

[54] CROWN REMOVING DEVICE

3,690,006 9/1972 Lozano 32/43

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[57] ABSTRACT

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[58] Field of Search 32/61

A pair of jaws are adjustably connected to a crossbar for being received at opposite sides of a crown to be removed. A threaded member through the crossbar applies the necessary pressure onto the underlying tooth to effect withdrawal of the crown from the tooth. A quick hardening material is inserted between the jaws and the crown, providing a conforming gripping surface.

[56] References Cited
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7 Claims, 4 Drawing Figures

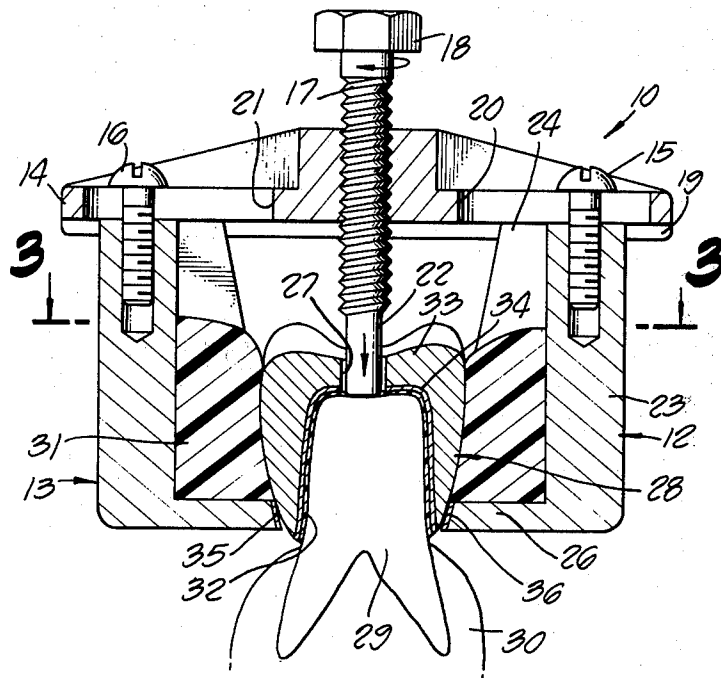


FIG. 1.

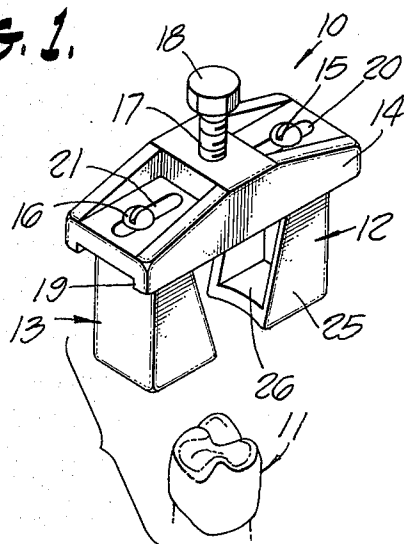


FIG. 3.

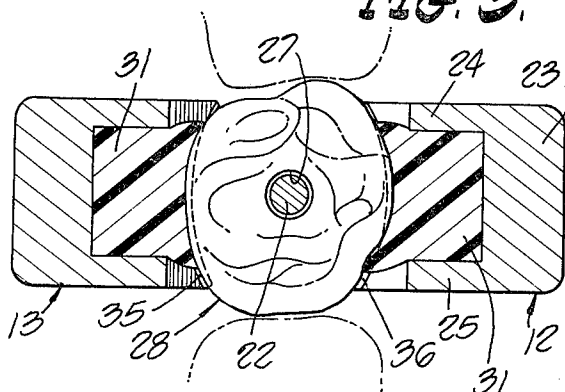


FIG. 2.

