

[54] DENTAL PROSTHETIC APPLIANCE

3,241,238 3/1966 Kersten..... 32/2

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[57] ABSTRACT

[52] U.S. Cl. 32/2

[51] Int. Cl. A61c 13/00

[58] Field of Search..... 32/2; 128/DIG. 14

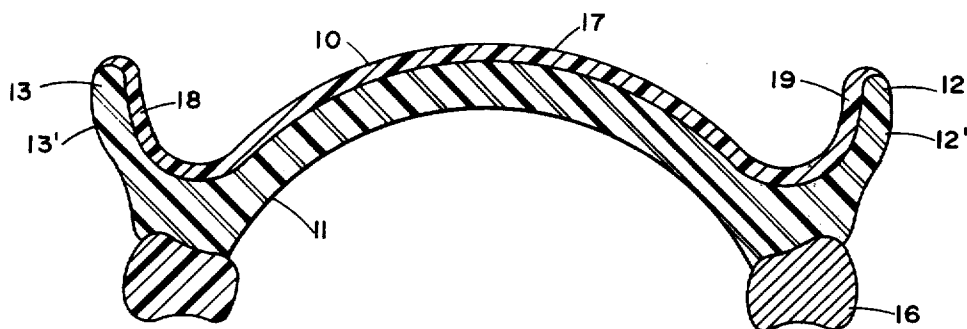
An improvement in dental prosthetic appliances is disclosed wherein fluorinated resins in particular fluorinated polyolefins are employed in the denture base material.

