Nov. 23, 1937. G. F. WEBB 2,100,116

METHOD AND APPARATUS FOR TREATING PYORRHEA

Filed Sept. 5, 1935

Fig. 1.

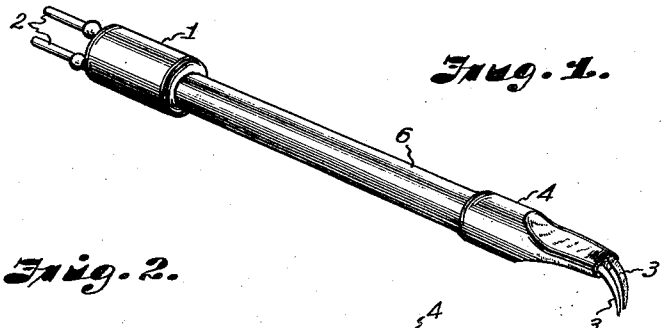


Fig. 2.

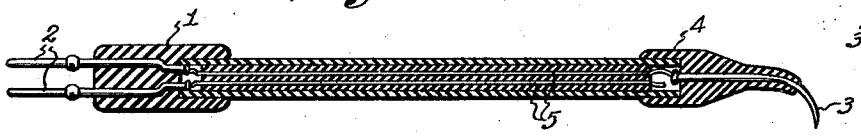


Fig. 5.

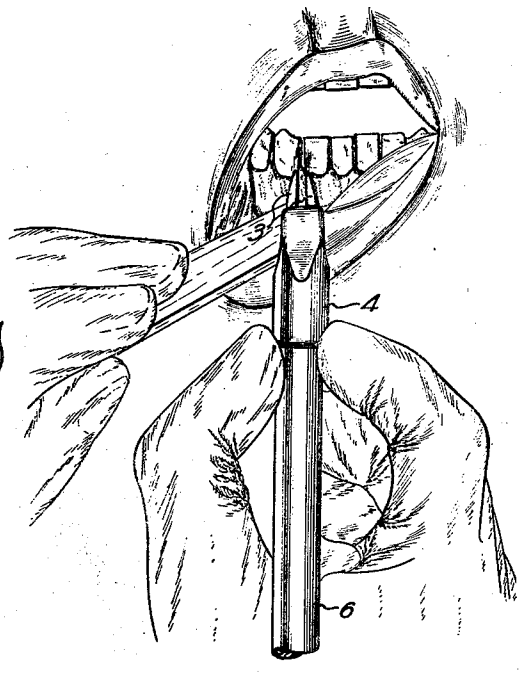
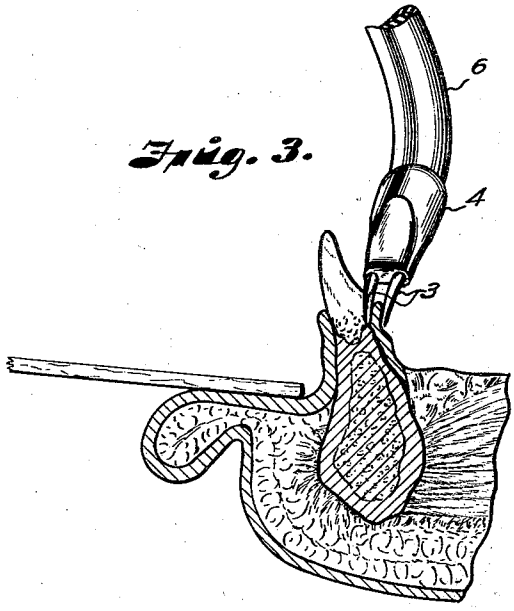


Fig. 3.



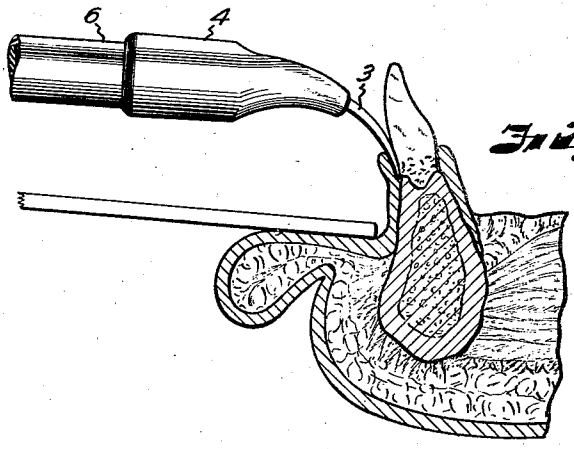


Fig. 4.

Fig. 6.



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METHOD AND APPARATUS FOR TREATING PYORRHEA

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Application September 5, 1935, Serial No. 39,266

4 Claims. (Cl. 128—303.17)

My invention relates to a method and apparatus for treating pyorrhea alveolaris or Rigg's disease and more particularly to an electro-surgical method and instrument.

