

TOOTHBRUSH

TECHNICAL FIELD: The present invention relates generally to toothbrushes and more particularly to a novel construction of a toothbrush which allows the brushing head to turn around and to be adjustable with respect to the handle.

BACKGROUND ART: A prior art exists in the form of a single head toothbrush bearing a plurality of tufts of bristles on its brushing head. The toothbrush is either rolled back and forth along the teeth in an oscillating motion or the toothbrush is "chewed on" in an up and down type motion. The main restriction is that the single bristle carrying head is usually formed as a planar continuation of an elongated handle. The hand holding the handle will have to move the brushing head in different orientations in order to brush efficiently the buccal and lingual surfaces of the teeth. Furthermore, for a right-handed person, this means that the brushing operation is more efficiently executed for the left half of the tooth set than for the right half. In order to brush the right half more efficiently, the person may switch the toothbrush to his left hand. A right-handed person is not so effective in the use of his left hand. Otherwise, the right hand may be slanted slightly.

Other prior art of a toothbrush exist in the different designs of the handle and the grouping of the bristles on the brushing head.

SUMMARY OF INVENTION: It is an object of this invention to provide a new and improved toothbrush.

It is another object of this invention to provide a

toothbrush which is capable of efficiently brushing the buccal and lingual surfaces of the teeth.

It is another object of this invention to provide a toothbrush which does not involve the use of multiple brush-carrying heads or multiple groups of bristles.

It is another object of the invention to encourage brushing by an up and down cleaning motion.

It is still another object of this invention to provide a toothbrush which is easy and economical to manufacture and which lends itself to mass production.

According to the invention there is provided a toothbrush comprising: an elongate handle; an elongate bristle-carrying head on the distal end of the said handle, a suitable means of turning the brushing head about an axis parallel to the longitudinal axis of the brushing head, the longitudinal axis of the head forming an angle to the longitudinal axis of the said handle, and a plurality of cleaning bristles on the said head, the free ends of the cleaning bristles forming a profile for brushing.

The toothbrush preferably comprises:

- 1) an elongated handle, preferably non-metallic, and in particular, made up of plastics. (This handle can be of one piece design or two pieces design, with a flexible but firm joint).
- 2) an elongate bristle-carrying head detachable but connectable to the distal end of the said handle at an approximate angle of 90° to 145° to the plane of the said handle, away from its distal end.

- 3) a plurality of cleaning bristles preferably made up of plastics on the said head, its free ends forming a wavy profile.
- 4) a suitable means of turning the brushing head about its own longitudinal axis, such as a pin-hole arrangement or a lever arrangement, preferably non-metallic, in particular made up of plastics, fitted to the end of said head.
- 5) The angle of rotation of the brushing head about an axis parallel to its own longitudinal axis may be from 145° to 250° and preferably is approximately 200° .

SPECIFIC EXAMPLE

The foregoing and other objects and advantages will appear from the description to follow. In the description, reference is made to the accompanying drawings which form a part thereof, and in which is shown by way of illustration a specific embodiment for practising the invention. It is understood that other embodiments may be utilised and that structural modifications may be made without departing from the scope of the invention. The following detailed description is therefore not to be taken in a limiting sense.

Fig. (1) (a) shows the assembled view of a preferred embodiment in a particular position whereas Fig. (1) (b) shows the same embodiment in a different position.

Fig. (2) shows the views of the bristle carrying head (1) in different positions after it is being turned about its own axis.

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Fig. (3) shows the design of a one-piece elongated handle (2) of a preferred embodiment as shown in Fig. (1).

Fig. (4) shows the view of a proposed lever (4) design used as a means to turn around the brushing head about its own axis.

Fig. (5) shows the view of another proposed lever design (4) as an alternative to that shown in Fig. (4).

Figure (6) shows the assembled views of yet another preferred embodiment of the invention, compared to that as shown in Figure (1).

5 Figure (7) shows the pin-hole arrangement, as a means of turning the brushing head about its own axis as shown in Figure (6).

10 Figure (8) shows the assembled view of yet another preferred embodiment, incorporating a two-pieces handle (50), with a flexible but firm joint, formed by holes (51, 52, 53) and a pin (41).

20 With reference to Figure (1), the novel construction of an improved toothbrush comprises of a one piece elongated handle (2), preferably made up of plastics, a bristle-carrying head (1), a plurality of bristle (3), and a lever (4) used as a means of turning the bristle-carrying head (1) about its own axis. The bristle carrying head (1) serves as a brushing head.

25 To achieve this objective, a plurality of tufts of straight bristles (3), made up of plastics preferably, is suitably mounted on the head (1). This head is moulded with a flat base (11) and a rounded appendix (12). The bristles are embedded on the flat base (11) and the rounded appendix (12) goes through a hole (5) located at the distal end of the handle (2), therefore forming a preperpendicular attachment to the plane of the handle (2).

30 Extending through the hole (5) on the distal end of the handle (2), the rounded appendix (12) carries a small hole (6) near its extreme end perpendicular to the plane of the appendix. Into this hole (6) is fitted a lever

arrangement (4) which is used as a means to turn around the entire bristle-carrying head (1) about its own axis, once it is fitted.

To turn around the head (1) (Figure (4)), the arm (7) of the lever arrangement (4) is rotated about the hole (5) as the pivot. The arm (7) of the lever arrangement can be flipped down from a protruding position to a position adjacent and parallel to the plane of the handle (2) with the arm (7) towards the direction of the holding end of handle (2). The main object of this arrangement is such that the arm (7) does not protrude beyond the brushing head (1) and interferes with the brushing action.

