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I. J. PLOTNICK
ARTIFICIAL DENTURE

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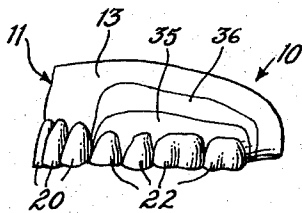


Fig. 1.

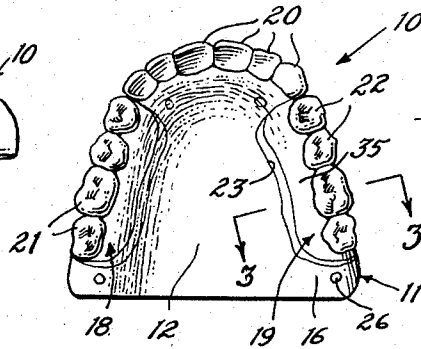


Fig. 2.

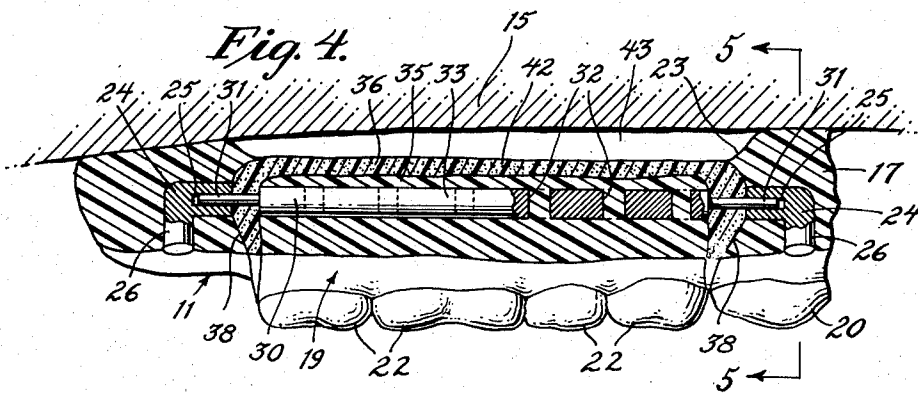


Fig. 4.

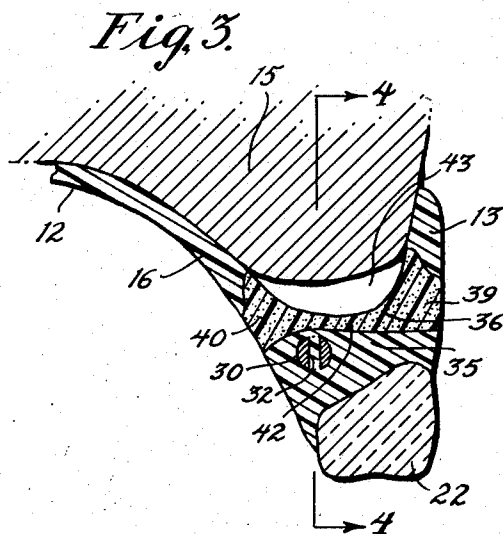


Fig. 3.

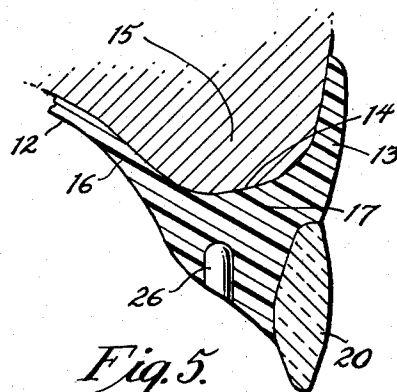


Fig. 5.

INVENTOR.
IRWIN J. PLOTNICK
BY *Robert K. Yawch*
ATTORNEY.

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2,896,324

ARTIFICIAL DENTURE

Irwin J. Plotnick, Philadelphia, Pa.

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9 Claims. (Cl. 32—2)

This invention relates generally to dental appliances, and is particularly concerned with improved artificial dentures or false teeth.

While a particular embodiment of the present invention is illustrated and described hereinafter as employed in conjunction with a full, removable denture, it is understood that this embodiment is shown for illustrative purposes only, and that the invention is equally well adapted for use with partial dentures, as well as fixed and removable dentures, all of which uses are intended to be comprehended herein.

