

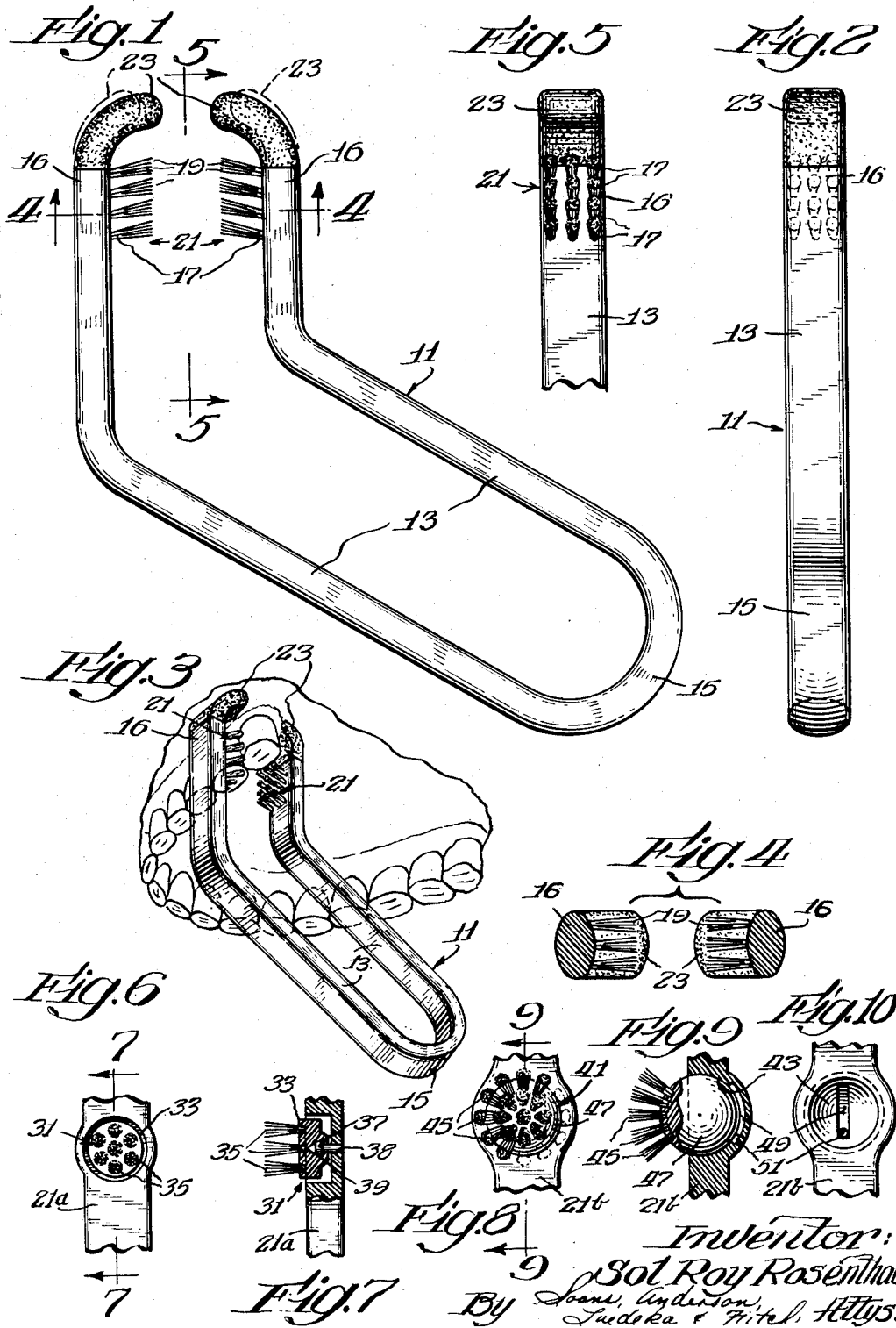
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TOOTHBRUSH

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3,146,478 TOOTHBRUSH

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This invention relates to an improved toothbrush and more particularly, to an improved toothbrush especially adapted for thorough cleaning of both sides of the teeth simultaneously while at the same time providing gum prophylaxis and minimizing injury to the gums.

People often carefully brush the outside surfaces of their teeth while only giving cursory attention to the inside surfaces thereof. Children who are learning to brush their teeth are prone to quickly brush across the outside surfaces of their teeth while neglecting the inside surfaces. Children likewise often brush vigorously across their rows of teeth rather than brushing from the gums downwardly or upwardly as the case may be for their upper or lower teeth. Vertical brushing thoroughly cleans the areas between the teeth where decay is most likely to form and, therefore, is the practice highly recommended for proper dental hygiene. Also people often brush from the teeth toward the gums, a method which brushes the gums away from the teeth and which is thereby injurious to the gums. Furthermore, people do not brush their teeth in such a way as to provide gum massage which is highly desirable for good oral hygiene.

