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(54) **REUSABLE COMPACTABLE TOOTHBRUSH ASSEMBLY WITH DISPOSABLE TOOTHPASTE, DENTAL FLOSS AND TONGUE CLEANER**

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(76) **Inventors: Oved Mualem, Herzlia (IL); Idit Biton Avraham, Givat Shmuel (IL)**

(57) **ABSTRACT**

Correspondence Address:  
**Idit Biton Avraham**  
**11 Ben Gurion Street Apt. 714**  
**Givat Shmuel (IL)**

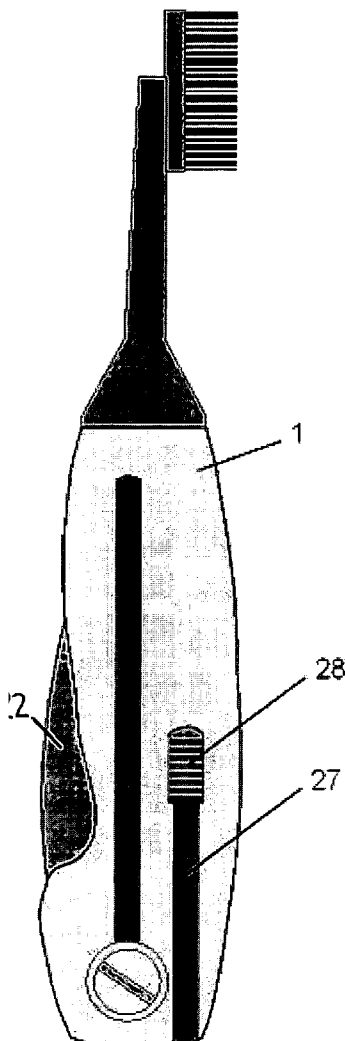
An all-in-one toothbrush that can be used at home or on the go for complete dental hygiene. Though it is the size of a regular toothbrush, it has added features for further benefits. The hollow handle conceals the refillable toothpaste, the dental floss and the tongue cleaner and the self adhering plastic cap covering the head of the toothbrush guarantees the bristle stay in shape and prevents the toothpaste from crusting. The toothbrush is not only compact and convenient because all the essential elements are housed within, but the simple exchanging of only the toothbrush head allows for use by additional users. This interchangeability and the refillable feature also make it both economically rewarding and environment friendly.

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(60) **Provisional application No. 60/473,709, filed on May 29, 2003.**



