

[54] DENTURE SUPPORT FRAME WITH RAMUS  
IMPLANT FOR MOLAR AREA OF LOWER  
JAW

[76] Inventor: **Harold Devere Roberts**, 217 N.E.  
Knott St., Portland, Oreg. 97212

[22] Filed: **Sept. 11, 1972**

[21] Appl. No.: **287,817**

[52] U.S. Cl. .... 32/10 A

[51] Int. Cl. .... A61c 13/00

[58] Field of Search ..... 32/70 A

[56] **References Cited**

**UNITED STATES PATENTS**

3,641,671 2/1972 Roberts ..... 32/10 A

Primary Examiner—Robert Peshock  
Attorney—L. R. Geisler

[57] **ABSTRACT**

A permanent frame for removably supporting an artificial denture in a molar area of the lower jaw, when there is a sound natural bicuspid or cuspid tooth adjoining that area, comprising a rigid bar with the rear end formed into a ramus implant, the exposed portion of the bar sized and shaped to conform to the molar area in question extending forwardly spaced a slight distance above the epithelium in that molar area, the forward end of the bar turning first downwardly near the first natural tooth and extending down into the top of the mandible bone, and finally turning forwardly and extending into a slit in the root of the tooth and anchored therein. When the bar is in place the exposed portion of the bar enables a denture to be firmly but removably set down over the bar in the desired molar area.