There are several modification to this lever arrangement. As shown in Figure (4), the lever arrangement (4) consists of a rounded non-metallic arm (7), particularly made up of plastics, both ends of which are bent ninety degrees inwards facing each other with a gap in between the ends. Using a small finger pressure, the gap can be extended slightly to allow the rounded appendix (12) of the bristle-carrying head (1) to slide in between such that the short bends (8) fit into the hole (6) on the rounded appendix (12). As shown in Figure (5), the lever consists of a U-shaped arm (9) with slightly flattened ends so that there is a hole perpendicular to the plane of the arm (9) at each end.

A non-metallic pin (10) goes through one hole on one flattened end of the arm (9), the hole (6) on the rounded appendix (12), and then another hole on the other flattened end of the arm. This arrangement prevents the bristle-carrying head (1) from falling off the handle, and acting as a means of turning the head about its own axis.

With reference to Figure (6) (a), (b) & (c), another preferred embodiment of the invention is illustrated. The one-piece handle (2) is particularly profiled to facilitate hand-gripping motion. It is not straight. The bristle-carrying head (24) is connectable to the distal end of the handle (2) at an approximate angle of ninety to one hundred forty five degrees to the plane of the said handle.

It is made turnable about its own axis by means of a pin-hole arrangement (21, 25). The details of this pin-hole arrangement are illustrated as in Figure (7). The distal end (20) of the one-piece handle (2) is rounded with a hole (23) punctured in the direction parallel to the flat face of the handle. One surface (25) of the circular rounded end (20) is notched, while the other surface is smooth. A plurality of tufts straight bristle (3), made up of plastics preferably, is correspondingly implanted on the head (24). The profile of the free ends of the bristle can be of various designs, particularly in a wavy form. This head is moulded to carry a slot (26) where the circular rounded end (20) of the handle is fitted. One inner surface (28) of the slot is likewise notched, corresponding to the notched surface of the circular rounded end (20) of the handle. The head also carries a hole (27) which is in alignment with the hole (23) of the circular rounded end (23). A washer (22) made up of soft material such as rubber is placed in between the smooth inner surface of the cavity (26) and the smooth surface of the circular rounded end (20). The washer is punctured with a hole (29) which is also in alignment with the holes (27) and (23). A non-metallic pin (21) then passes through all the holes and connects the brushing head (24) to the handle (2), whilst allowing the head to turn about its own axis.

The handle (2) as depicted in Fig. (6) is not straight, but it is rigid with regards to the angle (A) between the head (24) and the longitudinal axis of the handle. This angle varies approximately from 90° to 145°. The design of this newly improved toothbrush has one degree of freedom i.e the brushing head is able to turn about its own axis of attachment.

Another preferred embodiment is shown as in Fig. (8), where an additional degree of freedom is incorporated, by having a 2-pieces handle design. The not-so-straight handle (2) of Fig. (6) is now replaced by two pieces: one two-pronged holder element (50) and one flat adjustment arm (40).

The two prongs are located at the distal end of the holder element (50), each carrying a hole (51) in each prong. One end of the flat adjustment arm (40) is sandwiched in between the prongs (52) of the holder element (50). This end also carries a hole (42) in alignment with the holes (51) in the holder element (50). A non-metallic pin (41) is fitted passing through the holes (51), (42) and (53) respectively, constituting a flexible but firm joint.

The other end of the flat adjustment arm (20) is rounded with a hole (23) as previously described in Fig. (6). The end carries the brushing head (24) which also can turn about its own axis, in this case, hole (23), through a pin-hole arrangement.

It should be noted that the flat adjustment arm (40) need not be straight all the way.

a curved flat element, the degrees of freedom (of movement) are improved.



CLAIMS

1. A toothbrush comprising: an elongate handle; an elongate bristle-carrying head on the distal end of the said handle, a suitable means of turning the brushing head about an axis parallel to the longitudinal axis of the brushing head, the longitudinal axis of the head forming an angle to the longitudinal axis of the said handle, and a plurality of cleaning bristles on the said head, the free ends of the cleaning bristles forming a profile for brushing.
2. A toothbrush as claimed in claim 1, wherein the means of turning the brushing head includes a pin-hole arrangement.
3. A toothbrush as claimed in claim 1, wherein the means of turning the brushing head includes a lever arrangement.
4. A toothbrush as claimed in claims 1 to 3, wherein the angle of attachment of the brushing head to the distal end of the said handle is an angle from 90° to 145° with the longitudinal axis of the handle.
5. A toothbrush as claimed in any preceding claim, wherein the profile of the free ends of the plurality of the cleaning bristles is a wavy form.
6. A toothbrush as claimed in any preceding claim, wherein the angle of rotation about its own longitudinal axis of the brushing head is from 145° to 250° .
7. A toothbrush as claimed in claim 6, wherein the angle of rotation about its own longitudinal axis of the brushing head is approximately 200° .



(10)

8. A toothbrush as claimed in any preceding claim wherein the elongated handle is curved.

9. A toothbrush as claimed in any preceding claim wherein the elongated handle can be adjusted about a flexible but firm joint, connecting the two elements making up the handle.

10. A toothbrush substantially as described herein with reference to Figs. 1 to 5 of the accompanying drawings.

11. A toothbrush substantially as described herein with reference to Figs. 6 and 7 of the accompanying drawings.

12. A toothbrush substantially as described herein with reference to Fig. 8 of the accompanying drawings.
