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(54) **ORAL CARE TOOTHBRUSH**

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(51) **Int. Cl.**

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See application file for complete search history.

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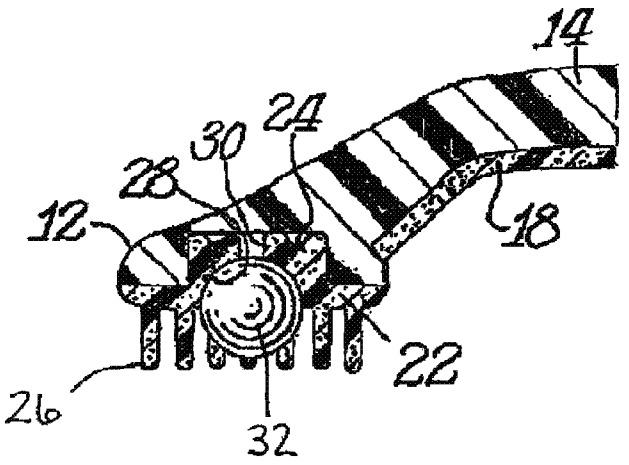
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(57) **ABSTRACT**

An oral care toothbrush includes a head mounted to one end of the handle containing a plurality of oral care elements. An oral care accessory is mounted to the opposite end of the handle. An oral care material dispenser is mounted in the head within the cleaning field defined by the oral care elements. The toothbrush is preferably made of small size and of lightweight so as to be readily portable for use away from the home.

71 Claims, 4 Drawing Sheets



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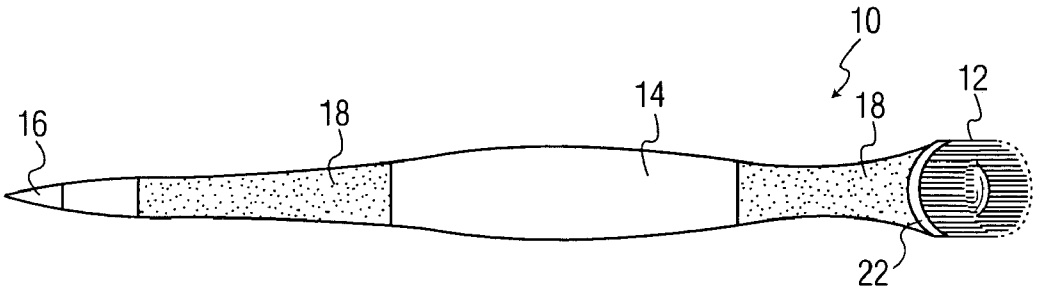


FIG. 1

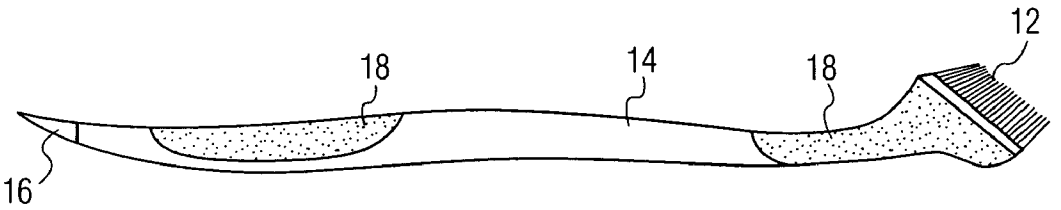


FIG. 2



FIG. 3

Fig. 12.

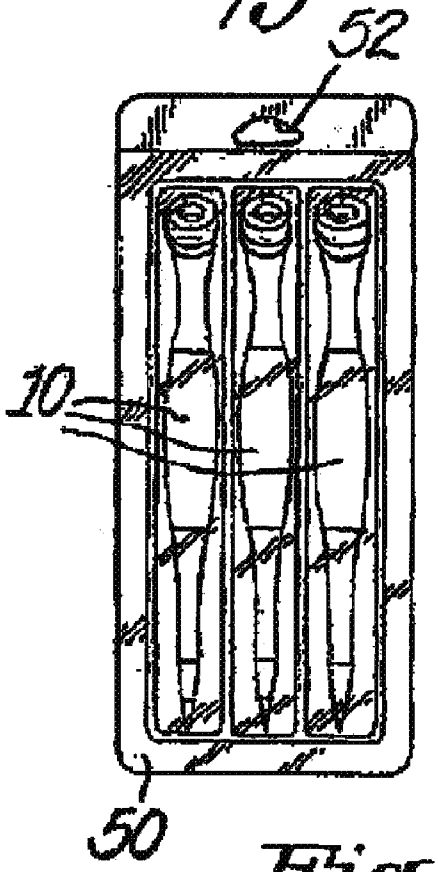


Fig. 13.

