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R. W. CHRISTENSEN
DENTAL PROSTHETIC APPLIANCE
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3,474,537

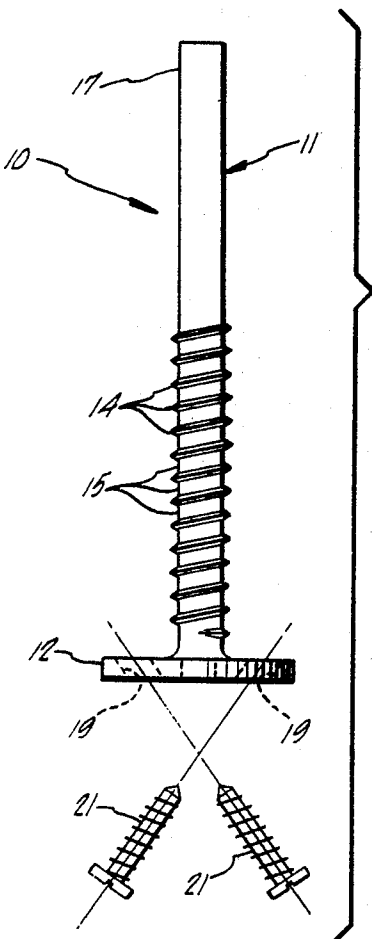


FIG. 1

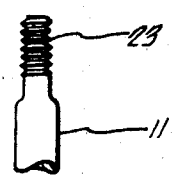


FIG. 3

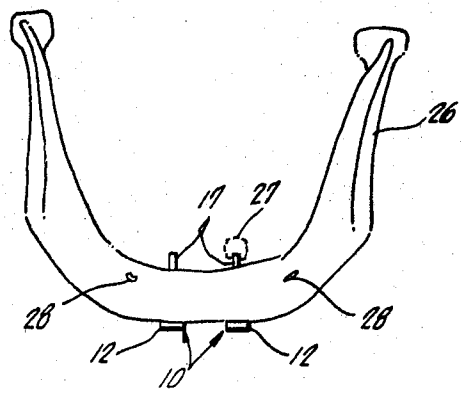


FIG. 4

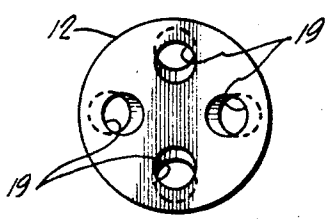


FIG. 2

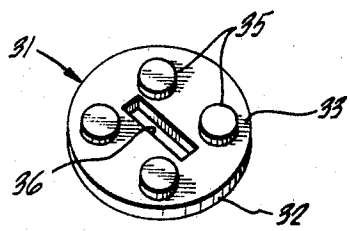


FIG. 5

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DENTAL PROSTHETIC APPLIANCE

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4 Claims

ABSTRACT OF THE DISCLOSURE

An anchor post adapted to be threaded vertically through a lower jawbone to provide a stable mounting for a denture or artificial tooth. The post has an enlarged head which fits against the underside of the jawbone, and one or more small locking screws extended obliquely through the head into the jawbone to lock the shaft against rotation. The upper end of the post extends above the jawbone and gum tissue for engagement with the denture or artificial tooth.

BACKGROUND OF THE INVENTION

When natural teeth must be replaced, an important goal is to provide a firm anchor or mounting for artificial tooth or for a denture comprising several artificial teeth. Achievement of this goal helps to assure patient comfort and to permit normal chewing. Further, disintegration of the alveolar ridge of the jawbone which may occur with a loose, poorly secured denture, is avoided when the denture is firmly anchored.

In the past, some dentures have simply been fitted to the patient's gum structure without any positive anchoring. This often results in a loose denture which prevents normal chewing. Another approach is to use a permanent bridge assembly which is secured by inlays secured to adjoining natural teeth. This method provides a relatively secure mounting, but requires removal of portions of the natural teeth, and may pose hygienic problems as well as making X-ray examination more difficult.

