Oct. 22, 1940. M. STRELL 2,218,774

DENTAL MATRIX ADJUSTER AND RETAINER

Filed Feb. 17, 1939

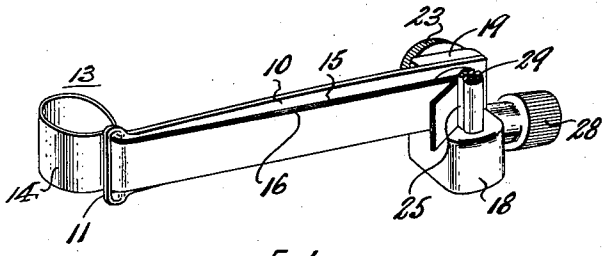


FIG. 1

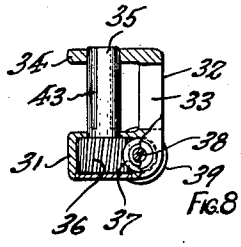


FIG. 8

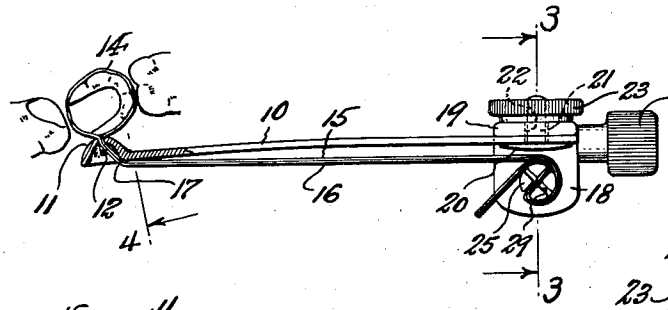


FIG. 2

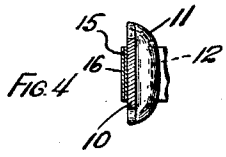


FIG. 4

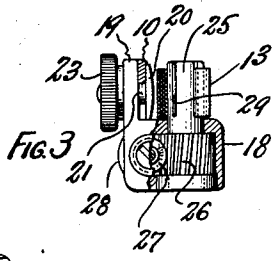


FIG. 3

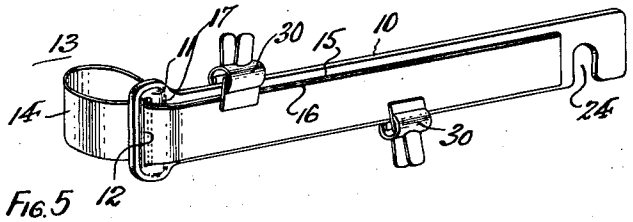


FIG. 5

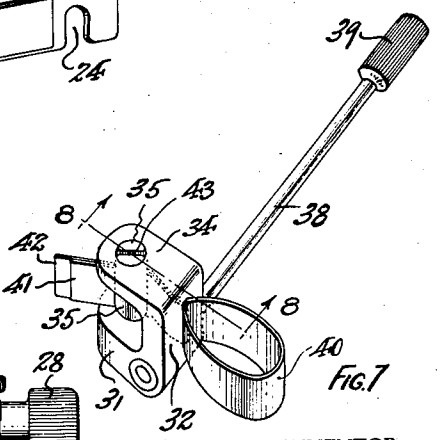


FIG. 7

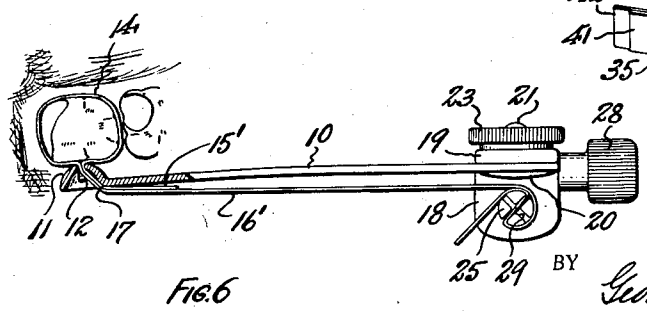


FIG. 6

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DENTAL MATRIX ADJUSTER AND RETAINER

Meyer Strell, Newark, N. J.

Application February 17, 1939, Serial No. 256,871

1 Claim. (Cl. 32—63)

This invention relates to means for adjusting and retaining a dental matrix band in encircling relation to a tooth to which it is applied; and the invention has reference, more particularly, to a novel tool for quickly contracting an applied matrix band around a tooth, the tool being self-locking against relaxation or loosening of said matrix band after application and adjustment thereof.

