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(54) **MODULAR TOOTHBRUSH ASSEMBLY**

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(57) **ABSTRACT**

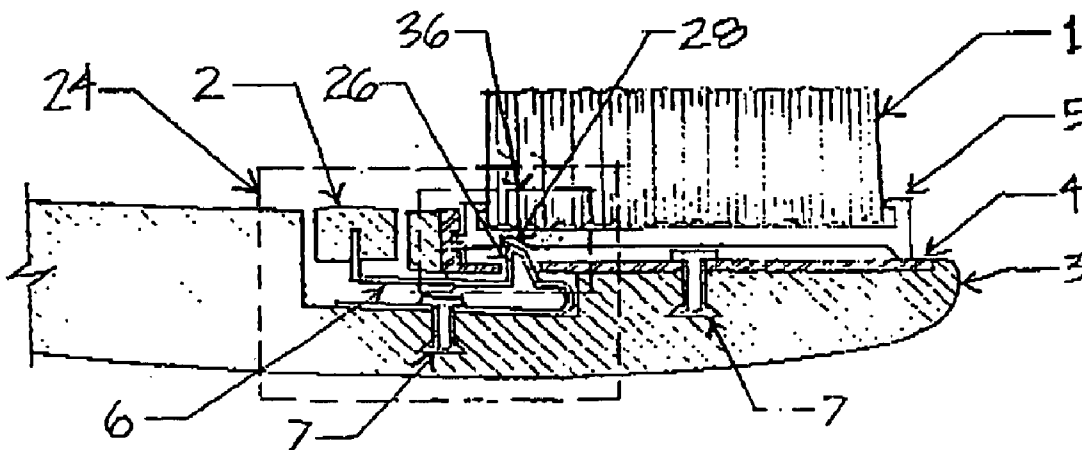
A toothbrush assembly with a removable dental head is disclosed. Rather than replace the entire toothbrush, a user can replace the dental head as needed. The toothbrush includes a handle comprising a head mounting track. A removable dental head is installable on the handle by sliding the dental head on the head mounting track. The handle includes a mechanism for locking the removable dental head in place, and a mechanism for allowing the dental head to be removed.

