Nov. 14, 1933. E. ACKERMAN 1,934,688

DENTAL DEVICE

Filed Feb. 24, 1931

FIG.1.

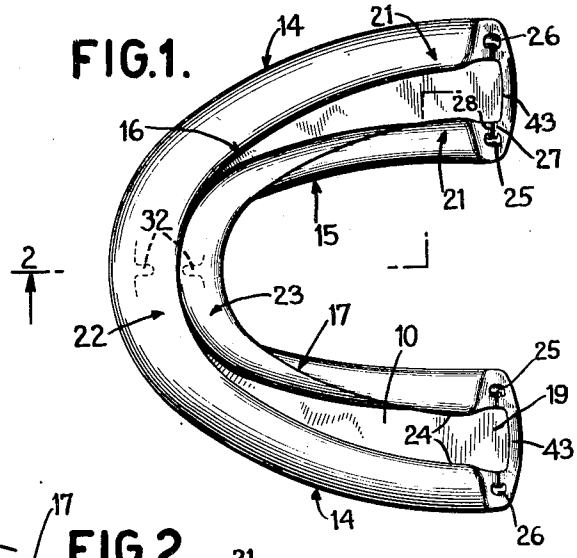


FIG.2.

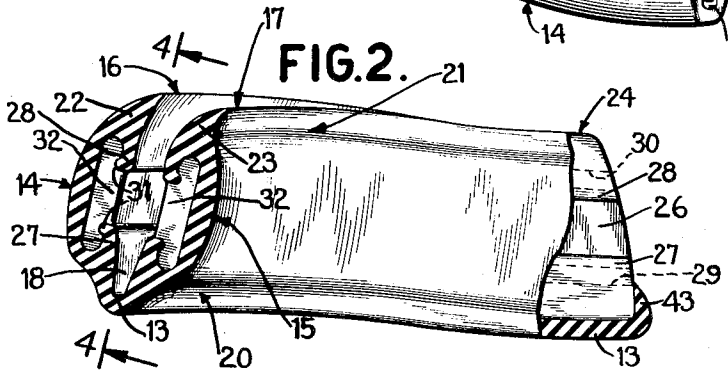
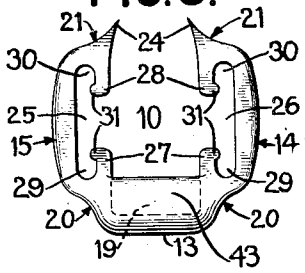


FIG.3.



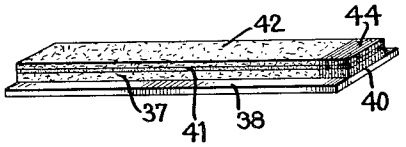


FIG.7.

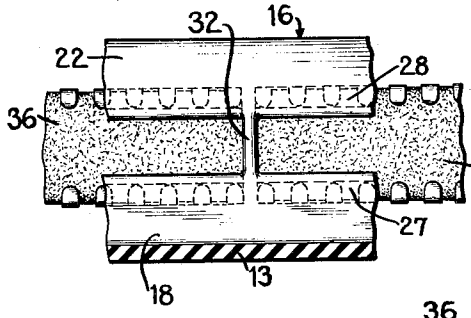


FIG.4.

FIG.5.

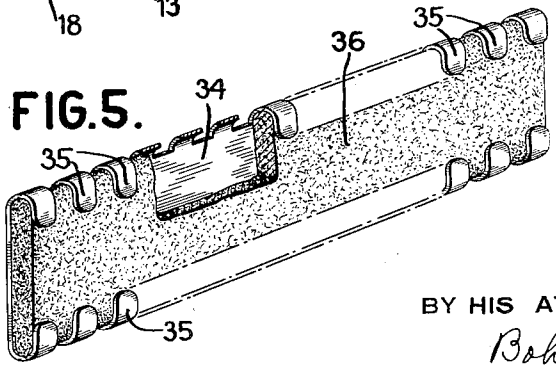
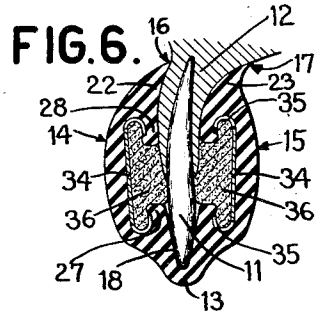


FIG.6.