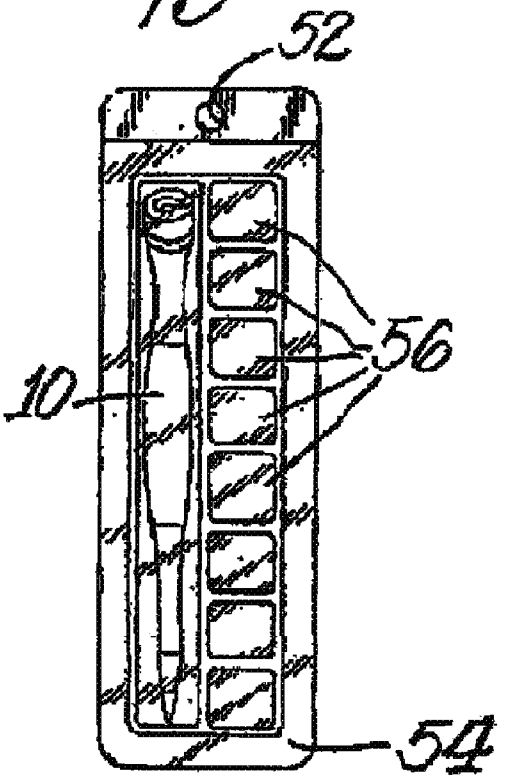
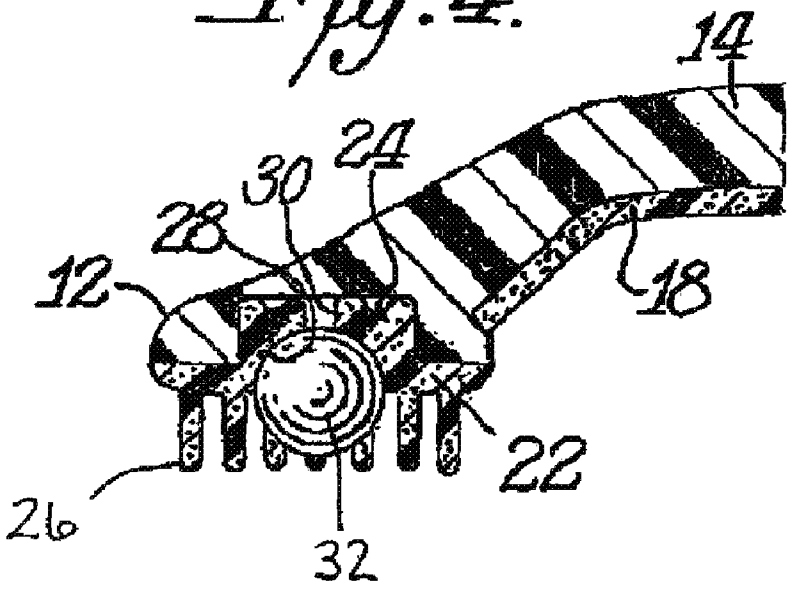


Fig. 4.



