portion of a jaw cast and also of setting artificial teeth sufficiently close to the ridges of a gypsum cast, by providing a thermoplastic base plate having two different thicknesses. For example, the area of an upper base plate which normally forms the palate of an upper trial denture, I provide with approximately double or more the thickness of a standard type, single thickness base plate, and that portion of the base plate which normally forms the ridge and flange portions, of an upper trial denture, I provide with a single thickness or being half as thick as the palatal portion. Thus the palatal area of the trial denture, where the most extensive bending takes place, will be formed of double thickness base plate, to resist bending, and the ridge area will be formed of base plate of single thickness, to provide easy adaptation to the cast in this area and at the same time allow artificial teeth to be positioned sufficiently close to the ridges of the jaw cast.

It is to be noted at this point that under normal procedure of constructing wax trial dentures, artificial teeth are attached to the base plate, on the ridge portions thereof, by paraffin wax. This attached wax at the same time also strengthens the single thickness portion of the base plate against bending. Thus, since the palatal area is provided with strength against bending, by possessing a double thickness, and the single thickness ridge portion is strengthened by paraffin wax, the trial denture, when using the base plate provided in the present invention, becomes quite rigid and thereby maintains its accuracy throughout the various procedures followed in normal denture construction.

Similarly, in lower base plates, the area thereof which forms the ridge and labial-buccal flange portions of the trial denture is of single thickness and the lingual flange portion, where greatest strength is necessary, is of double thickness.

Considering now the present invention in more detail, the upper base plate 1 and the lower base plate 2 may be formed of any suitable thermoplastic material. Shellac is used extensively in producing base plates in present standard use. Principally, it should be relatively rigid at mouth temperature, that is, about 99 degrees Fahrenheit, in plate thicknesses of approximately one-sixteenth of an inch, which is the average thickness of that which is called single thickness base plates, in the dental art, and be plastic and moldable at temperatures higher than that and below 212 degrees Fahrenheit. Preferably, their peripheral outlines should be similar to those in standard use today, although variations in form may be made without loss of advantage provided in the present invention. The preferable form of an upper base plate 1 is substantially arch-shape or trapezoidal. These shapes are adapted to very conveniently form the palate, ridge por-

tions and the labial and buccal flanges of an upper trial denture. However, an upper base plate may be, for example, square in outline and function as well. In this form however, there will be a waste of thermoplastic material. A modified trapezoidal outline is the form best adapted to form the palatal ridge and flange portions of an upper trial denture. Whichever form is used, the raised or thickened palatal area will be located in the central area, with one of its sides adjacent to the posterior border of the base plate and its opposite side spaced from the anterior border of the base plate. In lowers, the substantially U-shape type 2, is preferable. In respect to the peripheral outline of the palatal area, that is the double thickness or raised area 3 of upper base plates, I prefer the substantially arch shape outline, with its curved top located in the anterior region adjacent the ridge portion of the base plate and its straight bottom edge, adjacent the posterior border of the base plate. However, it may have a quadrangular outline and work just as well. Also its posterior border may have narrow lateral extensions for reenforcing the entire posterior border of the upper base plate. In respect to its upper surface it may be flat, slightly curved, have its edges taper to meet the base plate or be provided with a raised spine running anteriorly-posteriorly or buccal to buccal. In lowers, I prefer the raised area to be U-shape in outline, and located in the lingual flange area 18 of the lower base plate, with its inner edge adjacent the inner edge of the base plate. It may also have some of the forms recited above for upper base plates. 4 is the portion of the upper base plate, single thickness, which normally covers the ridge portion of the upper jaw cast 7, while 5 and 6 normally form the flanges of wax trial denture, 5 forming the labial flange and 6 forming the buccal flange. Likewise in the lower base plate 2, 16 covers the ridge portion of the lower jaw cast 8, while 17 forms the buccal flange and 19 the labial flange thereof. 9 and 10 are the peripheries of the flanges, 9 being the upper and 10 the lower. 11 and 12 represent paraffin wax which attaches the artificial teeth 14 and 15 to the single thickness areas of their respective base plates. It is this paraffin, as can be seen in the drawing, which reenforces and thereby strengthens the thin areas of the base plates, as explained above.

