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M. VALEN

3,548,499

ARTIFICIAL TOOTH

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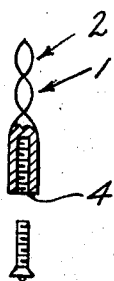


Fig. 1



Fig. 2

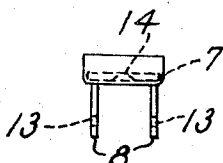


Fig. 3

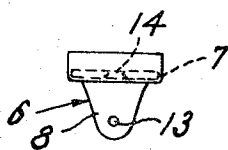


Fig. 4

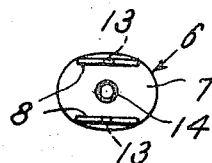


Fig. 5

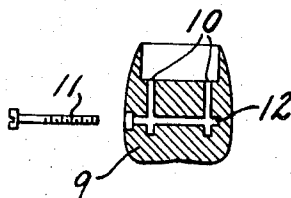


Fig. 6

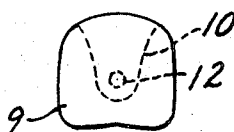


Fig. 7

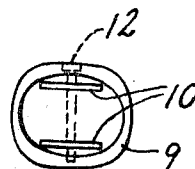


Fig. 8

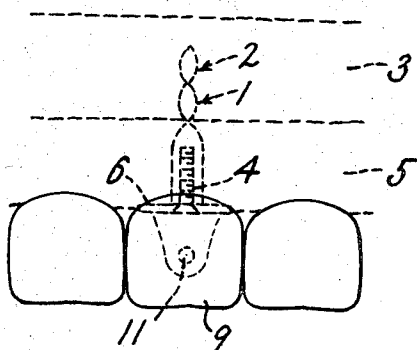


Fig. 9

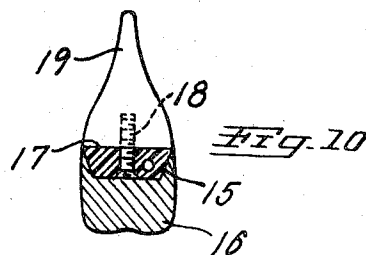


Fig. 10

INVENTOR.
Maurice Valen
BY Bert J. Lewen

ATTORNEY

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3,548,499

ARTIFICIAL TOOTH

Maurice Valen, 97-07 63rd Road,
Rego Park, N.Y. 11374

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3 Claims

ABSTRACT OF THE DISCLOSURE

An alignment plate and means for positioning an artificial tooth. The alignment plate has a substantially flat central portion in which a hole is formed after alignment of the plate on the gum surface. It projects and engages the artificial tooth and secures it firmly in position.

This invention relates to a method of securing artificial teeth to a rigid member embedded in the gum, such as, an implant or non-vital root, and a device therefor.

Replacing missing teeth by means of an implant was suggested over half a century ago (see U.S. Pat. No. 943,113) and, in the last fifteen years, implants have become an established dental technique. In present practice, after the implant is adequately encapsulated in the fibrous tissue of the jaw, the final prosthodontic bridge or crown is constructed about the portion of the implant which remains above the soft tissue. Similarly, it is well known to affix an artificial tooth to a part of a devitalized tooth.

The conventional procedures for fitting a crown are unsatisfactory from several standpoints. Firstly, the molding and fitting of each individual artificial tooth must be done with great precision and this is difficult and costly; and, secondly, the completion of work is delayed, thereby inconveniencing the patient.

To overcome the aforesaid disadvantages it would naturally be desirable to use standardized crowns which could be immediately secured to the implant or non-vital root. However, this approach has not been successful because of the unpredictability of the position of the implant or non-vital root in relation to the adjacent teeth and the gum.

In accordance with the invention, it has been discovered that the foregoing problems can be overcome and that standardized crowns may be used in conjunction with implants or non-vital roots. A minimum amount of time is necessary and the expense of the crown sharply minimized.

FIGS. 1 and 2 are side and top views, respectively, of a conventional implant.

FIGS. 3, 4 and 5 are front, side and top views, respectively, of one embodiment of the alignment plate of the invention.

FIGS. 6, 7, and 8 are, front, side, and bottom views, respectively of an artificial crown adequate for use in the invention.

FIG. 9 is a side view of the upper jaw showing the implant, alignment plate and crown in their final position.

FIG. 10 shows another embodiment of the invention employing a plastic alignment plate positioned between a crown and a devitalized root.

Briefly, the invention utilizes an alignment plate which is affixed between the implant or non-vitalized root and the crown. As will be described, the alignment plate may be readily prepared by the dentist so as to properly position the crown with respect to the implant or non-vitalized root, without the need of time consuming fabrication of the crown. In other words, rather than following the procedure of the prior art, where the crown was custom fit, the invention properly locates the crown by cus-

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tom fitting the alignment plate, a much less time consuming and expensive procedure.

Turning now to the drawings, a preferred embodiment of the invention is illustrated.

FIGS. 1 and 2 illustrate an implant 1 having a threaded portion 2 which is located in the jaw bone 3 shown in FIG. 9. The other end of the implant 1 has a female thread 4 which, after the implant is positioned, lies at the surface of the gum 5. As will be obvious to one skilled in the art, the implant may be replaced by a non-vital root which is appropriately threaded.