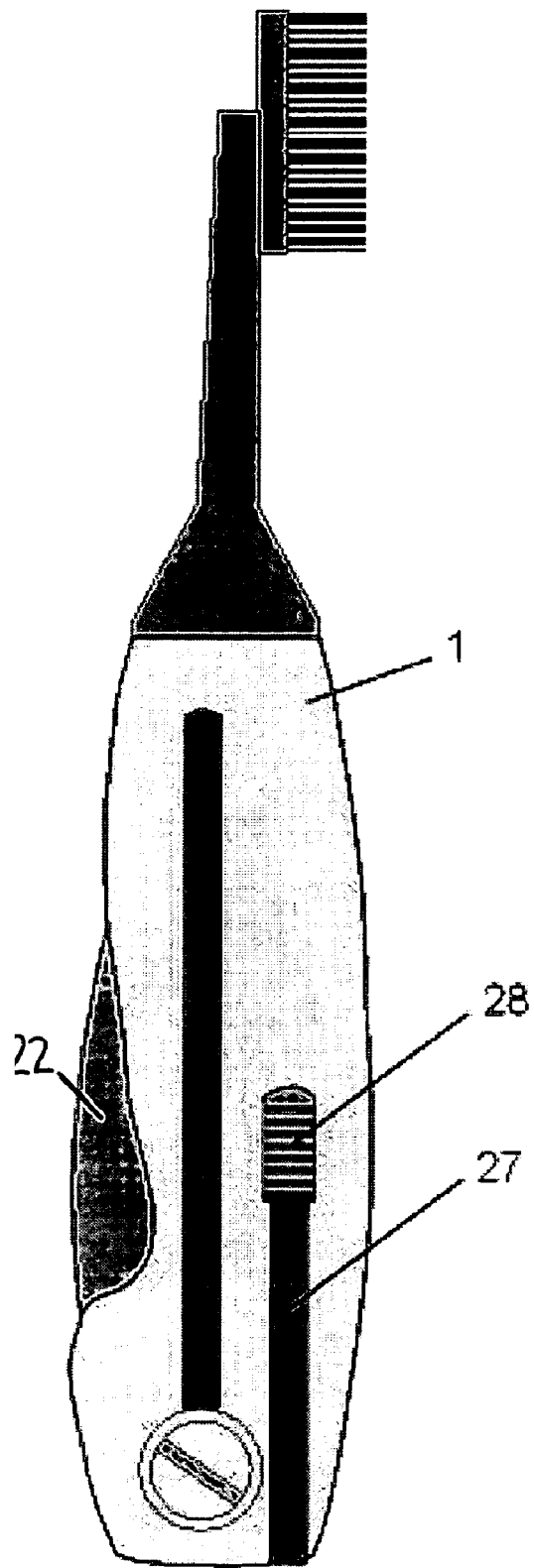


Fig. 1

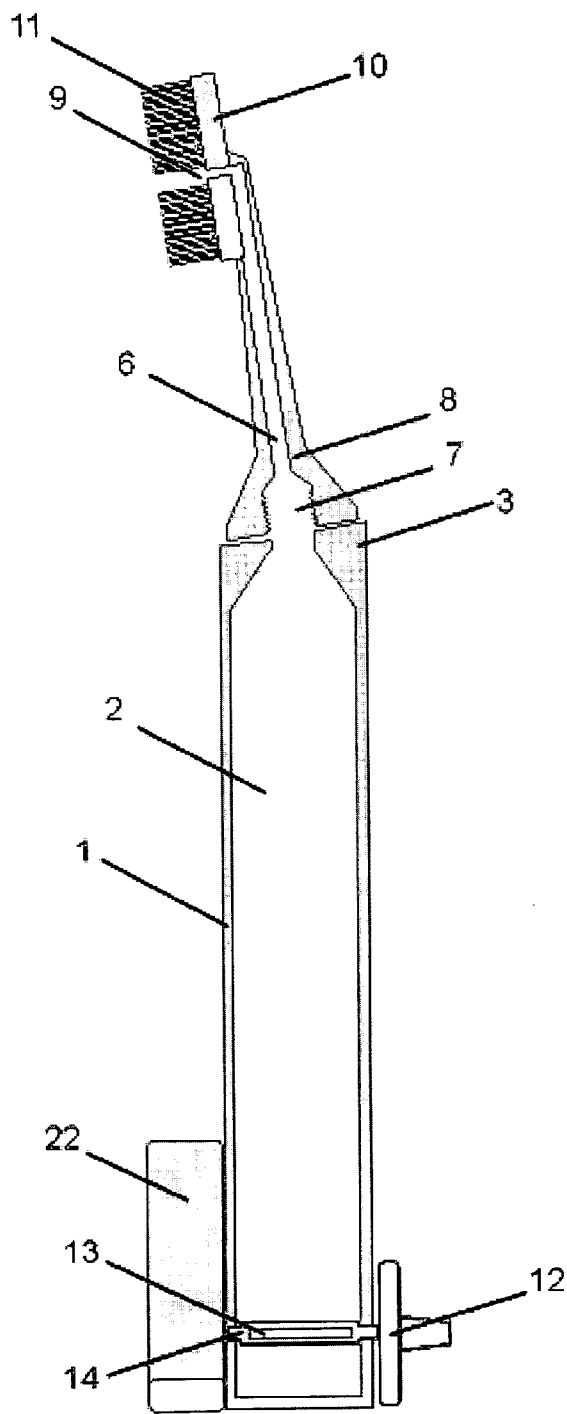


Fig. 1A

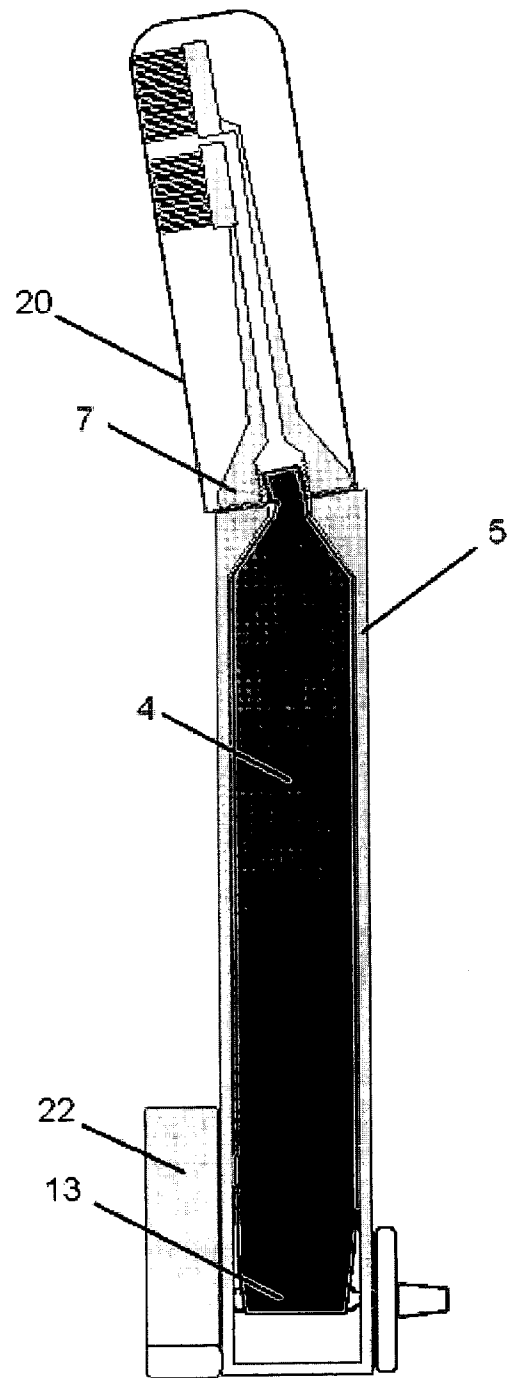


Fig. 1B

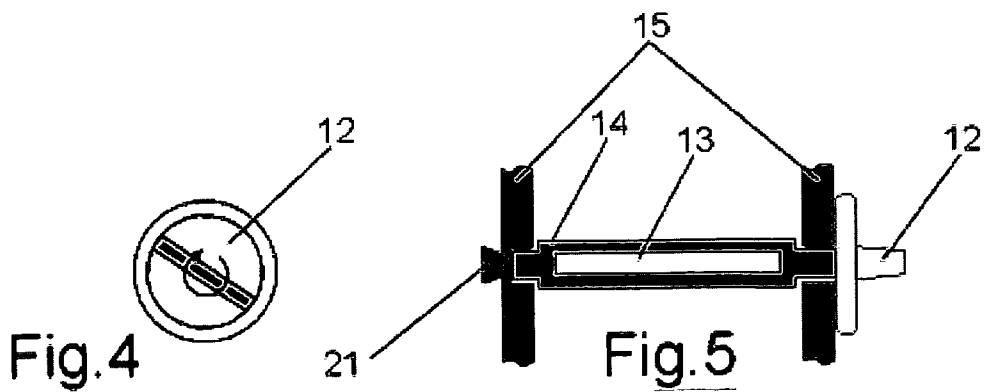
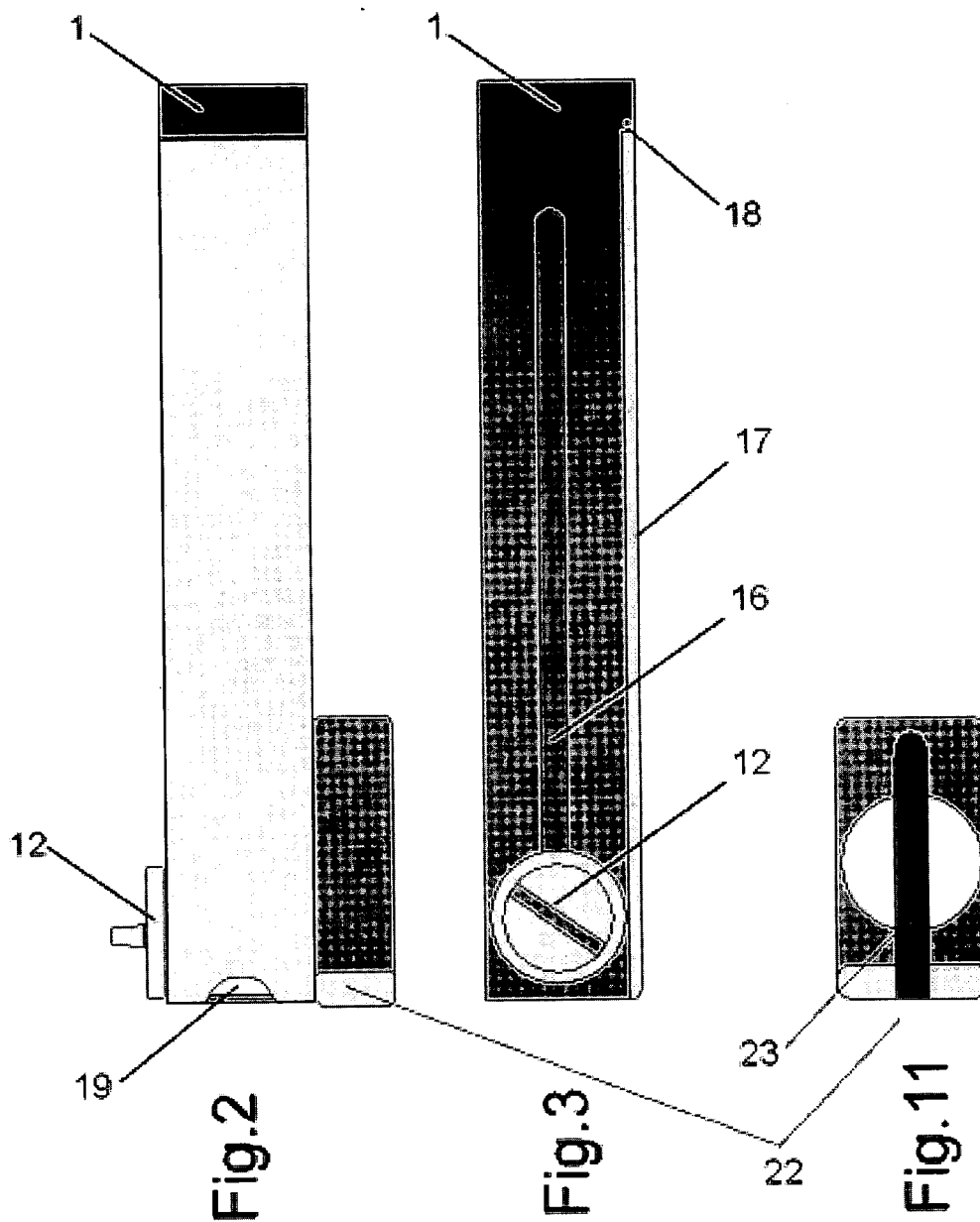


