This application is a continuation in part of applicant's invention entitled "Denture Construction," Serial No. 365,491, filed July 1, 1953. This application also covers the subject matter of applicant's invention entitled "Individual Tooth Implant," Serial No. 448,216, filed August 6, 1954, which application is now abandoned.

The present invention relates generally to dentistry and has particular reference to a novel construction for an individual tooth implant.

The principal object of the instant invention is to provide an implant which may be permanently secured in the mouth.

Another object of the instant invention is the provision of an artificial tooth arrangement comprising an anchoring device which is adapted to be firmly secured within the walls of the tooth socket.

A further object of the instant invention is the provision of an improved anchoring device for an implanted artificial tooth which initially secures the implanted tooth within the socket by penetrating the socket walls and eventually allows the socket bone structure growth to permanently embed the tooth anchoring device within the socket.

Still another object of the instant invention is the provision of an artificial tooth arrangement comprising an anchoring device which will be positively maintained against rotary as well as longitudinal movement.

A further object of the instant invention is the provision of an artificial tooth arrangement which is practical in use due to the fact that it may be mounted with a minimum of difficulty and inconvenience to both the patient and the dentist.

Other objects, features and advantages of the invention will become apparent as the description thereof proceeds when connected in connection with the accompanying illustrative drawings.

In the drawings which illustrate the best mode presently contemplated by me for carrying out my invention:

Fig. 1 is a perspective view of a lower jaw formation embodying the instant invention;

Fig. 2 is an elevational view, on an enlarged scale, of an artificial tooth implant in accordance with the instant invention, portions of the gum being broken away for purposes of illustration;

Fig. 3 is a circumferential vertical section, on an enlarged scale, taken on line 3--3 of Fig. 1;

Fig. 4 is a section, on an enlarged scale, taken on line 4--4 of Fig. 2;

Fig. 5 is a section, on an enlarged scale, taken on line 5--5 of Fig. 2;

Fig. 6 is a sectional elevation, on an enlarged scale, of the anchoring device which forms a part of my invention;

Fig. 7 is a sectional elevation, on an enlarged scale, of the anchoring device, and some of its associated structure;

Fig. 8 is a perspective detail, on an enlarged scale, of the washer member which forms a part of my invention;

Fig. 9 is a perspective detail, on an enlarged scale, of one of the pin members which form a part of my invention; and

Fig. 10 is an exploded perspective, on an enlarged scale, of the artificial tooth implant shown in Figs. 2 and 3, including the parts utilized during the implant operation.

It has been found advantageous to provide a permanent denture consisting of teeth which are individually implanted within the tooth sockets. To this end, provide teeth having anchoring bases made of suitable material, which are adapted to initially grip the bone socket structure and to permanently become firmly embedded within the socket as a result of the growth of the bone structure within serrated recesses which I provide on the anchoring base. An improved and extremely rigid mounting is obtained by the provision of both circumferentially extending and longitudinally extending serrations and also by the provision of apertures extending through the anchoring base, which apertures also function to receive therein bone structure growth.

Referring now to the drawings, Fig. 1 illustrates a set of lower jaw teeth 10 which includes an implanted artificial tooth 12 constructed in accordance with the instant invention. The artificial tooth 12 includes an anchoring base 14 of suitable material, preferably stainless steel, which anchoring base is of substantially frusto-conical configuration whereby to generally conform to the shape of the tooth socket 16 in the jaw. Base 14 is provided with an internally threaded vertical bore 18 adapted to sequentially receive a screw element 20 and a threaded stud 22 in a manner hereinafter to be described. The screw element 20 is provided with a pointed end 24 and a fluted head portion 26, while the stud 22 is provided with a head portion 28, all of which will be seen most clearly in Fig. 10.