The alignment plate 6, shown in detail in FIGS. 3, 4 and 5, is composed of a flat base 7 and projections 8. Base 7 is adapted to lie on the surface of the gum 5 in contact with the exposed portion of the implant 1 and is surrounded by a coating of a fluorinated hydrocarbon resin. A hole 14 is provided as will hereinafter be described.

The crown as shown in FIGS. 6, 7 and 8, is conventional construction except that it is fitted with grooves 10 which are adapted to receive the projections 8 from the alignment plate 6. When the projections 8 are engaged in the grooves 10, the alignment plate and crown are brought into a predetermined relationship. To maintain this relationship, a screw or pin 11 is passed through bore 12 and holes 13 in the crown 9 and alignment plate, respectively.

The dentist fits the artificial tooth 9 by locating it in the proper position in the patient's mouth or in a diagnostic model while the alignment plate 7 is engaged thereto. The alignment plate is butted against the gum 5 and the implant screw 2 or non-vital root, as the case may be, and the mesial distal relationship determined. Minor modifications of the crown may be necessary, particularly of the projecting sides thereof. This may be accomplished rapidly and simply by standard grinding technique. Preferably, a crown is provided having excessively long sides which may be readily ground away to fit a variety of gum contours.

After the tooth is properly fitted, a screw 20 shown in FIG. 1, is inserted into the threaded hole 4 in the implant screw 2. Preferably, the screw has a sharp point or a burr on its head.

The tooth is then carefully fitted in place and pressed downwardly against the screw head causing the burr to mark the underside of the alignment plate 6. The underside of the alignment plate, which is preferably formed of tetrafluoroethylene fluorocarbon resins or a fluorinated ethylene-propylene resin, is easily marked by moderate pressure.

Thereafter, the alignment plate is removed from the artificial tooth and a hole drilled at the position indicated by mark. The marking screw is removed from the hole 4. With the hole in the alignment plate properly aligned, the alignment plate is rigidly affixed to the root or implant screw by means of a screw through the hole in the alignment plate and hole 4. The artificial tooth 9 is now placed over the alignment plate 6, and secured thereto by means of a screw through the hole 12 aligned with threaded portions 13 in the alignment plate 6.

FIG. 10 illustrates another preferred embodiment of the invention, particularly with regard to the construction of the alignment plate. In this modification, the alignment plate 15 is constructed entirely of a resilient material, most desirably, of a fluorinated plastic, e.g., Teflon, and is in the shape of a truncated cone. The crown 16 is fabricated so as to fit over the tapered end of the cone. Using the technique previously described, the base of the alignment plate 15 is marked for proper alignment and the hole 17 drilled therein. By means of screw 18 the alignment plate 15 is secured to the de-vitalized root 19 (which has been previously threaded).

Thereafter, the crown is secured to the alignment plate

by means of a screw or glue. Interlocking means, e.g., an annular dovetail, may alternatively be provided permitting the crown to be snapped onto the alignment plate. If a screw arrangement is employed, the crown, already provided with a screw receiving hole, as for example shown in FIG. 7, may be placed over the secured alignment plate and the alignment of a corresponding hole in the latter determined. Where a resilient plastic is used, the alignment plate need not be threaded, it being sufficient to provide a hole for receiving a screw.

This embodiment of the invention is particularly useful because the resilient alignment plate serves to seal the de-vitalized root to the crown without requiring perfect fitting of the several parts.

The alignment plate may be constructed of any material which is inert to human tissue and to substances present in the mouth. Of course, it must not be so hard as to resist ordinary drilling techniques. Particularly preferred are the use of a metallic construction having a covering of tetrafluoroethylene or fluorinated ethylene-propylene resins laminated to the base of the alignment plate and a wholly fluorinated plastic alignment plate. Such constructions are particularly desirable since it is not irritating to human tissue and resists the adherence of food particles. Useful metals are gold and platinum.

Many modifications of the above embodiment can be made without departing from the spirit of the invention.

For example, the crown artificial tooth may be secured to the alignment plate by any convenient means. A screw, such as shown in the illustrations is particularly desirable since it may be removed easily. Of course, other means of securing the tooth to the alignment plate, as for example, gluing or interlocking construction are also effective.

Another modification would be to use a nut and bolt to secure the alignment plate to the implant screw or devitalized root, rather than using a machine screw. Here the implant screw or the root would contain a threaded pro-

jection which may be used both for marking the alignment plate and receiving a nut for securing the alignment plate.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A method of securing an artificial tooth to a rigid member embedded in the gum, said rigid member having an exposed surface at the gum surface and a projection extending outwardly therefrom, by means of an alignment plate which engages said artificial tooth in a fixed relationship, which comprises: aligning said alignment plate with respect to said exposed surface; contacting the base of said aligned alignment plate with said projection so as to mark said base; forming a hole at the marked point in the base of said alignment plate; affixing said alignment plate to said rigid member in aligned relationship by means of a projection through said hole and into said rigid member; and, thereafter, affixing said artificial tooth to said alignment plate.

2. The method of claim 1 wherein said alignment plate is affixed to said rigid member by means of a screw through the former into the latter.

3. The method of claim 1 wherein said alignment plate is a fluorinated hydrocarbon resin.

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ROBERT PESHOCK, Primary Examiner

U.S. Cl. X.R.

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