Fig. 6

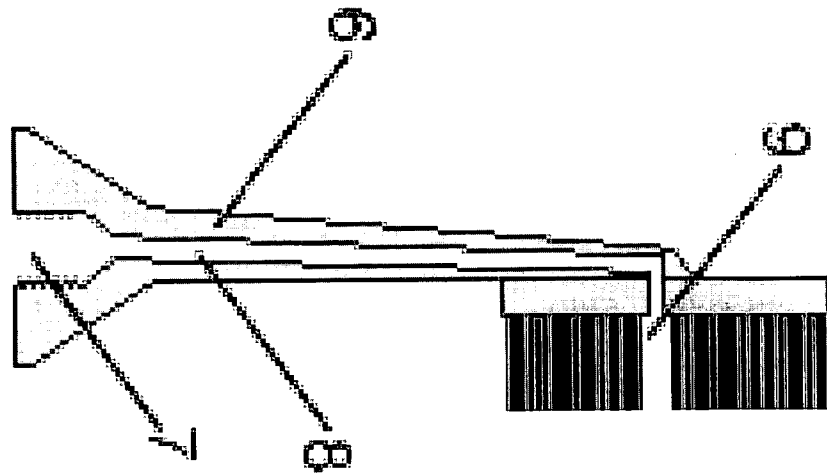


Fig. 7

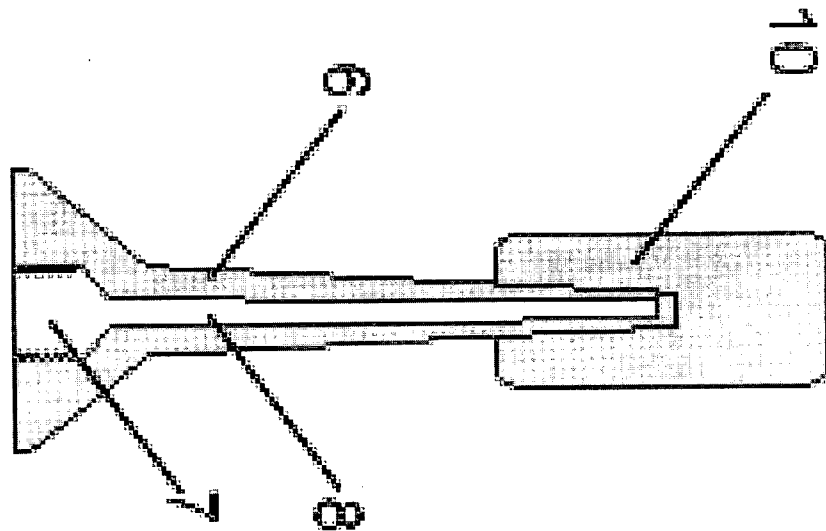
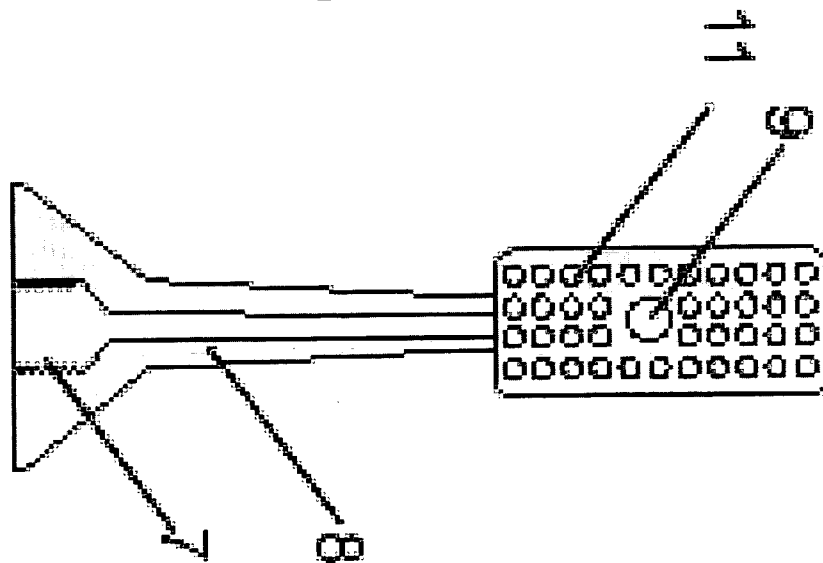


Fig. 8



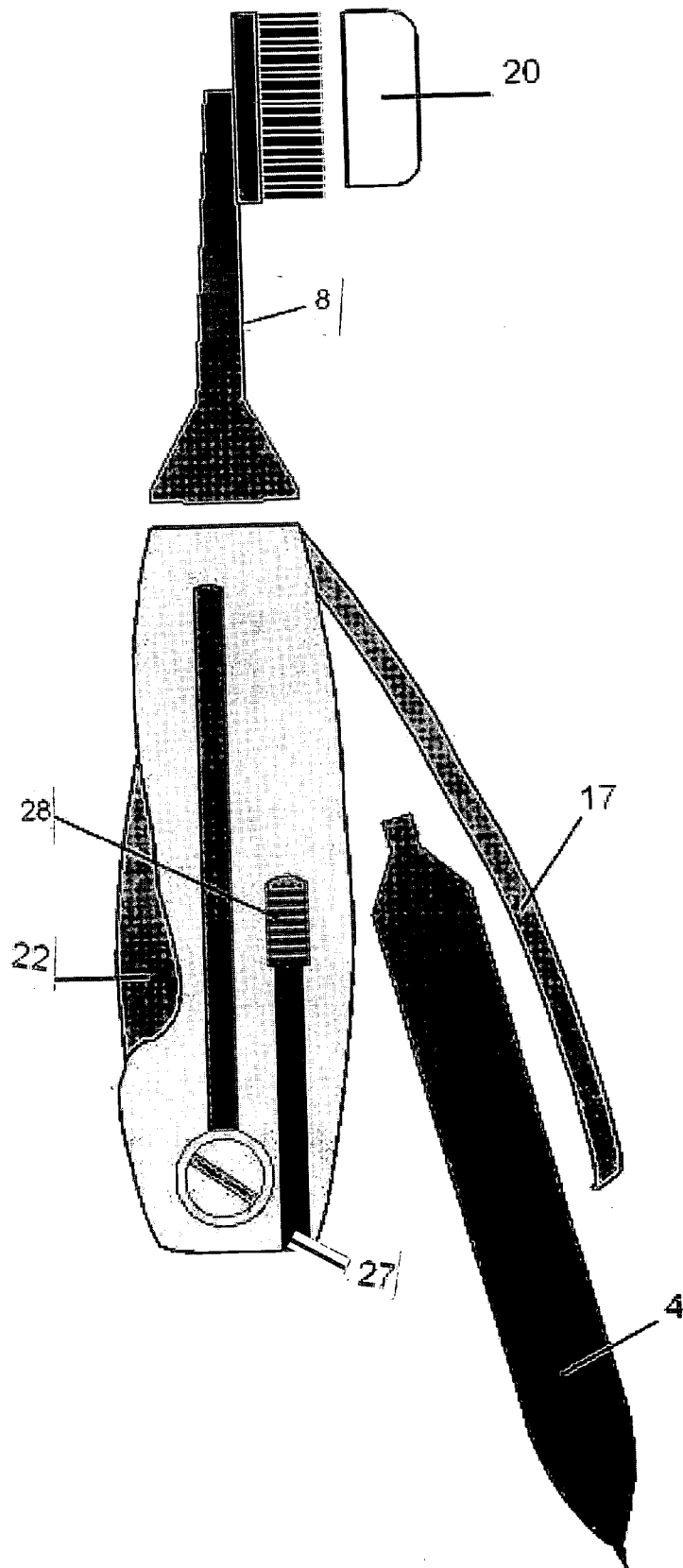


Fig. 9.