In pyorrhea alveolaris, the bony process in which the sockets for the teeth are formed, that is the alveolar process, is destroyed. Since the gingival tissue is normally attached to the periosteum, the destruction of this membrane results in an unattached gingival margin which forms a reservoir of disease. Unless the destruction of the alveolar process is effectively prevented, the teeth will become loose in their sockets and be lost.

The treatment of Rigg's disease known to the art consists in cutting away the unattached gingival margin and destroying the infection by means of germicides. This method has many disadvantages. The operation in the first instance must be performed by an exceptionally skilled operator and requires considerable time. The operation is an ordeal for the patient. A surgical cement pack must be applied over the operated area for two weeks subsequent to the operation. The exposed portions of the dentine render the teeth very sensitive; in fact so sensitive that severe pain is experienced, upon taking liquids or food into the oral cavity at a temperature above or below that of the body temperature. The operation is a shock to the patient and frequently both local and remote infections ensue. There is considerable hemorrhage which is often difficult to control. The gums are very sore and granulation frequently occurs during healing.

One object of my invention is to provide a method and apparatus for treating pyorrhea which can be employed by a competent dental surgeon without extensive previous experience and a method, further, which does not require an exceptionally high degree of skill.

Another object of my invention is to provide a method and apparatus for treating pyorrhea which does not require the use of a post-operative surgical cement pack.

Another object of my invention is to provide a method of treating pyorrhea in which the danger of hemorrhage is minimized.

Another object of my invention is to provide a method of treating pyorrhea which precludes the danger of remote or local infection, by sterilizing the field as the operation proceeds.

Another object of my invention is to provide a method of treating pyorrhea which minimizes post-operative pain.

Another object of my invention is to provide a method of treating pyorrhea which desensitizes the necks of exposed teeth, rendering them less sensitive to thermal changes.

Another object of my invention is to provide a method of treating pyorrhea in which only a few teeth at a time may be operated, thus substantially eliminating shock, pain, and presenting the advantage of enabling an area to be retreated merely in event of the recurrence of the disease in the area.

Another object of my invention is to provide a method of electro-surgical treatment of Rigg's disease which precludes the danger of devitalizing the teeth.

In general, my invention contemplates the use of electro-coagulation of the unattached gingival margin by means of a high frequency current. This coagulation is produced by a bipolar electrode whose points are positioned sufficiently close to one another to coagulate a small area, which is always less than the diameter of the tooth.

In the accompanying drawing which forms part of the instant specification and is to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views;

Figure 1 is a perspective view of an electrode showing one embodiment of an instrument capable of being used with a high frequency generator for carrying out the process of my invention.

Figure 2 is a sectional view of the electrode shown in Figure 1.

Figure 3 is a sectional view of a lower jaw showing the electrode points in contact with an unattached portion of the gingival margin to be coagulated.

Figure 4 is a sectional elevation of a lower jaw showing the electrode in contact with the dentine of a tooth for desensitizing the exposed neck of the tooth.

Figure 5 is a perspective view showing the electrode points placed on each side of gum papilla.

Figure 6 is an enlarged fragmentary perspective view of an electrode point.

More particularly referring now to the drawing, for the electro-coagulation of the gingival margin I employ an electrode such as shown in Figure 1. This electrode is adapted to be connected to a high frequency current generator. A suitable frequency is from 800 to 1000 kilocycles per second at a voltage of from 100 to 200 volts. In use, the current value will be from 1800 to 2200 milliamperes. Any suitable high frequency current generator containing an oscillat-

ing circuit such as known to the art may be employed. I have found that the high frequency generator manufactured by the General Electric Company and sold under the name of "Microsurgical Diathermy unit" is well adapted for carrying out the method of my invention.

The electrode consists of a base member 1 having a pair of prongs 2 adapted to be plugged into a suitable socket at the end of an extension cord connected to a high frequency generator. The electrodes 3 are embedded in any suitable insulating material 4 and are connected to the prongs 2 by conductors 5. Any suitable flexible, dielectric material 6 may be used for insulating the conductors 5. The electrode points 3 may be of soft silver or any suitable material. I prefer to use silver since this permits the adjusting of the inter-electrode distance. The inter-electrode distance is of major importance in my instrument since the improved results obtained by my method arise from the coagulation of small areas at a time. Furthermore, the spacing of the electrode points 3 should be such that it is less than a chord drawn through the tooth tangent to the pulp cavity. If the root canal is bridged by the electrode points so that the high frequency current passes therethrough, there is great danger of devitalizing the tooth.

In the operation of my method I first make a full mouth X-ray examination by the use of double film packs. One set is developed for a period of three and one half minutes at a temperature of 65° F. and the other is developed for a period of five minutes at the same temperature. A comparison of the two sets of films indicates the amount of soft tissue which must be destroyed.