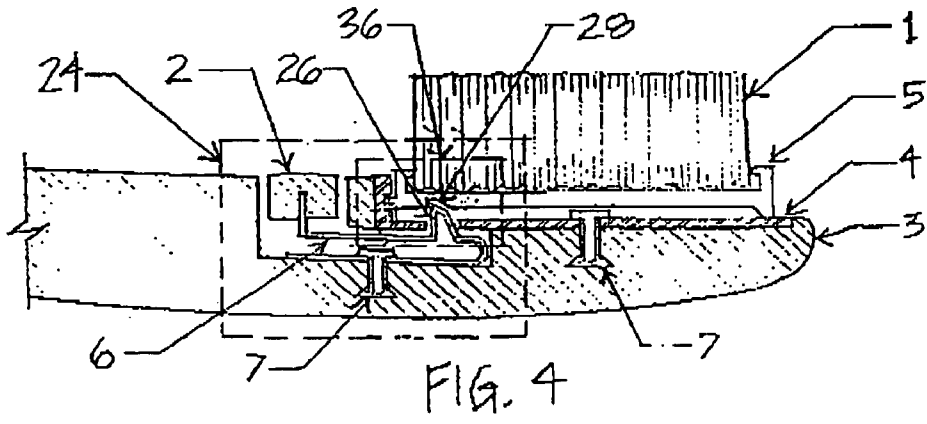
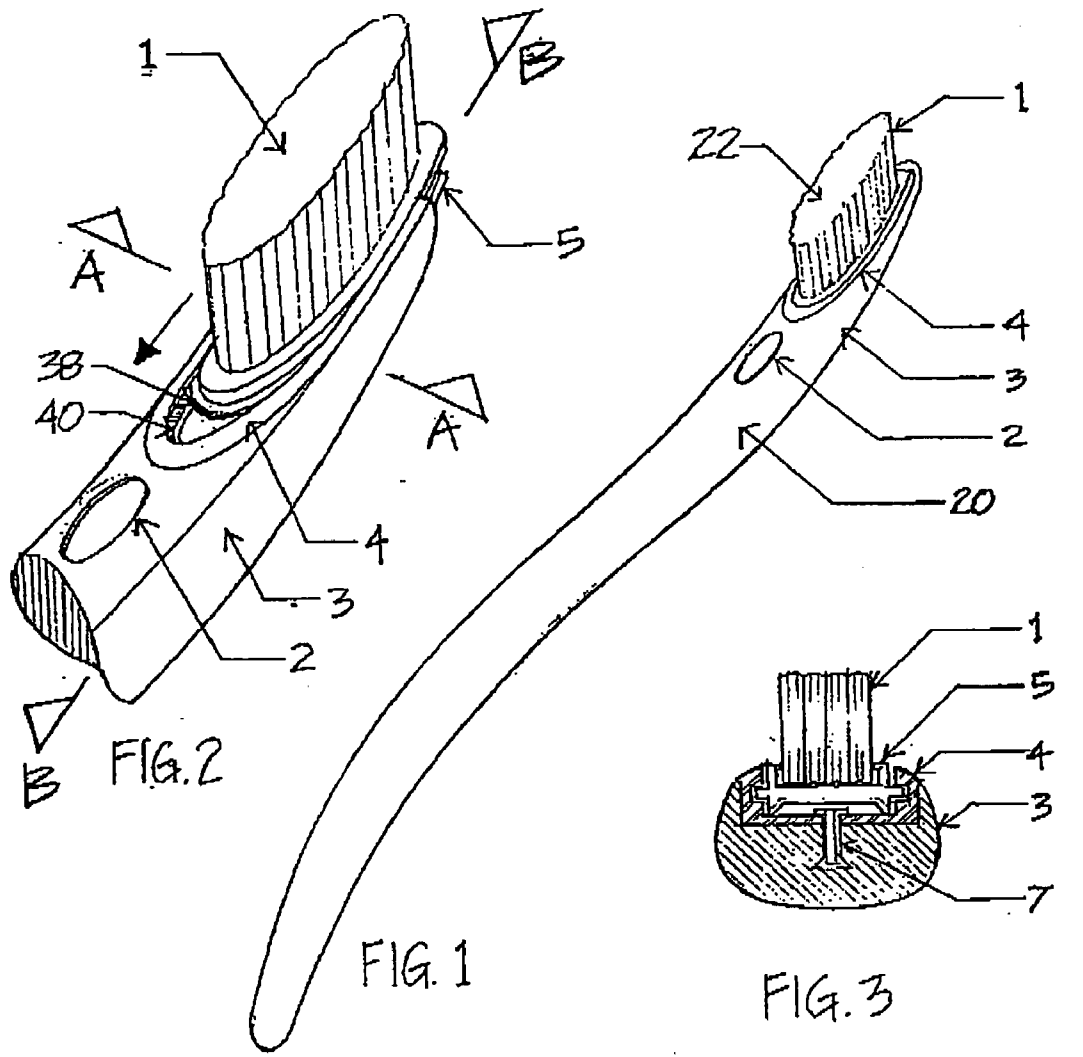
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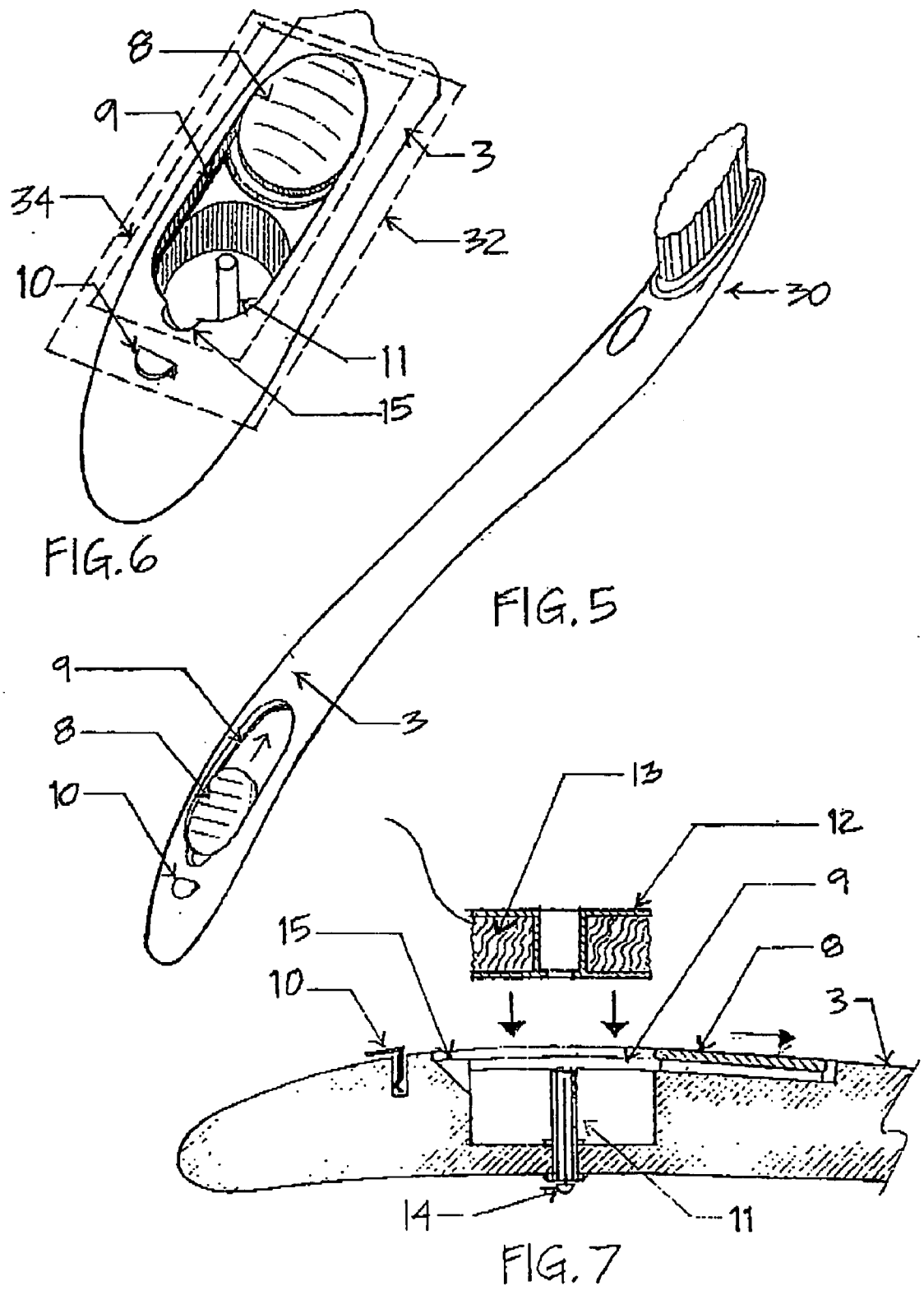