As is well known, conventional artificial dentures, especially those of the removable type, both full and partial, may often subject the wearer to discomfort and pain during mastication. More particularly, the forces necessarily exerted in biting or chewing are of a very high order, as are the impact and shock consequent thereto. In prior commercially accepted dental appliances, the forces of mastication are transmitted by a rigid denture directly to the wearer's gum, teeth, or both. These chewing forces and the accompanying shock produced by commonly used artificial dentures, frequently cause discomfort and injury to the wearer, as well as damage to the denture. In addition, prior dental appliances of many common types are readily dislodged or dislocated under the normal forces of mastication. This lack of stability in prior dental appliances increased wear, so as to reduce their useful life, and complicated the chewing procedure.

It is therefore one object of the present invention to provide a highly improved artificial denture which overcomes the above mentioned disadvantages, and absorbs and checks the shock of chewing forces to eliminate or minimize discomfort to the wearer. Viewed otherwise, the artificial denture of the present invention serves to eliminate or attenuate the shock of chewing forces by effecting their distribution both in time and space.

It is another object of the present invention to provide an artificial denture which eliminates the shock or impact from chewing forces in all directions, and which includes artificial teeth mounted for resilient yielding and return to their normal position, which operation aids and reinforces the wearer's chewing action. Indeed, the resilient yieldability and return of the teeth of the instant denture are proportional to the biting force exerted by the wearer, which approximates the resilient mounting of natural teeth in gum tissue, and therefore accurately simulates natural chewing action.

It is still another object of the present invention to provide an artificial denture wherein one or a group of artificial teeth may be isolated, so to speak, from one or more other artificial teeth in the same carrier structure, so that forces imparted to one group of teeth will not be transmitted to the other group. By this means, the stability of an artificial denture may be greatly enhanced, and the chance of inadvertent dislocation of the denture during mastication substantially eliminated.

It is a further object of the present invention to provide

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an artificial denture having the advantageous characteristics mentioned in the preceding paragraphs, which is extremely simple in construction, durable and troublefree in use, and which can be properly fit and manufactured at reasonable cost.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

Figure 1 is a side elevational view showing an artificial denture of the present invention, removed from the wearer's mouth, and shown for purposes of illustration as a full upper denture;

Figure 2 is a bottom plan view showing the denture of Figure 1;

Figure 3 is a partial transverse sectional view, greatly enlarged, taken substantially along the line 3—3 of Figure 2;

Figure 4 is a partial, sectional elevational view taken substantially along the line 4—4 of Figure 3; and

Figure 5 is a partial, transverse sectional view taken substantially along the line 5—5 of Figure 4.

Referring now more particularly to the drawings, 10 designates generally an artificial denture shown for purposes of illustration as a removable full denture or plate, wherein a relatively rigid carrier structure, generally designated 11, is adapted to be fixedly positioned in the mouth of a wearer by any suitable means, and includes a central portion, palate or roof 12, and an upstanding bounding or buccal flange 13. The palate portion 12 of the plate or carrier 11 is shaped to conformably engage with the roof of the wearer's mouth, being formed with an upwardly opening groove or trough 14, see Figure 5, which extends along and just inward of the buccal flange or wall for receiving the wearer's gum 15. More specifically, the gum-receiving groove 14 is defined in the carrier 11 by the buccal flange or outer wall 13 extending along the front or outer side of the gum, an inner or lingual wall 16 extending along the inner or rear side of the gum, and an intermediate or ridge portion 17 of the carrier extending along the ridge or gum line of the gum 15.

Embedded in the anterior portion of the carrier ridge 17, see Figure 2, are a plurality of teeth 20, which teeth may be fixed in the carrier in conventional manner. Also mounted in the carrier 11 are groups of teeth 21 and 22, which are respectively mounted in the carrier by means of assemblies or structures 18 and 19 which will be described hereinafter in detail. For purposes of illustration, assemblies 18 and 19 and their teeth 21 and 22 are located in opposite posterior regions of the plate or carrier 11.