Still another approach to anchoring artificial teeth is to implant a supporting structure within the gingival or gum tissue and resting against or around the jawbone. Several techniques utilizing this approach are described in my U.S. Patent No. 3,082,525 issued Mar. 26, 1963, and entitled "Dental Prosthetic Appliance." This earlier patent describes an improved subperiosteal implant which is secured around the jawbone and provides a mounting post or stud which extends through the gingival tissue to engage and anchor a denture.

My present invention relates to an improved implantable prosthetic appliance which is secured in a hole drilled through the mandible or lower jawbone. The device extends from the jawbone through the overlying gingival tissue to provide an intra-oral mounting post for an artificial tooth or denture.

The invention is a substantial improvement over known implantable devices in that a relatively simple surgery is involved, and a strong denture mounting is provided as the device is firmly secured in the strongest part of the jawbone. Only two relatively small areas of tissue need be separated from the jawbone, promoting rapid healing and greater patient comfort. Another advantage of the invention is that the implanted appliance is quite small, and pockets or traps for bacteria are minimized, reducing the danger of spreading infection.

Briefly stated, this invention relates to a dental prosthetic appliance for implantation in a jawbone and overlying gingival tissue. The invention comprises an elongated shaft of implantable material. The shaft has a flattened head integrally formed and extending laterally from one end thereof. The end of the shaft opposite the flattened

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head forms a mounting post adapted to engage a denture. An intermediate portion of the shaft between the flattened head and the mounting post is adapted to be secured within the jawbone. The shaft is dimensioned whereby the mounting post extends beyond the gingival tissue overlying the jawbone into the oral cavity of the patient.

In a preferred form of the invention, the intermediate portion of the shaft includes self-tapping threads to secure the shaft within the jawbone. Preferably, the flattened head includes at least one hole therethrough, the axis of this hole being oblique to the axis of the elongated shaft. An implant screw is inserted through this hole into the jawbone, providing secondary anchoring of the appliance and preventing undesired rotation of the shaft within the jawbone.

The invention will be described in detail with reference to the attached drawings in which:

FIG. 1 is an elevation of the prosthetic appliance of this invention;

FIG. 2 is an end view of the appliance, showing a plurality of holes in the flattened head;

FIG. 3 is a fragmentary elevation of an alternative form of the invention, showing a mounting post having threads to engage a denture;

FIG. 4 is an elevation of a lower jawbone, showing a pair of prosthetic appliances of the invention installed in the jawbone; and

FIG. 5 is a perspective view of a screwdriver adapter used to install the appliance in the jawbone.

Referring to FIGS. 1 and 2, a prosthetic appliance 10 includes an elongated shaft 11 of an implantable material. A flattened head 12 is integrally formed at one end of the shaft, and extends laterally away from the shaft.

An intermediate portion of the shaft includes threads 14 to secure the shaft within the jawbone. Preferably, the threads are of a self-threading type, and have a relatively broad root 15 whereby the amount of bone confined between individual threads is maximized.

The end of the shaft opposite flattened head 12 forms a mounting post 17 to engage a denture. The portion of the shaft extending from the threaded intermediate portion to the end of the mounting post has a diameter no larger than the minor diameter of the threads whereby this portion of the appliance can be inserted into a pilot hole drilled through the jawbone.

The flattened head of the appliance may include a slot to engage a conventional screw-driver. In a preferred form of the invention, the head includes a plurality of holes 19, the axes of which are obliquely oriented to the longitudinal axis of the shaft. When the appliance is screwed in place in the jawbone, one or more implant screws 21 are inserted in holes 19 and threaded into the jawbone. The appliance is thereby even more firmly anchored within the jawbone, and the implant screws resist any rotational forces on the mounting post tending to unscrew the appliance.

The appliance is dimensioned whereby the threaded intermediate portion of the shaft is confined substantially within the jawbone. Mounting post 17 extends above the jawbone and overlying gingival tissue to extend into the oral cavity. The mounting post may have a smooth surface to which an artificial tooth or denture may be cemented. In another form illustrated in FIG. 3, the mounting post may be provided with threads 23 for securing an artificial tooth or denture to the appliance. Of course, the mounting post may be necked down in diameter or otherwise formed to engage a specific type of artificial tooth or denture.