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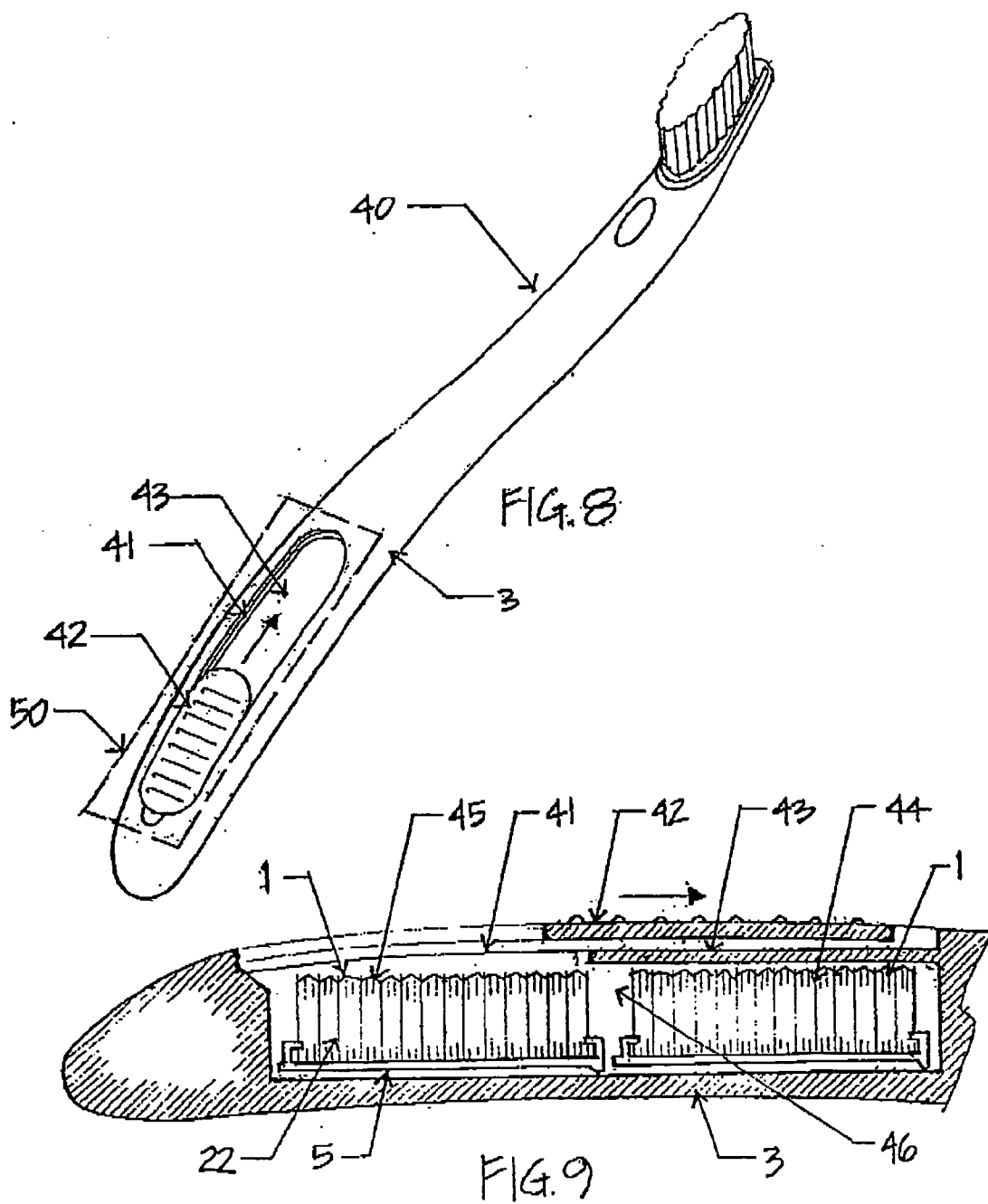
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MODULAR TOOTHBRUSH ASSEMBLY