**2 Claims, 6 Drawing Figures**

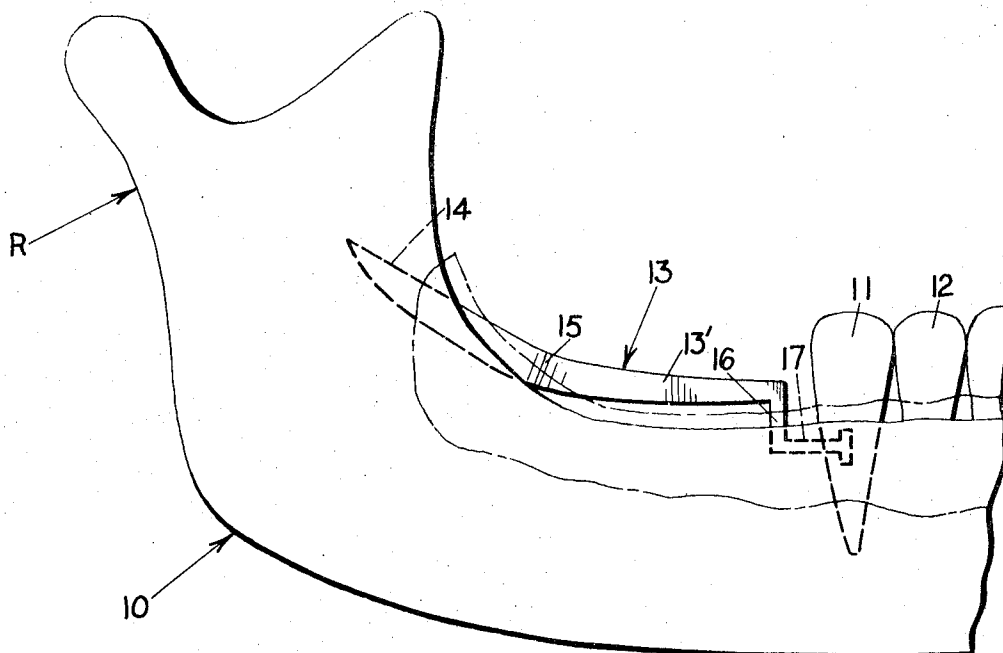


FIG. 1

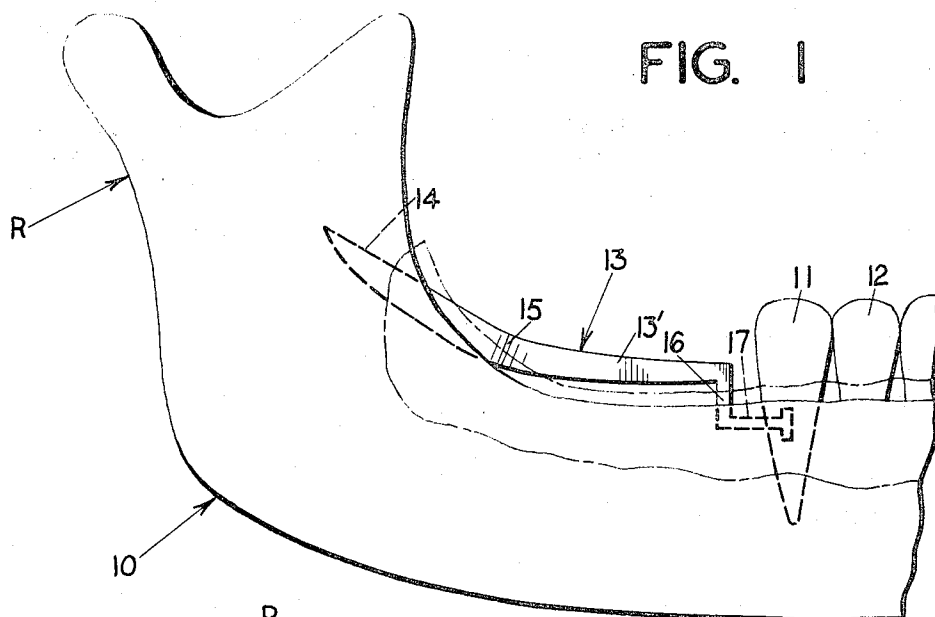


FIG. 3

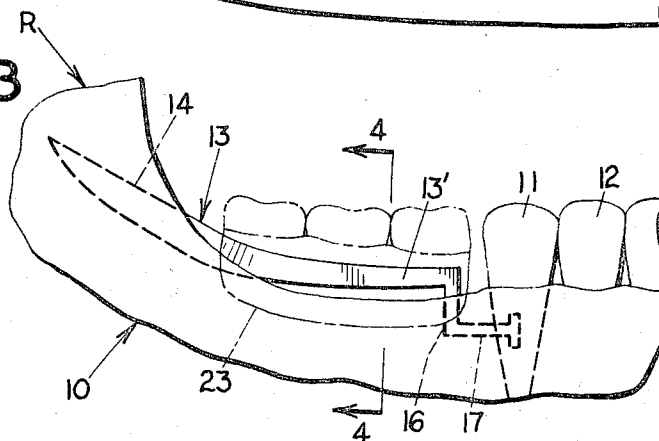


FIG. 2

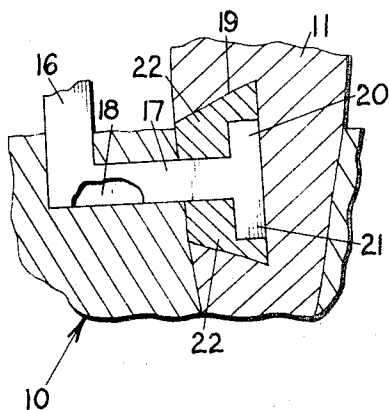


FIG. 5

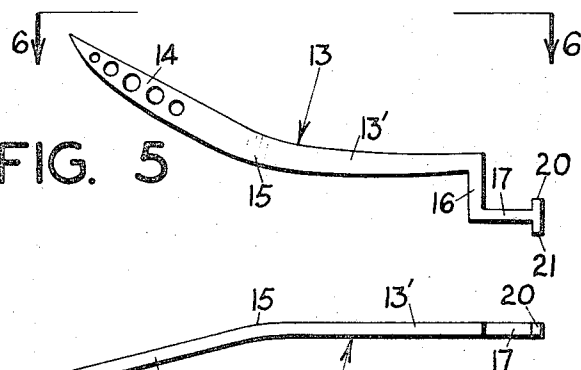


FIG. 6

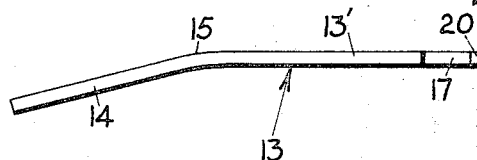
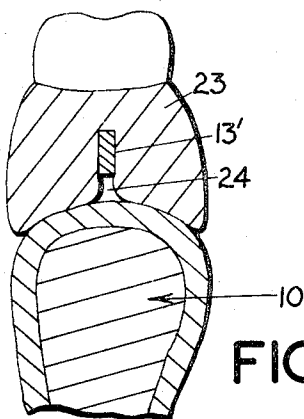


FIG. 4



## DENTURE SUPPORT FRAME WITH RAMUS IMPLANT FOR MOLAR AREA OF LOWER JAW

### BACKGROUND OF THE INVENTION

Often when extraction of wisdom and all molar teeth on one side of the lower jaw has been necessary both, or at least one, of the natural bicuspid teeth adjacent that area will still be in sound condition, and this may be true even though some atrophy in the molar area of the mandible has taken place.

