April 8, 1941. B. ALTSTADT 2,237,694

TOOTHBRUSH

Filed Feb. 16, 1939

Fig. 1.

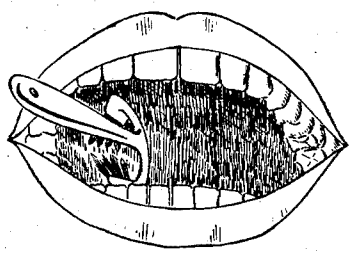


Fig. 2.

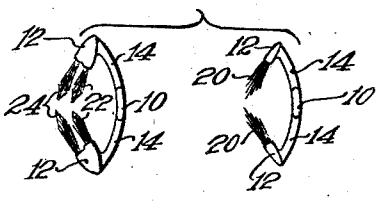


Fig 3

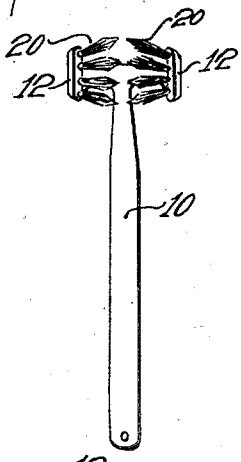


Fig 4

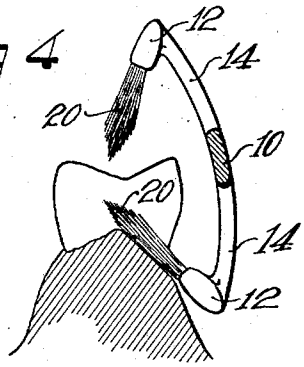


Fig 5

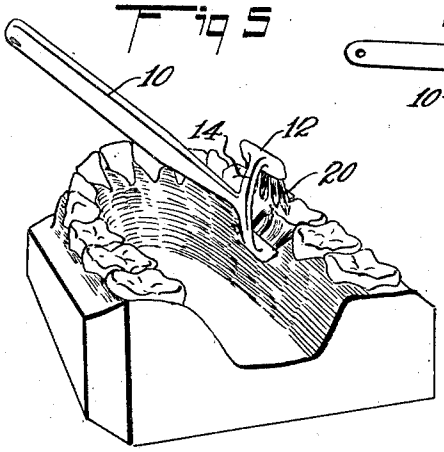


Fig. 6.

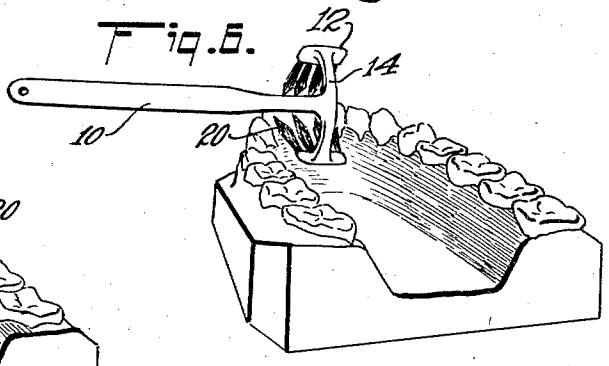
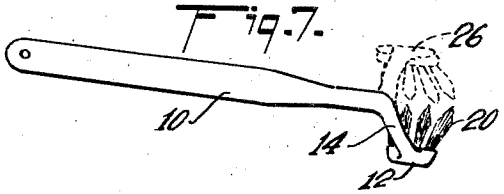


Fig. 7.



INVENTOR.
Benjamin Altstadt
BY
Brown & Jones
ATTORNEYS

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UNITED STATES PATENT OFFICE

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TOOTHBRUSH

Benjamin Altstadt, New York, N. Y.

Application February 16, 1939, Serial No. 256,627

7 Claims. (Cl. 15—167)

This invention relates to a new and improved toothbrush.

An object of the invention is to provide a toothbrush so designed and constructed that the user can readily and rapidly clean the so-called vital dental areas of the mouth, and more specifically approximal areas, the occlusial areas, the gingival areas, the cervicals of the teeth, and the interproximal mucous membrane.

A still further object of the invention is to provide such a toothbrush which is adapted for the proper stimulation and cleansing of the gum tissues and the proper polishing of the tooth enamel.

