

[54] REMOVABLE DENTAL CROWN

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[58] Field of Search 32/13, 41

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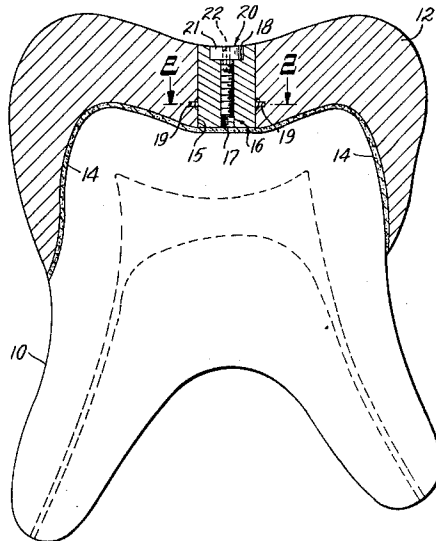
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[57]

ABSTRACT

A dental crown that can be cemented to a tooth and later removed from the tooth without destroying either the crown or the tooth. The crown has an embedded, threaded sleeve extending completely therethrough. The sleeve is permanently anchored in place by lugs, and carries a removable closure screw that extends into a threaded opening in the sleeve. When it is desired to remove the crown, the closure screw is removed and a relatively long jack screw is substituted. The jack screw, which is long enough to extend thorough and beyond the inner end of the sleeve, is manually rotated into engagement with the cement layer between the tooth and the crown and then further rotated until the cement bond is broken and the crown is freed from the tooth.

10 Claims, 5 Drawing Figures



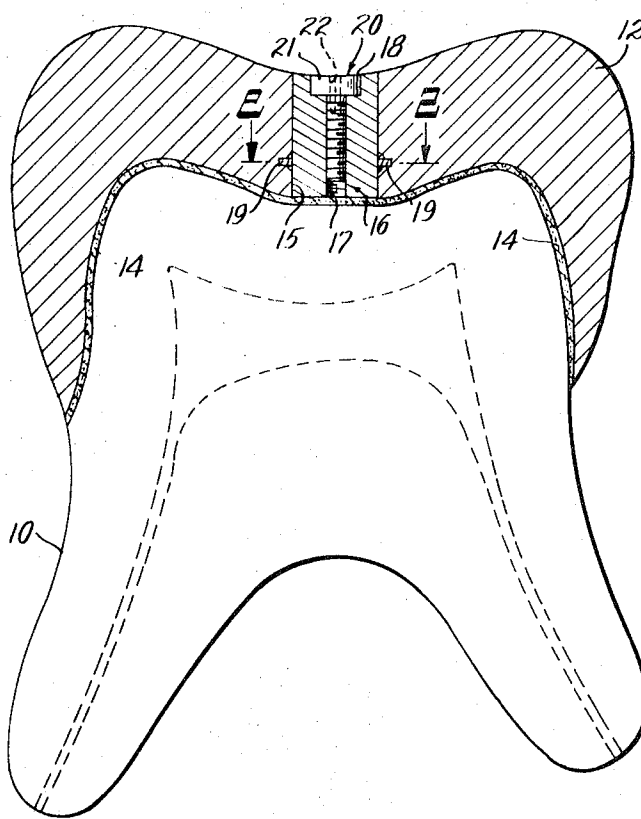


Fig. 1.

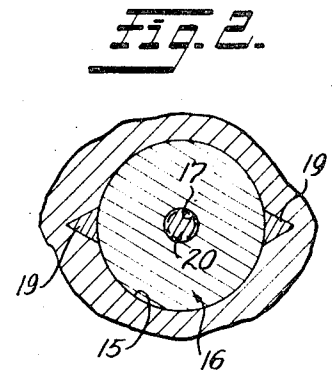


Fig. 2.

Fig. 3.

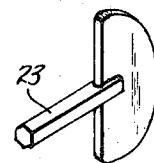
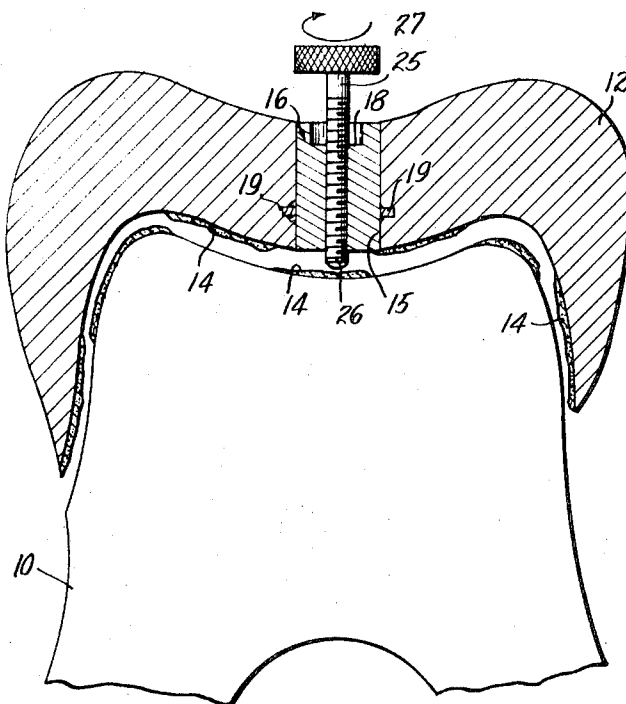
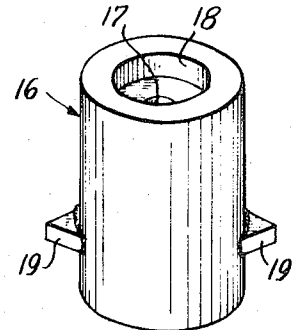


