Oct. 18, 1955 B. F. TOFFLEMIRE 2,720,701

DENTAL MATRIX BAND FOR USE WITH CONTRA-ANGLE RETAINER

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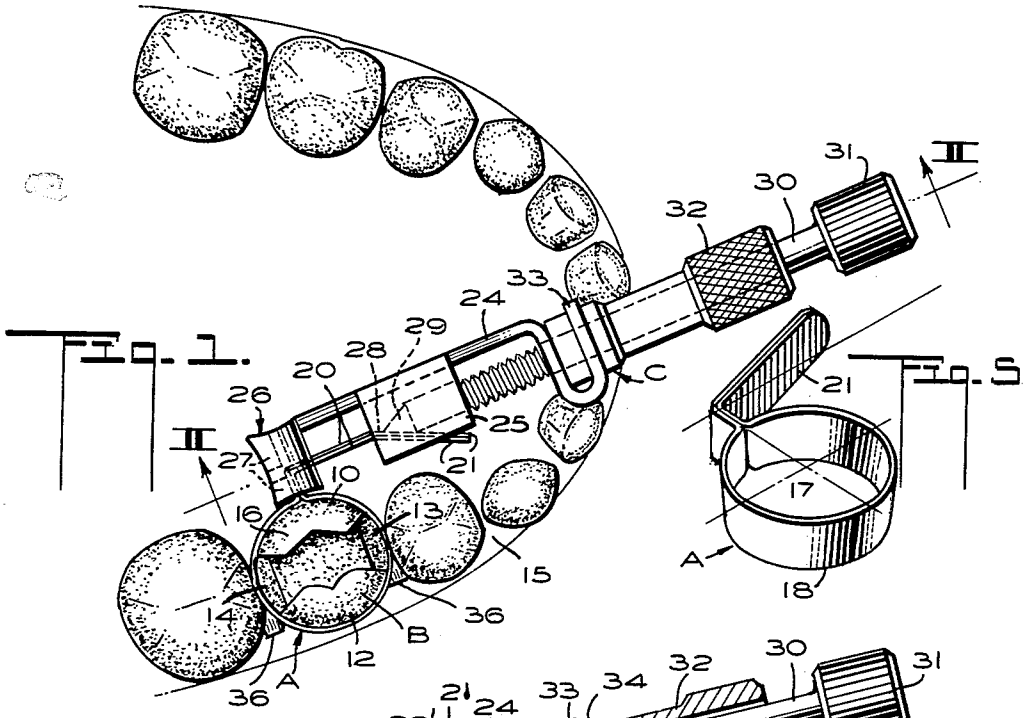


FIG. 1.

FIG. 5.

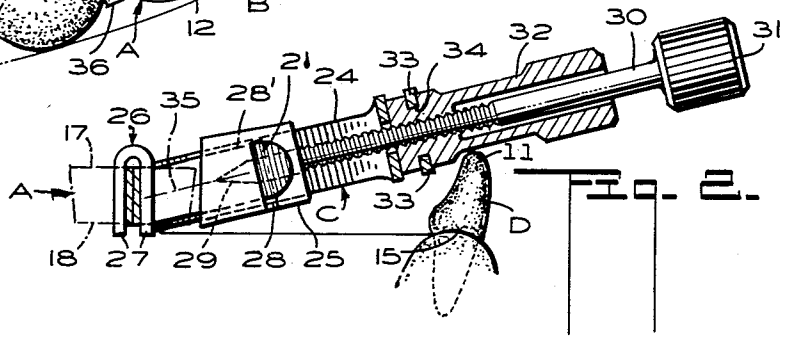


FIG. 2.

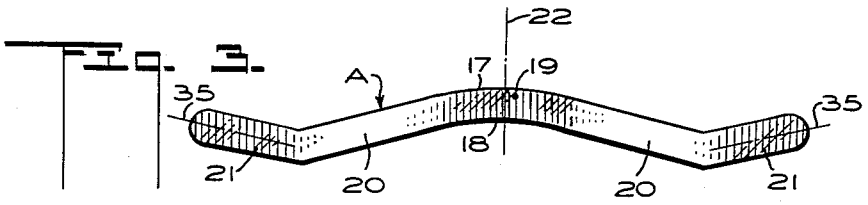


FIG. 3.