The possibility of mounting an implant in the ramus or retromolar portion of the mandible or jawbone, even when all the natural teeth have had to be removed from the lower jaw and atrophy of the mandible is present, and the results and advantages obtainable with such ramus implants have been explained in U.S. Pat. No. 3,577,853, dated May 11, 1971. U.S. Pat. No. 3,641,671, dated Feb. 15, 1972, has described how, when no natural teeth have been left in the lower jaw and individual implants would be unsatisfactory, a permanent frame for supporting an artificial denture for the entire lower jaw can be satisfactorily installed with the frame consisting of a rigid bar properly sized and shaped and terminating at each end in a ramus implant. However, in many cases where the removal of wisdom and molar teeth has been necessary, some or all of the adjacent cuspid and bicuspid natural teeth are still in sound condition. Consequently permanent bridges for the molar area have been suggested having the rear end of the bridge formed into, or secured to, a ramus implant, and the forward end of the bridge secured on the first available natural tooth. While bridges of this type have been found to be quite satisfactory, there are some disadvantages involved. A main objection is the fact that the tooth to which the front end of such bridge must be secured has to be capped and the cost of proper capping and the securing of the bridge to the capped tooth necessitates considerable expense to the patient. The object of the present invention is to have the forward end of the bridge secured to the root of the first sound tooth instead of the exposed top of the tooth. Not only is this a much less expensive operation, but it is much simpler to perform and avoids the other disadvantages of having a bridge permanently secured on the upper exposed portion of a tooth.

### OUTLINE OF THE INVENTION

The rigid, permanent frame for removably supporting an artificial denture required for a molar area of the lower jaw has the rear end of the frame formed into an implant which is set in the ramus portion of the jaw adjacent the molar area in question and driven rearwardly in between the lingual and buccal plates of the ramus. The frame is sized and shaped so that it will have a central exposed portion extending over the area for which the artificial denture is required with said exposed portion terminating in close proximity with the first sound tooth. At a slight distance rearwardly from the tooth the frame makes a downward turn of approximately 90° so as to extend down through the epithelium and into the top of the mandible bone. Then the end of the frame makes another approximate 90° bend so as to extend forwardly into a substantially vertical slot which is cut into the root of the tooth and in which slot the forward end of the frame is anchored. The end tip of the frame, preferably, has a slight vertical projection to aid in anchoring the end in the tooth slot, and the end is se-

cured to the slot by cement, packed in with silver alloy. The bone and epithelium in the slight space between the end of the exposed portion of the frame and the adjacent tooth are allowed to heal over. Thus the only exposed portion of the frame is the part on which the artificial denture is removably mounted and this portion extends along spaced a slight distance above the epithelium or gum so that thorough cleansing of the exposed portion of the frame is easily accomplished whenever the denture is removed.

### BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is an elevation of the rear portion of the right side of the lower jawbone, drawn to an enlarged scale, showing the natural bicuspid teeth in place and showing the denture support frame secured in position over the molar area on which the artificial denture is required, a portion of the gum or epithelium on the jawbone being indicated by dotted lines;

FIG. 2 is a fragmentary sectional elevation, drawn to a considerably enlarged scale, showing a portion of the root of a bicuspid tooth with the forward end of the denture support frame mounted therein;

FIG. 3 is a fragmentary elevation, similar in part to FIG. 1, with the support frame mounted in place and showing, in dotted line, the artificial denture mounted thereon;

FIG. 4 is a section on line 4—4 of FIG. 3, drawn to a much larger scale;

FIG. 5 is an elevation of the denture support frame by itself; and

FIG. 6 is a top plan view of the denture support frame taken on line 6—6 of FIG. 5.

In FIG. 1 the portion of the jawbone or mandible shown is indicated at 10, the rear end or ramus section being indicated at R. The natural bicuspid teeth on that side of the jaw, which are located anterior to the molar area in question where the artificial denture is required, and which are still sound, are indicated at 11 and 12.

The denture support frame comprises a rigid bar 13 of rectangular cross-section, having its exposed central portion 13' sized and shaped to correspond to the molar area over which the artificial denture is required. The rear end of the bar 13 is formed into a special implant 14 having a flat body, preferably approximately 2 mm. in width and approximately 6 mm. in height, with an overall length of approximately 30 mm., having an upwardly curved bottom edge, the bottom and top edges converging at the end tip. This special implant portion is driven rearwardly into the ramus portion of the jawbone or mandible in between the lingual and buccal cortical plates of the ramus, care being taken to have the upwardly curved bottom edge of the implant located a safe and suitable distance above the alveolar nerve. The flat body of the implant portion 14 is preferably formed with a plurality of holes to enable bone growth to enter the holes and cause the implant to be even more rigidly secured in place in the ramus. A ramus implant of this type is more fully described in U.S. Pat. No. 3,377,853, previously referred to. The bar 13 is bent slightly outwardly and upwardly at 15 to form the special ramus implant portion 14.

