Aug. 9, 1938. S. R. BUTLER 2,126,308

CLAMP

Filed July 6, 1937 2 Sheets-Sheet 1

Fig. 1.

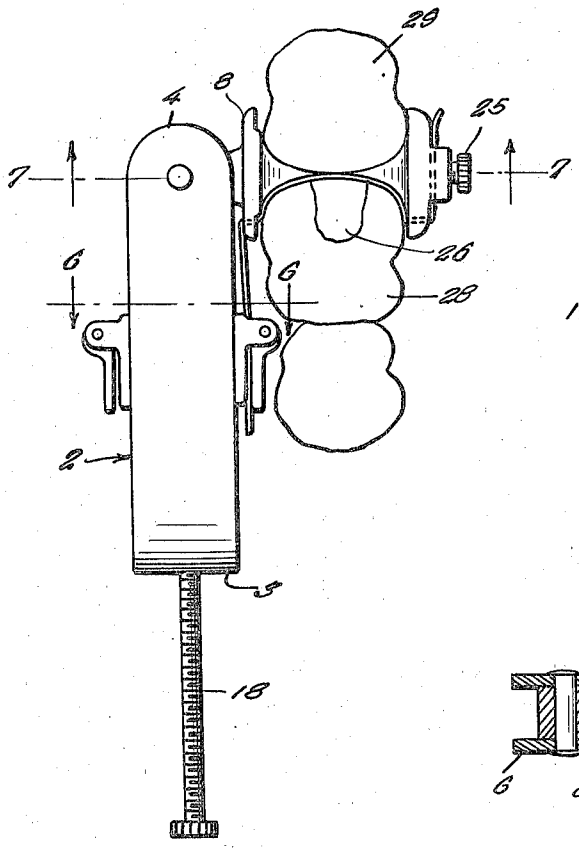


Fig. 6.

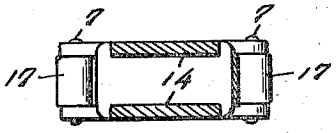


Fig. 7.

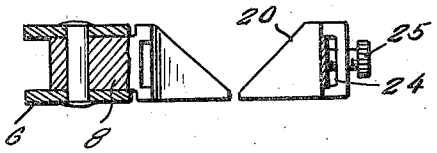


Fig. 8.

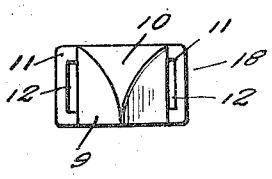
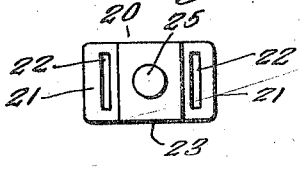


Fig. 9.



Inventor

S. R. Butler

By Clarence O'Brien
Hyman Berman

Attorneys

Aug. 9, 1938. S. R. BUTLER 2,126,308

CLAMP

Filed July 6, 1937 2 Sheets-Sheet 2

Fig. 3.

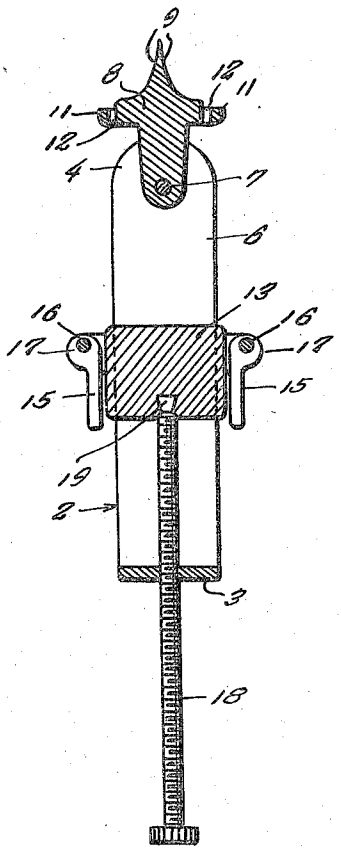


Fig. 2.

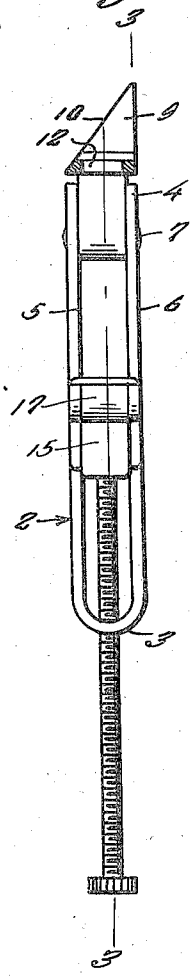


Fig. 4.