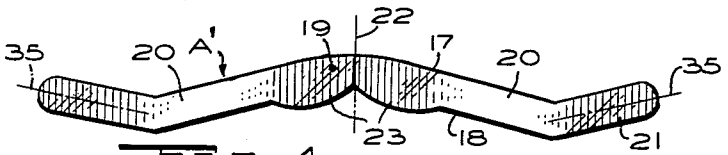


FIG. 4.

INVENTOR.

BENJAMIN F. TOFFLEMIRE

BY

Munn & Liddy

ATTORNEYS

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DENTAL MATRIX BAND FOR USE WITH CONTRA-ANGLE RETAINER

Benjamin F. Tofflemire, Lafayette, Calif.

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2 Claims. (Cl. 32—63)

The present invention relates to improvements in a dental matrix band for use with a contra-angle retainer, such as shown in my United States Letters Patent No. 2,591,745, issued April 8, 1952.

In the above-mentioned patent, there is disclosed a dental matrix band retainer, including a bar-like frame having a slotted head at the forward end thereof. This head defines a plurality of guide fingers defining slots arranged for slidably-receiving intermediate portions of a looped band, the latter being adapted to encircle the axial contour of a posterior tooth.

As shown in that patent, the length of the bar is inclined relative to the lengths of the fingers so that the bar will clear incisal edges of anterior teeth, or clear the patient's tongue and occlusal surfaces of posterior teeth in an opposite quadrant when the bar is directed across the patient's mouth, with the finger lengths paralleling the long axis of the banded tooth in either case. Moreover, a slidable block is provided on the bar, and is adapted to have the end sections of the band anchored thereto by means of a rotatable spindle. Upon retracting this block, the band is constricted about the banded tooth.

It is important, of course, that the band be made to conform to and embrace the entire axial contour of the banded tooth; yet, at the same time, the ends of the band must be firmly anchored to the sliding block. Inasmuch as this block is drawn along an incline, the bands disclosed in the present application have been provided with terminal extensions, which correspond to the angular arrangement of the bar of the retainer. Thus a straight pull may be obtained on the ends of the band in parallel relation with the length of the bar-like frame, regardless of whether the retainer is applied on the buccal or lingual surface of the tooth.

Another object of the invention is to provide a dental matrix band which has been specifically designed to utilize, augment and actually accentuate the advantages of the contra-angle retainer shown in my patent identified above. The terminal extensions on the band afford a positive and firm grip thereon by the retainer, and the band may be applied efficiently from either the buccal or lingual aspect of the tooth to be restored. It is well adapted to children's dentistry, but is not limited thereto.

The band presents many new, novel and altogether individualistic features which materially add not only to the functional efficiency, beauty of design and ease of operation, but also to the standardization of operative technique in the use of the contra-angle retainer and its specially-designed band, and greatly facilitates the clinical teaching of modern techniques, methods and procedures.

Other objects and advantages will appear as the specification proceeds, and the novel features will be set forth in the claims hereunto appended.

Drawings

For a better understanding of the invention, reference should be had to the accompany drawing, forming part of this application, in which:

Figure 1 is an occlusal view of primary or deciduous dentitions (upper or lower quadrants), illustrating my improved matrix band applied around one of the teeth, and held in place by the retainer;

Figure 2 is an elevational view of the retainer, taken along the plane II—II of Figure 1, parts being shown in section;

Figure 3 is a face view of one form of my dental matrix band;

Figure 4 is a modified embodiment thereof; and

Figure 5 discloses the first form of the band as being looped upon itself prior to being inserted into the retainer.