It is an object of this invention to provide an improved toothbrush. Another object of the invention is to provide a double toothbrush which can be used to effectively brush both the inside surfaces and the outside surfaces of one's teeth simultaneously. A further object of the invention is to provide a brush constructed so that the user will be inclined to brush his teeth in the recommended manner. Another object of the invention is to provide a brush which will minimize injury to the gums by the spacing apart the brushing heads so that they do not separate gums from teeth when the brush is used. A still further object of the invention is to provide a brush which is especially adapted to massage the gums simultaneously with the brushing operation. A still further object of the invention is to provide a brush which incorporates movable brushing heads especially adapted for effective cleaning action and for minimizing injury to gums.

These and other objects of the invention will be apparent from the following description when read in conjunction with the accompanying drawings of which:

FIGURE 1 is a front view of a toothbrush embodying various of the features of the invention;

FIGURE 2 is a side view of the brush shown in FIGURE 1;

FIGURE 3 is a perspective view of the brush shown as it would be used in brushing the upper teeth;

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1;

FIGURE 5 is a sectional view taken along line 5—5 of FIGURE 1;

FIGURE 6 is a fragmentary view of an alternate embodiment of a brushing head;

FIGURE 7 is a sectional view taken along line 7—7 of FIGURE 6;

FIGURE 8 is a fragmentary view of another alternate embodiment of a brushing head;

FIGURE 9 is a sectional view taken along line 9—9 of FIGURE 8; and

FIGURE 10 is a view similar to FIGURE 8 with the brushing element removed.

A toothbrush 11 embodying various of the features of the invention is shown in FIGURE 1 of the drawings. The brush 11 comprises a pair of similarly shaped arms 13 which are joined at the rear end by a curved, flexible

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section 15 that serves to space the arms 13 apart along their entire length but permits flexing of the arms 13. The forward ends 16 of the arms 13 are bent upwardly and accommodate bristles for brushing of teeth.

Groups or tufts 17 of bristles 19 are set in rows at the forward end of each of the arms 13 to form a pair of opposing brushing heads 21. The forward end 16 of each of the arms 13 is bent so that the brushing heads 21 will be generally vertically disposed when the handle portion 15 is angularly inserted into the mouth, as illustrated in FIGURE 3.

As can be seen in FIGURE 2, the forward ends 16 of the arms 13 are bent in such a direction that they are parallel. It has been found that the forward ends 13 should be bent upwardly at approximately 120° from the arms 13 in order to provide a toothbrush which can be most conveniently used.

The curved section 15 is designed to space the brushing heads 21 a sufficient distance apart so that the brush 11 can be inserted about a tooth or pair of teeth (FIG. 3), without contacting the teeth or the adjacent gum area, and then pressed together by pressure exerted by the thumb and a finger on the arms 13 to bring the brushing heads 21 into desired contact with both the inside and outside surfaces of the teeth. In this connection, the handle 15 is preferably made from a resilient material, preferably plastic, which allows ample bending but will return the brushing heads 21 to their preset position upon release of pressure on the arms 13. The preferred embodiment of the toothbrush of the invention has both its arms 13 and its curved section 15 formed from a single piece of resilient plastic. However, it is within the contemplation of the invention to provide a pair of separable, detachable arms joined by a handle having suitable resilient characteristics. In this respect, a resilient plastic tube, into which the forward ends 16 of the arms 13 could be inserted, would provide a suitable handle. A flexible tube or a pair of molded, pivotable pieces carrying blade or hair-springs can alternately be used as suitable handles.

To provide a means for massaging the gums simultaneously with the brushing of the teeth, a pair of massage tips 23 are provided. The tips 23 are disposed at the upper ends of the forward ends 16 of the arms 13 in a position adjacent to and above the brush heads 21 and are attached to the arms 13 by suitable means. Each of these massage tips 23 is formed of a soft, pliable, resilient material which is suitable for rubbing along the gums to provide massaging action. As can be seen in FIGURE 1, the massage tips 23 extend inwardly into the gap between the end portions of the brushing heads 21 to a further extent than do the bristles 19 of the brushing heads 21. However, the pliability of the massage tips 23 allows them to be compressed when the arms 13 are squeezed so that the brushing heads 21 contact the teeth. The dotted outline in FIGURE 1 illustrates the approximate position the resilient tips 23 will take during brushing action. Because the tips have been compressed they will bear against the gums with a steady pressure so as to provide excellent massaging action.