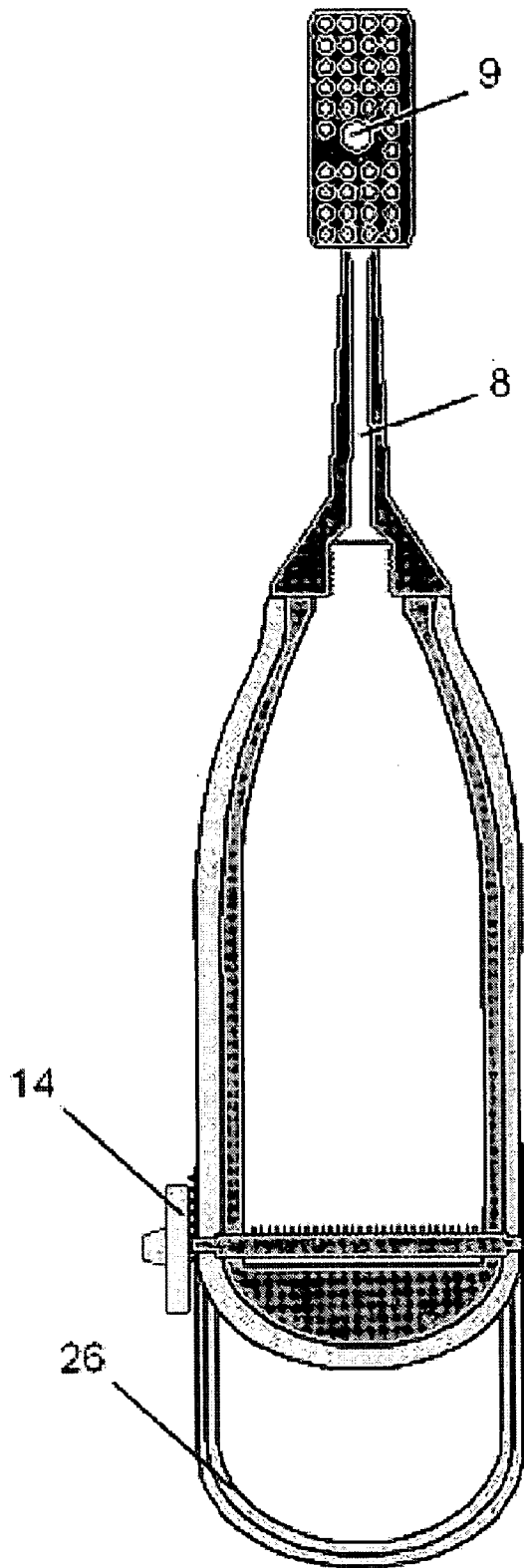


Fig. 10

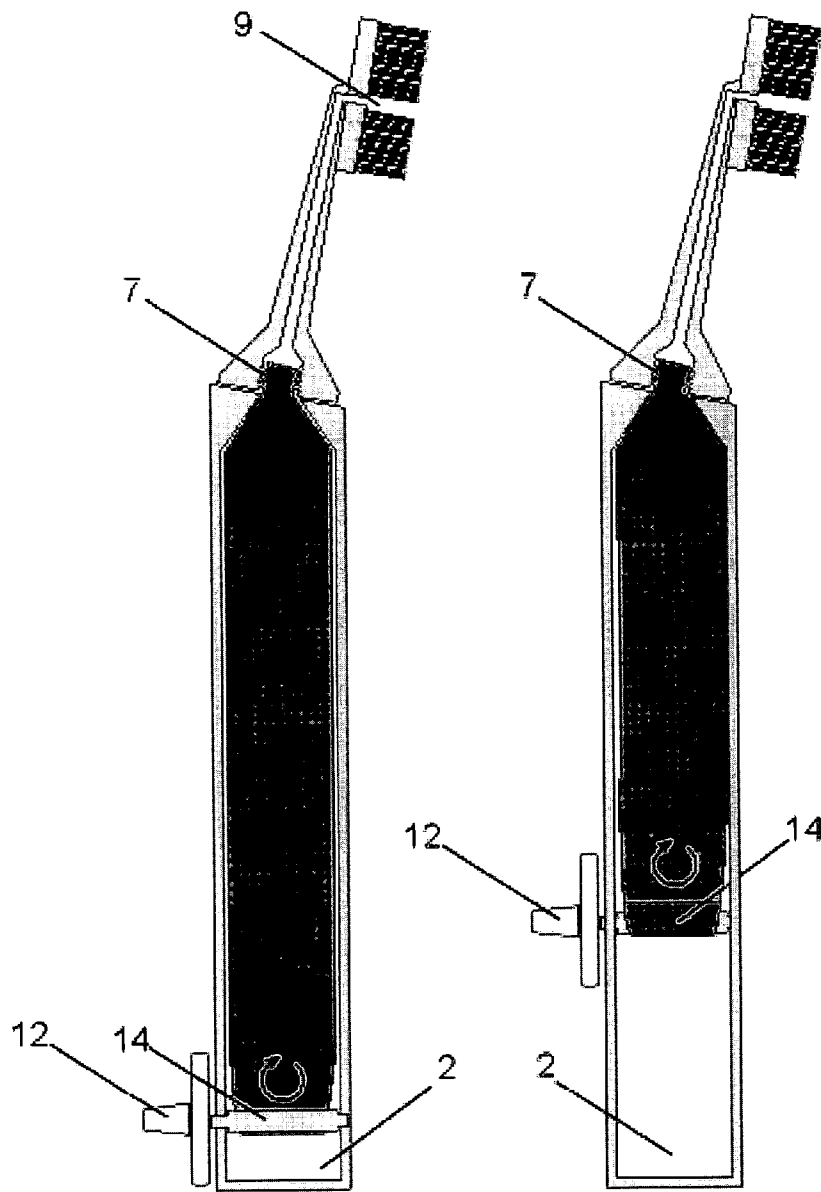


Fig. 13

Fig. 14

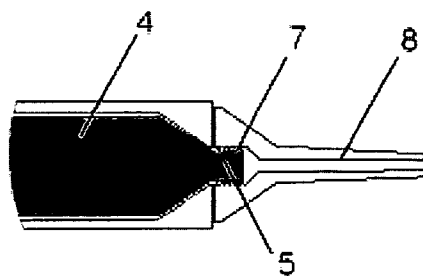


Fig. 12



**REUSABLE COMPACTABLE TOOTHBRUSH ASSEMBLY WITH DISPOSABLE TOOTHPASTE, DENTAL FLOSS AND TONGUE CLEANER**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefits of PPA Ser. No. 60/473,709, filed 2003 May 29 by the present inventors.

**FEDERALLY SPONSORED RESEARCH**

[0002] NONE.

**SEQUENCE LISTING**

[0003] NONE.

**BACKGROUND OF THE INVENTION—FIELD OF INVENTION**

[0004] This invention relates to dental hygiene and reusable compactable toothbrush assemblies, specifically to such a novel toothbrush assembly which consists of disposable yet reusable toothbrush, toothpaste, dental floss and tongue cleaner all in one.

[0005] Originally the toothbrush devices consisted of a handle, a head portion and a bristle portion with the application of the dentrifice material or toothpaste to the bristle portion of the toothbrush and the need of entirely separate independent units for dental flossing and tongue cleaning.

[0006] However, today with stronger public awareness of the importance of dental hygiene and the limited time consumers have in their hectic day for dental cleaning along with the environmental waste alert, the public demands a more convenient, less messy and more compactable toothbrush assembly. In addition, consumers may benefit from user friendly applications at home and while on the move while at the same time reducing waste and lowering economic costs.

[0007] In general, the traditional toothbrush, when in use, requires the application of the toothpaste to the bristle portion of the toothbrush. This procedure can be both messy and sloppy thereby being wasteful when the toothpaste is not properly applied to the toothbrush (sloppiness can lead to toothpaste on the handle or sink rather than on the bristle portion of the toothbrush). Depending on the type of toothpaste dispenser, a significant amount of toothpaste may be wasted as it remains in the dispenser.

[0008] Another aspect adding to the waste is the requirement that the traditional toothbrush unit must be replaced after a number of brushing as the toothbrush bristles become ineffective rather than the option of replacement of just the bristle portion of the toothbrush. The dental floss device can also be wasteful as in the conventional dental floss units the floss and the compartment housing the floss must be discarded once the floss thread is used up rather than the simple replacement of only the floss thread into the existing floss compartment. The present invention will be extremely effective while producing less waste, which makes it a crucial environment friendly device.