While I have shown only the preferred forms of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

Referring to the drawing, it will be noted that my improved dental matrix band A has been applied to a posterior (back) tooth B, and is held in encircling and embracing relation therewith by my contra-angle retainer C. This retainer has been illustrated as being disposed on the lingual (tongue) surface **10** of the banded tooth, and extending across the incisal edge **11** of an anterior (front) tooth D (see Figure 2); but, obviously, it may be applied to the buccal (cheek-side) surface **12** of the tooth being restored.

As pointed out in my United States Patent No. 2,591,745, which is directed to the details of the retainer, the mesial and distal surfaces **13** and **14**, respectively, have a decided pitch, flaring outwardly from the gingival (gum) border **15** to the occlusal (grinding) surface **16**. Moreover, the lingual and buccal surfaces **10** and **12**, respectively, have a moderate or slight flare. Human teeth are not round in cross-section, but are characterized by a decided mesio-distal flattening or constriction at the interproximal (between the teeth) gingival border.

With this complex anatomical feature in mind, the dental matrix band A has been designed to embrace the entire axial contour of the banded tooth when applied thereto. Figure 3 discloses this band as being flattened out, while Figure 5 discloses it as being looped upon itself and ready to be inserted into the retainer C, prior to being engaged around the tooth.

In its structural features, the band A defines a strip of flexible material having occlusal-facing and gingival-facing edges **17** and **18**, respectively. The strip, when flat, provides an arcuate central portion **19** having straight arms **20—20** extending therefrom in opposite directions, with these arms diverging outwardly relative to one another. As shown in Figure 3, the occlusal-facing and gingival-facing edges of the central arcuate portion **19** and the arms **20—20** define convexed and concaved arches, respectively, when the strip is flat. The strip provides terminal extensions **21—21**, each of which extends occlusally at an obtuse angle relative to its respective arm. Each half of the strip, on opposite sides of the midportion **22**, is identical with one another. The strip, when flat, defines substantially an extended **W**, in which the width of the **W** exceeds its height.

For those cases having extended interproximal cavities extending occluso-gingivally below the free marginal of the gum, a modified band A' has been provided (see Figure 4). This band is essentially the same as the band A, excepting for the fact that wider wing-like sections **23** formed on the gingival-facing edge **18**. Otherwise, the two bands are identical; accordingly, like reference numerals have been applied to corresponding parts.

In order to obtain a clear understanding of my dental matrix band, and the reasons for its particular construction, the retainer C will be described briefly. It includes

a bar-like frame **24** on which a matrix-clamping block **25** is slidably mounted. This frame has a slotted head **26** at its forward end, which defines four parallel and spaced-apart fingers **27**. The arms **20—20** of the matrix band being used are adapted to be guided through the slots between these fingers, as shown in Figures 1 and 2. The terminal extensions **21—21** are adapted to be abutted together and then introduced edgewise into a diagonally-extending slot **28** formed in the block **25**. Thereafter the extensions are clamped to the block by a pointed end **29** of a spindle **30**, which is threaded into the block. This spindle may be turned by a knob **31**.

As shown in Figures 1 and 2, a rotatable internally-threaded sleeve **32** has the spindle screwed therethrough. The sleeve is held against endwise movement relative to the bar-like frame **24** by a pair of prongs **33—33** on the frame engaging with an annular groove **34** formed in the sleeve. When the sleeve is turned, the spindle **30** and the block **25** are advanced or retracted relative to the head **26**. Obviously, movement of the block away from the head will constrict the matrix band upon the banded tooth.

It will be observed from Figure 2 that the length of the guide fingers **27** are inclined with respect to the length of the bar-like frame **24**. This angular arrangement will permit the fingers of the retainer to remain parallel with the long axis of the tooth B, while the retainer C may extend occlusally to clear the incisal edges of anterior teeth, or to clear the patient's tongue and occlusal surfaces of posterior teeth when the retainer is directed across the mouth.