INVENTOR
EDWARD ACKERMAN

BY HIS ATTORNEYS
Bohleber & Ledbetter

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DENTAL DEVICE

Edward Ackerman, New York, N. Y.

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18 Claims. (Cl. 32—5)

This invention relates to dental applicators of the kind adapted to apply medicament, etc. to the gums in the prevention or treatment of disease or in other treatment of the gums.

It has heretofore been proposed to provide a receptacle shaped to conform roughly to the configuration of the gums and teeth and through this receptacle to force a liquid medication into contact with the gums, as a douche. It has also heretofore been proposed to line a trough shaped member with sponge rubber, which sponge rubber absorbed a liquid medicament and held it, when applied, in contact with the gums. It is difficult, if not impossible, to clean the latter type of applicator thoroughly and to free the sponge rubber of the medicament absorbed thereby or of discharges from the diseased gums so that the applicator may be used a subsequent time with fresh and possibly different medicament upon another patient. The use of liquid medicament, forced through the applicator, has not proven effectual. The most effective medicaments for the gums, so far known, are either oils or come in powder form and neither of these can be successfully used in solution or conveyed by a liquid, such as water, in a douche. Furthermore, unless the applicator has been made especially for the particular patient, it has not fitted the gums tightly enough and leakage of the solution into the mouth has occurred. Neither of the devices heretofore proposed have gone into general use.

In practice, resort has heretofore been had to a paste of medicament which is applied directly to the gums and manually packed thereon. Such direct application of a paste has been found most effective in the prevention and treatment of disease of the gums, but has the disadvantage that it takes as long as a half hour or more to apply the paste to the gums, which is irksome to the patient, and while it is possible to apply the paste to the outside surfaces of the gums, it is not possible to readily apply such paste to the inside surfaces of the gums. Furthermore, because of the fact that the paste must be manually applied it is very difficult, if not impossible, to apply it evenly and, moreover, the discomfort to the patient during the application and the destruction of the coating of paste by saliva, an increased flow of which the medicament naturally induces, the paste does not remain on the gums for more than about three to five minutes thereafter, as a general rule.

One object of the present invention is a dental device for the purpose described, which may be quickly and easily applied and is readily applicable to mouths of different shapes and sizes, within limits, and which, moreover, permits a prolonged application of medicament without discomfort. Accordingly, a generally U-shaped trough-like member is formed, preferably, of yieldingly non-metallic material of the general shape of the average mouth and with walls thin enough to enable the trough to conform to the shape of the teeth and gums of different patients, while at the same time having sufficient inherent resiliency whereby the walls may grip the teeth and gums and so be retained in place.

The invention also seeks a dental applicator which is applicable with liquid (aqueous or oily), powder or granular or paste medicament and which can be readily sterilized for subsequent use upon another patient. To this end, vehicles for the medicament are adapted to be removably carried, interiorly, with the walls of the applicator for contact with the gums. More specifically, the walls of the applicator, opposite the line where the teeth meet the gums, carry medicament vehicle receiving means. More particularly, the walls of a channel formed in the applicator are provided with tracks, recesses, grooves or other receiving means to removably receive vehicles for the medicament, thus facilitating the use of the applicator with the same or different medicaments upon different patients.