[0009] The necessity of purchasing the conventional toothbrush, the toothpaste dispenser, dental floss and tongue cleaner unit as separate independent assemblies, increases

the overall cost of the dental hygiene system as a whole to the consumer. As production of separate selling units (toothbrush, toothpaste, tongue cleanser and dental floss unit) entails many unnecessary parts which are eliminated when integrating all units into one toothbrush assembly thereby the present invention decreases the manufacturing costs currently associated with production of the independent devices. As a result, lower manufacturing costs translate into lower consumer costs.

[0010] The conventional toothbrush is most primarily used in the home and less often in the dynamic and fast paced world we live in today. The present invention has the advantage of eliminating the need for a separate toothbrush, toothpaste, dental floss and tongue cleaner device as it discloses a simple all in one toothbrush assembly thereby enabling for more opportunities for the wide range of dental hygiene practices: brushing, flossing and tongue cleaning all under the same umbrella while consumers are managing their hectic schedules away from home.

[0011] As the present invention allows the user to meet all its dental hygiene needs using one compactable toothbrush assembly, the carrying of such requires less space as the present device fits into small handbags and even pockets. The compactable all in one unit offered by the present invention also reduces the opportunities for the misplacement or forgetting of the separate units.

[0012] The public's growing awareness regarding the necessity of proper preventive dental hygiene has led to the introduction of the practice of teeth brushing at a relatively young age. The added realization that the integration of both regular teeth flossing and tongue cleaning can be beneficial, has brought about these additional habits in the lives of consumers.

[0013] The present invention is composed of a number of different features for the various practices yet achieves these dental health goals with minimal complexity as it is practical in application. The product is simple to use and can therefore be quickly and easily understood by not only adult users, but also by the young mind and the elderly. Being simple to use also means that the present invention can be simultaneously operated with other actions as its use does not draw much attention from other duties.

[0014] Since the invention of the conventional toothbrush device, several inventors created various types of toothbrushes integrating in such a way as to effectively dispense the toothpaste to the toothbrush bristles. However, none of the toothbrush devices in the prior art possess all of the advantages of the present invention.

[0015] Variations of toothbrush assemblies containing the toothpaste in their handles are known in art, however none address all the dental needs which the present invention meets successfully. For example, U.S. Pat. No. 5,584,593 to Lafortune is a disposable, reusable toothbrush with toothpaste in handle, which while meeting the brushing need of the consumer, requires pressure be applied to the plastic pad in an attempt to have the toothpaste be ejected. This pressure method of activation limits the use of the product by major consumer groups such as the young and the weak and makes its not friendly user to all other targets. U.S. Pat. No. 6,397,859 to Byrd, also contains several drawbacks in spite of its meeting the primary goal of a toothbrush containing

toothpaste in the handle. The structure of the toothbrush is such that there is an external plunger which must be pushed in order to release toothpaste. As the plunger is pushed in, there is an added mechanism which prevents its removal, not allowing for the refilling of toothpaste and thereby making the toothbrush a single use product. This relates to the production of much unnecessary waste to be exposed of after final use, as well as an increase in consumer cost.

[0016] Also, since the structure contains an external plunger, not only are there circumstances during which this plunger will be pushed in unintentional during travel, inevitably leading to unwarranted messiness and wastefulness, but also requiring additional space in the carrying compartment making it significantly less convenient for travel.

[0017] Additional patents including U.S. Pat. No. 6,142,694 to Rivlin et al (which requires the pulling of a cord which may be unintentional disconnected in use or travel) and U.S. Pat. No. 6,213,662 to Aljanedi introduce means for meeting certain goals of the consumer regarding dental hygiene, but they do not meet all the needs of today's users. The present invention is designed to ensure the overcoming of the limitations of prior art by introducing improvements in structure and use.

[0018] All the toothbrush assemblies heretofores known suffer from a number of disadvantages:

[0019] (a) They lack the integration of several dental practices: brushing, flossing and tongue cleanin, into one complete and compact unit, thereby increasing overall consumer costs as the purchase of separate units is more expensive than the purchasing of a integrated unit combining all the above mentioned practices.

[0020] (b) They offer expensive and complex solutions

[0021] (c) Prior systems cause for unnessary waste:

[0022] a. The wasting of toothpaste as release of toothpaste from dispenser can be messy and sloppy as well as do not provide for the complete removal of all of the paste from the system.

[0023] b. They do not provide for the removal of the finished toothpaste from the system for replacement thereby requiring user to discard entire system once paste is finished, therefore fail to reduce the waste of replacing entire system.

[0024] c. They require the wasting of toothbrush assembly itself after several uses as the prior toothbrush devices do not offer a solution for a reusable replaceable toothbrush head.

[0025] (d) They include extra costs involved with their complex solutions where in some cases include extra unnecessary parts.

[0026] (e) They lack the unique combination of several dental cleaning practices under one simple assembly. Today the user needs to purchase and to store the conventional toothbrush assembly (brush head and toothpaste) as well as the dental floss and tongue cleaner separately. The present invention is the first to introduce the integration of the dental floss and tongue cleaning in combination with the brushing offered on the same toothbrush assembly. The present invention allows for convenience, simplicity and compactibility

when using the novel toothbrush device at home or outside. The present invention is a compact device allowing for minimum storage whereby fitting into a small handbag or pocket.

[0027] (f) They do not include the cap to be placed on the bristles of the toothbrush after each use ensuring that the birstles maintain their firmness and shape while remaining hygenically clean between uses.

#### BACKGROUND OF INVENTION—OBJECTS AND ADVANTAGES

[0028] Several objects and advantages of the present invention are:

[0029] to offer an integrated novel toothbrush system which wisely incorporates several dental practices: brushing, flossing and tongue cleaning, into one complete and compact unit, thereby both encouraging the mentioned dental practices as well as decreasing consumer costs as the purchase of an integrated units is much cheaper than the purchase of the separate units, not to mention the saving in hassles.

[0030] to provide an integrated toothbrush assembly which is simple in design and inexpensive to manufacture.

[0031] to ensure a clean environment by reducing amount of waste by:

[0032] i. Providing an integrated toothbrush assembly which can be used repeatedly with the effectiveness of replacing minimum units thereby enhancing cost effectiveness and reducing waste associated with the discarding of only the sub-units (toothbrush bristle head; floss thread) rather than entire device as a whole (entire toothbrush; floss compartment encompassing thread, etc.).

[0033] ii. For instance, when the paste is finished, the user can simply replace the toothpaste tube with the ability to vary the toothpaste type and when the toothbrush head is no longer effective to replace the bristle head. In both situations, the present invention allows for replacement of the particular sub-unit without the need to discard the entire toothbrush system.

[0034] iii. Allowing for the removal of the complete paste from the system as the structure and operation of the present invention ensures maximum "squeezing out" of paste thereby eliminating possible waste of unused toothpaste.

[0035] to provide a toothbrush assembly which is based on minimum parts to avoid extra manufacturing costs thereby minimizing consumer costs.

[0036] to provide an integrated toothbrush assembly which can be used easily and conveniently to encourage the increase of dental cleaning practices while at home and away from home. The present invention with its simplicity and compactibility allows consumers to adhere to dental hygiene while traveling abroad, after meals in restaurants, office or just about anywhere desired.

[0037] to provide an integrated toothbrush assembly which will obviate the need to purchase and carry while traveling the various units—allows for brushing, tongue cleaning and flossing under one compact and convenient umbrella. Thereby saving the user the hassle of purchasing and carrying separate units as the present invention is compact and holds up minimum space.

[0038] to provide an integrated toothbrush assembly which can be used by several users simultaneously as the assembly can be supplied with various toothbrush bristle heads and tongue handles to allow flexibility so that different family members can share the same toothbrush assembly while traveling.