Other objects of the invention are to provide a toothbrush of the character described which is adapted for use in a restricted and specialized area within the mouth; which provides little or no bristle-resistance in reaching the interproximal and other vital areas; which is adapted for use with irregularly positioned teeth and irregularly anatomically formed teeth; which can be used easily and readily in cleasing the lingual vital areas of the teeth and mucous membrane; which is adapted for use by persons of various ages, including children and adults; which is adapted to reach all parts of the mouth, and more specifically all of the vital areas to be cleansed, with equal facility; in which the bristles are so mounted as to protect the gum surfaces from contact with the brush shaft and from traumatic injury by bristle points, and in which the bristles are so mounted in connection with the brush handle as to facilitate proper motion of the brush with the bristles in contact with the teeth for cleansing the teeth and mucous membrane.

A still further object of the invention is to provide a brush of the character described which may be readily cleaned, which retains resiliency, and which is of long life.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a diagrammatic representation of a toothbrush embodying the present invention as it is positioned within the mouth of a user;

Fig. 2 is an end view of two modifications of the invention;

Fig. 3 is a plan view of one of the modifications of the invention shown in Fig. 2;

Fig. 4 is a greatly enlarged view showing diagrammatically a toothbrush of the present invention in one position for cleansing the interproximal areas between adjacent teeth;

Figs. 5 and 6 are diagrammatic views of the product of the present invention in use in cleaning the lingual surfaces of the lower teeth; and

Fig. 7 is a side view of a modified form of the invention.

The need for effective and thorough cleansing of the teeth and massage of the periodontium has long been recognized. One of the most frequent factors in the cause of marginal gingivitis is the improper brushing of the gingivae. It has also been well recognized that a great deal of the presence of caries or decay in teeth is primarily due to inadequate cleansing, and more particularly to inadequate brushing at the vital areas of the teeth and gums. Most tooth decay and periodontal and mucous membrane disease has been due to the difficulty, if not the impossibility, of adequately cleansing the vital areas of the teeth and stimulating the adjacent mucous membrane surfaces. Much of this difficulty has arisen because of improper toothbrush construction. Brushes have been designed to scour the exposed surfaces of the teeth, but without thought as to the difficulty or ease of handling necessary in connection with attempts to cleanse properly the interproximal and other vital areas.

Many brushing methods have been suggested and many types of toothbrush designed. The methods of brushing the teeth most commonly in use are the vertical or straight up and down method, the rolling or rotary or centrifugal method, the Fones method, or the Stillman or Charters method, in which a brush should be placed with the bristles at substantially a 45° angle to the long axis of the teeth, the bristles lying against the gum and so positioned that their points do not pierce the gum. The brush is then forcibly held against the teeth so that the bristles are wedged into the interproximal areas, and the brush is then given a series of slight rotary or vibratory movements so that the sides of the bristles come in contact with the margins of the gum and massage the gum while the bristle ends extend into the interproximal areas and cleanse them. The brush is not scoured across the teeth, but is moved deliberately from place to place in the mouth, each tooth or area, for example, being treated as a separate problem.

Heretofore, while this method of cleansing the teeth has been recognized generally as a preferred method, no toothbrush has been available for the easy, if not almost automatic, ap-

plication of the Charters method. A principal object of this invention is to provide a toothbrush which may be used in the correct position in any area in the mouth and with which the Charters method of brushing the teeth may be readily and easily performed. It will be understood that the toothbrush of the present invention is adapted also for use with other brushing methods which adequately cleanse the vital areas of the teeth and mucous membranes.

Reference is here made to the recently published volume entitled "The Toothbrush, Its Use and Abuse," by Dr. Isador Hirschfeld, which contains an exhaustive treatment of the entire problem.