Fig. 4.



REMOVABLE DENTAL CROWN

FIELD OF THE INVENTION

This invention relates to a tooth crown and to a built-in device for aiding in removing the crown from the tooth without damaging either the crown or the tooth, thereby enabling the crown to be replaced on the same tooth.

DESCRIPTION OF THE PRIOR ART

It is often necessary for a dentist, for one reason or another, to remove a crown or bridge that has been cemented in place. In the past this has been done by breaking it loose with a mallet, chisel or the like. This practice often fractures the tooth and is a harrowing experience for the patient.

Another method has been to drill a hole through the crown and screw a lug through the hole which threads the casting and forces the crown from the tooth. This method leaves the crown with a hole in it that must be repaired. Further, it is often unsuccessful because the threads of the lug tend to strip, thereby frustrating easy removal.

A third and obvious method has been to cut the crown off the tooth. While this method always works, it results in destruction of the crown.

SUMMARY OF THE INVENTION

The present invention relates to an improved dental crown. More particularly, it relates to a dental crown that can be removed from a tooth without injuring either the crown or the tooth, thus enabling the crown to be replaced on the same tooth in due course of treatment.

More specifically, the invention relates to a cast metal crown having a metal sleeve non-rotatably embedded therein, the sleeve having a counterbored, threaded opening to normally receive an Allen type screw for closing or blocking said opening and filling said counterbore, the closure screw being removable to enable substitution of a jacking screw in said threaded opening. The jacking screw has a relatively large knurled head and a threaded shank of greater length than the sleeve, so that upon turning the jacking screw clockwise the inner end of said shank will be projected beyond the inner end of the sleeve and react against the tooth to break the cement joint and "lift" the crown off the tooth. Thus, the embedded sleeve constitutes the primary element of a built-in jacking device for removing the crown. In making a permanent dental bridge for spanning a space between two teeth, more than one built-in removing device can be used, i.e., one with each crown portion of the bridge.

Accordingly, the principal object of the invention is to provide a dental crown, or dental bridge, with means that will enable easy removal thereof without damage thereto or to the tooth, or teeth, associated therewith.

Another object is to provide a denture having means to facilitate removal thereof with a minimum of effort and a minimum of pain and discomfort to the patient.

A further object is to provide a denture, and specifically a cast dental crown, that can be readily removed from a tooth and later replaced on the same tooth with a minimum of effort and expense.

A still further object is to provide a removable dental crown that is characterized by its simplicity in construction and durability in use.

Further objects and advantages of the invention will become evident from a reading of the following description. In this connection, in the interest of simplicity, the description will be limited to a dental crown, it being understood that the described structure for facilitating removal of the crown is equally applicable to other dental structures. Hence, the term "dental crown" as used herein is to be construed as including other dentures.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a greatly enlarged elevational view, partly in cross-section, showing the improved crown cemented on a tooth with the closure screw in place in the threaded sleeve.

FIG. 2 is an enlarged fragmentary sectional view, taken on the line 2-2 of FIG. 1.

FIG. 3 is a view similar to FIG. 1, but showing the crown and the tooth after separation of the crown from the tooth by rotation of the jack screw.

FIG. 4 is an enlarged perspective view of the sleeve, particularly showing the anchoring lugs and recessed upper end portion to receive the head of the closure screw.

FIG. 5 is a perspective view of an Allen-type wrench that can be used to remove the closure screw.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in detail, and first to FIG. 1 thereof, a tooth 10 is shown with a crown 12 thereon, the crown being held in place by a bonding layer of cement 14. The crown is preferably made of gold alloy, in accordance with usual practice, and is cast to the desired shape, including a central opening 15. Preferably embedded in the opening 15 in the crown 12, and extending throughout the length of said opening is a cylindrical sleeve 16, which is provided with a threaded axial bore 17 and, near its upper end, with a countersunk recess 18. Formed on the outer wall of the sleeve near its lower end are oppositely disposed pointed anchoring lugs 19. The lugs 19 are embedded in the crown metal and prevent axial and rotary movement thereof relative to the sleeve. The sleeve 16 is preferably made of stainless steel or other suitable material. It should be understood, however, that the sleeve 16 has an air-tight contact with the opening 15; is permanently mounted in said opening; must be made of material that is rust-proof and corrosion proof; must have a melting point higher than that of the gold alloys used in dental castings; and must be capable of withstanding substantial stress without breaking.