The invention also has to do with the vehicle for the medicament. In accordance with this aspect of the invention, a pad, either absorbent to a liquid medicament or upon which a paste medicament may be smeared, or with or within which medicament in powdered form may be carried, is inserted preferably within grooves in the walls of the channel of the applicator. More particularly, the pad is adapted to be carried with a reenforcing member or slide, herein called a carrier, of a substantially flexible and permanent character whereby the insertion and removal of the vehicle is facilitated.

Another object of the invention is the provision of means carried with the applicator to hold the vehicle in place and at the same time permit its ready insertion in and removal from the applicator. Accordingly, the grooves in the applicator are provided with means to grip the medicament vehicles and hold them in place.

A further object of the invention is to provide an applicator of the character described in which the area of the gums affected and the medicament applied thereto is sealed against the entrance of fluids, such as saliva, and all leakage

of the medicament from the applicator is prevented. In accordance with this aspect of the invention, the walls of the trough are substantially flexible and the edges are tapered or feathered, so as to conform readily to any irregularity in the gums and so as to be enabled to be held tightly against the gums as a seal. If desired, the free edges of the applicator may be so shaped as to follow the general contour of the gums.

The invention also seeks a dental applicator and medicament vehicle therefor which is practical from the standpoint of ease and cheapness of manufacture and convenience, practicability and duralibity in use. To this end, a generally U-shaped trough of flexible rubber is provided, the walls of which are shaped generally to conform to the teeth. In each wall of the channel is a groove to receive the medicament vehicle and the edges of the groove are formed with inwardly extending lips which conveniently overlie the carrier and hold it against displacement. The free edges of the trough are tapered or feathered so as to conform to and grip closely the gums and seal the joint, and the applicator is so shaped as to take advantage of the inherent resiliency of the material to hold the tapered free edges against the gums. At the ends of the U-shaped member, the applicator is open, the grooves also opening on the outside to receive the medicament vehicles and permit their insertion from the open ends. The medicament vehicle comprises, conveniently, a flexible strip, such as celluloid, as a carrier, to which a pad is secured as by an adhesive. If desired, the carrier may be formed with tongues on its longer edges, which tongues are bent inwardly to engage and hold a removable pad. These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description, taken in connection with the accompanying drawing illustrating one embodiment by which the invention may be realized, and in which:—

Figure 1 is a view showing the dental applicator of this invention, in plan.

Figure 2 is a view taken in the planes indicated by the broken line 2—2 of Figure 1 and showing the trough in cross section and the interior wall in elevation.

Figure 3 is a rear end view of one side of the applicator.

Figure 4 is a sectional view, taken in a plane passing through the channel, parallel to one of the walls thereof, and showing particularly the medicament vehicle in place.

Figure 5 is a view, in perspective, showing one of the carriers for the medicament with a pad attached thereto.

Figure 6 is a sectional view showing the dental applicator in place on the teeth and gums.

Figure 7 is a view, in perspective, showing a modified carrier with a pad secured thereto, as by an adhesive.

The dental applicator in accordance with this invention, is preferably made of a yielding non-metallic material, such as a soft rubber, and is broadly U-shaped in cross section as well as in plan. It is of the general shape to conform to the average jaw, as shown in Figure 1, and is yielding so as to conform to slight inequalities and differences in the teeth and gums of different patients. Through the middle of the applicator runs a channel 10 which receives the teeth 11 and gums 12 (Figure 6) when the device is in use. In detail, the applicator may be considered as comprising a bottom wall 13, an outer wall 14 and an inner wall 15, defining the channel 10, the walls 14 and 15 terminating in thin tapering flexible or feathered free edges 16, 17, respectively, and the walls 14 and 15 are formed to incline toward one another so that they will tend to engage and grip the teeth and gums when spread apart thereby to hold the applicator in place. The channel 10 is shaped to conform to the teeth of the jaw, being relatively narrow and wedge shaped to receive and conform to the front teeth, as shown at 18 at the left in Figure 2, and merging gradually rearwardly into a shape which is relatively wide and somewhat squared at its bottom to receive the molars, as shown at 19 in Figure 3. If desired, the outside surface of the bottom 13 may be formed concaved at the sides, as at 20, in the interest of comfort to the wearer as well as of a saving of material, and this thinness at the lower edges affords a flexibility which permits the walls 14, 15 to be spread widely apart in cleaning and in the insertion and removal of medicament. Otherwise, the walls 14 and 15 between the free thin edges 16, 17 and the bottom 13 are relatively thick so that grooves for the medicament may be formed therein.

