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ELECTRODE FOR TREATMENT OF TEETH

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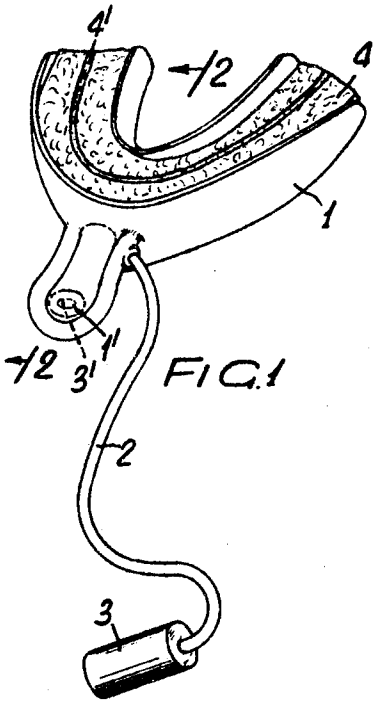


FIG. 1

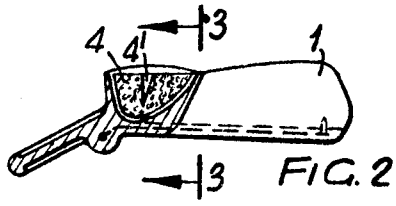


FIG. 2

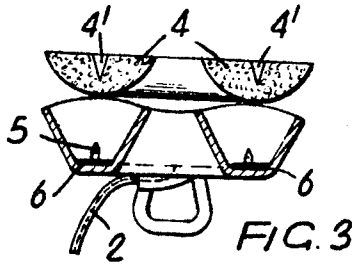


FIG. 3

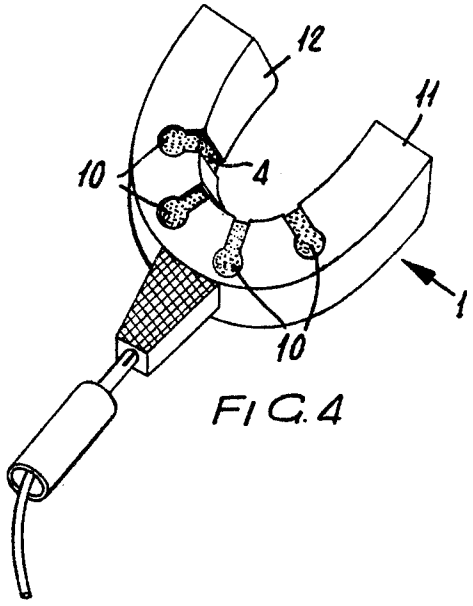


FIG. 4

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ELECTRODE FOR TREATMENT OF TEETH

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U.S. Cl. 128—172.1 5 Claims

ABSTRACT OF THE DISCLOSURE

An electrode for iontophoretic treatment of teeth comprising a U-shaped support having a channel therein, an electrical conductor in the form of a flat plate having pointed upstanding protrusions disposed on the bottom of the channel, a handle having a socket therein for receiving electricity to be supplied to the conductor, and a sponge shaped to fit into the channel and over the pointed protrusions to make contact with the conductor and having a V shaped split running through the center thereof. The sponge is saturated with a curative substance and the electrode is grasped by the patient by biting with his teeth inserted in the slit to receive the curative substance.

Apparatus are known allowing the desensitization and the cure of teeth by the penetration to their interior, by iontophoretic means, desenitizing curative substances or substances performing other functions.

Such apparatus generally include a battery for the delivery of current, measuring means and regulation means for the delivered current.

The subject of the present invention is an electrode that, connected to the apparatus above mentioned, allows antidecay or curative substances to penetrate to the interior of all the teeth of the upper or lower jaw. Simultaneous penetration may also be effected.

The electrode according to the invention includes a deformable insulating horse-shoe shaped support member having a pair of legs joined by a curved section and having a channel found therein. A grip protrudes from the curved section, and the support member has a configuration similar to a dental impression holder. A sponge or equivalent absorbent means, divided aolng its longitudinal center line is surrounded by the support member, and the sponge is saturated with one or more curative substances. Electrical conductors are situated at the base of the sponge or other absorbent means and terminate at a current-carrying sleeve in which is connected a pin terminating at a small cable connected to a pole of the apparatus for the delivery, regulation and measurement of the current. The other pole of the apparatus is located in contact with any part of the patient's body to complete the circuit.

According to a preferred embodiment, the conductors at the base of the horse-shoe channel are constituted by a metallic lamina which can also terminate with pegs or points, which are effective to hold the sponge in place and to provide uniform distribution of current throughout the sponge and to the teeth.

In particular, the insulating horse-shoe support includes a grip with a current-carrying sleeve and two channeled legs joined by a curved section similar to a dental impression holder, as above mentioned, and presents a plurality of slits with substantially parallel edges, each of which extends in the inner wall and base of the support and is radially arranged with respect to the curved section formed by the support in such a way that the support is of variable width and is adaptable to mouths and dentures of different forms and dimensions.

It is an object of the present invention to construct an electrode providing uniformly distributed electrical current to teeth for iontophoretic treatment.