When using standard type single thickness base plates in upper wax trial dentures, it is necessary to add paraffin wax to the palatal area thereof to bring the thickness up to the thickness desired in the palate of the finished denture. This is time consuming labor. However, since the desired thickness of a denture's palate is usually approximately that of double thickness base plate that is approximately one-eighth of an inch, and since the base plate provided in the present invention has a recommended double thickness, approximately one-eighth of an inch, in its palatal area, it becomes unnecessary to perform the task of building up the palatal thickness of the base plate provided in the present invention. Furthermore, double thickness palates provide a uniform thickness whereas manually increasing the thickness thereof produces a palate of very uneven thickness, which must be corrected in the finished denture. Similarly, in lowers, the same holds true of the lingual flange.

A further advantage lies in the fact that these base plates may be produced or manufactured as easily as standard base plates, molded as one piece or two pieces cemented or welded together, requiring a little less material than standard type double thickness base plates and a little more material than standard type single thickness base plates.

Having described the invention in one of its preferred forms, it clearly being understood that other forms and constructions may be made without departing from the spirit of the invention, I claim:

1. A thermoplastic base plate, for forming the base of an upper trial denture, including the bucco-labial flange,

ridge and palatal portions of said trial denture base, by molding said base plate in its plastic state, to the tissue surface of a cast of an upper jaw, formed of artificial stone, comprising a substantially flat body of thermoplastic material which is rigid at 99 degrees F. temperature and soft enough to be molded to said stone cast at less than 212 degrees F., said thermoplastic body having an area at least sufficient to cover the entire tissue surface of said stone cast, a portion of said area being substantially thicker than the rest of said thermoplastic body, said thicker portion having a thickness which is suitable as the palatal thickness of a finished denture formed of plastic, said thicker portion located spaced on at least a major portion of its periphery from the periphery of said thermoplastic body and having sufficient area to substantially cover the palatal surface of said stone cast, when molded thereto, so that when said trial denture base is produced by molding said thermoplastic body, in its heat softened state, to the tissue surface of said stone cast, with said thicker area covering the palatal surface of said cast, the palatal portion of said trial denture base will have the same thickness as said thicker portion of said thermoplastic body, providing the palatal portion of said trial denture base thereby with desirable resistance to bending when used in a mouth and desirable thickness for a pattern of a palate for forming a mold for a finished denture of plastic, and the flange and ridge portions of said trial denture base being not as thick, will allow artificial teeth to be attached thereto in proper position.

2. A thermoplastic base plate, for forming the base of an upper trial denture, including the bucco-labial flange, ridge and palatal portions of said trial denture base, by molding said base plate, in its plastic state, to the tissue surface of a cast of an upper jaw, formed of artificial stone, comprising a substantially flat body of thermoplastic material which is rigid at 99 degrees F. temperature and soft enough to be molded to said stone cast at less than 212 degrees F., said thermoplastic body having an area at least sufficient to cover the entire tissue surface of said stone cast, a portion of said area having a thickness which is approximately twice as thick as that of the rest of said thermoplastic body, said thicker portion being approximately one-eighth of an inch thick and located spaced on at least a major portion of its periphery, from the periphery of said thermoplastic body, and having sufficient area to substantially cover the palatal surface of said stone cast, when molded thereto, so that when said trial denture base is produced by molding said thermoplastic body, in its heat softened state, to the tissue surface of said stone cast, with said thicker area covering the palatal surface of said cast, the palatal portion of said trial denture base will have the same thickness as said thicker portion of said thermoplastic body, providing the palatal portion of said trial denture base thereby with desirable resistance to bending when used in a mouth and desirable thickness for a pattern of a palate for forming a mold for a finished denture of plastic, and the flange and ridge portions of said trial denture base being half as thick, will allow artificial teeth to be attached thereto in proper position.