The bristles 19 are set in the brush heads at angles slightly pointing towards the tips 23, as illustrated in FIGURE 1. This bristle arrangement guards against possible harm to the gums that could be caused from bristles set transversely to the forward ends 16 of the arms 13 and the arrangement inhibits harm to the gum tissue as the brush is drawn downward therealong. It is to be understood that the toothbrush is an equally well adapted for brushing the lower teeth from the gums upward as it is for brushing the upper teeth from the gums downward. However, for brevity of explanation, the use of the brush will be described with regard to the brushing of the upper teeth only. Because the bristles 19 will only angularly

contact the gums, they will give with pressure and slide along the gums rather than being forced directly against them.

FIGURES 6 and 7 illustrate an alternate embodiment of a brushing head 21a which comprises a rotatable brushing member 31. The brushing member 31 comprises a small disc 33 having a plurality of tufts of bristles 35 set in its face and having a journal 37 formed in its rear face. The journal 37 is adapted to receive a shaft 38 set in the arm of the brush. The shaft 38 is formed with a head 39 proportioned to fit into the journal 37 so that the brushing member 31 can be easily snapped over it. When snapped in place, the brushing member 31 is securely retained on the shaft 38 upon which it can be easily rotated. Thus, as the teeth are brushed the brushing member 31 will rotate. This rotary action provides more efficient cleaning of the areas between a pair of teeth because a larger number of the bristles 35 on the revolving member will come in contact with the surfaces of the teeth. The action also minimizes injury to the gums. It is further noted that the brushing member 31 is removable so that it can be individually replaced. This feature thus alleviates any need to replace the entire brush.

Another alternate embodiment of a brushing head 21b is shown in FIGURES 9, 10 and 11. In this embodiment, a generally spherical brushing element 41 is pivotably set into a suitable recess 43 formed on each arm of the brush. This spherical brushing element 41 contains a plurality of tufts of bristles 45 set into a surface area about one-fourth of total surface area of a small sphere 47. The remaining portion of the sphere 47 provides the seating surface of the brushing element 41 in the recess 43. In this connection, the recess 43 is formed with a shape slightly greater than a hemisphere so as to retain the sphere 47 therein after it has been pressed into the recess 43. The recess 43 is proportioned with a slightly greater diameter than that of the sphere 47 so that the sphere 47 is able to turn freely, viz. the arrangement will allow movement similar to a ball and socket. This rotatable element 41 provides for efficient cleaning action.

Optionally, the brushing element 41 can be stabilized in a manner so as to preclude rotary movement and allow only pivotal movement in one direction, longitudinally of forward ends of the arms. In this connection, a longitudinally extending slot 49 is provided in the arcuate surface of the recess 43, and a small button 51 is provided on the rear surface of the sphere 47. The button 51 is proportioned to be slidably seated within the slot 49 wherein it will reside when the sphere 47 has been pressed into the recess 43. As can be seen in FIG. 9, the button 51 is in contact with the lower end of the slot 49 when the brushing element 41 is in brushing position, the bristles 45 extending generally transverse the arms. This arrangement prevents the brushing element 41 from swinging upward as the brushing head 21b is drawn downward along the upper teeth, and thus holds the bristles 45 in brushing position. However, the arrangement allows the brushing head to swing downward should the bristles 45 contact the teeth or gums as the toothbrush is being inserted about the teeth preparatory to the brushing stroke. Thus, because this optional arrangement allows the brushing element to pivot away from the direction in which the brushing head 21b is being inserted, it assures that the gums will not be irritated even if they should be contacted while the brush is being inserted. The arrangement likewise assures that the gums will not be brushed off of the teeth.

Thus, there is provided an improved toothbrush 11 which is especially suited for massaging one's gums while simultaneously excellently cleaning the teeth and minimizing injury to the gums. It is well known that people's gums often suffer from a lack of proper hygiene which frequent massaging will remedy. In an attempt to encourage such massaging, various brushes have been designed with massage devices disposed at the ends opposite the brush head. However, these brushes have proven generally ineffective in remedying the problem

because the user, more often than not, only brushes his teeth and, because of lack of time or forgetfulness, neglects to reverse the brush and correctly massage the gum tissue. Because of the novel disposition of the message tips 23, it is nearly impossible to brush the bristles along the surfaces of the teeth without concurrently applying massaging action to the adjacent gum tissue. Thus, the toothbrush 11 of the present invention provides a device which, when used to brush one's teeth, necessarily provides simultaneous gum massage.