[56] References Cited

UNITED STATES PATENTS

2,825,706 4/1958 Sanders..... 128/DIG. 14

7 Claims, 9 Drawing Figures



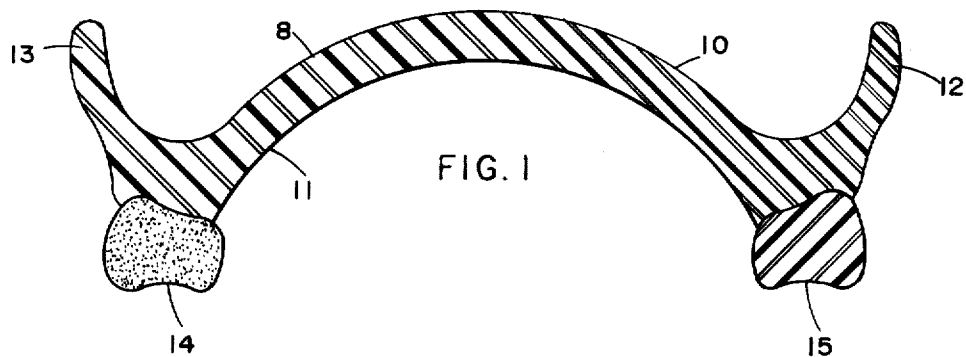


FIG. 1

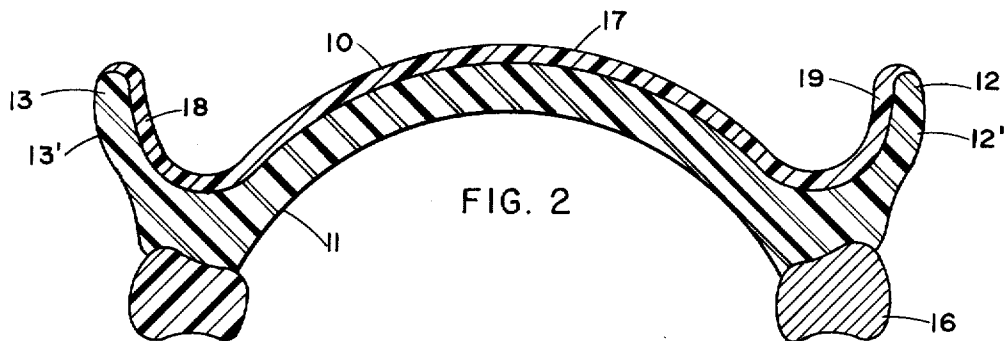


FIG. 2

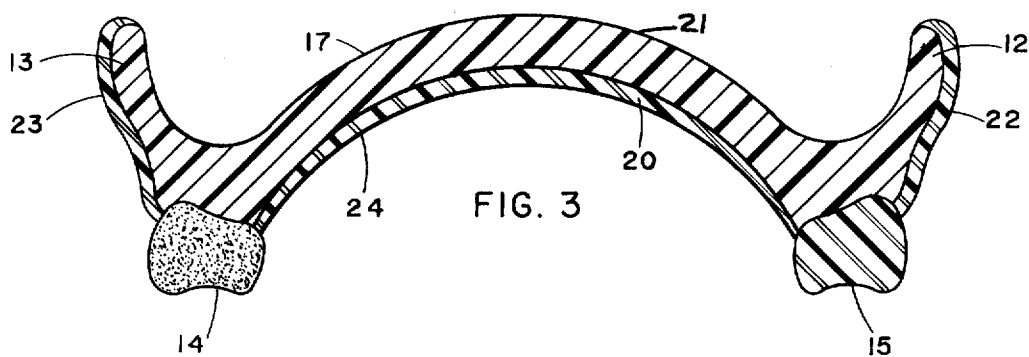


FIG. 3

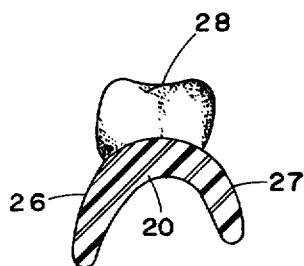


FIG. 4

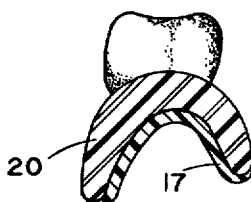


FIG. 5

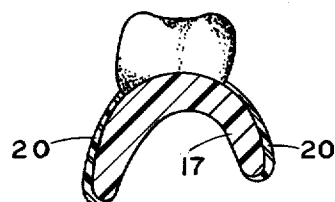


FIG. 6

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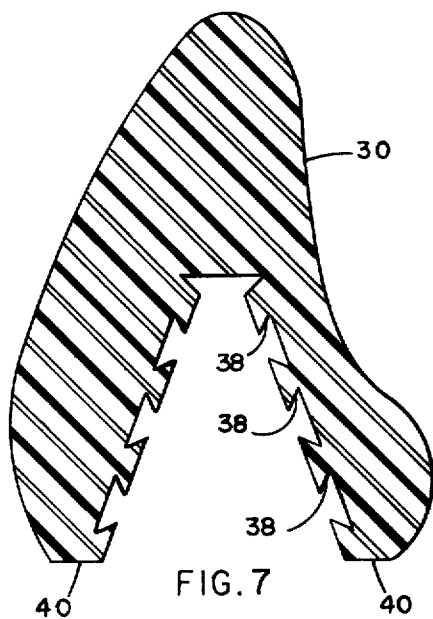


FIG. 7

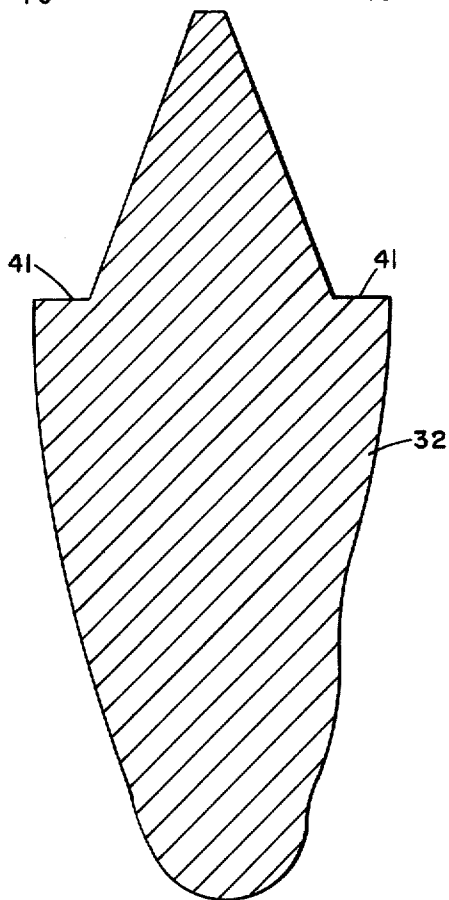


FIG. 8

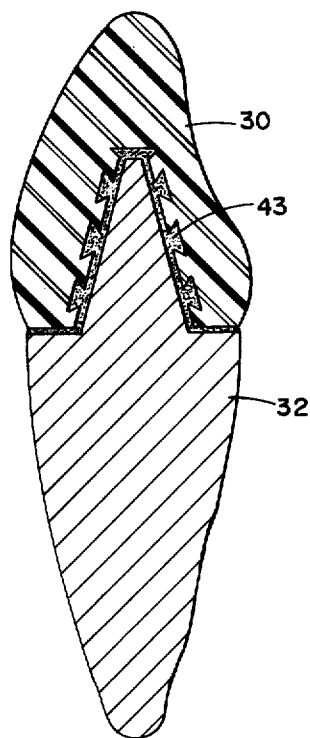


FIG. 9

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DENTAL PROSTHETIC APPLIANCE

This invention relates to prosthetic dentistry and more particularly to an improvement in denture base materials for prosthetic dentistry.