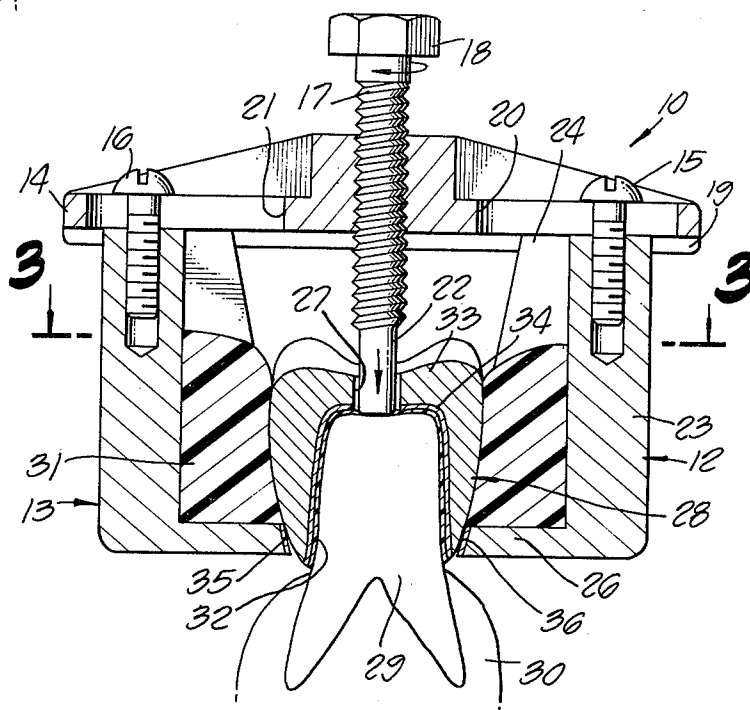
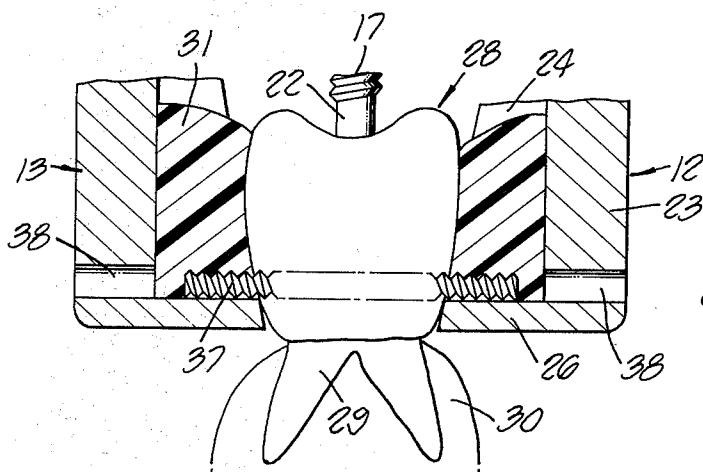


FIG. 4.

CROWN REMOVING DEVICE

The present invention relates generally to a device for removing crowns from teeth, and, more particularly, to such a device which effects minimal damage to the crowns during removal.

BACKGROUND OF THE INVENTION

It is frequently necessary where single or multiple units of porcelain or porcelain bonded to metal crowns are chipped, fractured or discolored, to remove the crown. This also occurs where multiple joined units have one or more areas that are damaged or need alteration. Still further, pain or sensitivity under a prosthesis may require removal for palliative treatment or for examination of the surface under the prosthesis.

In such removals according to prior techniques and particularly removal of porcelain and porcelain bonded to metal crowns, the possibility of further damage was great. That is, in the past the porcelain parts were almost certain to be fractured along with distortion or destruction of the thin metal lining for the porcelain (coping) and associated framework. Such fractures either require major repair, or, not infrequently, a total remake. Of course, the costs in this case can be equal to the original costs, and the patient is without the prosthesis for the repair period or time for remake.