3. A thermoplastic base plate, for forming the base of an upper trial denture, including the bucco-labial flange, ridge and palatal portions of said trial denture base by molding said base plate, in its plastic state, to the tissue surface of a cast of an upper jaw, formed of artificial stone, comprising a substantially flat body of thermoplastic material which is rigid at 99 degrees F. temperature and soft enough to be molded to said stone cast at less than 212 degrees F., the peripheral outline of said body being substantially that of a trapezoid, said body having an area at least sufficient to cover the tissue surface of said stone cast, a portion of said area having a thickness which is substantially twice as thick as the rest of said thermoplastic body, said thicker area having a peripheral outline of an arch, the base of said arch being

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adjacent the broad base of said trapezoid, and the rest of the peripheral outline of said arch being spaced from the periphery of said trapezoid, said thicker portion having an area sufficient to substantially cover the palatal surface of said stone cast, when molded thereto, said thinner portion having a thickness approximately one-sixteenth of an inch, so that when said trial denture base is produced by molding said thermoplastic body, in its heat softened state, to the tissue surface of said stone cast, with said thicker area covering the palatal surface of said cast, the palatal portion of said trial denture base will have the same thickness as said thicker portion of said thermoplastic body, providing the palatal portion of said trial denture base thereby with desirable resistance to bending when used in a mouth and desirable thickness for a pattern of a palate for forming a mold for a finished denture of plastic, and the flange and ridge portions of said trial denture base being half as thick, will allow artificial teeth to be attached thereto in proper position.

4. Claim 3 wherein the thick palatal portion of said base plate is depressed into a curved shape to simulate the arched palatal portion of a trial denture base, whereby to facilitate molding the thick palatal portion of said base plate to the palatal surface of said stone cast.

5. A thermoplastic base plate, for forming the base of a lower trial denture, including the bucco-labial flange, ridge and lingual flange portions of said trial denture base, by molding said base plate, in its plastic state, to the tissue surface of a cast of a lower jaw, formed of artificial stone, comprising a substantially flat, U-shape body of thermoplastic material, which is rigid at 99 degrees F. temperature and moldably plastic at less than 212 degrees F., and having an area at least sufficient to cover the tissue surface of said stone cast, a portion of said area being approximately one-eighth of an inch thick and the remaining area being approximately one half as thick, said thicker portion having an area sufficient to form the lingual flange portion of said trial denture base, and being located spaced on at least a major portion of its periphery from the periphery of said thermoplastic body so that when said trial denture base is produced by molding said thermoplastic body, in its heat softened state, to the tissue surface of said cast, with said thicker area covering the lingual surface of said cast, the lingual flange of said trial denture base

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will have the same thickness as said thicker portion of said thermoplastic body, providing the lingual portion of said trial denture base thereby with desirable resistance to bending when used in a mouth and desirable thickness for a pattern of the lingual flange for forming a mold for a finished denture of plastic, and the ridge and flange portions of said trial denture being half as thick, will allow artificial teeth to be attached thereto in proper position.

6. A thermoplastic base plate, for forming the base of an upper trial denture, including the bucco-labial flange, ridge and palatal portions of said trial denture base, by molding said base plate in its plastic state, to the tissue surface of a cast of an upper jaw, formed of artificial stone, comprising a substantially flat body of shellac, said thermoplastic body having an area at least sufficient to cover the entire tissue surface of said stone cast, a portion of said area being substantially thicker than the rest of said thermoplastic body, said thicker portion having a thickness which is suitable as the palatal thickness of a finished denture formed of plastic, said thicker portion located spaced on at least a major portion of its periphery from the periphery of said thermoplastic body and having sufficient area to substantially cover the palatal surface of said stone cast, when molded thereto, so that when said trial denture base is produced by molding said thermoplastic body, in its heat softened state, to the tissue surface of said stone cast, with said thicker area covering the palatal surface of said cast, the palatal portion of said trial denture base will have the same thickness as said thicker portion of said thermoplastic body, providing the palatal portion of said trial denture base thereby with desirable resistance to bending when used in a mouth and desirable thickness for a pattern of a palate for forming a mold for a finished denture of plastic, and the flange and ridge portions of said trial denture base being not as thick, will allow artificial teeth to be attached thereto in proper position.

References Cited in the file of this patent

UNITED STATES PATENTS

522,212	How	July 3, 1894
760,295	Allen	May 17, 1904