The exposed central portion 13' of the bar 13, on which the denture is removably mounted, terminates at a short distance, for example, 4 or 5 mm., from the first natural tooth 11 and the forward end of the bar is an-

chored in the tooth as presently explained. The bar is formed with a downward bend 16 where the central exposed portion 13' terminates, and the downward bend 16 ends with a final forwardly-extending portion 17.

A slit 18 (FIG. 2) is cut in the top of the mandible or jawbone 10 and is extended into the side of the root of the tooth 11 to accommodate the final portion 17 of the bar. The slit in the mandible and the slit in the tooth root are made sufficiently deep so that the top edge of the portion 17 preferably will be approximately 2 mm. below the top of the mandible or bone. The portion 16 of the bar extends downwardly a sufficient distance so that when the portion 17 is placed in the mandible slit and tooth slit the exposed portion 13' of the bar is spaced a slight distance above the epithelium over the mandible in the molar area in question.

The slit 18 (FIG. 2) in the top of the bone and in the root of the tooth for the forward end of the bar 13 is made first preparatory to mounting the bar in place, the epithelium or gum over the bone slit being temporarily folded back. The bar first is tapped rearwardly driving the implant portion 14 into the ramus. Then the bar, as the forward end is lowered into the bone slit, is tapped forwardly slightly so as to bring the tip of the portion 17 of the bar into the slit in the tooth root. Finally the slit in the tooth root is packed, as previously mentioned, and the epithelium between the leg 16 of the bar and the adjacent tooth 11 is pulled back into place.

When the end of the tip portion 17 of the bar is in place in the slit in the root of the tooth the slit is packed with cement and silver alloy as indicated at 19 in FIG. 2. Preferably, although not necessarily, the slit in the tooth root is extended vertically, as shown in FIG. 2, and the tip of the end portion 17 is formed with upper and lower projections 20 and 21 to produce an even more secure anchorage for this end of the bar in the tooth root.

Thus with the forward end of the bar 13 rigidly anchored in the sound tooth 11 and with the rear end of the bar firmly supported by its integral ramus implant, the exposed portion 13' of the bar will provide the desired support for the artificial denture, which support will be firm enough to enable the various molar stresses which will be imposed on the denture on the bar to be withstood.

The artificial denture for the molar area in question is removably supported on the bar as previously mentioned. The artificial denture includes the usual base foundation of acrylic compound, or other suitable den-

ture material, indicated at 23 in FIG. 4, in which foundation material the artificial molar teeth are secured as usual. The base foundation 23 is formed with an upwardly-extending central slot 24 so arranged that the base foundation 23 can be pushed down over the bar and firmly held thereby with the bottom edge of the base foundation in desired proximity to the epithelium or gum on the jawbone. Thus the artificial denture will satisfactorily and firmly be held in place on the permanent support frame for all practical use, but nevertheless the denture can be lifted from the permanent support frame without difficulty when temporary removal of the denture is desired for any reason. The thorough cleansing of the exposed portion of the permanent support frame is a very simple matter whenever the denture is temporarily removed.

I claim:

1. A permanent frame for removably supporting an artificial denture required for a toothless molar area in the lower jaw posterior to a sound natural tooth retained in the jaw, said frame formed from an integral rigid bar, preferably substantially rectangular in cross-section, the rear portion of said bar so formed as to constitute a ramus implant having an overall length of at least 30 mm., an upwardly curved bottom edge, the bottom and top edges converging at the rear end tip, and adapted to be driven rearwardly in between the lingual and buccal plates of the ramus, the denture-supporting portion of said bar being of the proper shape and length to extend forwardly from the ramus implant, spaced slightly above the epithelium in said molar area, to within a slight distance of said sound natural tooth, said latter mentioned portion of said bar ending with a 90° downward turn adjacent said natural tooth and forming a leg member, said leg member having a length sufficient to allow said leg to be implanted in the jawbone but only to a depth considerably less than the depth of the root of said natural tooth, the bottom end of said leg member turned forwardly 90° and forming the terminal of said bar and frame, said forwardly-turned bottom end and capable of extending into a slit cut in said tooth root and to be anchored therein.

2. The denture support frame of claim 1 with the tip of the terminal end of said bottom end of said leg member provided with a short, vertical projection to give increased anchorage hold of said terminal end in the tooth root.

\* \* \* \* \*

50

55

60

65