SUMMARY OF THE INVENTION

Now, however, in the practice of this invention there is provided an improved device for removing a crown from a tooth without subjecting the crown to other than minimal damage. A pair of adjustable jaws within a supporting bracket are arranged about the crown to be removed. A quantity of a relatively quick-setting-up liquid or semi-liquid material is placed between the jaws and crown and in contact with both. On setting-up, the device is manipulated to lever the crown from the tooth with force being applied to the crown along the entire surface of the material acting as a jaws facing.

DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the device of this invention shown in position for application to a crown.

FIG. 2 is a sectional, elevational view of the device of FIG. 1 depicted in crown pulling relation to a tooth.

FIG. 3 is a sectional, plan view taken along the line 3-3 of FIG. 2.

FIG. 4 is a sectional, elevational view of a modified form of the crown pulling device of this invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

With reference now to FIG. 1, the crown pulling device of this invention enumerated generally as at 10, is depicted located immediately above and in condition to be applied to a crowned tooth 11. As shown there, the device includes a pair of jaws 12 and 13 adjustably secured to the underside of a common base 14 by respective threaded members 15 and 16. A further threaded member 17, is received within a similarly threaded opening in the base 14 and which is adjustable via head portion 18 to extend outwardly of the base underside a controlled amount for a purpose to be described.

Referring also to FIGS. 2 and 3, the base 14 is somewhat elongate, the underside of which is formed to include a longitudinal guide groove or recess 19, into and

along which the jaws 12 and 13 are adjustably received. A pair of elongated slots 20 and 21 are centrally aligned on the guide recess 19 and through which the threaded members 15 and 16 pass for threaded receipt in the respective jaws 12 and 13. The further threaded member 17 is received within a centrally located opening in the base 14 and includes a lower cylindrical end portion 22 for a use and purpose to be described.

The jaws 12 and 13 are identical in construction and therefore only the jaw 12 will be described in detail. This includes an end wall 23, a pair of side walls 24 and 25, and a lower wall 26, all unitarily related. The side walls outer edges taper inwardly from the lower wall edge which is the maximum extension from the back wall. It is also to be noted that the lower wall outer edge is concavely curved about an axis parallel to the back wall. The edges of the back and side walls opposite the lower wall are faced off, forming a plane generally parallel to the lower wall. The faced off portions of the jaws are so dimensioned as to produce a sliding fit when received into the guide groove or recess 19 in the base (FIG. 1).

In use, the threaded members 15 and 16 are loosened and the member 17 is raised so that the smooth cylindrical portion 22 only extends a slight amount below the base 14. An opening 27 is formed in the upper surface of the crown 28 and extends completely there-through, bottoming on the upper surface of the underlying tooth 29, which opening is of such a dimension as to readily admit the cylindrical portion 22. The device 10 is then lowered over the crowned tooth and the jaws adjusted to engage the lower opposite sides of the crown just above the gum 30, after which the threaded members 15 and 16 are tightened, securing the jaws in place. A quantity 31 of a quick-setting-up liquid or pliant deformable solid material is added to the cavity formed by the side and bottom walls of the cavity, which material closely conforms to the crown sides. Accordingly, when the material 31 sets up to a hardened state, the jaws effectively grip the crown, not only with lower wall curved edge, but also throughout the entire area of contact of the material 31 and the crown. The threaded member 17 is then advanced in the base opening, moving the cylindrical portion 22 into the opening 27 to bear on the tooth upper surface (FIG. 2). Further advancement of the member 17 causes the jaws and intermediate material 31 to withdraw the crown upwardly from the tooth, breaking the cement layer 32 while preserving the crown.

Although the described device possesses utility in removing crowns of all kinds, it is particularly useful for porcelain crowns which are relatively fragile and subject to chipping or breaking. The crown 28 in FIG. 2 is a porcelain crown which typically includes an outer porcelain body 33 with a metal lined opening 34 received onto the tooth.

For the material 31, most auto-polymerizing dental plastics may be used. These materials are generically referred to as either chemical setting or auto-polymerizing plastics which quickly set up into a hardened condition conforming to the outer surface of the crown. An example of an excellent material for this purpose is the self-setting dental plastic manufactured by Bosworth Co., Chicago, Ill. and sold under the trade designation "Trim."