FIG. 4 shows a pair of prosthetic appliances according to the invention installed in a jawbone 26, and an artificial tooth 27 (shown in phantom) is mounted on one of the appliances. To avoid interference with the nerves and

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blood vessels extending through the mandibular canals on either side of the jawbone, the appliances are preferably mounted between left and right mental foramina 28 which mark the frontal termination of the canals.

FIG. 5 shows a screwdriver adapter 31 which permits a conventional screwdriver to be used for installing the prosthesis appliance. The adapter includes a body 32 having a front surface 33 from which extend a plurality of posts 35. The posts are spaced to engage holes 19 in the flattened head of the prosthesis appliance. The adapter includes a slot 36 extending through the body. A conventional screwdriver may be inserted from the back of the body to engage the slot. Posts 35 are then engaged with holes 19 on the appliance, and the appliance is rotated to be threaded into the jawbone.

To install the prosthetic appliance of this invention, a sub-mandibular incision is made to expose a small area on the bottom of the lower jawbone. A hole is then drilled upwardly through the jawbone to intercept a second small incision through the gingival tissue overlying the upper portion of the jawbone. The appliance is then inserted in the pilot hole and rotated whereby self-tapping threads 14 cut threads into the jawbone. When the appliance is seated in the desired position, it may be locked in place by inserting implant screws 21 through holes 19 into the jawbone.

A feature of the invention is that the appliance is threaded through the strong cortical portion of the jawbone and does not depend on the spongy, medullary portion of the bone for mounting rigidity. This method of securing the appliance to the jawbone provides a wobble-free mounting for an artificial tooth or denture, and minimizes installation surgery, patient discomfort, and healing time.

The prosthetic appliance of this invention may be formed from a metal such as titanium, zirconium or tantalum, or may be formed from surgical steel or other alloys which have been found to be suitable for implantation in the body. In a preferred form, the invention is fabricated from Vitallium which is an alloy of cobalt, chromium and molybdenum.

I claim:

1. In combination with an artificial tooth to be secured to a lower jawbone and overlying gingival tissue, an anchoring post comprising an integral shaft adapted to extend vertically through a jawbone and formed of an implantable material, the shaft having an enlarged flattened head extending laterally from a lower end there-

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of to abut the underside of the jawbone, the shaft having an intermediate portion defining broad-root threads for direct contact with the jawbone to provide anchorage against forces tending to loosen the post, the intermediate portion being of a length approximately coextensive with the jawbone through which it is adapted to vertically extend, the shaft further having an upper portion adapted to extend above the jawbone and being secured within the tooth, the upper portion terminating within the tooth, the upper portion having a cross section which is no larger than a minor diameter of the broad-root threads on the intermediate portion.

2. The combination defined in claim 1, and further comprising means engaged with the shaft head and adapted to contact the underside of the jawbone for providing secondary anchoring of the shaft to the jawbone whereby rotation of the shaft is prevented.

3. The combination defined in claim 1 in which the enlarged flattened head at the underside of the jawbone has a hole therethrough, and further comprising an implant screw formed of an implantable material and extending through the hole and engageable with the jawbone to provide secondary anchoring of the shaft against rotation with respect to the jawbone.

4. The combination defined in claim 1 in which the enlarged flattened head at the underside of the jawbone has a plurality of spaced-apart holes therethrough, the holes having axes which are oblique to a longitudinal axis of the shaft and diverging from the shaft, and further comprising a plurality of implant screws extending through the holes to engage the jawbone, the implant screws being positioned generally on the respective hole axis whereby the screws extend through the head without penetrating the intermediate portion of the shaft.

References Cited

UNITED STATES PATENTS

804,030	11/1905	Ostrander.	
928,997	7/1909	Muller	151-68
2,467,163	4/1949	Skinner	32-2

FOREIGN PATENTS

1,320,212	1/1963	France.
49,639	1/1889	Germany.
325,203	3/1935	Italy.

ROBERT PESHOCK, Primary Examiner