MEANS AND METHOD FOR TREATING PERIODONTAL DISEASES

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This invention relates to means and methods for treating and clearing up periodontal diseased conditions and has particular reference to a method of treating pyorrhea or other diseased conditions of the gums and tissues which surround the teeth and to the means by which the method is carried out.

The objects of the invention are to provide a method of treating and clearing up diseased conditions of the gums and periodontal tissues by the application of heat thereto and to provide means by which the method of treatment may be carried out.

The means by which the foregoing and other objects are accomplished and the manner of their accomplishment, will readily be understood from the following specification in reference to the accompanying drawings, in which—

Fig. 1 is a plan view, partially in section, showing the completed device ready for insertion in the mouth and diagrammatically showing the heating circuit and control.

Figs. 2 and 3 are fragmentary sectional plans showing progressive steps in the preparation of the device.

Fig. 4 is a sectional elevation taken on the line IV—IV of Fig. 3.

Fig. 5 is an enlarged section taken as on the line V—V of Fig. 3; and

Fig. 6 an identical section showing a further step in the preparation of the device.

Fig. 7 is a plan view showing substantially the final step; and

Fig. 8 an enlarged sectional elevation taken on the line XIII—XIII of Fig. 7.

Fig. 9 is a slightly enlarged elevation of a specific form of holder strip with heating element attached.

Figs. 10, 11 and 12 are sections as on the line XII—XII of Fig. 9, showing steps in securing the heating element to the strip.

Fig. 13 is a plan view of a strip as shown in Fig. 9, shaped into a holder ready for the heat transfer material; and

Fig. 14 a corresponding side elevation.

Referring now to the drawings in which the various parts are indicated by numerals, 10 and 11 represent respectively the teeth and the gum tissue surrounding the roots of these teeth or the same parts of an exact model prepared in usual and well known manner from such teeth and gums. 12 are flat strips of paraffin or other similar wax of uniform thickness and which may be rendered pliable by the application of a small amount of heat. 13 is a holder comprising a strip of thin soft metal such as copper, which may readily be deformed and/or distorted to desired contour or shape and which has been shaped into such holder. 14 is a heating element of wire surrounded by a protecting layer of insulating material such as asbestos, this heating element preferably being formed by tightly wrapping a fine, current-resisting wire with a soft cord of asbestos fibre and coating and consolidating the structure thus prepared with heat resisting varnish or cement. 16 is a specially prepared heat transferring material, which may be plastic, but is stable at treating temperatures. 17 is an insulating covering such as sheet asbestos applied over the metal holder 13. 18 is a thermometer which is inserted through an opening 19 formed through the holder 10 is a cable carrying current wires 21, 22 which are respectively connected to the two ends 14A, 14B, of the heating elements 14 and which lead to a current control apparatus diagrammatically illustrated herein as a variable auto-transformer 23, one of the current wires, as the wire 21 being connected through a variable tap 24, to the coil 25 of the transformer. 26 is a control switch and 27 a power circuit.

In Figs. 9 to 14, a modified form of holder strip is shown. This modified strip comprises a continuous central portion 14A of thin, soft metal such as copper, having integral fingers 13B, projecting from opposite sides thereof, and preferably having at intervals, lugs 13C in pairs, bent inward substantially at right angles to this strip and fingers, these lugs being adapted to receive a continuous heating element 14A as in Fig. 11, and to be bent together around this element as in Fig. 12 and Fig. 9.

In carrying out my invention an impression is taken, in usual and well known manner, of the jaw, including primarily the teeth and the gum structures 11 which are to be treated, and from this impression the usual model of plaster or other investment material is made.

After this model has hardened and set, a line (not here shown) is drawn along the model around both the inside and outside thereof indicating the center line of the zone along which heat treatment is to be applied. A sheet of paraffin wax, usually about one-sixteenth of an inch in thickness, is cut into strips usually three-eighths to one-half of an inch in width. One of these strips is then softened as by heating in warm water, and is carefully laid around and conformed to the contour and surface of the gum structure 11 and portions of the teeth 10 as indicated by
the inner of the layers 12 in Figs. 2 and 5, the center of this strip preferably being laid along the line marked on the model. Additional wax strips are then successively heated and conformed, three in all, usually being used, to form a build-up of uniform thickness entirely around both the inside and outside of the gum tissues as reflected in the model. Usually at the back end of the teeth, that is around the wisdom teeth, the strips as shown in Fig. 4, have to be considerably reduced in width.