FIELD OF THE INVENTION

[0001] The present invention relates generally to field of toothbrushes, and particularly to modular toothbrush assemblies.

BACKGROUND OF THE INVENTION

[0002] An item ubiquitous in the daily life of people is the toothbrush. It is highly recommended by dentists that the toothbrush be regularly replaced, for hygiene reasons and because the brush head bristles become less effective over time. Unfortunately, when a new brush head is needed, the entire toothbrush, including the handle, must be replaced. Individuals must pay for the entire new toothbrush instead of just the portion that is actually affected. And, the individual must part with the handle that the individual has become used to using. Further, it is hard to remember to purchase this seldom thought of item.

[0003] Some electric teeth cleaning devices provide removable rotating heads, which allows one to replace only the brush head portion of the toothbrush. However, these devices are much more expensive than a conventional toothbrush; in many cases, at least 10 times more expensive. Electric toothbrushes can be awkward to manipulate, and they inconveniently require a power source. In addition, they are difficult to use while traveling, and have only one option for brush head strength and style.

[0004] What is needed is a conventional toothbrush that is adapted to accept removable dental heads of various styles so that the handle can be retained by the user, and so that the dental head can be replaced at will.

SUMMARY OF THE INVENTION

[0005] In accordance with the principles of the invention, a toothbrush assembly with a removable dental head is provided. Rather than replace the entire toothbrush, a user can replace the dental head as needed.