Reference is made to Figure 2, wherein it will be seen that the angularity of the terminal extensions **21** is such that they will parallel the length of the inclined bar-like frame **24**. Thus the pointed end **29** of the spindle **30** will contact with the extensions **21** along their longitudinal centerline **35**, when the spindle is advanced relative to the clamping block. Moreover, when the block is retracted away from the head **26**, the terminal extensions will be pulled parallel with the bar **24**, thus giving a good purchase on the ends of the band.

The angular arrangement of the extensions **21—21**, which permits them to correspond with the inclination of the frame **24** when the band is applied to the retainer, permits a uniform distribution of the gripping force of the spindle end **29** on the extensions of the band. This will reduce the amount of finger pressure required in clamping the band to the block **25**, and will materially reduce the mutilation of the band. The extensions **21—21** of the band occupy a centralized position in relation to the threaded spindle **30**, which exerts traction along the centerline **35—35** of these terminal extensions in the normal line of pull.

It will be noted from Figure 2 that the occlusal-facing and gingival-facing edges **17** and **18**, respectively, of the looped band A define horizontal planes around the banded tooth, while the floor **28'** of the slot **28** and the frame-like bar **24** are disposed on an incline—a condition made necessary in order that the retainer C will clear the incisal edges **11** of the anterior teeth D. The angularity of the terminal ends **21—21** correspond with this inclination of the retainer, thereby clearly defining the functional position of the band in relation to the banded tooth and the retainer.

The angularity of the terminal ends of the band permit the latter to be used in the contra-angle retainer in remote areas of the mouth, and to be applied on the teeth which are displaced, rotated and badly positioned. Moreover,

the precision-formed band is especially designed so as to form an accurate, form-fitting mould for the reception of the plastic alloy for amalgam work, or the ideal wax-pattern form for cast-gold work.

Particular mention is made of the fact that the band shown herein is ideally designed for the restoration of an entire buccal surface, or a complete buccal cusp, by using it in the contra-angle retainer, the latter being applied from the lingual aspect. There is no flattening pressure on the missing area, when the retainer is tightened, as the pressure from the retainer is against the remaining solid cusp or surface. Since the band is reversible, this same application may be made from the buccal side in those cases where the lingual surface or lingual cusp is missing.

Well-rounded and fully contoured restorations may be obtained. With cases having a very short muscle-attachment, such as frequently seen in small-mouthed individuals, and always found in children, the band shown herein is particularly well suited for use in the contra-angle retainer and is adapted to be applied from the lingual. Separating wedges **36** may be inserted from the buccal so that the ends thereof do not protrude from the buccal, and thus the youngster cannot attain leverage for displacement of the band.

The band disclosed herein may be used successfully with the contra-angle retainer on isolated third molars, the central long axis of which may be inclined and the coronal portion rotated, deviated or mutilated to an extent heretofore considered beyond restoration.

I claim:

1. In a dental matrix band: a strip of flexible material adapted to be looped around a tooth in embracing relation with the axial contour thereof; the strip having occlusal-facing and gingival-facing edges; the strip, when flat, defining an arcuate central portion having straight arms extending in opposite directions from said central portion, with the arms diverging outwardly relative to one another; the occlusal-facing and gingival-facing edges of said central portion and arms defining convexed and concaved arches, respectively, when the strip is flat; the strip providing terminal extensions on the arms, each of which extends occlusally at an obtuse angle relative to its respective arm; the terminal extensions both sloping toward the occlusal and being angularly related to one another when the strip is flat.

2. In a dental matrix band: a strip of flexible material adapted to be looped around a tooth in embracing relation with the axial contour thereof; the strip having occlusal-facing and gingival-facing edges; the strip, when flat, defining an arcuate central portion having straight arms extending in opposite directions from said central portion, with the arms diverging outwardly relative to one another; the occlusal-facing and gingival-facing edges of said central portion and arms defining convexed and concaved arches, respectively, when the strip is flat; the strip providing terminal extensions on the arms, each of which extends occlusally at an angle relative to its respective arm; the strip, when flat, defining substantially an extended W, in which the width of the W exceeds its height.

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