Normally mounted in the bore 17 is a closure screw 20. As seen in FIG. 1, the closure screw 20 terminates short of the lower end of the bore 17 and has a head 21 that is snugly received in the recess 18. When fully in place, the upper surface of the head 21 will be flush with the top of the sleeve 16 and the upper surface of the crown 12. The head 21 is provided with a hexagonal socket 22 to receive the end of an Allen-type wrench, such as is shown at 23 in FIG. 5. The closure screw 20 seals the bore 17 in the crown 12 against leakage and remains in place until such time as it becomes necessary to remove the crown.

When it is desired to remove the crown 12 from the tooth 10, the closure screw 20 is first removed. This is done by engaging the end of the Allen wrench 23 in the socket 22 and rotating it in a counterclockwise direc-

tion. It will be understood that if any food deposits or the like are lodged in the socket 22 they may be first removed therefrom by rinsing or by using a suitable dental instrument.

After removal of the closure screw 20 from the bore 17, a jack screw 25 is screwed into said bore. The jack screw 25 has a threaded shank 26, which is substantially longer than the sleeve 16, and a knurled head 27 that is of such size that it can be grasped between a thumb and forefinger and readily rotated. The threads on the jack screw are of the same diameter and pitch as the threads on the closure screw 20.

Actual separation of the crown 12 from the tooth 10 is accomplished by rotating the jack screw 25 in a clockwise direction until its lower end engages the layer of cement 14, and then further rotating the screw 25 until the bond provided by the cement layer 14 is broken and the crown 12 is freed from the tooth, as shown in FIG. 3. In the separation of the crown 12 from the tooth 10, the cement 14 will break randomly with portions adhering to both the crown 12 and the tooth 10. Since the sleeve 16 is made of strong metal there is no danger of stripping the threads in the bore 17. Nor is there any possibility of the sleeve 16 turning or being stripped out of the crown 12, because both are prevented by the anchoring lugs 19.

It will be understood that various changes can be made in the design details of the sleeve 16, and in the shape, size and configuration of the closure and jack screws without departing from the principles of the invention or the scope of the annexed claims.

I claim:

1. A removable dental crown adapted to be secured by a layer of bonding material to a tooth, said crown having a cylindrical permanently mounted therein, said sleeve having an axial threaded opening; removable closure means normally threaded in and forming a seal with said opening; and threaded means mountable in said threaded opening upon removal of said removable closure means and being axially movable in said threaded opening to engage said bonding material and react against said tooth for breaking said bonding layer and forcing the crown away from the tooth.

2. A removable dental crown as recited in claim 1, including means on the sleeve embedded in the crown and anchoring the sleeve against rotation relative to the

crown.

3. A removable dental crown as recited in claim 1, wherein the removable closure means is a screw shorter than the sleeve that is threaded into the opening in the sleeve, and wherein the axially movable means is a jack screw of greater length than the sleeve.

4. A removable dental crown as recited in claim 3, wherein the upper surface of the sleeve is flush with the top of the crown and has a recess extending thereinto, and wherein the closure screw has a head that is received in the recess when said screw is fully threaded into the opening in the sleeve, the depth of the recess and the height of said head being such that the upper surface of said head lies substantially flush with the upper surface of the sleeve to provide a smooth surface for the top of the crown.

5. A removable dental crown as recited in claim 4, wherein the closure screw head has a wrench socket formed therein, and a wrench engageable in said socket for use in removing and in inserting the closure screw.

6. A removable dental crown as recited in claim 3, wherein the jack screw has a relatively large head for manual rotation thereof.

7. A removable dental crown as recited in claim 6, wherein the head of the jack screw is knurled.

8. Means for use in making a removable dental crown and for removing the crown from a tooth, comprising: a sleeve to be vertically, permanently and non-rotatably mounted in the crown, said sleeve having a threaded opening extending axially therethrough; a closure screw shorter in length than said opening adapted to be removably threaded in said opening to seal said opening; and a jack screw greater in length than said opening, adapted to be threaded in said opening after removal of said closure screw, for use in removing the crown from a tooth.

9. Means as defined in claim 8, wherein the closure screw has a socket; and wherein a wrench is included to engage said socket for use in inserting and in removing said closure screw.

10. Means as defined in claim 8, wherein the jack screw has a large knurled head to facilitate manual rotation of the jack screw to remove the crown from a tooth.

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