After the wax build-up is completed, the metal strip is conformed carefully in shape to the build-up. This is begun by placing the center of the strip lengthways at the point 30 (Fig. 3) and conforming the strip in both directions from such point along the build-up until the ends of the strip meet and overlap at 31. This point is marked on both ends of the strip, the strip removed both ends cut, and the overlay 32, preferably not over $\frac{1}{4}$" soldered. Holes 33, in some cases notches, are then formed in the strip, adjacent the overlap, to permit the ends of the heating element 14 to extend therethrough, and on one side, the opening 19 is formed to permit insertion of the thermometer 18.

After the strip has been soldered and the holes formed therein, the holder thus formed is preferably again placed over the wax build-up and re-conformation. After such check-up and re-conformation, the holder is removed and the heating element is placed along the inside of the strip, following the center longitudinal line, and the two ends allowed to project through the holes 33, the element being secured to the holder as by being held in the resisting cement. Should it be desired to give final check up on shape the outer of the wax strips 12 may be removed from the build-up leaving two only as shown in Fig. 6 and the holder be replaced as there shown.

The build-up tips 15, are now removed from the model, the completed holder is placed and centered over the model as shown in Figs. 7 and 8 and the heat-transfer material 16, heated until quite plastic, is molded between the gum-tooth structure 10, 11 and the surrounding holder 13, and allowed to cool and set, care being taken to form therein a hole for the thermometer 18, this being accomplished by the thermometer itself if it will stand the temperature necessary to place the wax. After completion surplus portions of the heat transfer material may be cut away as along the dotted lines 40 of Fig. 8.

The procedure is largely the same in using the modified form of strip 13A shown in Fig. 9, except that only such number of the wax strips 12 are placed as are necessary to establish the thickness of heat transfer material desired between the heating element and the gums and the holder strip with the heating elements attached thereto is shaped directly on these layers this being substantially in accord with the showing in Fig. 6 of the drawings. The holder strip is shaped as before, except that the individual fingers may be more easily bent inward and outward than would be the edges of a solid strip. After forming the strip into a holder the steps of completing the device are substantially as hereinbefore described.

After being connected up the structure is placed in the patient's mouth and if proper care has been used, will conform exactly to the surface of the gum to be treated, and in so conforming will position the heating element 14 in proper relation to the parts to be treated, and at a uniform distance therefrom.

With the thermometer inserted the variable transformer tap 24 is set at its lowest point, the switch 28 is closed and the heating element allowed to heat up, thereby slowly raising the temperature of the gum tissues to be treated. As this material responds to the heating of the element successive increments of the transformer coil are cut in and the temperature is built up until the entire heat transfer mass attains the desired treating temperature, usually approximately 130 degrees Fahrenheit, though in some cases higher or even lower temperatures may be used. After the desired temperature is reached, treatment is continued for such length of time as may be deemed necessary. In mild cases as short a time as 30 minutes appears possible; ordinarily however, about an hour has been found satisfactory, though in stubborn or advanced cases as much as three hours has been found advantageous and without harmful effect. When the desired length of the treatment has been had, the current is cut off and the holder with the heat transfer material and other parts is removed.

It will be understood then that for minor treatments thirty minutes may be sufficient, while in advanced cases much more time will be required.

What I claim is:

1. The method of treating periodontal diseases, which comprises conforming a heat transferring material of uniform thickness closely against the tissues to be treated, applying heat at the uniform distance from the tissues thus established, and raising the temperature of such heat transferring material slowly from body temperature to between 120 and 140 degrees Fahrenheit and maintaining such temperature for at least thirty minutes.

2. The method of treating periodontal diseases, which comprises conforming a plastic heat transferring material of uniform thickness closely against the tissues to be treated applying heat at the uniform distance from the tissues thus established, shielding adjacent parts against direct transfer of heat, raising the temperature of such heat transferring material slowly from body temperature to approximately 130 degrees Fahrenheit, and maintaining such latter temperature for at least thirty minutes.