[0006] The innovative toothbrush includes a non-electric handle comprising a head mounting track. A removable dental head is installable on the handle by sliding the dental head on the head mounting track. The handle includes a mechanism for locking the removable dental head in place, and a mechanism for allowing the removable dental head to be removed. The mechanism for allowing the removable dental head to be removed comprises a dental head release button engaging the dental head.

[0007] In accordance with another embodiment of the invention, the toothbrush further includes a floss receptacle. The floss receptacle includes a sliding cover for covering the floss receptacle, and a floss spool hub mount for accepting a floss spool including floss. A floss cutter is conveniently mounted on the handle of the toothbrush.

[0008] In accordance with another embodiment of the invention, the toothbrush further includes a storage receptacle for storing dental heads. The storage receptacle includes a sliding cover for covering a storage compartment built into the handle.

[0009] The innovative toothbrush allows a user to select and keep a preferred toothbrush handle. The removable dental heads can be replaced at will, as needed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In order to facilitate a fuller understanding of the present invention, reference is now made to the appended drawings. These drawings should not be construed as limiting the present invention, but are intended to be exemplary only.

[0011] **FIG. 1** is a view of a toothbrush in accordance with the principles of the invention. **FIG. 2** is an axonometric detail showing removable, replaceable dental head sliding into place.

[0012] **FIG. 3** is a lateral section through the dental head and mounting track shown in **FIG. 2**.

[0013] **FIG. 4** is a longitudinal section through the dental head and release mechanism shown in **FIG. 2**.

[0014] **FIG. 5** is a view of an alternate embodiment of the toothbrush of **FIG. 1**, showing a built-in dental floss dispenser.

[0015] **FIG. 6** is a detailed view of the portion of the toothbrush of **FIG. 5** having the floss dispenser.

[0016] **FIG. 7** is a longitudinal section of **FIG. 6** showing the internals of the floss dispenser.

[0017] **FIG. 8** is a view of an alternate embodiment of the toothbrush of **FIG. 1**, showing a built-in storage receptacle for storing dental heads.

[0018] **FIG. 9** is a longitudinal section through the storage receptacle of **FIG. 8**.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0019] Referring to **FIG. 1**, there is shown a toothbrush 20 in accordance with a preferred embodiment of the invention. The toothbrush 20 includes a non-electric handle 3 upon which a removable dental head 1 is removably mounted. The dental head 1 is slidably inserted onto a head mounting track 4 attached to the handle 3. A head release button 2 is engageable to release the dental head from the head mounting track 4 for removal from the handle 3. The arrangement is advantageous in that, after a period of use of one dental head 1, the dental head 1 can be removed and a fresh new dental head 1 can be inserted onto the handle 3.

[0020] In accordance with a further aspect of the invention, various different embodiments of the dental head 1 can be made available. As seen in **FIG. 2**, the dental head 1 includes a dental implement 22 coupled to a dental head base 5. One dental implement 22 consists of conventional toothbrush bristles. Different dental heads 1 may have bristles of varying qualities and strengths, from soft to stiff, and may have bristles of varying lengths. Dental heads 1 may be of different shapes depending upon their intended purpose. Further, dental heads 1 may employ dental implements other than bristles; for example, a dental head 1 can include a dental pick or a gum massager. Many other shapes and styles of dental heads can be employed and the invention is not limited to any particular implementation. Thus, should a user so require, the dental head style and strength can be changed without the purchase of additional toothbrushes to accommodate the user's specific dental and periodontal needs as per their dental professional.

[0021] In FIGS. 2 and 3 there are shown more detailed views of the preferred embodiment of the toothbrush 10. FIG. 3 is a lateral cross section taken across "A" of FIG. 2. The head mounting track 4 is shown to be attached to the handle 3 via a rivet fastener 7, for example an aluminum rivet fastener. The dental head 1 is shown in FIG. 2 to include a dental implement 22, herein shown as bristles, mounted upon a dental head base 5. The dental head base 5 is shaped to slidably engage the head mounting track 4, for example via a slotted or tongue and groove construction whereby the tongue edge 38 of the dental head base 5 friction fits into a slot 40 in head mounting track 4.