At the upper free edges 16 and 17, the outer surface of the walls may again be concaved, as at 21 so as to afford a degree of flexibility to the edges 16, 17 and permit them to taper to a thin edge to thus conform to any irregularities in the gums and permit them to be held against the gums tightly to form a seal. As shown in Figures 1, 2 and 6, the free edges of the outer wall 14, at the front, is directed inwardly, as at 22, to conform to the contour of the normal gum at that point, while the free edge of the inner wall 15, at the front, is directly rearwardly, as at 23, to conform to the roof of the mouth at that point. The curvature of these walls changes gradually from the midpoint of the front of the applicator to the rear ends of the applicator where both free edges are directed upwardly and inwardly, as shown at 24 in Figures 1 and 3. Thus, the free edges of the applicator are formed to conform to the average or normal mouth and at the same time are sufficiently flexible to enable the edges to form a sealing contact with the gums irrespective of any inequalities or differences in the contour of the gums of different individuals.

Along each side of the channel 10, the surfaces or walls thereof are formed, respectively, with grooves 25 and 26 to receive medicament or vehicles for the medicament, the edges of the grooves being formed with flanges or lips 27, 28, respectively, extending in a direction substantially in the plane of the surfaces of the channel to form grooves with narrower mouths to hold the medicament in place. Thus, there extends upwardly from the bottom wall 13, on each side of the channel, a flange, lip or wall 27 on the outside of the teeth and a similar flange or wall 27 on the inside of the teeth defining therebehind slots 29, respectively, which form the lower sides of the respective grooves 25 and 26. Similarly, flanges or walls 28, extend downwardly in the outer and inner sides of the channel 10. These flanges or walls 28 define behind them recesses 30, forming the upper sides of the respective inner and outer grooves 25 and 26. In other words, the mouth of a groove is narrower than another transverse dimension thereof. In some situations it might be desir-

able to pack a paste or thick oil in the grooves, and the recesses permit an interlock between the medicament and the applicator to prevent displacement of the medicament when the device is applied. These lips 27 and 28 may, if desired, terminate in enlarged portions 31 forming, in effect, beads, preferably on the inside of the channels, as shown in Figure 3, whereby the medicament vehicles may be gripped more tightly and held in place within the grooves.

It will be observed (Figures 1 and 3) that the grooves 25 and 26 open out through the ends of the applicator to permit the medicament vehicles to be inserted into the grooves from that end. It is proposed that each vehicle extend from the end to the midpoint of the applicator at the front and stops are provided in the form of ribs 32 in the inner and outer walls at the midpoint of the front end of the applicator to limit the insertion of the vehicles, as shown in Figure 4.

The medicament vehicles may take various forms. They may, if desired, comprise generally a carrier and a pad. As shown in Figures 4 and 5, each carrier is formed of a strip 34 of flexible material, conveniently of celluloid or any material unaffected by the medicament and of sufficient stiffness to be retained in position when gripped by its edges. The carrier 34 is substantially rectangular, and on its longer edges is formed with pad holding means, illustrated as tongues 35, which are bent inwardly as shown to retain a pad 36, desirably of absorbent material, which pad is readily removed from the tongues and replaced by a clean pad, while the carrier 34 can be readily sterilized. The pad 36 may be of absorbent material, if desired, or it may serve merely as a surface upon which a paste is applied and to which a paste will cling, or a powder may be carried thereby as will be more fully described in connection with Figure 7.