Hitherto, some of the materials employed in the construction of denture base materials used for prosthetic restorations have exhibited the undesirable property of permitting food and tartar to stick to their surfaces. Tartar could then accumulate and harden to a substantial thickness. In an extreme case, as much as a quarter of an inch of tartar can accumulate on conventional denture base materials. To remove such build-ups, patients are driven to use chisels and pocket knives to dislodge such accumulations and may thereby damage the denture. Even the dentist must frequently use chisels, cutting instruments and pumice or other abrasives to remove such deposits. Proprietary denture cleaners have little effect on the elimination of such tartar build-ups.

A denture coated with debris and tartar is not esthetically appealing and generally is responsible for the formation of very disagreeable odors. This odious "denture breath" not only repels those who approach it but frequently condemns the wearer of the offending appliance to have a perpetual bad taste which no amount of "mouth washing" can effectively correct.

Another less obvious disadvantage arising from the use of conventional materials is that by allowing these deposits of food substances, tartar, and the like to remain in the oral environment, they provide repositories for bacteria. Physicians have stated that wearers of such restorations often reinfect themselves with colds and other maladies once an environment favorable for the growth of bacteria, virus and the like is established.

It is therefore an object of this invention to provide a denture base for prosthetic purposes which comprises a material whose surface does not favor the accumulation of tartar and the like.

Another object of the present invention is to provide a prosthetic appliance incorporating an improved denture base which does not provide a favorable site for bacteria incubation thereby reducing the threat of infection and the incidence of undesirable taste and odor from the denture.

Another object is to provide a denture base material for dental prosthetic use which is easily cleaned due to its particular surface characteristics and low moisture absorption.

The foregoing and further objects and advantages as hereinafter described are achieved according to the present invention by providing a dental prosthetic appliance wherein the surface of the denture base material which is exposed to food and the like consists essentially of a polymerized fluorocarbon resin selected from the group consisting of fluorinated polyolefins, such as polytetrafluoroethylene; fluorinated ethylene-propylene mixtures-copolymers and block copolymers or polyallomers; mono halogenated trifluoroethylenes; and the like, and fluorinated polyvinylidene. The family of trademarks based on TEFLON registered by E. I. DuPont de Nemours & Co., Inc. identifies proprietary fluorocarbon resins manufactured by DuPont which find application in various of the embodiments disclosed herein. These include TEFLON S and Teflon-like polymers such as polytetrafluoroethylene (TFE). DuPont also markets suitable fluorocarbon resins

under the trademarks TEFZEL TE and TEFLON FEP (Fluorinated ethylene propylene copolymers). Other materials also useful in the practice of the present invention include:

5 CHLOROTRIFLUOROETHYLENE CTFE and PLASKON CTFE manufactured by Allied Chemical Corp.

KEL - F 81 and KEL - F 82 manufactured by Minnesota Mining and Mfg. Co. and

10 KYNAR PUF₂ and ISOTRON by Pennsalt Chemicals Corporation

The invention will be more fully understood by reference to the embodiments disclosed in the accompanying drawings.

15 FIG. 1 is a transverse vertical sectional view, on an enlarged scale, through an upper denture embodying the invention.

FIG. 2 is a transverse vertical sectional view, on an enlarged scale, through an upper denture showing another embodiment of the invention.

FIG. 3 is a transverse vertical sectional view, on an enlarged scale, through an upper denture showing still another embodiment of the invention.

FIG. 4 is a transverse vertical section through one side of a lower denture.

FIG. 5 is also a transverse vertical section through one side of a lower denture showing another embodiment of the invention.

FIG. 6 is still another embodiment of the invention shown on a transverse vertical section through one side of a lower denture.

FIG. 7 is a transverse section of a jacket crown.

FIG. 8 is a transverse section of a tooth prepared to receive the crown of FIG. 7.

30 FIG. 9 is a transverse section of the assembled crown and tooth of FIGS. 7 and 8.

In the sectional view shown in FIG. 1 of a fluorocarbon denture 8, the palatal surface 10, the lingual surface 11, and the buccal marginal flanges 12 and 13 are fabricated in a conventional manner, such as shown in U.S. Pat. No. 3,530,581. Molar tooth 14 made of porcelain, and plastic tooth 15 are either attached by conventional means, adhesives or the like. For example, the technique of undercutting the denture base to provide a locking connection for the tooth as taught in German Pat. No. 6,945,831 is suitable by providing an anchor between the tooth and the denture base where the materials do not readily adhere with conventional or even special adhesives. The tooth 15 can be made of a fluorocarbon plastic but it could also be formed of any suitable plastic, porcelain or of metal as indicated at 16 in FIG. 2. Gold or stainless steel may be utilized or any non-toxic metal. In this embodiment, the body, as well as the surfaces of the denture base 8, is made up from a fluorocarbon resin suitable for that purpose.