[0039] To provide the addition of a unique self adhesive detachable cap to cover the bristles of the toothbrush after each use, thereby ensuring that the bristles maintain their firmness and shape while remaining hygienically clean between uses and to prevent the toothpaste from crusting.

[0040] Still further objects and advantages will become apparent from a consideration of the drawing and ensuing description.

#### SUMMARY

[0041] This invention relates to toothbrush assemblies, specifically to a new innovative five part detachable toothbrush assembly comprising of a built-in reservoir allowing the insertion of disposable toothpaste tube(s), dental floss option for insertion of a floss compartment thereby forming an integral functioning unit with multi use in various combinations.

[0042] The new toothbrush assembly is composed of four detachable and replaceable units (toothbrush head, reservoir/handle, toothpaste tube, dental floss and tongue cleaner), thereby allowing users to benefit from its novel features in various combinations, depending on desired usage.

[0043] The new invention ensures continual usage of the toothbrush assembly and its independent toothbrush, toothpaste, dental floss and tongue devices, with the simple replacement of the toothpaste tube, dental floss and tongue cleaner within their separate storage compartments of the handle as necessary. The replacement of the toothpaste tube alone allows for enough applications and usage of the toothbrush before its replacement, a significant and economical advantage over prior art systems.

[0044] In addition, the combination of tooth brushing with dental flossing and tongue cleaning units into one multi purpose device is a novel concept allowing users to easily perform various tasks of cleaning between the teeth and eliminating germs using the compact assembly at home or while traveling. Each unit serves as an independent unit. Therefore, the floss compartment serves as an independent unit whereby allowing its replacement as necessary.

[0045] Another object of the new invention is to provide a new toothbrush head that may be disposed, thereby allowing the user to replace only the toothbrush head once its bristles begin to lose effectiveness. This ability to replace the toothbrush head rather than the need to replace the entire

toothbrush assembly is another significant economical advantage over prior art systems.

[0046] The tongue cleaner and toothpaste may also be replaced separately at the stage where they are no longer effective or useful.

[0047] The toothbrush assembly should also be appreciated for its environmentally friendly attribute. The fact that only the ineffective feature, (toothbrush head or toothpaste tube or dental floss or tongue cleaner compartment) is disposed of, results in the discarding of less waste.

[0048] An additional advantage of the new invention is that it allows users to alternate toothbrush heads or types among different users, enabling change during use by different family members.

[0049] Alternatively, the toothpaste tube type can also be made the element that is alternated, enabling change of toothpaste for any number of reasons during different periods of time.

[0050] Apart from the significant, economic and environment friendly features of the new invention mentioned, the easy substitution of any or all of the separate units of the toothbrush assembly—head, paste, dental floss or tongue cleaner, makes the toothbrush assembly user friendly and convenient for operation by all users.

[0051] The upper portion of the toothbrush assembly is fitted with a removable cap, thereby ensuring that the brush head is protected from dirt and germs. This is an important feature when using the present invention away from home.

[0052] The toothbrush with the insertion of the mentioned units (toothpaste tube, dental floss and tongue cleaner) into their separate corresponding storage compartments within the handle and the possible alternation of only the toothbrush head, creates a more flexible, compact and lightweight device convenient for use by the entire family at home or while traveling.

[0053] Accordingly the various objects and advantages of the invention mentioned are to provide an improved, economic, convenient, user friendly, environment conscious toothbrush assembly thereby allowing for optimum dental hygiene.

#### BRIEF DESCRIPTION OF THE DRAWINGS—FIGURES

[0054] This new invention will be better understood and objects and advantages set forth above will become more apparent when consideration is given to the following detailed description thereof.

[0055] It should be understood that these drawings are merely illustrative and that changes and/or amendments may be made in the specific construction of the toothbrush assembly illustrated.

[0056] FIG. 1 is a side view of all the different portions of the new toothbrush assembly, prior to the insertion of toothpaste, the preferred embodiment, constructed in accordance with the present invention.

[0057] FIGS. 1A and 1B are cross-sectional side views of the different portions of the new toothbrush assembly, with an additional embodiment a toothbrush head slanted at a 15

degree anglem including a tube of toothpaste. **FIG. 1A** is a cross sectional side view, prior to the insertion of the toothpaste, while **FIG. 1B** includes the tube of toothpaste (**FIG. 1B**). The depiction of the present invention was modified and does not include the tongue cleaner for simplification purposes to allow for a better understanding focused on the toothpaste mechanism.

[0058] **FIG. 2** is a side view of the lower portion of the present invention.

[0059] **FIG. 3** is a back view of the lower portion of the present invention.

[0060] **FIG. 4** is a front view of the turn knob of the present invention.

[0061] **FIG. 5** is a side view of the toothpaste tube security pin of the present invention.

[0062] **FIG. 6** is a cross-sectional side view of the upper portion of the present invention.

[0063] **FIG. 7** is a cross-sectional back view of the upper portion of the present invention.

[0064] **FIG. 8** is a cross-sectional front view of the upper portion of the present invention.

[0065] **FIG. 9** is a reduced back view depicting the insertion of toothpaste tube, with door ajar, into the present invention.

[0066] **FIG. 10** is a cross sectional view depicting the opening of the tongue cleaner portion of the present invention.

[0067] **FIG. 11** is a front view of the dental floss compartment of the present invention.

[0068] **FIG. 12** is a cross-sectional view of the connection between the upper and lower portion of the present invention.

[0069] **FIG. 13** is a side view of toothbrush depicting starting position of toothpaste tube of the present invention.

[0070] **FIG. 14** is a side view of toothbrush depicting advancement of toothpaste tube along toothbrush assembly of the present invention.

DETAILED DESCRIPTION—FIGS. 1-14—PREFERRED EMBODIMENT

[0071] A preferred embodiment of the toothbrush assembly of the new invention is illustrated in **FIGS. 1-14**.

[0072] With reference now to the drawings, the present invention is a new reusable toothbrush assembly composed of a number of detachable portions into which a disposable toothbrush head, a toothpaste tube, a dental floss compartment and a tongue cleaner can be inserted.

[0073] **FIG. 1** is a side view of all the different portions of the new toothbrush assembly constructed in accordance with the present invention. **FIG. 1** depicts a complete detailed view of the entire toothbrush assembly, it serves as a macro frame of reference and will be used as such. Therefore to better understand the toothbrush assembly structure on a micro-level, the succeeding figures (**FIGS. 2-8**) will be discussed to further detail the individual features.

[0074] As best illustrated in **FIGS. 1 through 5**, the lower portion of the new toothbrush assembly generally comprises of a rigid hollow cylinder **1** with a reservoir, storage **2** (**FIGS. 13 and 14**) for storing a toothpaste tube **4**, also serving as a handle for holding the toothbrush assembly as well as a detachable dental floss compartment **22** storing the dental floss and a pop out tongue cleaner **26**.

[0075] **FIGS. 2 and 3** along with **FIG. 9** depict the lower portion of the toothbrush assembly, and in particular the process of insertion for replacement of the toothpaste tube **4** and the movement of the paste within the storage compartment **2**. A plastic door **17**, which allows for the replacement of the toothpaste tube **4**, is held in steady position by a hinge **18**, and a clip **19** assists in the opening and closing of the door **17** by performance of a snap action.

[0076] The insertion process illustrated in **FIGS. 9** and the movement of the toothpaste within the storage compartment **2** illustrated in **FIGS. 2 and 3**, will be discussed in further detail in the Operation section below.

[0077] As illustrated in **FIGS. 13 and 14**, the lower tip of toothpaste tube **4** is inserted into an opening **13** (**FIG. 5**) of a security pin **14**, which places the tube **4** in an upright position to ensure that the toothpaste moves only in the desired parallel direction. The security pin **14** is also lodged in place by two clips **15** positioned on the wall of the hollow cylinder **1**, to further prevent disruptive nonparallel movement as illustrated in **FIG. 5**.