The invention has for an object to provide a simple, easily manipulatable and efficient device for contracting a dental matrix band in snug fitting encircling relation to a tooth and thereupon securely holding the same against displacement from the tooth during the operation of filling a cavity therein, obtaining an impression of a cavity therein, or during other operations upon the tooth which are facilitated by the presence of the matrix band applied thereto.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of this invention are shown in the accompanying drawing, in which:

Fig. 1 is a perspective view of one form of the novel dental matrix adjuster and retainer of this invention; Fig. 2 is a top plan view of the same, on a somewhat larger scale; Fig. 3 is a vertical cross section, taken on line 3—3 in Fig. 2; and Fig. 4 is a vertical cross section, taken on line 4—4 in Fig. 2.

Fig. 5 is a perspective view of the matrix band support with the band actuating mechanism detached.

Fig. 6 is a top plan view, similar to that of Fig. 2 but showing a different way of operatively mounting the matrix band in connection with the tool.

Fig. 7 is a perspective view of another form of the dental matrix adjuster and retainer according to this invention; and Fig. 8 is a vertical cross section of the same, taken on line 8—8 in Fig. 7.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to Figs. 1 to 5 inclusive, the reference character 10 indicates a matrix carrier plate comprising a flat strip of springy metal of suitable length. Formed in connection with the forward end portion of said carrier plate 10 is a laterally disposed, outwardly offset hollow boss 11 having a slotted opening or mouth 12.

The matrix band 13 (which usually consists of a narrow strip of thin pliable metal) is doubled upon itself to form a loop 14, the meeting end portions 15 and 16 of which are passed rearwardly through the mouth 12 of the boss 11, and thence over the rounded shoulder 17 at the juncture of said boss with the carrier plate, and thence along the face of said carrier plate 10.

Mounted in connection with the rearward end portion of said carrier plate 10 is a housing 18, having along one side thereof an upstanding flange 19 with which the carrier plate is connected. Preferably the carrier plate 10 is detachably coupled to the housing 18 and its flange 19, and to this end a clamp piece 20 is provided, the shank 21 of which extends through an opening 22 in the flange 19. The free end of said shank 21 is screw-threaded to receive a thumb-nut 23. The rearward end portion of said carrier plate 10 is provided with a laterally extending notch 24 which indents one marginal portion of the same. Said rearward end portion of the carrier plate 10 is engaged between the flange 19 and the clamp piece 20, with its notch 24 embracing the shank 21 of the latter. When thus disposed the carrier plate is locked in fixed or immovable relation to the housing 18 by turning the thumb-nut 23 to draw home the clamp-piece 20 into holding engagement with said carrier plate 10.

Journaled in said housing 18, to turn on a vertical axis, is a winding barrel 25, which is thus disposed in upstanding relation adjacent to the fixed rearward end portion of said carrier plate 10. Affixed to said winding barrel 25, within the interior of the housing 18, is a worm gear 26. Journaled in said housing 18, to turn on a horizontal axis, is a drive worm 27 which meshes with said worm gear 26. Affixed on an external end of said drive worm 27 is a finger piece or knob 28 for rotating the same to thereby transmit rotary motion through said worm gear 26 to said winding barrel 25 in a desired direction. Said winding barrel 25 is provided with one or more open ended cross slots 29 to receive the extremities of the end portions 15—16 of said matrix band 13.

In the use of the tool for applying a matrix band 13 in operative relation to a tooth, the loop 14 is loosely engaged around the tooth, whereupon the operator rotates the drive worm 27 to impart rotary motion to the winding barrel 25, e. g. in a clockwise direction, thereby winding around the latter the extremities of the matrix band end portions 15—16, so that the matrix band is drawn outwardly through the slotted opening or mouth 12 of the boss 11, thus contracting the loop 14 of the matrix band in tight and snug fitting encircling engagement with and around the tooth. As the matrix band is drawn taut, the carrier plate 10 tends to flex or bow, thus putting the carrier plate under tensional stress which holds the matrix band tautly stretched against loosening relative to the tooth to which its loop is applied; while at the same time providing, exteriorly of the mouth of the

patient, visible indication that the matrix band loop has attained snugly embracing operative relation to said tooth. Owing to the fact that the drive worm and worm gear transmission is self-locking against back-lash and against reverse rotation of the winding barrel under the pull of the tautened matrix band, the latter is firmly held against relaxation.

It will be obvious that the tool may be used and applied to selected teeth at either side of the jaws, and in either the upper or lower jaw regions, merely by turning the tool to such position that the boss 11 is disposed to impinge the particular tooth to which it is desired to apply the matrix band.