[0022] In FIG. 4, which is longitudinal section taken across "B" of FIG. 2, there is shown a more detailed view of the toothbrush 20 showing a dental head locking mechanism 36 and release mechanism 24. The release mechanism 24 includes the dental head release button 2, which is coupled to a spring actuated flexible lock tab 6. The lock tab 6 is shown coupled to the handle 3 via a rivet fastener 7, for example an aluminum rivet fastener. The lock tab 6 includes a protrusion 26. The dental head base 5 includes a slot 28. The protrusion 26 and slot 28 form the locking mechanism 36. As the dental head 1 slides onto the head mounting track 4, the protrusion 26 on the lock tab 6 inserts into the slot 28 on the dental head base 5 for locking the removable dental head 1 in place. In order to remove the dental head 1 from the handle 3, the head release button 2 is pressed, causing the flexible lock tab 6 to compress. The compression of the flexible lock tab 6 causes the protrusion 26 to lower from the slot 28 on the dental head base 5, enabling the dental head 1 to slide off of the handle 3.

[0023] In accordance with the preferred embodiment, the handle 3 is a high quality molded handle, constructed for example of brushed molded Lucite or high-strength and aesthetically pleasing brushed glass. The head mounting track 4 and the spring-actuated flexible lock tab 6 are preferably constructed of a corrosion resistant alloy. The dental head base 5 is preferably constructed of molded Lucite. It is understood, however, that other materials may be used in order to comply with particular design constraints. For example, the handle could be molded of low cost disposable plastic in order to produce a relatively inexpensive version of the toothbrush 10. Or, the handle can be constructed of recycled plastic, thereby making the entire toothbrush an ecologically sound and possibly more cost-effective device for user and manufacturer. Alternately, the handle could be constructed of high quality metal or glass to produce a long lasting and aesthetically pleasing high-end product. An alternate toothbrush 30 is shown in FIG. 5 in accordance with another embodiment of the invention. The toothbrush 30 includes the removable dental head 1, preferably operable in the same manner as for the toothbrush 10 of FIG. 1. The toothbrush 20 further includes a floss unit 32. As seen in FIG. 6, the floss unit 32 includes a floss receptacle 34 and a floss cutter 10. The floss receptacle 34 includes a sliding cover 8 having a tongue edge for engaging a groove track 9 in the handle 3. The sliding cover 8 is slidable within the groove track 9 to expose floss. The sliding cover 8 is preferably molded and ribbed for grip. The floss cutter 10 is pressure fit into a slot in the handle 3.

[0024] Referring to FIG. 7, the floss receptacle 34 is shown in further detail. The floss receptacle 34 includes a floss spool hub mount 11 on which a floss spool 12 including floss 13 may be mounted. The floss spool hub mount 11 is preferably constructed of a corrosion resistant alloy. The floss spool hub mount 11 is fastened to the handle 3, for example via an aluminum rivet fastener 14. Once installed on the hub mount 11, floss 13 can then be extruded through a floss dispensing slot 15 in the handle 3 and cut by the floss cutter 10. The floss cutter 10 is also preferably constructed of a corrosion resistant alloy.