Some of the difficulties in connection with the use of the ordinary toothbrush, when it is to be employed with the Charters method, may be mentioned. The interproximal and other vital areas, particularly those areas which lie between adjacent teeth, cannot be reached by the conventional toothbrush for several reasons. There is too much bristle resistance. It is impossible, for example, to force bristles in between the teeth the considerable distance necessary for adequate cleansing when other bristles are bearing directly upon the upper outer surfaces and greater convexities of the teeth. The fixed and static form of the normal toothbrush is not adapted for differences in anatomical structure found widely. The ordinary toothbrush is bulky. It cannot be swung in the small lingual or palatal arc without danger of injury to adjacent gum areas. As a matter of fact, with the average toothbrush there is substantially no provision for brushing the small lingual arc or for manipulating the brush correctly at any of the lingual areas. The brush must, for example, be so positioned that the handle extends upwardly and out of the mouth, and in this position it is impossible to arrange the brush against the teeth with the bristles at the angle preferred in the Charters method. With the usual brush no provision is made to prevent the shaft ends from bruising and irritating gum tissue with which they come in contact.

The product of the present invention is designed to overcome these and other difficulties. In its preferred form it comprises a toothbrush having a preferably rigid handle 10 to which there are affixed rigidly a pair of bristle-holding shafts 12. The shafts, as shown in the drawing, may each have a longitudinal axis substantially parallel to the plane of the somewhat flattened handle, and, as shown, they are at such a distance from the handle and the bristles are so positioned and of such length that entire device may be placed between the cheeks and the teeth and gums, i. e., in the buccal corridor. These shafts are set off from the handle of the brush, as shown clearly, for example, in Figs. 2 and 3 and are connected to the handle by small, preferably rigid, arms 14. These arms are preferably so positioned as to engage the shafts centrally between their ends. The degree of offset or the length of the arms 14 may be varied with the size of the brush so that the brush may be adapted for use with adults or with children. Preferably the arms 14 are of such length that the shafts 12 are offset, so that when the handle of the brush is held substantially horizontally, which is always its working position, as shown for example in Figs. 1, 5 and 6, the shaft holding the bristles which are to be employed in brushing the teeth drops below the cervical of the teeth, so that the bristles may rest against the gum at an angle inclined to the long axis of the tooth in the manner previously described in connection with the preferred Charters method of brushing. Figs. 5 and 6 show the brush of the present invention in position for use in connection with brushing certain areas in a lower jaw. In Fig. 6 the brush is shown positioned to brush the small anterior lingual arc.

Preferably the shafts 12 are short and of such a length only that the brush may be moved freely while employed in cleansing the small lingual arc without the ends of the shaft coming in contact with gum tissue. A single row of bristles 20 may be held in each shaft, or, as shown in Fig. 2, each shaft may be provided with a plurality of adjacent rows 22, 24. Where a plurality of rows is employed, a preferred form is that shown in Fig. 2, where the bristle rows farthest from the handle of the brush are somewhat longer than those nearest the handle. Such a structure reduces bristle resistance when the interproximal areas are being cleansed.

Preferably the bristles are mounted in the shafts 12 so as to flare outwardly, as clearly shown, for example, in Fig. 3. Such a structure acts further to protect the gum areas from injury as a result of contact therewith of the shafts 12.

It should be noted that while the preferred brush of the present invention comprises a plurality of complementary bristle rows, for example the two rows 20 in Fig. 4, it is not intended that both rows be used simultaneously. When the lower teeth are being brushed, for example, the upper row of bristles is not necessarily in contact with any teeth. It may, however, be employed to cleanse the grinding surfaces of the teeth, as shown for example in Fig. 4. Primarily, however, the provision of two such complementary bristle rows is intended to facilitate use of the brush with all areas in the mouth. The brush may be readily moved, for example, from the upper to the lower teeth, as shown in Fig. 1, and one bristle row may be employed in cleansing the upper vital areas of the teeth, following which the complementary row is employed in cleansing the lower areas. The relative dimensions of the teeth and interproximal gum and the length of bristles and the distance of their exposed tips from the handle axis are shown in Fig. 4. The buccal corridor is the space between the outside of the teeth and the inside of the cheek when the cheek is moved away from the teeth without uncomfortable distension. Having in mind the known relative proportions of the teeth, gums and that corridor, it will be recognized that the instrument described above and shown in Fig. 4 lies, when in operation within the buccal corridor and that the distance of the exposed bristle tips from the handle axis is less than the width of the buccal corridor.