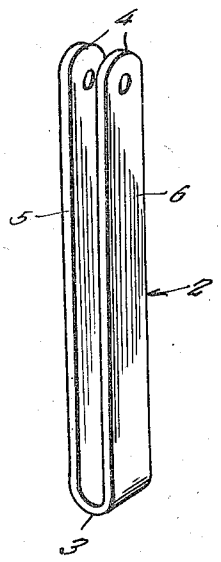
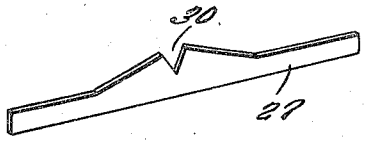


Fig. 5.



Inventor

S. R. Butler

By Clarence A. O'Brien

Hyman Berman

Attorneys

Patented Aug. 9, 1938

2,126,308

UNITED STATES PATENT OFFICE

2,126,308

CLAMP

Samuel R. Butler, Grand Island, Nebr.

Application July 6, 1937, Serial No. 152,198

3 Claims. (Cl. 32—63)

My invention relates to improvements in clamps for use in dental work and more particularly for securing denture, matrix bands, so called, in proper position for the filling of teeth.

The invention is designed with the particular object in view of providing an efficient, inexpensive device for positioning a matrix band along side, or around, a tooth to be filled, drawing the band taut into close contact with the tooth and clamping the same in taut position.

Another object is to provide a device for the purposes above set forth which is equipped for tensioning the matrix band to break the same when desired.

Other objects together with the precise nature of my improvements will be readily understood when the following description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in top plan illustrating the manner in which a matrix band is applied in the practice of my invention,

Figure 2 is a view in side elevation of a tensioning and clamping unit forming part of my invention,

Figure 3 is a view in longitudinal section taken on the line 3—3 of Figure 2 looking in the direction indicated by the arrows,

Figure 4 is a perspective view of a frame forming part of the clamping and tensioning unit,

Figure 5 is a perspective view of a denture matrix band,

Figure 6 is a view in transverse section taken on the line 6—6 of Figure 1 looking in the direction indicated by the arrows,

Figure 7 is a similar view taken on the line 7—7 of Figure 1 looking in the opposite direction as indicated by the arrows,

Figure 8 is a view in front elevation of a rear, or lingual side, matrix guide member, and

Figure 9 is a view in rear elevation of said rear guide member.

Referring to the drawings by numerals, the basic part of my invention is a combined tensioning and clamping unit comprising an elongated U-shaped frame 2 preferably of flat metal and having a closed end 3 and rounded free ends 4 on top and bottom arms 5 and 6 respectively. Pivotally mounted at one end thereof, as at 7, between the free ends 4 of the frame 2 for lateral swinging movement of the frame thereon, or vice versa, is a front, or buccal side, matrix guide member 8. The free end of the front guide member 8 is provided with convergent concave sides 9 and an oblique top edge 10, said sides and edge tapering to a point for fitting into the interdental space between adjoining teeth one of which is to be filled. Intermediate its ends the guide member 8 is formed with a pair of flanges 11 upon opposite sides thereof, respectively, and extending from the top to the bottom thereof, each flange having formed therein a lengthwise extending slot 12.

Between the arms 5 and 6 of the frame 2 is a block like tensioning member 13 slidably mounted thereon for adjustment endwise thereof, said tensioning member having formed therein upper and lower guideways 14 in which said arms 5 and 6 are countersunk. A pair of clamping levers 15 are pivotally mounted, as at 16, upon opposite sides of the tensioning member 13, said levers comprising rounded pivoted ends 17 spaced from the sides of the member 13 for the passage of the matrix band therebetween, and said ends 17 being pivoted eccentrically for coaction with said sides of the member 13 to clamp the band between said ends and said sides when the levers 15 are moved toward said member. An adjusting hand screw 18 threaded through the closed end 3 of the frame 2 and suitably mounted at its inner end, as at 19, in the member 13 provides for adjusting said member.

The described tensioning and clamping unit is designed to be used with a rear, or lingual, matrix guide member 20 having a front end identical with the described front end of the front guide member 8 and adapted for insertion in the interdental space between the two aforesaid teeth from the lingual side thereof in opposed relation to the front guide member 8. The rear guide member 20 also includes a pair of lateral flanges 21, slotted, as at 22, parallel with the slots 12 of the front guide member 8 when said guide members are positioned as described. As will be understood when said guide members 8 and 20 are so positioned the slots on opposite sides of one member are related to the slots on the corresponding sides of the other member. The rear guide member 20 has a tail boss 23 laterally slotted, as at 24, and a set screw 25 threaded into said boss to traverse the slot 24.