In Figure 7, a modified medicament vehicle is shown in which a pad 37 is affixed to a carrier in the form of a plain rectangular strip 38, as by an adhesive 40, say, collodion. The strip is received in the grooves 25, 26 and the lips 27, 28 hold it in place. The pad 37 extends between the lips into contact with the gums as in the previous modification.

Along each longitudinal edge of the rectangular vehicle carrier 34 and 38 there is provided means or ways adapted to be engaged by the vehicle holder or applicator and retain the carrier thereupon. In the carrier 34 the bent over tongues 35 comprise the ways and the exposed or uncovered edges of the carrier 38 form the ways for this carrier. These ways are received in the groove 32 of the applicator and are retained in position thereby. It is clear that other structures equivalent to the grooves are suitable to receive the ways of the vehicle carrier.

Where a powder, such as sodium perborate, is used as a medicament, it may be spread over the cotton pad, say 37, as at 41 in Figure 7 and another sheet or layer, say, of cotton superimposed, as shown at 42. This upper layer 42 serves to hold the powder in place but permits the powder to pass through the gums, particularly, when some moisture is present. Thus the pad may be impregnated with a medicament which only requires the addition of water or other liquid at the time of use.

With the pad of either modification, the cotton forming the same may be compressed as shown for instance at 36 in Figures 4 and 5 and when it is to be used, the pad may be moistened to cause the pad to swell as shown in Figure 6 and seek depressions or recesses in the gums and between the teeth to bring the medicament into more intimate contact with the tissues.

In use, four medicament vehicles may be used, one for insertion in the outer groove 25 on one side of the applicator as far as the stop 32 and one for insertion in the outer groove 25 on the other side of the applicator as far as the same stop 32. Similarly, the other two vehicles are inserted through the open ends of the grooves 26 as far as the stop 32 on the inner wall of the applicator.

It will be readily apparent that the rear ends of the applicator may be open because they engage the jaw in the back of the mouth, but at the bottom an upwardly extending wall or lip 43 is shown which is adapted to engage the rear face of the last molar and contact with the gum therebehind and seal that part against the entrance of moisture. To prevent the entrance or escape of moisture at the ends of the grooves, the ends of the pads 36 or 37, may be coated, as at 44 with collodion or a similar waterproofing substance to render the pad non-porous.

It will thus be seen that a dental applicator is provided which is readily sterilized so that it can be used upon different patients. In the shape illustrated, it conforms readily to the teeth of different patients although formed to the general shape of the average jaw and leakage or seepage of fluid is prevented. The applicator permits the use of replaceable vehicles suitable for medicament of any character. The word "engage" as used in the claims means interlocking for ready removable engagement.

Various modifications will occur to those skilled in the art in the composition and configuration of the component features of this invention as well as in its use with various medicaments and in the type of vehicles for medicament used in connection therewith, and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawings, except as indicated in the appended claims.

What is claimed is:—

1. A dental device of the character described comprising, in combination, flexible means formed with a channel to receive the teeth and gums, means carried by each of the walls of said channel to carry a medicament vehicle and a replaceable vehicle for a medicament removably carried by the carrying means.

2. A dental device of the character described comprising, in combination, flexible means formed with a channel to receive the teeth and gums, the walls of said channel being formed with grooves, and vehicles for a medicament in the grooves.

3. A dental device of the character described, comprising flexible means formed with a channel to receive the teeth and gums, the walls of the channel being formed with grooves to receive a paste medicament and lips carried with the walls of the grooves to retain the medicament in the groove.

4. A dental device of the character described, comprising flexible means formed with a channel to receive the teeth and gums, the walls of the channel being formed with grooves to receive a medicament vehicle and means carried with the walls to retain the vehicle in the grooves.

5. A dental device of the character described,

comprising flexible means formed with a channel to receive the teeth and gums, the walls of the channel being formed with grooves to receive a medicament vehicle and lips carried with the walls to retain the vehicle in the grooves.