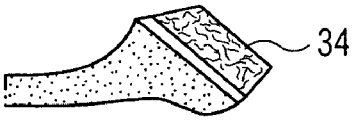


FIG. 5

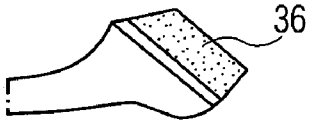


FIG. 6

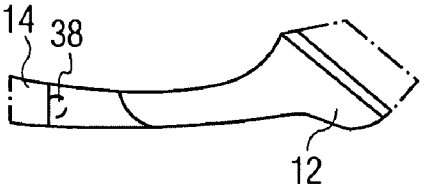


FIG. 7

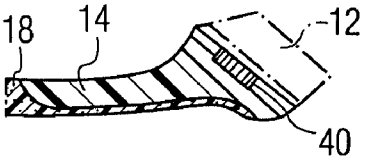


FIG. 8

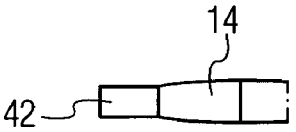


FIG. 9

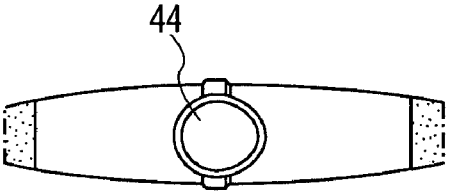


FIG. 10

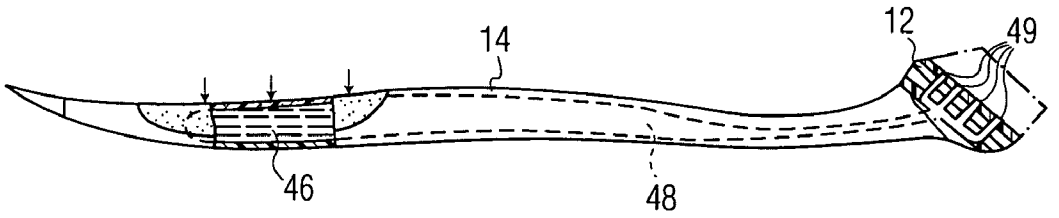


FIG. 11

ORAL CARE TOOTHBRUSH

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of PCT application Ser. No. PCT/US03/27455, filed Sep. 4, 2003, which claims the benefit of U.S. provisional application Ser. No. 60/408,321, filed Sep. 5, 2002.

BACKGROUND OF THE INVENTION

A. Field of the Invention

The present invention relates generally to toothbrushes, and, more particularly, to a toothbrush which may have an oral care dispenser, such as a breath freshening, teeth cleaning gel capsule, and an oral care accessory, such as a toothpick.

B. Description of the Related Art

The advantages of good dental hygiene are well known. Often, however, toothbrushes are forgotten when one is traveling or away from home. Hotels, health care facilities, nursing homes, hospitals, daycare facilities, schools, airlines, etc. have a need for single use disposable or limited multiple use toothbrushes that may be economically supplied to and discarded by individuals without a toothbrush and/or a water supply. Such toothbrushes could be used in vending machines, or distributed in large quantities for simple, portable use from anywhere.

Various types of disposable, limited use, or portable toothbrushes are known in the art. For example, some toothbrush systems have attempted to meet some of these needs by providing toothpaste within the toothbrush itself, through an integrated channel, for distribution through the toothbrush and around the bristles. This approach can be less economical due to the added manufacturing costs of toothbrushes with integrated channels. In addition, the toothpaste in some of these integrated channel toothbrushes, not being properly sealed, has a tendency to become dry, hard and stale.

U.S. Pat. No. 6,135,274 shows an apparatus for brushing teeth that includes an outer bag, a toothbrush sealed within the outer bag, and a dispenser sealed within the outer bag and containing a mouth care solution. In use, the rupturable dispenser is squeezed or otherwise subjected to pressure while the toothbrush remains sealed within the outer bag. Unfortunately, the apparatus for brushing teeth requires an outer bag, increasing the cost of the apparatus, and fails to provide the rupturable dispenser and toothbrush as one complete, connected unit. The reference also fails to provide a toothpick mechanism for cleaning in between teeth, and which is also connected to the toothbrush.

U.S. Pat. No. 6,397,860 discloses a disposable, waterless tooth brushing assembly that includes a toothbrush, a non-foaming, saliva-activated, teeth-cleaning agent pre-applied to the bristles of the toothbrush, a small moistened disposable towel for user after teeth cleaning, and a compact, lightweight, two-layer heat-sealed packaging container for pre-use sanitary storage of the toothbrush and towel. Like U.S. Pat. No. 6,135,274, the assembly of U.S. Pat. No. 6,397,860 requires a packaging container, increasing the cost of the assembly, and fails to provide a rupturable dispenser and toothbrush as one complete, connected unit. The reference also fails to provide a toothpick mechanism for cleaning in between teeth, and which is also connected to the toothbrush.

Published U.S. application 2002/0106234 discloses a chewable toothbrush made of a flexible shell with bristles coupled to the shell and a chewable centerpiece disposed within the shell interior. A burstable capsule is disposed adjacent to the chewable centerpiece within the shell interior and maintains a digestible fluid.

None of the toothbrush assemblies of the related art includes a rupturable dispenser containing a dentifrice, a toothpick, and a toothbrush as one complete, connected unit or the various other combination of oral care members and materials, later described. Thus, there is a need in the art for a waterless, toothbrush having a toothpick connected thereto to enable cleaning in between teeth or other accessory, and a dispenser containing a dentifrice or other oral care material and being connected in the bristle or cleaning element portion of the toothbrush for dispensing the dentifrice to the teeth to provide teeth cleaning and breath freshening or other oral care benefits.