In Fig. 7 there is shown a brush having a single row of bristles in which the shaft 12 is offset from the handle 10 in the manner previously described. Such a brush would be adapted for use in cleansing the small lingual or palatal areas in the manner in which the brush shown in Fig. 6 is being employed, but the brush shown in Fig. 7 would not be adapted for cleansing the inner right side surfaces of the upper teeth in the manner shown, for example, in Fig. 1. For such purposes a brush such as is shown in dotted lines at 26 in Fig. 7 might be employed. It will be apparent, therefore, that in lieu of the compound brush shown in Figs. 1 to 6 inclusive, a pair of supple-

mental brushes, such as those shown in Fig. 7, may be used. Such brushes are to be deemed within the scope of the invention.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and cleaning of its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising, in combination, a handle, a plurality of short, bristle-holding shafts, each connected to said handle and set off therefrom, a plurality of bristle tufts held in each shaft, said bristle pluralities making an obtuse angle with each other and an acute angle with a line joining the centers of said shafts.

2. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and cleaning of its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising, in combination, a handle, a plurality of short bristle-holding shafts, each connected to said handle and set off therefrom, a plurality of bristle tufts held in each shaft, said bristle pluralities making an angle with each other and an acute angle with a line joining the centers of said shafts, one of said bristle pluralities lying substantially in a plane and the other of said bristle pluralities lying substantially in another plane.

3. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and cleaning of its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising, in combination, a handle, a plurality of short, bristle-holding shafts, each connected to said handle and set off therefrom, a plurality of bristle tufts held in each shaft, said bristle pluralities making an angle with each other and an acute angle with a line joining the centers of said shafts, said handle being connected to said shafts by arcuate arms extending from the respective, longitudinal centers of said shafts.

4. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and cleaning of its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising, in combination, a handle, a plurality of short, bristle-holding shafts, each connected to said handle and offset therefrom, a plurality of bristle tufts held in each shaft, said bristle pluralities lying in different, respective planes said bristle pluralities making an angle with each other and an acute angle with a line joining the centers of said shafts, said shafts being separated from said handle by a distance at least as great as the average lingual heights of the exposed portion of normal human teeth whereby, if said toothbrush is held horizontally in the mouth of a user in position for brushing the inner surfaces of lower teeth, the base of the operative bristle row is below the gun line of said teeth.

5. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and cleaning of its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising, in combination, a handle, a plurality of short, bristle-holding shafts, each connected to said handle and set off therefrom, a plurality of bristle tufts held in each shaft, said bristle pluralities lying in different, respective planes said bristle pluralities making an angle with each other and an acute angle with a line joining the centers of said shafts, each said shaft being shorter than the normal human lower-lingual arc whereby said brush may be moved laterally with said shaft positioned within the small lingual arc of a user and with said handle substantially horizontal.

6. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and cleaning of its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising a handle, two short bristle holding shafts, each shaft connected at substantially its center with said handle and set off therefrom, and a plurality of bristles each attached to one of said shafts, said bristles along one of said shafts being at an angle with said bristles along the other of said shafts, the bristles on each shaft making an acute angle with the plane determined by the long axis of that shaft and the longitudinal axis of said handle the bristles at the ends of each of said shafts flaring outwardly beyond the ends of and at an acute angle with the axis of their respective shafts, the space within said angle and between its apex and said handle being unoccupied.

7. A prophylactic instrument for the simultaneous stimulation of the mucous membrane and its adjacent cervical enamel in but only one of the areas known as buccal and lingual, said instrument comprising a handle, two short bristle holding shafts, each at a distance from the axis of said handle and each having its long axis substantially parallel to the axis of said handle and each connected at a point between its ends to said handle and each having bristles attached thereto, the bristles on one of said shafts and the bristles on the other of said shafts lying respectively along the sides of a dihedral angle having its apex along a line spaced from said axis of said handle and on the same side thereof as said bristles, the exposed ends of said bristles being at a distance from the longitudinal axis of said handle less than the width of the buccal corridor, whereby said instrument may be positioned between the teeth and gums and the adjacent inner cheek surfaces, the exposed ends of the bristles on one of said shafts being spaced from the exposed ends of the bristles on the other of said shafts, the bristles on each shaft making an acute angle with the plane determined by the longitudinal axis of the respective shaft and the axis of said handle.

BENJAMIN ALTSTADT.