Referring to the use and operation, in preparing a tooth for the filling of a side cavity, such as shown at 26 in Figure 1, and with the aid of the usual matrix band, such as shown at 27 in Figure 5, the band 27 is disposed between the tooth 28 to be filled and the adjoining one 29 adjacent to the cavity. In the further practice of the described invention, one end of the band 27 is inserted through the appropriate slot 22 in the rear

guide member 20 and clamped to said guide member by inserting said end through the slot 24 and turning the set screw 25 thereagainst. The rear guide member 20 is then inserted into the proper interdental space, as shown in Figure 1, with the intermediate stretch of the band 27 trained between the teeth 28 and 29. The other end of the band 27 is trained through the related slot 12 in the front guide member 8 and clamped between the related side of the tensioning member 13 and the appropriate clamping lever 15 in a manner which will be readily understood. The front guide member 8 is then appropriately inserted in the interdental space opposite to the rear guide member 20 with the frame 2 swung straight out, or in other words, aligned with the front and rear guide members 8 and 20. The hand screw 18 is then manipulated to pull the matrix band 27 taut. The frame 2 is then swung inwardly on the pivot 7 toward the mouth and in the direction of the side thereof to which the matrix band 27 is clamped. This operation kinks the matrix band 27 around the edge of the slot 12 through which it is trained to thereby frictionally lock said band in taut position. If the band 27 is not sufficiently taut greater tension may be obtained by further adjustment of the tensioning member 13 after the frame 2 has been swung into the position indicated. The extent to which the frame 2 is swung is optional. Preferably said frame should extend in its swung position substantially at a right angle to the longitudinal axis of the front guide member 8 as shown in Figure 1. As will be clear by the initial tensioning of the matrix band 27, as described, the front and rear guide members 8 and 20 are forced home simultaneously with such tension and by the swinging of the frame 2, as described, said guide members are locked in home position under the tension exerted on said band. When it is desired to remove the matrix band 27, the end thereof clamped to the tensioning member 13 may be released by proper movement of the appropriate clamping lever 15 and the other end released by loosening the set screw 25. The guide members 8 and 20 and the frame 2 may be then removed and the matrix band 27 torn in two in the usual manner and pulled out. If desired the matrix band may be notched as at 30 to weaken the same, at an appropriate point, and a sufficient tension exerted thereagainst by the setting of the tensioning member 13 to snap the band in two at the weakest point. The parts may then be removed as desired.

As will be clear either side of the described devices may be used in tensioning and clamping the band 27 in accordance with the location of the tooth to be filled.

In another use of the invention the matrix band 27 may be looped around a tooth and both ends thereof inserted through the slots 12 of the front clamping member 8 and clamped to opposite sides of the tensioning member 13 by means of both levers 15 and said band tensioned by adjustment of the hand screw 18 with the frame 2 swung into alignment with the longitudinal axis of the front guide member 8. In this use the band 27 may be appropriately positioned for the filling of a cavity in the rear side of a tooth.

Other uses and operations of the invention may be resorted to, but it is not deemed essential to a clear understanding of the invention to enter into such other uses and operations herein.

Manifestly the invention as described is susceptible of modification without departing from the inventive concept and right is herein reserved to such modifications as fall within the scope of the claims appended hereto.

What I claim is:

1. In a dental clamp for use with a denture matrix band, a pair of front and rear guide members, respectively, for insertion in opposed relation in the inter-dental spaces between adjacent teeth, one member including means for securing one end of said band thereto, and the other member being provided with a guide slot for the passage of an intermediate portion of said band therethrough, and manipulative means on said other member for gripping the other end of the band and tensioning the same, and comprising a swingably mounted clamping and tensioning unit.

2. In a dental clamp for use with a denture matrix band, a pair of front and rear guide members, respectively, for insertion in opposed relation in the inter-dental spaces between adjacent teeth, one member including means for securing one end of said band thereto, and the other member being provided with a guide slot for the passage of an intermediate portion of said band therethrough, and manipulative means on said other member for gripping the other end of the band and tensioning the same, and comprising a swingably mounted unit including cooperating clamping devices, and means for adjusting said devices toward or from said other member.

3. In a dental clamp for use with a denture matrix band, a pair of front and rear guide members, respectively, for insertion in opposed relation in the inter-dental spaces between adjacent teeth, one member including means for securing one end of said band thereto, and the other member being provided with a guide slot for the passage of an intermediate portion of said band therethrough, and manipulative means on said other member for gripping the other end of the band and tensioning the same, and comprising a frame swingably mounted on said other member, a tensioning member slidable in the frame, a clamping lever coacting with the tensioning member to grip said other end of the matrix band therebetween, and means for sliding the tensioning member into different positions on the frame.

SAMUEL R. BUTLER.