The outer surface of anchoring base 14 is provided with a plurality of serrations comprising spaced circumferentially extending grooves 30 and spaced longitudinally extending grooves 32. Also provided in the anchoring base are a pair of cross apertures 34 extending completely through the lower portion of the base, as shown most clearly in Figs. 5, 6 and 7. The serrations 30, 32 and the apertures 34 each permits bone structure of the tooth socket to grow and penetrate therein when the anchoring base is mounted in the socket, whereby said anchoring base will become firmly embedded against any type of movement.

A plurality of horizontally extending pins 36 being tapered at both ends as at 38 are mounted in the base 14 in radially extending horizontal channels provided therein. More specifically, a plurality of radially extending channels 40 are provided in the base 14 in spaced relation from the top surface thereof while additional channels 42 are grooved in the upper surface of said base 14.

As will be seen clearly in Figs. 3, 6 and 7, the pins 36 are of a length so that when the screw element 20 with its pointed end 24 and slotted head 26 is threaded into the vertical bore 18, the pins will be slid radially whereby the ends thereof will extend outwardly of the periphery of the anchoring base and will be caused to penetrate the surrounding socket bone structure. As will be obvious, the pointed end 24 of screw 20 will cooperate with the pointed ends 38 of pins 36 to effect a camming action whereby to facilitate the radial spreading of the pins 36 and their penetration into the surrounding bone structure.

Before screw 20 is threaded into position, a washer member 44, preferably metallic, is placed over the upper surface of the anchoring base whereby to overlie the upper pins 36. Washer 44 cooperates with the head 26 of screw 20 to maintain the upper pins properly and securely positioned in their respective grooves and also results in an even distribution of the downward pressure exerted by said head 26.
In operation and use, the anchoring base 14 with the pins 36 positioned therein in their respective channels 40 and 42, is mounted in the tooth socket. The washer 44 is placed in its proper position and then the screw 20 is threaded downwardly whereby to force the pins 36 radially outwardly in the manner heretofore described. The radial movement of the pins 36 causes the outer ends thereof to penetrate the surrounding bone structure whereby to maintain the anchoring base in its proper position. The parts are then left in this position for a substantial length of time, for example, six months, in order to allow the anchoring base to become firmly embedded. During this period of time, it will be understood that the growth of the surrounding bone structure will cause said bone structure to penetrate and grow into serrations 30 and 32, as well as into apertures 34, thereby eliminating the possibility of any undesirable movement of the anchoring base within the socket.

After the desired time interval has elapsed, the screw 20 is removed and screw 22 is then threaded into the vertical bore 18. As will be seen most clearly in Fig. 10, the artificial tooth crown 46 is provided with a recess 48 of corresponding shape to that of the head 28 of the screw 22 whereby said recess is adapted to receive said head and may be secured thereto by any desirable manner, such as cementing or the like. Since the upper surface of the anchoring base is located slightly below the gum surface, it will be obvious that the tooth crown 46 will extend through said gum surface thereby eliminating the presence of any undesirable recesses or cavities which might prove uncomfortable and harmful to the patient.

It will thus be obvious that there has been provided in accordance with the instant invention an implanted tooth construction which provides a natural fitting denture, that is more permanent, more comfortable, and more sanitary than heretofore possible. The utilization of an anchoring base which initially penetrates the surrounding bone structure of the tooth socket to securely grip same and which eventually permits bone growth to permanently embed it, is thought to constitute a desirable and worthwhile step forward in the art.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the parts may be made without departing from the spirit and scope of the underlying concept and that the same is not limited to the particular forms herein shown and described except as noted as indicated by the scope of the appended claims.

I claim:

1. An artificial tooth for implanting in a natural tooth socket, comprising: a substantially solid, frusto-conical anchoring base adapted to fit within a tooth socket, a tooth crown, means attaching said tooth crown to said anchoring base, outwardly extending studs carried by said anchoring base for penetrating the tooth socket bone structure whereby to grip same, and serrations on said anchoring base for allowing growth of the socket bone structure whereby, whereby the anchoring base is firmly secured within the tooth socket.

2. An artificial tooth as set forth in claim 1 further characterized in that said serrations comprise a plurality of spaced, circumferentially extending grooves and a plurality of spaced longitudinally extending grooves.

