Oct. 29, 1963 A. MEYER 3,108,377

MATRIX FOR INTERPROXIMAL ANTERIOR RESTORATIONS

Filed July 25, 1960

Fig. 1.

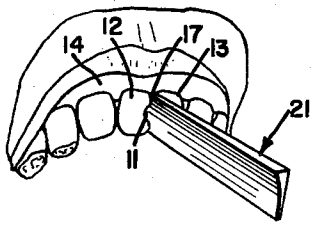
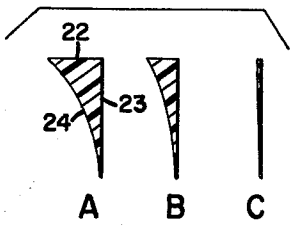


Fig. 5.



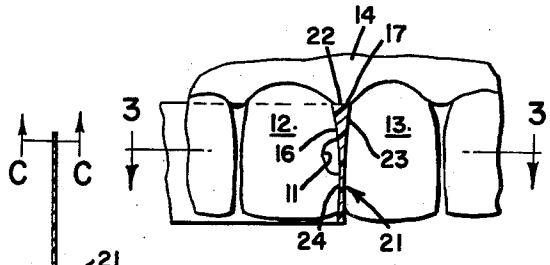


Fig. 2.

Fig. 3.

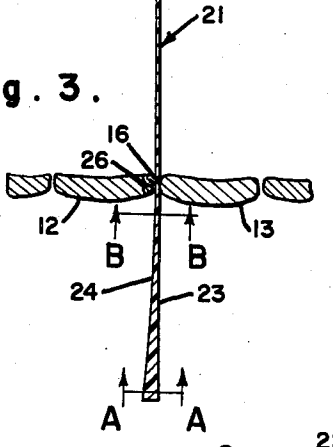


Fig. 4.

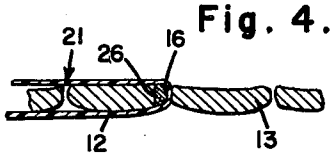
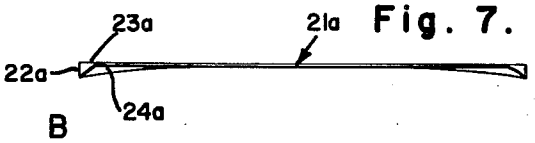


Fig. 7.



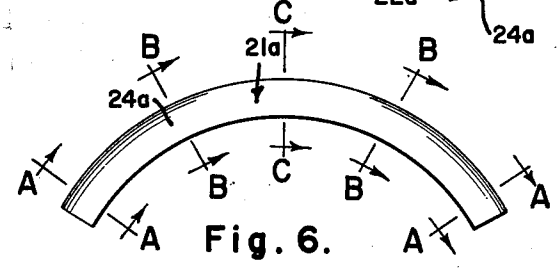


Fig. 6.

INVENTOR.
Alvin Meyer
BY
Julian Caplan
attorney

United States Patent Office

3,108,377

Patented Oct. 29, 1963

3,108,377

MATRIX FOR INTERPROXIMAL ANTERIOR RESTORATIONS

Alvin Meyer, 1690 Woodside Road, Redwood City, Calif.

Filed July 25, 1960, Ser. No. 45,163
4 Claims. (Cl. 32—63)

This invention relates to a new and improved matrix for interproximal anterior restorations. More particularly, the invention relates to a formed plastic strip which a dentist may use to seal off the area between two teeth at the gum line when a restoration of a plastic nature is being performed.

At the present strips of thin plastic material are used for the purpose of sealing off the space between teeth during the formation of the restoration. The use of such flat strips is in some instances desirable, but in many instances is unsatisfactory in the results obtained. The present invention is designed to remedy the deficiencies of the prior device.

One of the deficiencies of prior devices resides in the fact that the human tooth is bulbous at about the gum line rather than being prefectly conical. Where a flat strip is used in accordance with the prior art, it is difficult or impossible to simulate the convexity of the tooth and hence the restoration has flat spots and particularly has thin spots at the edges. The flat spots and thin spots occasion future difficulty and failure of the restorations.

Accordingly it is a principal feature of the present invention to provide a matrix which is concave in at least one of its surfaces to match the convexity of the bulbous portion of the tooth.

A further characteristic of the human tooth is the fact that the space between teeth varies as between two teeth in the same mouth and as between the particular teeth of different patients. The present invention provides a matrix so constructed as to accommodate itself to such variations in spacing.

Another advantage of the invention is the fact that less trimming is required after the restoration has solidified as compared with the trimming required in prior practice.

Still a further feature of the invention is the fact that the gum is depressed away from the location of the cavity as distinguished from the straight matrix which tends to cut between the gum and the tooth.

A still further advantage of the invention is the reduction in the likelihood of nonremoval of a piece of the restoration which would create irritation of the gum.

Still another feature of the invention is the fact that the matrix is sterilizable and hence reusable as contrasted with prior devices used for the same purpose.

In a modification of the invention the strip is curved and thus follows the curvature of the palate and eliminates the tendency to irritate the roof of the mouth as the strip is inserted between the teeth.