In some cases it may be desired to remove the carrier plate from the actuating mechanism carried by the housing 18, and after the matrix band is operatively applied to a tooth. In such case, the end portions 15—16 of the matrix band are secured to the carrier plate 10 by spring gripping clips 30 of suitable kind (see Fig. 5). After the matrix band is thus secured to the carrier plate 10 against displacement, the winding barrel 25 is reversely rotated to disengage the extremities of the matrix band therefrom, whereupon the thumb-nut 23 is loosened to in turn loosen the clamp piece 20 so that the housing 18 and carrier plate 10 may be separated and detached one from the other.

The novel tool, in the form thereof above described may be satisfactorily used with short lengths of matrix band material. This is shown in Fig. 6, wherein the matrix band 13 is formed into a tooth encircling loop 14 and passed through the opening or mouth 12 of the boss 11 in such manner as to provide an inwardly disposed short end portion 15' and an outwardly disposed long end portion 16'. The extremity of the long end portion 16' is engaged with the winding barrel 25, and by rotating the latter is drawn taut. The tautened long end portion 16' will press and hold the short end portion 15' into snubbed relation to the shoulder 17, thus preventing longitudinal displacement thereof, and consequently maintaining the loop of the matrix band in tight encircling and embracing relation to the tooth to which it is applied.

In Figs. 7 and 8 there is shown a modified form of the novel matrix band adjusting and retaining device according to this invention. This modified form of the device comprises a housing member 31 having a front wall portion 32 provided with a vertical slotted opening or mouth 33 extending therethrough into communication with a space intermediate the housing body and a top bracket 34 spaced thereabove and springing from said wall portion 32. Journaled in said housing 31 and bracket 34, to extend vertically therebetween and behind said wall portion 32 is a winding barrel 35. Affixed to the winding barrel 35, within the interior of the housing 31, is a worm gear 36. Journaled in said housing, to turn on a horizontal axis, is a drive worm 37 which meshes with said worm gear 36. Connected with said drive worm 37, to extend axially therefrom is a long shaft or stem 38 on the free end of which is affixed a finger piece or knob 39 for rotating the same and said drive worm. The matrix band, as used with the above described modified form of adjusting and retaining means, is doubled upon itself to form a loop 40, the meeting end portions 41 and 42 of which are passed through the opening or mouth 33, and then engaged through the cross slot 43 of said winding barrel 35. In the use of this modified form of matrix band adjusting and retaining device, the loop 40 of the matrix band is loosely engaged around a tooth, whereupon the operator rotates the drive worm 37 to in turn rotate the winding barrel 35 so as to wind onto the same the end portions 41—42 of the matrix band, thereby tightly contracting the loop 40 in tight and snug fitting encircling engagement with and around the tooth. As in the first described construction, so in the last described modified construction, the drive worm and worm gear transmission is self locking against back-lash and against reverse rotation of the winding barrel with consequent undesired relaxation or loosening of the loop of said matrix band relative to the tooth to which it is applied.

From the above description it will be apparent that this invention provides a very simple, efficient and easily and quickly manipulated device for adjusting and retaining a dental matrix band in snug fitting relation to a tooth in connection with which it is desired to be used for purposes well known to the dental practitioner.

I am aware that various changes could be made in the devices embodying this invention, and that apparently widely different constructions thereof could be made without departing from the scope thereof as defined in the following claims. It is therefore intended that all matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

A dental matrix forming means comprising, a housing member having an externally projecting upstanding cross-slotted winding barrel journaled therein and a worm and gear means for actuating said barrel, said housing member having an upstanding flange laterally offset parallel to said barrel, a clamp means carried by said flange, an elongated carrier plate of springy material having means at its rearward end portion engageable with said clamp means to detachably anchor the same to said flange for free forward extension from said housing member, said carrier plate having a laterally projected slotted boss at its forward free end portion, a matrix loop band having its closed together end portions extending rearwardly through said slotted boss and thence back along said carrier plate into operative engagement with said winding barrel, rotation of said winding barrel being operative to tightly contract said loop band around a tooth encircled thereby, said carrier plate being adapted to bow slightly under the tension of said tightened loop band to thereby provide, exteriorly of the mouth of the patient, visible indication that said loop band has attained snugly embracing relation to the tooth encircled thereby, detachable means for holding the end portions of the tightened loop band in secured relation to the carrier plate, whereby, when the extremities of said loop band are released from said winding barrel, the latter with its supporting housing member and actuating worm and gear means may be removed from said carrier plate upon release of said clamp means.

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