The carrier is advantageously fabricated of relatively stiff or rigid material, such as hard acrylic or other suitable substance; and the assemblies 18 and 19 carried by the carrier are substantially identical, so that a detailed description of assembly 19 will suffice. As best seen in Figures 3 and 4, substantially the entire intermediate or ridge portion 17 of the plate 11 is cut away or removed, as at 23 in the region of assembly 19, to permit the latter to be mounted in the cutout region according to the teachings of the instant invention. More specifically, the carrier 11 opens at 23 through the ridge portion 17 to the wearer's gum 15. On opposite sides of the cutout or opening 23, spaced longitudinally of the gum 15, a pair of supports 24 are em-

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bedded in the adjacent portions of carrier ridge 17 in facing relation with respect to each other. Each support 24 is formed with a bore or hole 25 which may be of circular or noncircular cross section and opens into the cutout ridge region 23 of the carrier; and, the bores 25 are preferably in alignment with each other. Further, each support 24 may be further provided with an angularly projecting lug or stud 26 which serves to locate its support in the carrier 11 during casting of the latter, and may subsequently be filed or otherwise reduced flush with the carrier surface, as seen in Figure 5.

An elongate bridging member, rod, or bar 30 extends across the carrier cutout 23 between the supports 24, being disposed longitudinally of and spaced from the wearer's gum 15 when in use, and has outwardly projecting opposite end portions 31 slidably received in respective support openings 25. The major portion 33 of the elongate member 30, lying intermediate the end portions 31, may be fabricated of suitable metal, and is preferably provided with a plurality of transversely extending through holes 32. The bridging-member end portions 31 are resiliently bendable or deflectable, so that the entire elongate member 30 is resiliently deflectable preferably in all directions transverse of its length in the manner of a beam. That is, resilient flexure of the elongate-member end portions 31, and also their slidable reception in supports 24, serves to mount the major or intermediate region 33 of elongate member 30 for resilient transverse deflection vertically, forwardly and rearwardly, and combinations thereof. While the distal ends of extensions 31 are illustrated as contiguous to the end walls of holes 25, they may terminate short of the end walls, if desired. The extensions 31 preferably extend from their respective supports into the carrier cutout 23 to enhance resilient yieldability of the bridging member 30 by bending deflection of the end extensions.

Surrounding the central or major portion 33 of the elongate member 30, spaced from the supports 24, is a mass of rigid mounting material 35, which may be of hard acrylic or other suitable composition. Stated otherwise, the intermediate portion 33 of elongate member 30 is embedded in the mounting material 35, the latter preferably filling the openings 32; and, the mounting material, while surrounding the elongate member, is appreciably spaced from the gum line or ridge of the gum 15. The artificial teeth 22 are embedded in the rigid mounting material 35 remote from the wearer's gum.

It will now be appreciated that the assembly 19 of teeth 22, mounting material 35, and elongate member 30 is positioned in spaced relation within the cutout or opening 23 formed in the carrier 11; and depending upon the cross-sectional configuration of elongate-member end portions 31, the assembly may or may not be rotatable about the longitudinal axis of the elongate member. More particularly, the elongate-member end portion 31 may be of a noncircular cross section and conformably received in the support bores 25 to prevent rotation of the assembly 22, 35, 30.

Interposed between the assembly 19 and the bounding surfaces of the carrier cutout 23, is a quantity of yieldably resilient material 36, such as may be fabricated of soft acrylic or other suitable substance. In particular, it will be seen that the resiliently yieldable material 36 extends entirely about the boundary of the carrier cutout 23, occupying the space between the cutout bounding surfaces of carrier ridge 17 and the adjacent ends of the mounting body 35, as at 38, occupying the forward region between the mounting body and carrier cutout bounding surface of the buccal wall 13, as at 39 in Figure 3, and occupying the rear region between the mounting body and cutout bounding surface of the lingual wall 16 at 40. The resiliently yieldable material 36 thus provides a cushion supporting the assembly 19 against chew-

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ing forces having vertical, lateral, and forward or rearward components. As the soft acrylic of the cushion 36 forms a permanent bond with the hard acrylic of the carrier 11 and mounting body 35, the assembly 19 is permanently secured by the cushion to the carrier.

It will be noted in Figures 3 and 4 that the material of the cushion 36 may also occupy the space between the ridge or gum line of the gum 15 and the mounting body 35, as at 42. While the cushion region 42 may fully occupy the space between the gum line and mounting body 35, it is preferred that a clearance space 43 remain unoccupied to afford an air cushion and permit greater yielding of the cushion 36 without pressure against the gum. If desired, the entire cushion 36 may be formed so as to have no contact with the gum 15 by merely reducing the size of the carrier cutout 23, as is evident from examination of Figure 3.