Oher objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawing:

FIG. 1 is a perspective view of the upper jaw showing insertion of the matrix in accordance with this invention.

FIG. 2 is a front elevational view with the device in the position shown in FIG. 1.

FIG. 3 is a horizontal sectional view taken substantially along the line 3—3 of FIG. 2.

FIG. 4 is a view similar to FIG. 3 showing the matrix foldback to complete the contouring of the restoration and during the period while the plastic restoration is setting.

FIG. 5 is a composite view showing sections A, B and C taken respectively at lines A—A, B—B and C—C of FIG. 3.

FIG. 6 is a plan view of a modified matrix of curved shape.

FIG. 7 is a side elevation of the structure of FIG. 6.

As shown in FIG. 1, the device is used during the restoration of a cavity 11 occurring in the interproximal region of two teeth 12 and 13 respectively in the upper jaw 14. The surface of the tooth 12 in which the cavity 11 is located, as indicated by reference numeral 16 and as is particularly apparent in FIGS. 2 and 3, is bulbous—i.e. of a somewhat spherical shape. It is also apparent that the space between teeth 12 and 13 is wider at the top than at the bottom. It is also apparent that in different mouths and in the spaces between different teeth, the spacing varies. The present invention accommodates such bulbous shape and varying spacing. Further, the device pushes the gum as indicated by reference numeral 17 away from the cavity 11, leaving the dentist with a clear access to the cavity.

The matrix 21 used in accordance with this invention consists of a strip of flexible plastic material such as a polyethylene material of Eastman Chemical Products, Inc., known as Tenite, Series 50, Number 811, having a molecular weight of 18,000. Other polyethylene plastics, polypropylene, nylon and Teflon plastics may be used. The desired characteristics of the plastic are that it be flexible, strong and smooth and preferably will withstand repeated sterilization so that the matrix may be reused. In cross section as best shown in FIG. 5, the matrix 21 has a flat upper edge 22 which fits against the gum and a flat edge 23 disposed at right angles to the edge 22. A concave surface 24 is provided opposite side 23 so that the matrix has a generally triangular cross section, with the hypotenuse being inwardly curved instead of straight. Further, the matrix 21 tapers in thickness. Thus the thin end as shown by cross section C—C in FIG. 5 is practically flat and is extremely thin so as to penetrate even the tightest space between teeth. The thickness gradually increases so that at section B—B the wedge shape and concave nature of the surface 24 is apparent. At its end opposite section C—C as shown by section A—A, the thickness is considerably greater than as shown in section B.

In use, after preliminary drilling, etc. has been performed and the dentist is prepared to make the restoration, the thin end C of the matrix 21 is inserted in the space between teeth 12 and 13 and pulled inwardly. The inward pulling wedges the matrix tightly in the space between the two teeth. Further, the surface 22 pushes the gum 17 away from the cavity. The distance which the matrix 21 may be inserted depends upon the spacing at the particular location where it is employed. Completion of this operation is shown in FIGS. 1 to 3 inclusive. The dentist then fills the cavity by means of a plastic restoration material 26 in accordance with common practice. The matrix 21 reduces the excess material which is inserted and hence reduces the amount of trimming required after the restoration has hardened. Upon completion of the insertion of the plastic restorative material 26, the matrix is pulled back to the position shown in FIG. 4, thereby shaping the restoration while the restorative material is hardening. By reason of the concave shape of surface 24 the restoration assumes the natural bulbous configuration of the tooth as indicated by the surface bearing reference numeral 16 in FIGS. 2 and 3.

In the modification shown in FIGS. 6 and 7 the matrix 21*a* is curved. Thus when the matrix is inserted in the mouth it follows the curvature of the palate and does not irritate the patient as it is being positioned. In the modification of FIGS. 6 and 7, the matrix 21*a* is narrowest at the center and tapers to increased thickness at either end.

Thus the narrowest portion is inserted between the teeth and the matrix pulled in either direction to wedge itself into position. The cross sectional shape of the matrix at various positions resembles that shown in FIG. 5 and hence identical section lines are employed in FIG. 6.

What is claimed is:

1. A matrix for dental restorations comprising a relatively long, narrow strip of flexible material shaped to fit between teeth, characterized by the fact that said strip is thicker in cross-section at one end than at the middle section of said strip and thicker at the end opposite said first-mentioned end than said middle section, and intermediate said section and said one end the cross-section of said strip increases in thickness substantially continuously, said strip being sufficiently flexible to bend back along both the lingual and labial surfaces of one of said teeth while restorative material is hardening.

2. A matrix according to claim 1, in which said strip is longitudinally arcuate.

3. A matrix according to claim 1, in which said strip in transverse cross section is wider at one edge than at the other, the wider edge being of a thickness about equal to the space between teeth at the gum line.

4. A matrix according to claim 3, in which one side surface is flat and the other side surface is concave.

References Cited in the file of this patent

UNITED STATES PATENTS

2,782,503	Thompson	Feb. 26, 1957
2,867,905	Meacham	Jan. 13, 1959
2,891,313	Crowley	June 23, 1959

FOREIGN PATENTS

1,020,102	France	Nov. 12, 1952