An area is then selected which may include from one to five teeth. If the patient is nervous, anesthesia may be employed, which may be either local, general, or topical. I have found, however, that anesthesia is unnecessary since the pain is slight and the discomfort is not great. The area to be operated is packed with an astringent on cotton around the buccal and lingual gum margin. By the use of my electrode, accurate management of coagulation is possible since it can only take place between the two poles. The electrode points are put in contact with that portion of the gingival margin to be coagulated as shown in Figure 3. One prong of the electrode is placed next to the tooth, while the other prong is left on the outside of the gum tissue. With gentle pressure, the prongs are forced downwardly until the inside prong, that is the one next to the tooth, is at the bottom of the pocket while the outside prong is down the same distance on the outside of the gum. A foot switch with which the generator is provided is then closed for a period just long enough to bring about the coagulation of the diseased tissue. This occupies only a fraction of a second. After the electrode is placed, closing the switch with the foot and immediately releasing it is ample time to coagulate the small area of tissue embraced by the electrodes. The process is repeated until the tissue of each tooth being treated has been completely circled at all pathological points. In order to eradicate the inter-proximal tissue, I adjust the points so that they can be placed in position on each side of the gum papilla as shown in Figure 5. The process of coagulation is repeated on both the lingual and buccal surfaces until all of the diseased area has been reached. The coagulation of the gingival margin exposes the necks of the teeth which are not covered with enamel. The dentine of the tooth is composed of myriads of dental tubules each of which is filled with albumen or branch nerve fibres which transmit sensation to the nerve of the tooth proper. By placing the electrode points in contact with the tooth as shown in Figure 4, the albumen at the terminals of the tubules is coagulated. This renders the teeth insensitive to thermal changes and appears to accelerate the formation of secondary dentine.

No surgical cement pack is needed as the coagulated tissue remains in place. The coagulated gingival tissue soon sloughs off and leaves a healthy gum surface. A few teeth at a time are treated at intervals of one week or more until the entire diseased area is treated. The patient is then taught Charters' method of brushing the teeth (W. J. Charters; Eliminating mouth infections with the tooth brush and other stimulating instruments, Dental Digest, 38; 130, April, 1932) and is then dismissed.

Charters' method is given by the author as follows:

1. The brush is placed at a 45° angle to the long axis of the teeth, being careful not to pierce the gums with the points of the bristles.

2. With the bristles between the teeth, as much pressure as possible is exerted, giving the brush several slight rotary or vibratory movements. This causes the sides of the bristles to come in contact with the gum margin, producing an ideal massage. This movement, however, should not be sufficient to remove the bristles from their position.

3. After three or four small circles have been made, the brush is removed and replaced in the same position, making three or four applications in the same place. The reason for this is that the points strike the labial, lingual, and buccal surfaces, then slide into the interproximal spaces.

4. The same process is repeated, moving the distance of one embrasure, and holding the sides of the bristles against the gingivac or gum margin. Care should be taken to enter every embrasure or space on both upper and lower teeth.

5. The chewing or grinding surface should not be brushed with a sweeping or sliding motion, but the brush should be placed directly upon this surface, giving a slight rotary movement after the bristles have been gently forced into the pits and fissures.

6. The brush is then removed, and the process repeated until the entire chewing surface has been cleaned.

After considerable research I have satisfied myself that there is no unavoidable danger of bad after-effects or detrimental physiological local or systemic changes. The histological effects of my treatment have been checked at frequent intervals and I have found that the prognosis is unusually favorable in all cases where thirty percent or more attachment remains. The after pain and discomfort to the patient is negligible. Clinical histories as old as three years show that there has been no recurrence of the disease. Preliminary instrumentation, scaling, and polishing are neither necessary nor advisable before operation.

It will be observed that I have accomplished the objects of my invention. I have provided a method and apparatus for treating pyorrhea which eliminates the disadvantages of the surgical methods heretofore employed. The danger of remote or local infection is eliminated because the field is sterilized as the operation proceeds. The danger of hemorrhage is minimized. After pain is minimized and the teeth are rendered in-

sensitive to thermal changes, a result impossible of achievement by prior methods. The coagulated diseased tissue sloughs off in three to five days and leaves a healthy tissue which will heal in the course of a few days. Post-operative granulations do not occur and the operation does not require an exceptionally high degree of skill.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It is, therefore, to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. In a method of treating pyorrhea the steps of successively subjecting small areas of unattached gingival margin to the action of a high frequency current.

2. In a method of treating pyorrhea, the steps of successively subjecting areas of unattached gingival margin smaller than the cross-sectional area of a tooth to coagulation by the passage of a high frequency current.

3. A method of treating pyorrhea including the steps of subjecting predetermined small areas of unattached gingival margin and exposed necks of teeth to the action of a high frequency current.

4. A method of treating pyorrhea including the steps of subjecting diseased gingival margin between two points spaced apart less than the diameter of a tooth to the action of a high frequency current.

GEORGE FARRELL WEBB.