SUMMARY OF THE INVENTION

The present invention solves the problems of the related art by providing in one embodiment a waterless toothbrush having a toothpick connected thereto to enable cleaning in between teeth, and a rupturable dispenser containing a dentifrice and being connected in the bristle portion of the toothbrush for dispensing the dentifrice to the teeth to provide teeth cleaning and breath freshening, all of which deliver a cleaning, polishing, whitening, between teeth cleaning, and breath freshening action in addition to enhancing the cleaning efficiency of a typical disposable or limited use toothbrush. The toothbrush of the present invention in this embodiment combines three benefits into one toothbrush: (1) tooth surface cleaning provided by the toothbrush bristles or other cleaning elements and the dentifrice in the rupturable dispenser; (2) between teeth cleaning provided by the toothpick; and (3) breath freshening provided by the dentifrice in the rupturable dispenser.

As embodied and broadly described herein, the present invention is broadly drawn to an oral care toothbrush, preferably comprising: a handle having an oral care head mounted to one end of the handle with an oral care accessory mounted to an opposite end of the handle. A plurality of oral care elements such as cleaning/massage elements, which could be bristles, extend outwardly from the outer surface of the head. The head also includes structure for dispensing oral care material in the oral care field of the head.

In a preferred practice of the invention the oral care toothbrush is characterized by its small size and light weight so that it is readily adaptable for travel use. The oral care toothbrush is preferably capable of having multiple functions by including an accessory as part of the toothbrush such as a toothpick, dental floss or tongue cleaner.

In one practice of this invention the oral care toothbrush includes a toothpick formed at one end of the handle; and a head connected at another end of said handle, said head having a bristle block that includes a plurality of bristles and retains a gel capsule therein, the gel capsule containing a mouth care solution. In further embodiments, the gel capsule can be replaced by a quantity of toothpowder, toothpaste or a tooth cleaning gel dentifrice, to provide the cleaning benefits of the dentifrice within the rupturable dispenser.

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of

illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

Among the advantages of various practices of the invention are that the size and configuration of the toothbrush allows discreet hygienic use, such as no fingers in the mouth, adapting it to be readily used in public areas. Such uses could be done without the need for a sink or fountain or other source of water.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:

FIG. **1** is a front elevational view of an oral care toothbrush with a toothpick and a breath freshening, teeth cleaning gel capsule connected thereto in accordance with an embodiment of the present invention;

FIG. **2** is a side elevational view of the toothbrush shown in FIG. **1**;

FIG. **3** is a rear elevational view of the toothbrush shown in FIGS. **1-2**;

FIG. **4** is a fragmental, cross-sectional view of the head of an oral care toothbrush shown in accordance with this invention;

FIGS. **5-6** are side elevational views of other forms of heads for an oral care toothbrush in accordance with this invention;

FIG. **7** is a fragmental side elevational view showing a head detachably mounted to the handle in accordance with a further practice of this invention;

FIG. **8** is a fragmental cross-sectional elevational view showing a vibrating toothbrush head in accordance with this invention;

FIGS. **9-10** are fragmental front elevational views partly broken away of portions of a handle in accordance with yet another practice of this invention;

FIG. **11** is a side elevational view partly in section of yet another toothbrush in accordance with this invention; and

FIGS. **12-13** are front elevational views showing various forms of toothbrushes in accordance with this invention in the packaged or display condition.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The following detailed description of the invention refers to the accompanying drawings. The same reference numbers in different figures identify the same or similar elements. Also, the following detailed description does not limit the invention. Instead, the scope of the invention is defined by the appended claims and equivalents thereof.

FIGS. **1-4** illustrate one practice of the present invention wherein an oral care toothbrush **10** includes a head **12** and a handle **14**. Head **12** may be a refill head and thus be removably connected to handle **14**, or head **12** may be permanently connected to head **12** within the practice of the present invention.

The majority of handle **14** and a portion of head **12** may be molded from a variety of rigid materials, including plastics, resins, etc., such as, for example, polypropylene. An end portion of handle **14**, opposite the end head **12** is attached to an accessory, preferably a toothpick **16** formed of a resilient and soft thermoplastic elastomer. Toothpick **16** may be a refill and thus be removably connected to handle **14**, or toothpick **16** may be permanently connected to handle **14** within the practice of the present invention. Toothpick **16** provides a mechanism for spot cleaning between teeth. Forming toothpick **16** of a soft elastomer provides more comfortable interproximal cleaning between teeth. Toothpick **16** could, however, be made of a stiff rigid material similar to the main portion of handle **14**, or could simply be a rubber or elastomeric pick adhered or otherwise mounted to the end of handle **14**.