It will now be apparent that the assembly 19 is yieldably and resiliently supported in the carrier 11 for movement under the forces of chewing action in vertical, forward, rearward, and sidewise directions; and, that the deflection and restoring force of the assembly is proportional to the chewing force so as to resiliently return the assembly 19 to its normal position in substantially the same manner as natural teeth in gum tissue. It will also be appreciated that shock imparted to one or the other groups of teeth 21 or 22 will be checked by the mounting thereof, and not transmitted to the carrier 11, or transmitted in such small measure as to not adversely affect stability of the plate 10.

From the foregoing, it is seen that the present invention provides a denture construction which fully accomplishes its intended objects, and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

For example, it is within contemplation of the present invention that the carrier structure 11 be other than a full denture, say a partial denture secured to permanent teeth by clasps or other conventional means; or, that the carrier structure be a permanent or fixed denture rather than removable.

What is claimed is:

1. In a denture construction, a carrier structure having an opening adapted to be fixedly positioned in the mouth of a wearer with said opening overlying the wearer's gum, a pair of supports fixedly carried by said carrier structure at spaced locations about said opening adjacent to the gum line of the wearer, a resiliently deflectable elongate member between and having its opposite ends each extending slidably into a respective support and spaced from said gum line to afford said elongate member increased deflectability under the forces of chewing action, and at least one artificial tooth carried by said elongate member remote from said gum line, whereby said artificial tooth is mounted for resilient yieldability under the force of chewing action.

2. In a denture construction, a carrier structure having an opening and adapted to be fixedly positioned in the mouth of a wearer with said opening overlying the wearer's gum, a pair of supports fixedly carried by said carrier structure at spaced locations about said opening adjacent to the gum line of the wearer, a resiliently deflectable elongate member extending between and connected to said supports and spaced from said gum line, a cushion of resiliently yieldable material interposed between and secured to said elongate member and said carrier to cushion the forces of chewing action and at least one artificial tooth carried by said elongate member remote from said gum line, whereby said artificial tooth

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is mounted for resilient yieldability under the force of chewing action.

3. A denture construction according to claim 2, said cushion extending forward and rearward beyond said elongate member for securement to forward and rearward portions of said carrier structure, to thereby effect cushioning of chewing forces in all directions.

4. In a denture construction, a carrier structure having an opening and adapted to be fixedly positioned in the mouth of a wearer, with said opening overlying the wearer's gum, a pair of supports fixedly carried by said carrier structure on opposite sides of said opening along the ridge of the wearer's gum, an artificial tooth assembly disposed in said opening spacedly overlying the wearer's gum and including resiliently deflectable opposite ends extending slidably into said supports and a cushion of resiliently yieldable material interposed between said assembly and carrier structure to cushion the forces of chewing action.

5. A denture construction according to claim 4, said cushion being spaced from the ridge of the wearer's gum and extending forward and rearward for engagement with front and rear regions of said carrier structure, whereby said cushion serves to check said chewing forces having forward and rearward components.

6. A denture construction according to claim 4, said cushion extending between said artificial tooth assembly and each of said supports to check chewing forces having components longitudinally of the wearer's gum.

7. In a denture construction, an open carrier structure

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adapted to be fixedly positioned in the mouth of a wearer, a pair of supports fixedly carried by said carrier structure located along the ridge of the wearer's gum on opposite sides of an opening in said carrier structure, an elongate member disposed along the ridge of said gum spaced therefrom and having resiliently deflectable opposite end portions extending slidably into said supports, a relatively stiff mounting material secured to said elongate member between its resiliently deflectable end portions and spaced from the gum, and at least one artificial tooth embedded in said mounting material remote from the wearer's gum.

8. A denture construction according to claim 7, in combination with a cushion of resiliently yieldable material interposed between said mounting material and the carrier structure to cushion the forces of chewing action.

9. A denture construction according to claim 8, said cushion extending from said mounting material forward and rearward to said carrier structure and from said mounting material longitudinally of said elongate member to each of said supports, whereby said cushion serves to check chewing forces having forward and rearward components and components longitudinal of said elongate member.

References Cited in the file of this patent

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