3. The method for heat treating periodontal tissues, which includes preparing a model of the teeth and the tissues therearound to be treated, establishing around such model in the zone to be treated, a build-up of uniform thickness, shaping and conforming a metal strip around said build-up and forming said strip into a holder, removing said holder and said build-up, securing a heating element against the tissue-proximate surface of said removed holder, substantially along the center of the zone of treatment, replacing said holder and centering same on said model, and establishing between said holder and the heat treating element thereon a heat transferring material of inherently uniform thickness, and connecting said heating element through a current control device to a source of electric current; and thereafter placing said device in the mouth from which said model was made, and establishing current flow to create and maintain a temperature of about 130 degrees F. for at least thirty minutes.

4. The method for heat treating periodontal tissues, which includes preparing a model of the teeth and the tissues therearound to be treated,
establishing around such model in the zone to be treated, a build-up of uniform thickness, securing a heating element against the tissue-proximate surface of said removed holder, substantially along the center of the zone of treatment, replacing said holder and centering same on said model, and establishing between said holder and the heating element thereon a heat-transferring material of inherently uniform thickness, covering the exterior of said holder with insulating material, and connecting said heating element through a current control device to a source of electric current; and thereafter placing said device in the mouth from which said model was made and establishing uniform current flow to create and maintain a temperature substantially between 120 and 140 degrees F. for at least thirty minutes.

5. A method for heat treating periodontal tissues, which includes preparing a model of the teeth and the tissues therearound to be treated, establishing around such model in the zone to be treated, a build-up of uniform thickness, forming a holder around said build-up, removing said holder and said build-up, securing a heating element against the tissue proximate surface of said removed holder, substantially along the center of the zone of treatment, replacing said holder and centering same on said model, and establishing between said holder and the heating element thereon a heat-transferring material of inherently uniform thickness, and connecting said heating element through a current control device to a source of electric current; and subsequently placing said device in the mouth from which said model was made, and establishing current flow to create and maintain a temperature substantially between 120 and 140 degrees F. for at least thirty minutes.

6. The method for heat treating periodontal tissues, which includes preparing a model of the teeth and the tissues therearound to be treated, establishing around such model in the zone to be treated, a build-up of uniform thickness, forming an insulated holder around said build-up, removing said holder and said build-up, securing a heating element against the tissue proximate surface of said removed holder, substantially along the center of the zone of treatment, replacing said holder and centering same on said model, and establishing between said holder and the heating element thereon a heat-transferring material of inherently uniform thickness, and connecting said heating element through a current control device to a source of electric current; and thereafter placing said device in the mouth from which said model was made and establishing current flow to create and maintain a temperature substantially between 120 and 140 degrees F. for at least thirty minutes.

7. A method for heat treating periodontal tissues, which includes preparing a model of the teeth and the tissues therearound to be treated, establishing around said model in the zone to be treated, a build-up of uniform thickness, forming a holder around said build-up and securing a heating element along the inner surface of said holder, removing said build-up from said model and holder, replacing and centering said holder on said model, and establishing between said holder and the heating element secured thereon, a heat-transferring material inherently separating said element a uniform distance from said model, and connecting said element through a current control device to a source of electric current; and subsequently placing said device in the mouth from which said model was made, and establishing current flow to create and maintain a temperature substantially between 120 and 140 degrees F. for at least thirty minutes.

8. A method for heat treating periodontal tissues, which includes preparing a model of the teeth and the tissues therearound to be treated, establishing around said model in the zone to be treated, a build-up, forming a holder around said build-up, securing a heating element along the inner surface of said holder, replacing said build-up with a heat-transferring material of inherently uniform thickness, and connecting said heating element through a current control device with a source of electric current; and subsequently replacing said device in the mouth from which said model was made and establishing current flow to create and maintain a temperature substantially between 120 and 140 degrees F. for at least thirty minutes.

9. The method of treating periodontal diseases which includes making a model of the teeth and gums which are to be treated, conforming to the model along the zone in which treatment is to be applied, a layer of heat transfer material of uniform thickness, securing against said layer substantially along the center line of said zone, an electric heating coil and intimately securing said coil to said heat transfer material, removing the unit thus established from said model and placing said unit on the teeth and gums from which said model was made, establishing current flow through said coil to create a temperature of approximately 130 degrees Fahrenheit and maintaining such temperature for at least thirty minutes.

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