Portions **18** of handle **14** may also be formed of a resilient and soft thermoplastic elastomer. The thermoplastic elastomer which forms toothpick **16** and handle portions **18** may be a thermoplastic vulcanate (TPV) consisting of a mixture of polypropylene and EPDM (ethylene propylene diene monomers) which is available as SANTOPRENE (brand), described in U.S. Pat. No. 5,393,796, or VYRAM (brand), another TPV consisting of a mixture of polypropylene and natural rubber. Both SANTOPRENE and VYRAM (brands) are elastomers marketed by Advanced Elastomer Systems. Other suitable elastomers include KRATON, a brand of styrene block copolymer (SBC) marketed by Shell, and DYNAFLEX G 2706 (brand), a thermoplastic elastomer marketed by GLS Corporation and which is made with KRATON (brand) polymer.

Handle **14** may further include dimples, bumps, or ridges protruding from portions of its surface, and providing a decorative appearance to handle **14** and enhanced gripping of handle **14** during use of toothbrush **10**. The dimples may be formed from the same material as soft elastomer portions **18** of handle **14** or from the same material as the majority of handle **14** (e.g., a rigid material such as polypropylene). All or part of handle **14** could be made of any suitable material, such as plastic, wood, metal or various natural materials which are biodegradable.

Preferably handle **14** is made of a generally flat or oval shape rather than cylindrical in its gripping portion which would be between the spaced elastomer portions **18**,**18** to facilitate the gripping of the handle.

As shown in FIG. **4** another portion of head **12**, defining a bristle or cleaning element block **22** of head **12**, may also be formed of a resilient and soft thermoplastic elastomer, such as the thermoplastic elastomer used to form handle portions **18**. Cleaning block **22** may include one or more depressions **24** provided in a surface thereof with an opening **30** therein that provides a cushioning effect to a rupturable dispenser, preferably a gel capsule **32**, contained therein, as described more fully below. Cleaning block **22** further includes a multitude of cleaning elements which could be conventional filament, preferably nylon, or elastomeric bristles or fingers **26** extending integrally outwardly from the outer surface of head **12**. In the illustrated embodiment as best shown in FIG. **4**, all of the cleaning elements **26** extend outwardly from the outer surface of block **22** the same distance so as to create a generally flat surface. Alternatively, however, some elements **26** may be shorter or longer than other elements **26**.

The term "cleaning elements" as used herein is intended to be used in a generic sense as cleaning elements or massage elements arranged in a circular cross-section shape or any type of desired shape, including straight portions or sinusoidal portions. It is to be understood that the specific illustration of the cleaning elements is merely for exemplary

purposes. The invention can, however, be practiced with various combinations of the same or different configurations (such as stapled, in-mold tufting (IMT) bristle technology as disclosed in U.S. Pat. Nos. 5,609,890, 5,390,984, and 5,533,791, the disclosures of which being incorporated by reference herein in their entirety, etc.) and/or with the same or different bristle materials (such as nylon bristles, spiral bristles, rubber bristles, etc.). Similarly, while FIGS. **1-4** illustrate the cleaning elements **26** to be generally perpendicular to the outer surface of head **12**, some or all of the cleaning elements **26** may be angled at various angles with respect to the outer surface of head **12**. It is thereby possible to select the combination of configurations, materials and orientations to achieve specific intended results, such as enhanced cleaning, tooth polishing, breath freshening, tooth whitening and/or massaging of the gums.

As stated above, the cleaning block **22** may include one or more depressions **24** which are designed to receive and retain an oral care dispenser, such as a rupturable gel capsule **32** therein. The one or more depressions **24** can be varied in size so as to accommodate not only varying size dispensers **32**, but varying quantities of toothpowder, a toothpaste or tooth cleaning gel dentifrice or other oral care material, for delivery to the dentiture as the elements **26** extending from the block **22** are applied thereto, during use of the present invention such that the oral care material enhances the cleaning of the dentiture by the cleaning elements. While the present invention can be manufactured containing a packed toothpowder, toothpaste or tooth cleaning gel dentifrice and used repeatedly by the user refilling the dispenser with toothpowder, toothpaste or tooth cleaning gel dentifrice, it is preferably used with one or more gel capsules **32** contained therein. Most preferably the present invention is used with a single gel capsule **32**, supplied therewith, so as to be most easily transported, used, and subsequently disposed of; however, it may also be used repeatedly with replaceable gel capsules **32**, and then disposed of.