The particular angular formation of the arms 13 of the toothbrush 11 eliminates another serious brushing problem. Dental hygienists have long lectured against horizontal brushing of the teeth, i.e., drawing the brushing head crosswise along a row of teeth, which produces both incomplete cleaning between the teeth and possible harmful erosion of tooth enamel at points adjacent the gum line. Instead, vertical brushing, i.e., drawing the bristles downward from the gums, has been heartily recommended as to the proper method to insure maximum cleaning. The particular construction of the toothbrush 11 of the present invention makes it awkward and difficult to brush the teeth horizontally because the arms 13 will contact other teeth if the toothbrush 11 is so positioned. Because of this construction, vertical brushing is positively encouraged.

By spacing apart the brushing heads, a toothbrush is provided which inherently protects the gums. When the toothbrush is inserted around the teeth and gums, it will be in its spread position so there will be no pressure exerted that will press the brush against the gums. It is normal and natural not to squeeze the arms of the brush together until the brushing stroke begins. Thus, the gums will be stroked onto the teeth and not away from them.

A brush of the design illustrated as the preferred embodiment has been used in the prescribed manner over a period of a few months and has been found to produce results noticeably superior to those obtained by the use of a standard toothbrush.

Various features of the invention are set forth in the appended claims.

What is claimed is:

1. An improved toothbrush for simultaneously brushing the inner and outer surfaces of rows of human teeth, which toothbrush comprises a pair of generally parallel arms, a handle connecting said arms near one end thereof and resiliently spacing the free ends thereof a predetermined distance apart so as to form a gap substantially larger than the thickness of the teeth and gums, said handle being adapted to be squeezed so as to narrow said gap, a pair of bristle-containing brushing elements mounted in opposed relation on said arms near the free ends thereof, said bristles extending a preselected distance into said gap so as to narrow said gap to a width slightly larger than the thickness of the teeth and gums, and a pair of soft, resilient massage tips mounted at the ends of said arms, said tips extending a greater distance into said gap than said bristles.

2. An improved toothbrush for simultaneously brushing the inner and outer surfaces of rows of human teeth, which toothbrush comprises a pair of generally parallel coplanar arms each of which is bent so as to form the legs of an angle of about 120°, a handle connecting said arms near one end thereof and resiliently spacing the free ends thereof a predetermined distance apart so as to form a gap substantially larger than the thickness of the teeth and gums, a pair of bristle-containing brushing elements mounted in opposed relation on said arms near the free ends thereof, said bristles being arranged in tufts and extending a preselected distance into said gap so as to narrow said gap to a width slightly larger than the thickness of the teeth and gums, all of said tufts of bristles being angularly disposed from the transverse direction across said gap, said angular disposition being

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in the direction toward the free ends of said arms, and a pair of soft, resilient massage tips mounted at the free ends of said arms, said tips extending a greater distance into said gap than said bristles.

3. An improved toothbrush for simultaneously brushing the inner and outer surfaces of rows of human teeth, which toothbrush comprises a generally U-shaped body formed with a pair of generally parallel co-planar arms each of which is bent so as to form the legs of an angle of about 120° and a curved portion connecting said arms and resiliently spacing the free ends thereof a predetermined distance apart so as to form a gap substantially larger than the thickness of the teeth and gums, a plurality of tufts of bristles mounted in opposed relation in said arms near the free ends thereof, said bristles extending a preselected distance into said gap so as to narrow said gap to a width slightly larger than the thickness of the teeth and gums, said bristles being angularly disposed from the transverse direction across said gap, said angular disposition being in the direction toward the free ends of said arms, and a pair of inwardly curved, soft, resilient massage tips mounted at the extreme ends of said arms, said tips extending a greater distance into said gap than said bristles.

4. An improved co-planar toothbrush for simultaneously brushing the inner and outer surfaces of rows of human teeth, which toothbrush comprises a pair of generally parallel arms each of which is bent so as to form the legs of an angle of about 120°, a handle connecting said arms near one end thereof and resiliently spacing

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the free ends thereof a predetermined distance apart so as to form a gap substantially larger than the thickness of the teeth and gums, a pair of reciprocating bristle-containing brushing elements, attaching means pivotally mounting said reciprocating brushing elements to said arms so that said bristles extend a preselected distance into said gap so as to narrow said gap, said attaching means retaining said reciprocating bristles in a position transverse the arms during a brushing stroke while allowing pivotal movement from said position rearwardly toward said handle during positioning of the toothbrush.

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