3. An artificial tooth for implanting in a natural tooth socket comprising an anchoring base of substantially solid frusto-conical configuration and adapted to fit within a tooth socket, said anchoring base having an internally threaded vertical bore, a tooth crown having a socket recess, a screw element including a head and a threaded lower shank, said shank being threadedly positioned within said bore and said head being seated in said crown socket recess, outwardly extending studs carried by said anchoring base for penetrating the tooth socket bone structure whereby to grip same, and serrations on said anchoring base for allowing growth of the socket bone structure to penetrate wherein, whereby the anchoring base is firmly secured within the tooth socket.

4. An artificial tooth as set forth in claim 3 further comprising serrations on the outer surface of said anchoring base, said serrations comprising a plurality of spaced, circumferentially extending grooves and a plurality of spaced longitudinally extending grooves.

5. An artificial tooth for implanting in a natural tooth socket comprising an anchoring base of substantially solid frusto-conical configuration and adapted to fit within a tooth socket, said anchoring base having an internally threaded vertical bore, a tooth crown having a socket recess, a screw element including a head and a threaded lower shank, said shank being threadedly positioned within said bore and said head being seated in said crown socket recess, outwardly extending studs carried by said anchoring base for penetrating the tooth socket bone structure whereby to grip same, and serrations on said anchoring base for allowing growth of the socket bone structure to penetrate wherein, whereby the anchoring base is firmly secured within the tooth socket.

6. An artificial tooth as set forth in claim 5 further characterized in that said serrations comprise a plurality of spaced, circumferentially extending grooves and a plurality of spaced longitudinally extending grooves.

7. An artificial tooth for implanting in a natural tooth socket comprising an anchoring base of substantially solid frusto-conical configuration and adapted to fit within a tooth socket, said anchoring base having an internally threaded vertical bore, a tooth crown having a socket recess, a screw element including a head and a threaded lower shank, said shank being threadedly positioned within said bore and said head being seated in said crown socket recess, outwardly extending studs carried by said anchoring base for penetrating the tooth socket bone structure whereby to grip same, and at least one aperture extending laterally through said anchoring base for allowing growth of the socket bone structure to penetrate wherein, whereby the anchoring base is firmly secured within the tooth socket.

8. An artificial tooth as set forth in claim 7 further characterized in that said serrations comprise a plurality of spaced, circumferentially extending grooves and a plurality of spaced longitudinally extending grooves.

9. An artificial tooth for implanting in a natural tooth socket comprising an anchoring base adapted to fit within a tooth socket, said anchoring base having an internally threaded vertical bore and vertically spaced radial channels, a tooth crown having a socket recess, a screw element including a head and a threaded lower shank, said shank being threadedly positioned within said bore and said head being seated in said crown socket recess, means including slidably movable pins in said radial channels for gripping said anchoring base to the tooth socket bone structure, the upper of said radial channels being grooved in the upper surface of said anchoring base.

10. An artificial tooth as set forth in claim 9 further comprising a metallic washer disposed between said upper surface and said head.

11. An artificial tooth for implanting in a natural tooth socket comprising an anchoring base adapted to fit within a tooth socket, said anchoring base having an internally threaded vertical bore and vertically spaced radial channels, a tooth crown having a socket recess, a screw element including a head and a threaded lower shank, said shank being threadedly positioned within said bore and said head being seated in said crown socket recess, means including slidably movable pins in said radial channels for gripping said anchoring base to the tooth socket bone structure, and serrations on said anchoring base for allowing growth of the socket bone structure to penetrate wherein, whereby the anchoring base is firmly secured within the tooth socket, said serrations comprising a plurality of spaced, circumferentially extending grooves.
and a plurality of spaced longitudinally extending grooves.

12. An artificial tooth as set forth in claim 11 further comprising at least one aperture extending laterally through said anchoring base for permitting penetration by socket bone structure growth.

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