It is preferred that the depression is in the form of a cushioned socket **28** sized and shaped to receive and retain the gel capsule **32**, without premature rupture of the gel capsule **32** prior to use thereof during application of the bristle block **22** to the dentiture and brushing thereof. Cushioning socket **28** opening **30**, and the material making up bristle block **22** provide a cushioning effect for gel capsule **32** to prevent gel capsule **32** from rupturing prior to use.

Gel capsule **32** holds and applies a mouth care solution onto bristles **26** of toothbrush head **12**. The mouth care solution may be a toothpaste, a gel, a mouthwash, or similar dentifrice or oral hygiene product, or a combination of the same contained in the rupturable capsule **32**. Preferably gel capsule **32** is a liquid-filled gel capsule having frangible, thin walls that easily rupture or burst when rubbed against the teeth, or dissolve when mixed with the saliva of a user. The materials making up gel capsule **32** and the oral or mouth care solution contained therein preferably are consumable by the user of toothbrush **10**, eliminating the need for water, a sink, or a waste receptacle to expectorate the gel capsule **32** or its contents. The mouth care solution remains in gel capsule **32** until toothbrush **10** is ready for use. Preferably, gel capsule **32** is fully sealed, helping the mouth care solution to remain fresh until use.

In use, gel capsule **32** would be pressed against the teeth and burst or rupture or dissolve, applying the mouth care solution over cleaning elements **26**. The user then may brush their teeth with toothbrush **10**. The user may also use toothpick **16** to clean between teeth, either before or after brushing. After the user has used toothbrush **10**, one may, but not necessarily, then easily and economically dispose of toothbrush **10**.

In one preferred aspect of the present invention, the entire structure of toothbrush **10**, including head **12**, handle **14**, and toothpick **16**, is molded as one integral structure, using a conventional two-component injection molding operation typically used in the manufacture of toothbrushes. This enables toothbrush **10** to be economically and quickly manufactured. Although toothbrush **10** may have a variety of sizes and dimensions, it is preferred that toothbrush **10** have a small profile, with head **12** being small enough to cover one tooth at a time and handle being thinner than conventional, everyday toothbrush handles. Toothbrush **10** is thus readily portable or space saving.

The toothbrush **10** of the present invention provides many benefits, including the cosmetic benefits of brushing one's teeth in a form that can be used when one is away from home, and away from a water supply. The cosmetic benefits achieved by the toothbrush **10** of the present invention include the cleaning of debris between teeth with toothpick **16**, broad tooth surface cleaning (particularly the front teeth) with cleaning elements **26** and the mouth care solution of gel capsule **32**, and breath freshening with the mouth care solution of gel capsule **32**.

In addition to the cosmetic benefits, the toothbrush **10** of the present invention also provides economic benefits in the form of an inexpensive toothbrush that is both quickly and economically manufactured. Toothbrush **10** also provides a mechanism for maintaining oral health, without the need for toothpaste, water, mouth wash, and containers to hold the same. Thus, toothbrush **10** is also very convenient to use.

Although FIGS. **1-4** illustrate a manually-operated, disposable toothbrush, the present invention may also be practiced where the head includes one or more power or electrically operated movable sections carrying cleaning elements. Such movable section may oscillate in a rotational manner or may oscillate linearly in a longitudinal direction with respect to the longitudinal axis of the head or may oscillate linearly in a lateral or transverse direction with respect to the longitudinal axis of the head. The movable section may oscillate in and out in a direction toward and away from the outer surface of the head. The movable section may rock back and forth with respect to the outer surface of the head. The movable section may rotate continuously in the same direction, rather than oscillate. Any suitable drive mechanism may be used for imparting the desired motion to the movable section. Where plural movable sections are used, all of the movable sections may have the same type and direction of movement, or combinations of different movements may be used.

In accordance with one aspect of this invention the cleaning elements may be in the form of bristles made from conventional materials, such as nylon, as well as from a combination of materials so as to provide the proper stiffness in an economical manner. For example, the cleaning elements could be made of a flexible resilient material, such as TPE and a lesser expensive material such as LLDPE (linear low density polyethylene) or EVA (ethylene vinyl acetate) or a TPE. The cleaning elements could be made of a blend of TPE and either LLDPE, EVA, or polypropylene. Preferably, the two materials are combined to provide a stiffness of less than 600 MPa. The blend of materials would give the properties of conventional nylon bristles, while offering reduced costs. For example, there would be lower manufacturing costs by injection molding instead of conventional bristle tufting. Alternatively the resilient material could be a

single material, such as hard TPE (i.e. Shore A 80 hardness), straight LLDPE or straight EVA.