6. A dental device of the character described comprising an applicator adapted for retention on the teeth and gum and formed with a side wall adapted to contact the point of junction of the teeth and gum, a groove in the side wall, a vehicle for a medicament removably received in the groove and means to retain the applicator upon the teeth and gums.

7. A dental device of the character described comprising an applicator adapted for retention on the teeth and gum and formed with a groove to receive a medicament, the mouth of said groove being narrower than another transverse dimension of the groove.

8. A vehicle for medicament for use with a dental device of the character described comprising a rectangular carrier of resilient material having sufficient stiffness to be retained in the dental device when gripped by its edges, and a pad carried by the carrier adapted to receive a medicament, said carrier being formed with at least one tongue bent over the pad upon opposite sides thereof to anchor the pad in place on the carrier.

9. A vehicle for medicament for use with a dental device of the character described comprising rectangular carrier of resilient material having sufficient stiffness to be retained in the dental device when gripped by its edges, and a pad carried by the carrier adapted to receive a medicament, said carrier having devices upon opposite sides thereof to removably secure the pad thereto and to be received by a vehicle holder.

10. As an article of manufacture, a vehicle for medicament for use with a dental applicator of the character described comprising a carrier, a pad secured thereto, medicament on the surface of the pad remote from the carrier, and a pad-like layer superimposed on the last named surface of the first pad.

11. As an article of manufacture, a vehicle for medicament for dental use comprising a carrier, and an absorbent pad secured thereto, one end of said pad being rendered non-porous.

12. A replaceable vehicle for medicament adapted to be held immovably against the gums in a vehicle holder which is adapted for retention on the teeth comprising a rectangular carrier of bendable material having sufficient stiffness to support a pad within the vehicle holder when engaged by its edges, a pad carried upon the carrier to retain medicament thereupon and at least portions of opposite edges of the carrier being exposed and projecting beyond the pad thereby forming sliding ways upon the edges of the carrier to be engaged by the vehicle holder to retain the replaceable vehicle thereupon.

13. A dental device of the character described comprising in combination means formed with a channel to receive and enclose the teeth and gums, the ends of the channel being open, at least one replaceable and adsorbent vehicle for medicament, and means to removably hold said replaceable vehicle in the channel for contact with the gum and forming openings at the end of the channel means not closed by the gum and teeth when the device is placed in the mouth, the end of said absorbent vehicle at the open end of the channel being rendered non-porous and non-absorbent to close the openings.

14. A dental device of the character described comprising, in combination, flexible means formed with a channel to receive the teeth and gums, the walls of said channel being formed with grooves, said grooves having an open end to slidably receive a medicament vehicle, and a vehicle for a medicament in each groove slidable into the groove from its open end.

15. A dental device of the character described comprising, flexible means formed with a channel to receive the teeth and gums, the bottom of the channel being relatively sharp at the center of the channel and widening out towards the ends to conform substantially with the shape and size of the teeth received therein, means carried by at least one of the walls of the channel to carry a medicament vehicle, and a replaceable vehicle for medicament removably carried by the carrying means.

16. In a dental device of the character described, in combination, flexible means formed with a channel to receive the teeth and gums, means formed in the channel means to receive portions of a medicament vehicle and a vehicle for medicament formed with portions adapted for reception in said receiving means.

17. In a dental device of the character described, in combination, flexible means formed with a channel to receive the teeth and gums, engaging means in the channel means to engage portions of a medicament vehicle, and a vehicle for medicament formed with means adapted for engaging said engaging means in the channel whereby the vehicle is removably secured in said channel means.

18. In a dental device of the character described, flexible channeled means for receiving the teeth and gums, said channeled means being provided with connecting means for detachably interconnecting the channeled means with a medicament vehicle, and a medicament vehicle provided with complementary connecting means for engaging with the connecting means on the channeled means for ready removable engagement therewith.

EDWARD ACKERMAN.