C. J. EMERSON.

DENTAL MATRIX RETAINER.

APPLICATION FILED APR. 2, 1915.

1,151,253.

Patented Aug. 24, 1915.

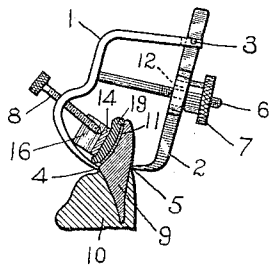


Fig. 1.

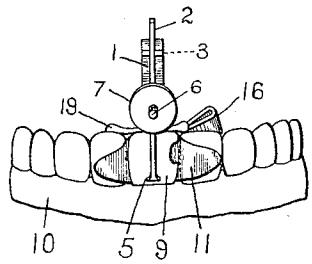


Fig. 2.

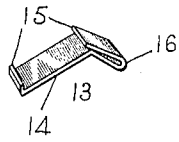


Fig. 3.



Fig. 4.

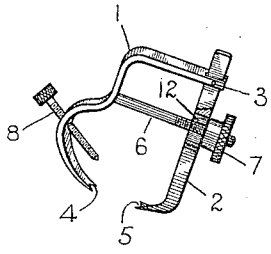


Fig. 5.

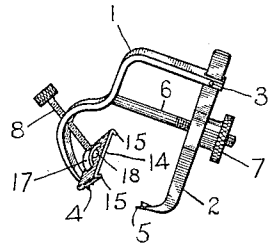


Fig. 6.

Witness

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DENTAL MATRIX-RETAINER.

1,151,253. Specification of Letters Patent. Patented Aug. 24, 1915.

Application filed April 2, 1915. Serial No. 18,728.

To all whom it may concern:

Be it known that I, CHARLES J. EMERSON, a citizen of the United States, residing in Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Dental Matrix-Retainers, and have described the same in the following specification, illustrated by the accompanying drawings.

My invention relates to that class of retainers which are used by dentists for the purpose of clamping band matrices and the like to the teeth during operations of filling. Such a matrix, it will be understood, may consist of a thin strip of easily deformable metal fitted by pressure to a tooth in position in the human mouth; and is applicable with recognized advantage in case the cavity to be filled is located at the approximal surface of an upper or lower front tooth from which a portion of the lingual surface has been lost. Such a retainer is the subject of my allowed patent application No. 867,111, which was filed October 17, 1914.

It is the object of the present invention to diminish the necessary length of band matrices used with retainers of this class; to secure the band matrix to its tooth in such a manner as not to work loose; to clamp such a matrix to its seat upon the tooth by pressure which is distributed uniformly to different parts of the matrix; to distribute the pressure from the matrix uniformly over the contacting palatal or lingual surface of the tooth to be filled; to apply uniformly distributed pressure to the entire lingual or palatal surface of the tooth, including the exposed portion of that surface as well as that portion which is covered by the matrix; to keep the tooth dry by preventing the seepage of moisture around its neck; to press back and away from the gingival margin of the tooth to be filled the adjacent soft tissue at the neck of the tooth, so as to obtain a freer and better exposure; to facilitate thereby the operation of filling proximal cavaties in the anterior teeth; and in general to produce a superior retainer of the specified class. To accomplish these results I utilize in my improved retainer a plastically formed impression of the tooth and matrix in operative contact.

In said drawings, illustrating the best manner in which I have contemplated applying the principles of the invention, Figure 1 is a side elevation, partly in section, showing a retainer which is constructed in accordance with these principles and operatively applied to a tooth and matrix which are shown in section. Fig. 2 is a front elevation of the same matrix and retainer, applied to a defective tooth standing between other teeth. Fig. 3 is a perspective detail of the impression tray forming part of the retainer. Fig. 4 is a detail plan of the flat matrix blank, to be fitted to the tooth by deformative pressure. Fig. 5 is a perspective view of the screw clamp forming part of the retainer. Fig. 6 is a like view of the same clamp and a connected impression tray of modified form.

In the illustrated forms of my invention, the jaws of the clamp are denoted by the numerals 1 and 2 respectively, and are radially of unequal lengths. They are hinged together at one end by the pivotal pin 3, and are provided at the other end with the inwardly directed teeth, the points 4 and 5, respectively. They are interconnected by the transverse arm 6, which spans the space between them, and works through the longitudinally disposed slot 12 in the shorter jaw. This arm has a terminal screw thread and the thumb-nut 7 for drawing the jaws together. The sharp-pointed screw 8, having a knurled head, works in a screw-hole through the jaw 1, toward and from the point of the jaw 2. As in said allowed application, the screw 8, the screw arm 6, and the jaws 1 and 2, are all disposed with their longitudinal axes in a single plane, which is normal to the axis of the hinge pin 3.