Another object of the present invention is to provide iontophoretic treatment of all the teeth of an upper or lower jaw by providing a longitudinal, center slit in a U-shaped sponge carried by a U-shaped support member having a conductor disposed on the base thereof.

Further objects and advantages of the present invention will become apparent from the description of the preferred embodiment as shown in the accompanying drawings.

FIG. 1 is a perspective view of an electrode according to the present invention.

FIG. 2 is a sectional view of the electrode taken along lines **2**—**2** of FIG. 1.

FIG. 3 is a sectional view of the electrode taken along lines **3**—**3** of FIG. 2 with the sponge detached from the support.

FIG. 4 is a perspective view of the electrode from the side opposite to that shown in FIG. 1.

The apparatus as illustrated in FIGS. 1–4 includes a support **1** constructed of a deformable, insulating material such as plastic which has a grip **1'** extending therefrom. Support **1** has a U-shape similar to dental impression holder and has upwardly extending walls forming a trough or channel.

A sponge **4** has a shape corresponding to the shape of support **1** as is illustrated in FIG. 3 and has a V-shaped slit or notch **4'** cut from its center. The sponge **4** is inserted in the channel of support **1** and is saturated with an electrolyte or any other suitable curative substance, such as a solution of fluorides or other antidecay or curative salts.

An arcuate conductor **6** is disposed on the bottom of the channel in support **1** and has pointed protrusions **5** extending therefrom to grip sponge **4** and to uniformly distribute current in sponge **4**. Conductor **6** is connected with a sleeve **3'** disposed in the grip **1'** and to a small cable **2** which terminates at another sleeve **3**.

Either sleeve **3** or sleeve **3'** may receive a prong connector which is connected to the desensitizing apparatus (not shown). The desensitizing apparatus, which can assume any form, is generally constituted by a grip which is siezed by the patient and constitutes a pole of the battery, and by a casing which besides containing the battery, contains the apparatus for measuring and regulating the current.

In operation the divided sponge **4** is introduced into the patient's mouth and is there fitted on his teeth like an impression holder with the teeth penetrating the split **4'**. Support **1** is then fitted on the sponge so that conductor **6** comes in contact therewith, and the patient holds the electrode in place with the teeth of his upper and lower jaws. Sponge **4** is saturated with an electrolyte, preferably fluoride of tin or sodium, thereby establishing good contact. During the conduction of the electrical current, which is controlled with respect to duration and magnitude, the antidecay substance is supplied to the interior of the teeth with the curative and desensitizing substance.

A plurality of slits **10** are disposed in the curved section of support **1** as may be seen in FIG. 4. Slits **10** are radially aligned with center of curvature and extend entirely through inner wall **12** in parallel with each other. Slits **10** extend partially into base **11** and terminate in a circular portion to provide a key-hole shape.

The purpose of slits **10** is to permit the shape support **1** to be varied to fit mouths and dentures of different configurations and dimensions. The space between the edges of the slits permits narrowing of the legs of the support without compression of the material of the inner wall of

the support, and the key-hole shaped slits in base **11** permit varying of the legs without compressing the material of the base and also permit variations in level configuration.

Any electrolyte or curative substance may be utilized with the present invention, and similarly the support may be constructed of any suitable material since slits **10** permit the adapting of a relatively firm material to individual mouths and dentures. The material may be sterilized and if the material is elastic, slits **10** may not be necessary.

What is claimed is:

1. An electrode for use in the treatment of teeth comprising

a support member having a pair of legs joined by a curved section to form a U-shape and constructed of an elastic material, said support member having a flat U-shaped base having an inner side and an outer side, an upstanding inner wall joined with said inner side of said base, an upstanding outer wall joined with said outer side of said base and a projecting grip secured to said outer wall at said curved section, said base, said inner wall and said outer wall forming a channel in said support member having a U-shaped opening above said base in plan;

U-shaped conductor means including a strip of flat electrically conductive material, said flat strip being disposed on said base of said support member and having a width substantially equal to the width of said base, said conductor means including a plurality of spaced, pointed projections extending from said flat strip, and terminal means disposed at said curved section of said support member for supplying electricity to said conductor means; and

a U-shaped sponge disposed in the channel in said support member to contact said flat strip and said pointed projections of said conductor means, said sponge having a top surface with a V-shaped longitudinal slit extending into the center thereof;

whereby said sponge may be saturated with a curative substance and said substance may be applied to a patient's teeth by supplying electricity to said conductor while the patient inserts the teeth of one jaw into said slit in said sponge and grips said base of said support member with the teeth of the other jaw.

2. The invention as recited in claim **1** wherein said terminal means is integrally formed in said grip of said support member.

3. The invention as recited in claim **1** wherein said terminal means includes a wire connecting a socket with said conductor means.

4. The invention as recited in claim **1** wherein said support member includes a plurality of slits in said curved section, said slits being radially arranged from the center of the curve of said curved section and being cut entirely through said inner wall and partially through said base whereby said support member may be easily adjusted to mouths and dentures of varying dimensions and configurations.

5. The invention as recited in claim **4** wherein said slits have a circular shape in said base to permit adjustment of the level of said support member.

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U.S. Cl. X.R.

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