FIG. 2, also a transverse, vertical section of a denture, illustrates a denture base consisting of a fluorocarbon resin laminate where the lingual surface 11 and the outside surfaces 12' and 13' of the buccal marginal flanges 12 and 13 consist of a fluorocarbon resin.

The palatal portion 10 shown with different section lines comprises a layer of methyl methacrylate resin 17, which also covers the areas 18 and 19 on the inner tissue touching portions of the flanges 12 and 13.

This lining can be made of any suitable material. For example, it is possible to use other materials instead of the fluorocarbons in these areas because these areas

are generally cleaner and in well-fitting dentures, there is not as great a tendency for tartar or food to collect. The need for another material in these tissue-touching areas may also arise when on rare occasions, a patient may be sensitive to the fluorocarbon resin employed. Laminates with fluorocarbon resins can be prepared as taught by the art and in particular according to the teaching in U.S. Pat. No. 3,484,337.

In FIG. 3, the main portion of the denture 21 is made of conventional denture base materials, such as polymers of acrylic resins. For purposes of cleanliness, the areas 22 and 23 on the buccal and labial surfaces of the flanges 12 and 13 and the lingual surface 24 of the palate shown are coated with a layer 20 of a fluorocarbon resin. The layer 20 can, if desired, be applied by a spray of a fluorocarbon emulsion and cured at the temperature recommended by the manufacturer of the brand used. The fluorocarbon layer may be as thin as 0.3 to 0.009 of an inch and yet be serviceable. It may, of course, be as thick as desired, with thicknesses of a quarter of an inch being possible.

Where it is desired to apply a thin coat of fluorocarbon that is self-curing and does not require a heat cure, one may use an air-drying fluorocarbon coating such as CTF DURAFILM, which is a compounded TEFLON coating — a product of the American Durafilm Company. Such a thin coat is applied by brushing, spraying, or dipping and then allowed to air dry. Where practical and desirable, the dried CTF coat can be highly polished with fine steel wool or preferably be sanded with No. 600 wet or dry sandpaper.

FIGS. 4, 5 and 6 are sections through a lower denture at the molar area.

In FIG. 4, 26 is the buccal flange area and 27 is the lingual flange surface. The molar tooth is 28 and the entire denture portion 20 is made of a fluorocarbon plastic.

In FIG. 5, a similar section as FIG. 4, 17 is the tissue bearing area and is of an acrylic polymer, whereas the rest of the denture is made up of a fluorocarbon resin polymer 20.

In FIG. 6, which again is similar to the sections in FIGS. 4 and 5, the denture is made of an acrylic resin polymer 17 but the buccal and labial, as well as the lingual surfaces, are coated with a layer 20 of fluorocarbon resin. The method of application of the fluorocarbon can be accomplished as hereinbefore described.

Inasmuch as cements will not adhere well to pure flu-

orocarbons, crowns, bridges, fillings, and other dental appurtenances of this material which are to be cemented to teeth must have retention means built into them as shown in FIG. 7. A crown 30 of fluorocarbon plastic built to fit the tooth 32 is shown in FIG. 8. The shoulders 40 on FIG. 7 will seat on the shoulders 41 of FIG. 8.

FIG. 9 shows the crown 30 cemented onto the tooth 32, held in position by cement shown at 43. Since the cement will adhere to the tooth 32 but may not adhere well to the crown 30, retention undercuts 38 have been built into the crown for mechanically holding the cement for retaining the crown 30 on tooth 32.

It should be understood that while the novel fluorocarbon dental prosthetic appliances are hereinbefore illustrated by certain examples, other ingredients than those specifically named may be included and these and other changes may be made without departure from the invention or sacrificing the advantages thereof.

I claim:

1. A dental prosthetic appliance comprising artificial teeth attached to a denture base material wherein substantially all of the exposed surfaces of said denture base material thereof contains laminated thereto a layer of a polymerized fluorocarbon resin selected from the group consisting of fluorinated polyolefins and fluorinated polyvinylidene.

2. The dental prosthetic appliance of claim 1 wherein the resin is polytetrafluoroethylene.

3. The dental prosthetic appliance of claim 1 wherein the resin is a fluorinated ethylene-propylene copolymer.

4. The dental prosthetic appliance of claim 1 wherein the resin is chlorinated trifluoroethylene.

5. A dental prosthetic appliance wherein the entire denture base is made of a polymerized fluorocarbon resin.

6. A dental prosthetic appliance wherein the lingual portion of the denture base and the exposed buccal and labial portion of the denture base are coated with a polymerized fluorocarbon resin laminate and the remainder of the tissue touching surfaces of the denture base consists predominately of polymerized acrylic resins.

7. A dental prosthetic appliance wherein substantially all of the exposed surfaces of said appliance consist essentially of polymerized fluorocarbon resins.

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