For added retention and lifting force, certain cyanoacrylates may be used for the material 31. However,

since these materials adhere to the crown, they must be removed later by heat or grinding.

In the event the material chosen for the body 31 has an initial low viscosity (highly liquid), soft wax may be used at the sides of the jaws 12 and 13 to confine the material until it hardens. Moreover, a small amount of wax used to line the interface between the jaws and crown as at 35 and 36 in FIG. 2 prevents surface marking by the metal jaws and insures only the plastic material 31 contacts the crown.

Although as described above only a single crown is removed from a single tooth, the invention may be advantageously used for multiple prosthesis. That is, several such devices 10 may be utilized at the same time, one for each crowned tooth, and cooperative withdrawal of the crowns produced. That is, to remove a multiple unit, one such device as described herein may be used by moving from crown to crown and breaking the cement bonds one at a time. This is made possible because of the give in the supporting ligaments surrounding the teeth.

In some situations, the crown may be adhered so tightly to the underlying tooth that on attempted withdrawal by the described device the jaws and intermediate material 31 will be merely cammed away from the crown sides instead of removing the crown. The alternative version depicted in FIG. 4 prevents this separation of the jaws 12 and 13, by initially locating one or more rodlike members 37 such that each end portion extends into a jaw cavity. More particularly, the member 37 has threaded ends and has its central section formed about the crown side. When the auto-polymerizing plastic 31 sets up, it is tightly secured about the threaded ends of the member 37, preventing separation of the jaws 12 and 13. Optionally, openings 38 may be formed in the jaws 12 and 13, through which the members 37 may be passed and via which the members are secured until the material sets up.

In the practice of the subject invention there is provided a device which quickly and easily removes a prosthesis from a tooth without damaging it. The device includes means for gripping the crown sides over relatively extensive areal portions such that the withdrawing pressure at any point on the crown is maintained within safe limits. Although specifically described in connection with the removal of relatively fragile porcelain and porcelain on metal crowns, the subject device may also be advantageously employed for removal of full gold crowns and particularly thin-walled gold crowns.

I claim:

1. Crown removing apparatus, comprising: a pair of jaws for being received about the crown;

a material carried by the jaws and having a surface for contactingly gripping the crown, said surface being contoured to substantially the same shape as that of the crown being gripped; and

means interconnected with said jaws for exerting a force on said jaws in such direction as to remove said crown.

2. Crown removing apparatus as in claim 1, in which said material consists of an auto-polymerizing plastic.

3. Apparatus for removing a crown from a tooth, said crown having an opening in its top, comprising:

a base;

a pair of jaws extending from the same side of the base for being received about the crown with the base extending over the crown top;

a quantity of molded material carried by each jaw for contacting the opposed crown surface, the surface of said material contacting the crown surface also conforming to the crown surface;

a threaded member received in a similarly threaded opening in said base and having an end passing through the crown opening and bearing on the underlying tooth.

4. Apparatus as in claim 3, in which said jaws are releasably interconnected with said base for adjustment toward and away from each other.

5. Apparatus as in claim 3, in which there are further provided at least one rodlike member embedded in said molded material and extending between said jaws.

6. Apparatus as in claim 3, in which said base includes a pair of elongated slots through which individual threaded members pass for threaded receipt within the jaws, whereby said jaws are positionally adjustable with respect to each other.

7. Apparatus for removing a crown from a tooth, said crown having an opening in its top, comprising:

an elongated base having a top side and a bottom side;

a pair of jaws extending from the base bottom side for being received about the crown with the base extending over the crown top, said jaws having concavely formed surfaces facing each other;

first and second quantities of molded material respectively received between each jaw and the opposed crown surface, said quantities conforming to the crown surface; and

a threaded member received in a similarly threaded opening in said base and having first end passing through the crown opening and bearing on the underlying tooth and a second end extending above said base terminating in a head portion.

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