[0025] In FIG. 8 there is shown an alternate embodiment of the invention, which is particularly convenient for the traveling user. The toothbrush 40 includes the removable dental head 1, preferably operable in the same manner as for the toothbrush 10 of FIG. 1. The toothbrush 20 further includes a storage receptacle 50 for storing removable dental heads 1. Referring also to FIG. 9, the storage receptacle 50 includes a sliding cover 42, which engages a slot 41 formed in the handle around a storage compartment top enclosure 43. The sliding cover 42 may be conveniently ribbed for ease of grip. A user slides the sliding cover 42 along the slot 41 to expose a compartment 46 formed in the handle 3 in which dental heads 1 can be stored. As herein shown, the dental heads 1 include bristles 22 attached to dental head bases 5. As previously mentioned, the bristles 22 may be of different types: for example, a dental head 1 may include soft bristles 44 or hard bristles 45. The user can remove either dental head from the storage receptacle 50 as needed, and can place currently unneeded or already used dental heads back in the storage receptacle 50. The present invention is not to be limited in scope by the specific embodiments described herein. Indeed, various modifications of the present invention, in addition to those described herein, will be apparent to those of ordinary skill in the art from the foregoing description and accompanying drawings. Thus, such modifications are intended to fall within the scope of the invention. For example, though a particular arrangement of components is shown by which the removable dental head 1 operates, the components could be constructed of different materials and arranged at different locations. The release button 2, for example, could be located further down the handle 3 from the head mounting track 4. The dental head 1 is shown as slidably engaging the head mounting track 4; however, the dental head 1 could be installable in many different ways. For example, the dental head 1 could be pushed onto the head mounting track 4. The spring-actuated lock tab 6 could be constructed in various different configurations. Though the head mounting track 4 and spring-actuated lock tab 6 are shown as attached to the handle 3 via rivets 7, other means of attachment could be used, for example glue. And of course, the handle 3 can be shaped in any number of forms advantageous for different purposes. For example, the handle (and/or the dental heads) could be made smaller to accommodate children, or could be shaped to accommodate adults with particularly small, large, narrow, or wide mouths. Further, although advantages of the present invention have been described herein in the context of a particular implementation in a particular environment for a particular purpose, those of ordinary skill in the art will recognize that its usefulness is not limited thereto and that the present invention can be beneficially implemented in any number of environments for any number of purposes.

We claim:

- 1. A toothbrush handle comprising:
 - a non-electric handle comprising a head mounting track for receiving a removable dental head;
 - a locking mechanism for locking the removable dental head in place;
 - a release mechanism for allowing the removable dental head to be removed.
- 2. The toothbrush handle of claim 1 wherein the head mounting track comprises a slot for slidably receiving the removable dental head.
- 3. The toothbrush handle of claim 1 wherein the dental head comprises a brush.
- 4. The toothbrush handle of claim 2 wherein the release mechanism comprises a dental head release button for engaging the dental head.
- 5. The toothbrush handle of claim 1 further comprising a floss receptacle.
- 6. The toothbrush handle of claim 5 wherein the floss receptacle further comprises:
 - a sliding cover for covering the floss receptacle;
 - a floss spool hub mount for accepting a floss spool including floss.
- 7. The toothbrush handle of claim 6 further including a floss cutter.
- 8. The toothbrush handle of claim 1 further comprising a storage receptacle for storing one or more removable dental heads.
- 9. The toothbrush handle of claim 8 wherein the storage receptacle comprises:
 - a storage compartment formed in the handle;
 - a sliding cover for covering the storage compartment.
- 10. A dental head for a toothbrush comprising:
 - a dental implement coupled to a dental head base, the dental head base being shaped to engage a head mounting track on a toothbrush handle.
- 11. The dental head of claim 10 wherein the dental head base comprises a tongue edge for engaging a slot in the head mounting track.

- 12. The dental head of claim 10 wherein the dental implement is bristles.
- 13. The dental head of claim 12 wherein the bristles are soft.
- 14. The dental head of claim 12 wherein the bristles are stiff.
- 15. A toothbrush comprising:
 - a non-electric handle comprising a head mounting track;
 - a removable dental head installable on the handle by sliding the dental head on the head mounting track;
 - a locking mechanism for locking the removable dental head in place;
 - a release mechanism for allowing the removable dental head to be removed.
- 16. The toothbrush of claim 15 wherein the dental head comprises a brush.
- 17. The toothbrush of claim 15 wherein the release mechanism comprises a dental head release button for engaging the dental head.
- 18. The toothbrush of claim 15 further comprising a floss receptacle.
- 19. The toothbrush of claim 18 wherein the floss receptacle further comprises:
 - a sliding cover for covering the floss receptacle;
 - a floss spool hub mount for accepting a floss spool including floss.
- 20. The toothbrush of claim 19 further including a floss cutter.
- 21. A method of operating a toothbrush comprising the steps of:
 - installing a removable dental head on a non-electric handle by sliding the brush head on a head mounting track in the handle;
 - locking the removable dental head in place.
- 22. The method of claim 21 further comprising the steps of:
 - removing the removable dental head by operating a dental head release button for releasing the dental head.

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