The impression tray 13, representing an essential element of the invention, is shown separately in Fig. 3. This receptacle, being a rigid strip of metal, of uniform width and thickness, comprises the flat rectangular floor, or bottom, 14, the shallow end walls, or flanges, 15, inclined toward each other, and the loop 16, which is disposed at an angle with the floor and is adapted to serve as handle of the tray. In the modified form shown in Fig. 6, this tray is similarly formed, but without any handle, and is flexibly mounted on the forward end of the screw 8 by means of a swivel joint, comprising the central perforated bracket 17 on the back of the tray, and the terminal bulb 18 carried by the screw.

By manipulation of the blank shown in

Fig. 4, and by applying the same to the defective tooth 9 with deformative pressure, exerted on the side of the blank by the dentist's finger, the matrix 11 may be formed and at the same time accurately fitted to that tooth, in the desired and illustrated position, in the usual and obvious manner. Operatively the dentist first applies and fits the band matrix to the tooth in the manner just mentioned. Then he applies the jaws to the same tooth, with the points 4 and 5 at the margins of the gum 10, as shown in Figs. 1 and 2, and clamps the tooth firmly between those points by turning the nut 7. Then from metallin, modeling compound, or some other impression material which is normally hard and rigid, is easily made plastic by heat, and quickly sets and hardens on cooling, he forms the impression block 19 in the manner following. He places on the floor of the impression tray a piece of such material, of sufficient size, softens it by heat, as from an alcohol lamp, and by manipulation molds it to the tray, thereby filling to excess the dovetailed space between the tray flanges; trims down, when necessary, the softened material to approximately the form shown, by cutting off surplus material, as with a knife; then either with or without additional heating, as the state of the material may require, applies with his fingers the soft block in the tray to the tooth and matrix thereon collectively, with deformative pressure, and thereby forms in the plastic face of the block an impression of the tooth and matrix in juxtaposition as shown; and then by means of the hardened block secures the matrix accurately in position on the tooth by turning the setscrew 8 forward against the back of the tray.

With the modified tray shown in Fig. 6, the mode of operation is similar, but differs in this, that the impression block is advanced to receive the impression by turning the screw 8.

Constructed and applied as described, the invention accomplishes the above stated object in all its enumerated branches. Furthermore it is obvious that, if the band matrix be structurally omitted from the described mechanism, the remaining parts can, in certain cases, be advantageously used alone, by applying the impression block, as itself a matrix, to the lingual or palatal surface of the affected tooth immediately, after cutting from the block the teat, or other projection, if any, which has been previously formed thereon in the cavity of the tooth during the plastic formation of the block.

I claim as my invention—

1. A dental matrix retainer of the specified class, comprising an impression block molded plastically to the mutually contacting tooth and matrix, and means for clamping the block against the tooth and matrix conjointly.

2. A dental matrix retainer of the specified class, comprising an impression tray adapted to hold an impression block, and means for adjusting the tray relatively to the tooth to be treated.

3. A dental matrix retainer of the specified class, comprising a clamp for engaging the tooth, a tray for an impression block, adjusting means carried by the clamp, and a flexible joint between the adjusting means and the tray.

4. A dental matrix retainer of the specified class, comprising jaws for engaging a tooth, an impression block for engaging the tooth and the matrix collectively, a tray adapted to hold the block, and a screw working through one of the jaws to engage the tray.

5. A dental matrix retainer of the specified class, comprising a pair of coacting jaws, hinged together and adapted to engage opposing surfaces of the tooth to be filled, a screw for operating the jaws to grip the tooth between them, an impression block to engage the matrix on the tooth, a tray to hold the impression block, and a screw working through one of the jaws to engage the tray.

6. That improvement in the art of dentistry which consists in first applying a band matrix to a tooth which is to be filled; in then clamping deformatively to the tooth and the matrix thereon a block of impression material previously rendered temporarily plastic by heat; in then allowing the block to harden by cooling, while so clamped; and in then keeping the hardened block still clamped to the tooth and matrix, during the operation of filling the tooth.

Witness my signature at Omaha, Nebraska, March 31st, 1915.

CHARLES J. EMERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."