[0078] The outer side of the rigid hollow cylinder **1** has a twist knob, turning handle, roller **12** (**FIG. 4**), which is connected to the inner security pin **14**. The knob **12** slides along the outside of the toothbrush within a shaft housing path **16** as the knob is turned to move the lower tip toothpaste tube and force the toothpaste **4** upward.

[0079] The dental floss compartment **22** and the tongue cleaner **26** will be discussed later.

[0080] The lower portion of the toothbrush, the rigid hollow cylinder **1** and the reservoir **2** is in communication with an upper head portion, brush head **10** of the toothbrush assembly. As illustrated in **FIGS. 6 through 8**, which depict the side, front and back view of the upper portion of the present invention, the lower portion of the toothbrush is connected to the upper head portion, brush head **10** of the toothbrush assembly via an internal duct **8**. This internal duct **8** runs within a long narrow neck **6** until it terminates at an opening **9** located among the plurality of bristles **11** located at the brush head **10**. A receiving station **7**, located at the meeting point between the lower and upper portions, is adapted for receiving the upper tip of a toothpaste tube **5**. The tip of the toothpaste tube **5** and the receiving station **7** are joined via a screw action, as illustrated in **FIG. 12**, that shows the connection between the upper and lower portion of the present invention. Both the tip of the upper portion of the toothpaste tube **5** and the lower portion of the brush head **10** can be at a 15° angle orientation (discussed under "Additional Embodiment") thereby allowing the two portions to more properly join at the receiving station **7**.

[0081] Preferably, the upper portion of the toothbrush assembly is fitted with a removable toothbrush bristle protector cover, detachable adhesive cap **20** by a snap action (**FIG. 9**). The upper portion of the toothbrush assembly has a peripheral groove **3** extending around an outer rim (**FIG.**

1A), while the cap 20 has a peripheral edge. The peripheral groove is adapted for the peripheral edge of the upper portion for frictionally holding the cap 20 on the toothbrush assembly.

[0082] Returning to the dental floss feature 22 and the tongue cleaner 26. FIG. 2 also depicts the dental floss compartment 22, which is illustrated from a front view in FIG. 11. The dental floss compartment 22 has a clip, an outer portion which sticks out, 23 and is attached to the toothbrush assembly handle at the point of the loop 21 (receiving end viewed in FIG. 5) allowing with the snap action the insertion of the floss compartment 22 onto the toothbrush assembly. This connection between the loops 23 and 21 is similar to the connection between two pieces of the puzzle.

[0083] FIG. 1 is a side view of all the different portions of the new toothbrush assembly, particularly depicting the tongue cleaner mechanism. FIG. 10 is a cross sectional view depicting the process associated with the opening of the tongue cleaner 26. The mechanism operating the tongue cleaner 26 is comprised of an external sliding knob 28, a shaft housing path 27 and the pop out tongue cleaner 26.

[0084] The tongue cleaner mechanism illustrated in FIG. 10, will be discussed in further detail in the Operation section below.

[0085] Operation—Preferred Embodiment—FIGS. 1-14

[0086] The present invention is composed of five detachable and replaceable units (toothbrush head 10, reservoir 2/handle 1, toothpaste tube 4, dental floss compartment 22 and tongue cleaner 26), thereby allowing users to benefit from its novel features in various combinations, depending on desired usage.

[0087] The present invention ensures continual usage of the toothbrush assembly for brushing and flossing teeth as well as tongue cleaning, similar to the conventional toothbrush, dental floss and tongue devices, with the simple replacement of the toothbrush head 10 and/or toothpaste tube 4 and/or dental floss compartment 22 and/or tongue cleaner 26 within different respective handle portions 2, 21 or 27 as necessary. The manner of toothpaste tube insertion/replacement is carried out as follows. In a snap action, pressing on the clip 19 located on the lower edge of the plastic door 17 (FIGS. 2 and 3), the door 17 is lifted outward in a swing like manner, allowing for the insertion of the toothpaste tube 4, as depicted in FIG. 9.

[0088] Following the lifting of the door 17 and removal of the cap on the toothpaste tube 4, the tube 4 is inserted into the reservoir portion 2 such that the upper tip of toothpaste tube 5 meets and is joined by a screw action with the receiving section 7 of the upper portion of the toothbrush assembly. By tightly reinforcing the tip of the tube 5 and the receiving section 7, the user has now fastened together as one unit the two detachable components, the lower (handle 1) and upper (toothbrush head 10) portion of the toothbrush assembly.

[0089] Next, holding the body of the toothbrush assembly upright, the lower tip of the toothpaste tube is set into the opening 13 of the security pin 14. This action places the tube 4 in an upright position and ensures that the toothpaste 4 moves in the desired parallel direction (FIG. 5).

[0090] Once the toothpaste tube 4 is in place and the door 17 is securely closed by a snap action, the toothbrush assembly is ready for usage. The user simply removes the detachable adhesive cap 20 from the upper portion of the toothbrush assembly, which is adapted for holding the cap 20, by a snap action thereby revealing the bristles 11.

[0091] The user then proceeds to turn the knob 12 in a clockwise direction. As illustrated in FIGS. 13 and 14, the turning of the knob 12, along the outside of the toothbrush within a shaft housing path 16, activates the security pin 14, which is connected to the knob 12 on the inside of the reservoir 2. The rotation of the security pin 14, which is secured to the tip of the toothpaste tube 4, compels the toothpaste tube 4 to curl around the security pin 14. This curling action thereby forces the toothpaste to move upward through the receiving section 7 (at a 15° angle orientation) and internal duct 8, which runs within the long narrow neck 6 of the upper portion of the toothbrush assembly (FIG. 12). The toothpaste 4 continues to move upward until reaching the opening 9, where the toothpaste 4 is ejected for brushing among the plurality of bristles 11 located at the brush head 10 (FIGS. 6 through 8).

[0092] With each usage of the toothbrush assembly, there is additional need for toothpaste and requires further turning of the knob 12, moving the knob 12 further along the outside of the toothbrush within a shaft housing path 16. Once the knob 12 reaches the end of the path 16, indicating that the toothpaste tube is fully used, the entire process of replacement of the tube 4 is repeated with a new toothpaste tube 4, without the need to replace the entire toothbrush assembly.

[0093] The present invention also comprises of an additional feature, a dental floss compartment on the lower portion of the toothbrush assembly, allowing user to also floss the teeth with the new toothbrush assembly. The manner of dental floss compartment insertion/replacement is carried out as follows (FIG. 11). The dental floss compartment 22 has a clip, an outer portion which sticks out, 23 and when the user wishes to insert a new compartment, this portion 23 is attached onto the toothbrush assembly handle at the point of the loop 21 by a snap action thereby securing the storage compartment 22 to the entire toothbrush assembly as a whole unit. Once the dental floss is depleted, the manner of replacing the dental floss compartment 22 is repeated with the insertion of a new floss compartment.

[0094] The present invention also provides for an additional dental hygiene feature, a tongue cleaner at the lower portion of the toothbrush assembly, used to eliminate germs. The manner of tongue cleaner practice is carried out as follows (FIG. 10). The external sliding knob 28 is glided down the shaft housing path 27 thereby allowing for the pop out of the tongue cleaner 26. The tongue cleaner 26 can be removed from its housing within the toothbrush assembly as necessary by simple detachment of at the lower end of the shaft housing path 27.

[0095] Another option for users of the present invention is luxury of replacing only the detachable upper portion of the toothbrush assembly once the bristles 11 begin to lose effectiveness or when wishing to alternate toothbrush heads or types among different users. The manner for replacing the upper portion of the toothbrush assembly is identical to the original joining of the receiving section 7 with the upper tip of the toothpaste tube 5, mentioned when replacing the

toothpaste tube **4**. The user simply screws the different toothbrush upper portions desired with the lower portion at the receiving section **7** and the upper tip of the toothpaste tip **5** and the toothbrush assembly is ready for usage.