The cleaning elements may be of any desired shape. For example, the cleaning elements could be of cylindrical shape having a uniform diameter throughout their length. Alternatively, the cleaning elements could taper from the root of each cleaning element where it extends from head **22** to its outer cleaning end. Since a preferred practice of the invention is to provide a small lightweight toothbrush the dimensions of the various components of toothbrush **10** are preferably small. Thus, for example, each cleaning elements may extend outwardly from the outer surface of cleaning block **12** a distance no greater than 10 mm and preferably no greater than 8 mm and most preferably no greater than 6 mm. Where tapered cleaning elements are used the root diameter should be no greater than 1.5 mm, preferably no greater than 1 mm, most preferably no greater than 0.7 mm or no greater than 0.5 mm or no greater than 03. mm. The diameter could then decrease in size to no greater than 0.2 mm at a distance of no greater than 6 mm from the base of the cleaning element. The taper relationship of diameter at a distance location above the root diameter could be a range of no greater than 1 mm at a distance of no greater than 10 mm, preferably no greater than 0.6 mm at a distance of no greater than 8 mm, most preferably no greater than 0.2 mm at a distance of no greater than 6 mm. Preferably, the length of the entire toothbrush **10** is no greater than 5 inches, preferably no greater than 4 inches, and more preferably no greater than 3.75 or 3 or 2.50 inches, and may be in the range of 2 to 4 inches.

As illustrated in FIGS. **1** and **4** the cleaning elements define a cleaning field in the head and the dispenser **32** is mounted within this cleaning field. The cleaning elements **26** preferably extend outwardly from the cleaning block **22** to be approximately flush with the outer surface of the gel bead or capsule **32**, as shown in FIG. **4**. The invention, however, can also be practiced where the cleaning elements extend either a greater distance or a lesser distance than the dispenser **32**. Since toothbrush **10** is intended to be both small and lightweight, it is preferred that toothbrush **10** weigh no more than 3 grams. The small size is such that it can be held completely within the palm of an adult user. Head **12** is of a size that it would correspond to the size of an individual tooth or an individual tooth and the interproximal areas. Head **12** could be made of any suitable shape and is preferably of circular or oval shape having a maximum lateral dimension or diameter of no greater than 13 mm, preferably no greater than 12 mm and most preferably no greater than 11 mm. Where head **12** is of non-circular shape its maximum lateral dimension is 14 mm.

As shown in FIG. **2** head **12** is preferably at an angle between 0° and 90° to the longitudinal axis of handle **14**. The preferred angle is from 20° to 70° and more preferably from 30° to 60°. The cleaning elements could be perpendicular to the outer surface of head **12** or could also be at an angle to the outer surface such as in the range of 60° to 90° or in the range of 75° to 90°.

In one practice of the invention the cleaning elements could be hollow, such as hollow bristles, which are capable of absorbing a medicament by capillary action. Such practice of the invention would be particularly useful for children where a medicament or some form of flavor could be dispensed from the hollow cleaning elements. It is also possible to leach antibacterial material from the cleaning elements. In one practice of the invention where the cleaning elements are used to dispense oral care materials the cleaning elements themselves may be considered as the oral care dispensers without requiring additional dispensers such as capsule **32**.

Where specific parameters and characteristics have been given for cleaning elements, the invention could be practiced where other cleaning elements do not include those parameters and characteristics.

FIGS. **5-6** show other variations in the practice of this invention wherein the cleaning elements are in the form of a single mass having an irregular outer surface. As shown in FIG. **5** the mass **34** is similar to that of "steel wool" as used in household cleaning or could be part of Velcro® formations, such as hooks or loops.

FIG. **6** shows a variation where the cleaning element **36** is of a single mass of foam for cotton which could be used as a swab for oral care material. The outer surface of the swab could be generally planar or could have surface irregularities. In such practice of the invention the cleaning element **36** could be impregnated with the oral care material or could be dipped into oral care material so as to absorb the material and thereby the cleaning element **36** would also function as the oral care dispenser. Such swab type cleaning elements are gentle for children, particularly infants.

