My invention relates to improvements in holders for dental matrix bands and to clamping means for operating the bands to clamp cotton or the like to maintain the teeth dry in tooth restoring treatments.

The primary object of my invention is to provide a holder as in the above with clamping means for operating flexible matrix bands to clamp cotton to adjoining teeth and to wedge the teeth apart in interproximal restoring treatment of confronting cavities.

Another object is to provide a holder for the above purposes with clamping means for operating a matrix band to clamp cotton around single teeth in restoring treatments.

Still another object is to provide a holder with clamping means for operating matrix bands for clamping celluloid or gutta percha bands against single or several adjoining teeth in restoring such teeth.

Yet another object is to provide clamping means for the above purposes which are interchangeable in the holder.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereininafter described and claimed, reference being had to the accompanying drawings forming a part thereof, and in which:

Figure 1 is a fragmentary view in plan of my improved matrix holder provided with means for operating matrix bands to clamp cotton to adjoining teeth;

Figure 2 is a view in longitudinal vertical section taken on the line 2-2 of Figure 1;

Figure 3 is an enlarged perspective view of a pair of matrix band holding and clamping members forming part of the operating means of Figures 1 and 2;

Figure 4 is an enlarged view in transverse section taken on the line 4-4 of Figure 1;

Figure 5 is a fragmentary view in plan of the matrix holder provided with means for operating a matrix band for clamping cotton around a single tooth;

Figure 6 is an enlarged perspective view of a matrix band holder forming part of the operating means of Figure 5;

Figure 7 is a fragmentary view in plan illustrating the matrix holder provided with means for operating matrixes to clamp celluloid or gutta percha against single or several teeth;

Figure 8 is a perspective view of the operating means of Figure 7;

Figure 9 is an enlarged perspective view of one of the matrix bands.

Referring to the drawing by numerals and first to Figures 1 to 4, as shown therein, my improved matrix holder comprises a shank 1 provided at its front end with a substantially oval open frame 2 having convex sides 3 and a convex front end 5, the sides 3 being longitudinally bowed upwardly to straddle the gums 7 and teeth 9 of a jaw. The shank 1 is provided with a longitudinal slot 11 opening into the frame 2 and which

is closed at the rear end 13 of the shank 1 and the front end 5 of the frame 1 is provided with a slot 15 aligned with the slot 11 and opening into said frame 2 all for a purpose presently seen.

A slide 17 is fitted by side grooves 19 in the slot 15 for advance and retraction by a feed screw 21 threaded through the rear end 13 of the shank 1 into the slot 11 and is operatively connected to the rear end of the slide 17 by a reduced end 23 on said screw rotatably extended through a U-clip 25 and having a terminal ball 27 in said clip, the clip 25 straddling and being riveted, as at 29 to a rear end of the slide 17. A knurled head 31 on the screw 21 provides for turning the same. The slide 17 is provided with an opening 33 in its front end for a purpose presently clear.

Means is provided in the frame 2 for operating a pair of conventional, dental matrix bands 35 to clamp cotton 37 to the buccal and lingual sides of adjoining teeth in restoring interproximal cavities and as follows:

A pair of substantially crescent shaped matrix supporting and clamping plates 39 of thin resilient metal are attached to the front end 5 of the frame 2 and to front end of the slide 17 in opposite relation by the lateral stems 41 on one side and in the transverse center thereof extended through the slot 15 and opening 33 with thumb nuts 43 on said stems for securing the plates 39 against said end 5 and said slide 17. Rectangular bosses 45 are provided on the plates 39 at the base of the stems 41 and are adapted to fit in the slot 15. The plates 39 are interchangeable so that either one may be secured to the front end 5 of the frame 3 and prevented from turning by its boss 45 while the other may be fastened to the slide 25 and swing thereon with compensating movement in operating a matrix band 35.

The plates 39 are provided with confronting scalloped edges forming opposite pairs of complemental rounded notches 47 in said plates respectively, and a flat tapered wedge 49 on each plate between its pair of notches 47. Reduced shouldered studs 51 are formed on the ends of each plate 39.

In operating the described holder a pair of the matrix bands 35 are interposed between the plates 39 with portions tuck into the notches 47 and the studs 51 inserted in end openings 53 with which said bands 35 are provided as shown in Figure 9. Layers of cotton 37 are then tucked into the bands 35 and the frame 2 placed over the adjoining teeth 9 to be treated with the plates 39 straddling the teeth to position the bands at the buccal and lingual side of the teeth. The feed screw 21 is then tightened and the plates 39 will cause the bands 35 to clamp the cotton 37 against the teeth 9 conformably while the wedges 49 will wedge the bands 35 and cotton 37 between the adjoining teeth 9 to separate the same, all as shown in Figure 1.

As shown in Figure 5, a pair of quadrant shaped plates 55 are provided for securing to the front end 5 of the frame 2 and the slide 17 in opposite relation. The plates 55 are each provided with a notch 57 like the notches 47 which confront each other, a wedge 59 at one end of the notch 57, a shouldered stud 61 at the other end of the notch, and a threaded stem 63 with a base lug 65 whereby said plates 55 are adapted to be secured in the same manner as plate 39. A matrix band 67 double upon itself is interposed between the plates 55 and tucked into the notches with its ends secured on the studs 61 to clamp cotton to a single tooth 9 by operation of the feed screw as previously described. In the position shown in Figure 5 the plates 55 are positioned for clamping cotton to a tooth to be treated for a mesial cavity but as shown in dotted lines the plates 55 are adapted to be interchanged and inverted for clamping cotton to a tooth with a distal cavity.
As shown in Figures 7 and 8 a pair of curved resilient matrix plates 67 are provided for securement to the front end of the frame 2 and to the slide 17 for clamping a pair of gutta percha or celluloid matrix strips 69 to the buccal and lingual sides of a plurality of teeth 71. The plates 67 are provided with central studs 73 having a rectangular base 75 and threaded stem 77 like the bosses 45, 65 and the stems 41, 63 whereby said plates 67 are attachable to the front end 5 of the frame 2 and to the slide 17 in the same manner as plates 39, 55 for operation in the same manner by the feed screw 21. The plates 67 are provided with pressed out studs 79 for biting into and holding the strips 69 and as will be clear may be used to clamp cotton instead of the strips 69. The plates 67 like the others are interchangeable.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A dental matrix holder comprising a shank having an open frame on one end adapted to be positioned over teeth to be treated, said shank and frame having aligned slots therein opening into the frame, a slide on said shank operative in the slot of the shank and having an opening therein, a feed screw on said shank operatively connected to said slide, a pair of opposite matrix holders in said frame having means thereon for attaching flexible matrix bands thereto, stems on said holders extending through the slot in the frame and the opening in the slide and provided with clamping nuts thereon and whereby said holders are clampingly attached to said frame and slide for movement of one holder toward the other to clamp material therebetween to opposite sides of the teeth.

2. The combination of claim 1, said holders having rectangular bosses thereon fitting in the slot in the frame to prevent the holder attached to the frame from turning therein.

3. The combination of claim 1, said holders having opposed rounded notches therein for curving said bands.

4. The combination of claim 1 said first named means comprising studs on said holders interlocking with said bands.

5. The combination of claim 1, said holders having opposed rounded notches therein for curving said bands, and wedges at an end of the notches for separating teeth.

6. The combination of claim 1, said holders being interchangeable and invertible to vary the position of the notches.

References Cited in the file of this patent

UNITED STATES PATENTS

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