[0096] Alternatively, the toothpaste type can also be made the element that is alternated, by switching the toothpaste tube **4**, in a manner similar to the above-detailed process.

[0097] From the description above, a number of advantages of my novel toothbrush assembly become evident:

[0098] an integrated novel toothbrush system which wisely incorporates the various dental practices into one complete and compact unit, thereby both encouraging the mentioned dental practice both in the comfort of home and while traveling.

[0099] an integrated toothbrush assembly which is simple in design and inexpensive to manufacture.

[0100] a clean environment by reducing amount of waste associated with the replacement of minimum units thereby discarding of only the sub-units (toothbrush bristle head; floss thread) rather than entire device as a whole (entire toothbrush; floss compartment encompassing thread, etc.).

[0101] a toothbrush assembly which is based on minimum parts to avoid extra manufacturing costs thereby minimizing consumer costs.

[0102] the present invention with its simplicity and compactibility allows consumers to adhere to dental hygiene.

[0103] an integrated toothbrush assembly which can be used by several users simultaneously as the assembly can be supplied with various toothbrush bristle heads and tongue handles to allow flexibility so that different family members can share the same toothbrush assembly while traveling.

[0104] the addition of a unique self adhesive detachable cap to cover the bristles of the toothbrush after each use, thereby ensuring that the bristles maintain their firmness and shape while remaining hygienically clean between uses and to prevent the toothpaste from crusting.

[0105] The easy process for the substitution of the unit of the toothbrush head **10**, toothpaste tube **4**, dental floss compartment **22** or tongue cleaner **26** described, makes the present invention user friendly, compact and convenient for operation by all users while at home or traveling.

#### DETAILED DESCRIPTION—ADDITIONAL EMBODIMENTS

[0106] As briefly mentioned above, the present invention includes high flexibility and variability both in its construction and operation, some of which will be discussed below.

[0107] Mentioned briefly above is the beneficial option of the tip of the upper portion of the toothpaste tube **5** and the lower portion of the brush head **10** being at a 15° angle orientation as depicted in **FIGS. 1A and 1B**, thereby allowing the two portions to more properly join at the receiving station **7**. The additional feature of the slanting also for more

convenient brushing as the slant in the toothbrush head **10** allows user hold the toothbrush assembly more comfortable for teeth brushing.

[0108] There are several options within the toothbrush head types, including a wide range of colors and designs to express individuality/personality of user as well as a selection in the firmness of the bristles (soft, medium, hard) or amount of bristles (size of toothbrush head) suitable for dimensions of individual users (adult, child). All of these options for toothbrush head types will be easily joined to the lower portion of the toothbrush assembly by a screw action (joining of the receiving section **7** and upper tip of the toothpaste tube **5**).

[0109] While certain novel features of the present invention have been shown and described above, it is not intended to be limited to the exact construction and operation shown and described above. In fact, the foregoing description is considered as a mere illustration of the principles of the present invention.

[0110] Therefore, it is to be realized that the optimum dimensional relationships, include variations, omissions, substitutions and modifications in size, shape, form, function, materials, details of present invention as well as in its operation and usage, which can readily be made by those skilled in the art, without departing in any way from the spirit of the present invention and thereby still fall within the scope of the present invention.

#### CONCLUSION, RAMIFICATIONS, AND SCOPE OF THE INVENTION

[0111] Accordingly, the reader can see that this novel toothbrush unit provides the necessary elements for complete dental hygiene. The toothbrush head portion carries the bristles, for teeth cleaning; the dental floss, is to be exposed by the lifting of a plastic door on the side of the toothbrush handle, and the tongue cleaner is available with a pop out mechanism at the door at the bottom of the handle.

[0112] It has all the necessary items for complete dental care in one multi functional unit makes it compact and convenient for travel.

[0113] Its toothpaste is housed within the handle and can be refilled as needed as can the dental floss, toothbrush head and tongue cleaner. This refillable feature, along with the possibility of interchanging only the tongue cleaner and/or the toothbrush head with bristles for use by multiple users, make this toothbrush assembly more environment safe.

[0114] It allows for the advantage of reducing waste by replacing minimal parts, thereby eliminates extra parts and in turn decreases production costs which translate into lower consumer costs.

[0115] its simple application makes it usable by the majority of the population. The product is simple to use and can therefore be quickly and easily understood by not only adult users, but also by the young mind and the elderly.

[0116] It permits for all the features in one unit thereby may also encourage complete dental hygiene as there is no need for additional products to be purchased or carried.

[0117] When its self adhesive cap is attached to the toothbrush head, it guarantees that the bristles stay clean and firm and prevents the toothpaste from crusting.

[0118] While the above description contains many specificities, these should not be construed as limiting the scope of the invention, but as merely providing illustrations of some of the presently preferred emodiments of this invention.

[0119] For example, the present invention of the toothbrush assembly can have:

[0120] variations in color, shape, size and material of the different features (the bristles, the toothbrush head, the toothbrush handle, the doors, bristle cap and the tongue cleaner) as well as the packaging are possible;

[0121] the toothbrush bristles can be produced in varying degrees of firmness and sizes;

[0122] the bristle head may have one or more openings for the ejection of toothpaste;

[0123] the toothpaste and dental floss to be refilled can be produced in a range of flavors and thickness/density levels;

[0124] the additions, omissions, modifications, substitutions and changes and/or variation of the details of the different units (head, body, tongue cleaner, dental floss and toothpaste) of the toothbrush device; etc.

[0125] Thus the scope of the invention should be determined by the claims and their legal equivalents, rather than by the examples given.

I claim:

1. A reusable and compact toothbrush assembly, comprising:

(a) a brush head portion, said brush head portion having a plurality of bristles, at least one opening at the said plurality of bristles, a detachable toothbrush bristle protector cover and an internal duct therein, where the passage of the toothpaste travels from said internal duct towards said opening at said brush head portion,

(b) a handle portion, said handle being generally a tubular member having a rigid hollow cylinder cavity with a toothpaste reservoir therein and first lower and second upper openings for containing toothpaste tube therein and an opening of a security pin located at the said first

lower end for attachment of toothpaste tube and for holding the toothpaste in an upright position as well as ensuring that the said toothpaste moves in the desired parallel direction and a rotator with a twist knob connected to said inner security pin, the rotation of said knob enables the sliding within a shaft housing path therein moving the lower tip toothpaste tube and allowing for dispensing mechanism, when said twist knob is rotated by user, the rotation enables the toothpaste to pass within said cavity from first lower end of said handle portion; said handle also having a cavity for a tongue cleaner compartment, said tongue cleaner released using an external sliding knob located at outer end of said handle, the gliding down along a shaft housing path on the outer end of the said handle allowing for the pop out of the tongue cleaner

(c) a dental floss compartment, said floss compartment being attached to outer end of said handle portion with a snap action;

(d) a receiving portion, said receiving portion being the intermediate having a lower and upper end, said receiving portion being attached to said second upper end of handle portion at said lower end of said receiving and being attached to said head portion via said internal duct at said upper end of said receiving portion allowing for a dispensing mechanism whereby permitting for the delivering of the toothpaste from the said handle portion through the said receiving portion to the said head portion.

2. The toothbrush assembly with integrated toothpaste dispenser,dental floss and tongue cleaner compartments according to claim 1, wherein said brush head portion contains at least one opening at the said plurality of bristles composed of soft material and has the said etachable cap thereby preventing any foreign material from contaminating the said head portion and avoiding the toothpaste from crusting.

3. The toothbrush assembly with integrated toothpaste dispenser,dental floss and tongue cleaner compartments according to claim 1, wherein the said cavity with a toothpaste reservoir is hollow and has a plastic door helpd is steady position which allows for the replacement of the toothpaste tube into an opening of the said security pin, which places the tube in an upright position to ensure that the toothpaste moves only in the desired parallel direction and the said security pin is also lodged in place by two clips positioned on the wall of the hollow cylinder to further prevent disruptive nonparallel movement.

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