The invention could be practiced where the various components of the toothbrush **10** are segmented for manufacturing and assembly purposes. Such segmented components could also be detachably connected together so as to permit the interchangeability of the components thereby providing the possibility for the substitution of different components in the combination. Thus, the head **12** could be detachably connected to the handle **14**. FIG. **7**, for example, illustrates head **12** to be detachably mounted to handle **14** by a snap fitting **38** which may be of any suitable construction as is known to those of ordinary skill in the art.

The concept of a detachable interconnection may also be used wherein the dispenser **32** is detachably mounted in the head **12** or wherein the oral care accessory, such as toothpick **16**, is detachably mounted to handle **14**. Thus, as later described with respect to FIGS. **12** and **13** the toothbrush and its various components could be packaged wherein the same package includes a plurality of toothbrushes and/or a plurality of different components such as heads, dispensers or accessories.

FIG. **8** shows a further practice of the invention wherein a piezoelectric crystal **40** is provided in the handle **14** at the junction with head **12** so as to cause the head **12** to vibrate during use. Alternatively the head **12** could be mounted to a rotatable shaft extending from the handle and having an eccentric weight on the shaft to cause the head to vibrate.

Although FIGS. **1-3** illustrate an oral care accessory **16** in the form of a toothpick, other types of accessories **42** could be used as schematically shown in FIG. **9**. As illustrated therein such accessory **42** would be mounted to the end of handle **14** similar to the mounting of toothpick **16**. Such mounting could be detachable or of a permanent nature. Examples of such oral care accessories include tongue cleaners, floss holders or an interproximal brush. Similarly, the accessory could be of a swab or foam type similar to the cleaning element **36** of FIG. **6** or could be of the single mass of roughened material such as the cleaning element **34** of FIG. **5**.

FIG. **10** shows another variation of the invention wherein the toothbrush is particularly adapted for use by children. Such use is enhanced by providing any suitable ornament or caricature **44** on the toothbrush, such as on the handle or on any other suitable location including the backside of the head. Such ornament **44** could be detachably mounted so

that it could be kept by the child after the rest of the toothbrush is thrown away. Other aspects of the invention which make it desirable for use by children include the possibilities of dispensing various types of oral care materials including materials having special flavors, tooth numbing materials, anti-sensitive materials or various medicaments.

The toothbrush could also be made of various colors for different parts of the toothbrush. For example, soft elastomer **18** could be made of a different, such as a contrasting, color with respect to the remainder of handle **14** which would be made of a rigid material. Similarly, the head **12** could be made of a different color than the rigid portion of the handle and/or the soft elastomer portions **18**. The cleaning elements **26** could be made of distinct colors and the dispenser **32** could also be made of a distinct color. Along the same lines the accessory such as toothpick **16** or other accessory **42** could be made of a distinct color. These various colors could be contrasting or complementary with each other. Thus, for example, the various colors could differ only slightly in color or shade.

FIG. **11** illustrates another practice of the invention wherein the handle **14** has a hollow chamber **46** in which the oral care material could be contained. Chamber **46** leads to a passageway **48** which extends to the head **12** such as terminating in a plurality of branches **49** at the outer surface of head **12** within the cleaning field. In order to dispense the oral care material located in the chamber or reservoir **46** handle **14** would have sufficient resiliency so that it can be squeezed thereby forcing the material from the handle to the head into a dispensing cavity or one or more dispensing openings.

Any suitable oral care products could be dispensed from the dispenser. Such products include, but are not limited to the gel capsule **32** as previously described and could contain toothpaste, tooth powder or could be a small vial of mouthwash having a gel, a powder or a liquid. Such a vial could be separately included in a package containing the toothbrush. The materials could be flavored and could be provided in sets of different flavors and/or different characteristics such as medicaments, numbing materials, etc.

Where the dispensers **32** are in the form of beads, different beads or capsules could be used with different colors/flavors to enhance consumer appeal. As described the capsule **32** could be an impregnated bead that burst. Suitable beads include those supplied by Mane Inc.

Any suitable methods may be used for forming toothbrush **10** and its various components. For example, multi-component injection molding could be used to integrally couple various components such as the cleaning elements and the head and/or the handle. This could be done in an automated or multiple step process. The handle could be rotocast blow molded to form a hollow squeeze handle that would be usable in the embodiment shown in FIG. **11**.

FIGS. **12-13** show different manners of packaging toothbrushes in accordance with this invention. As shown in FIG. **12**, for example, a single package **50** could contain a plurality of toothbrushes **10** all of which could be the same or could differ from each other. The package **50** could be of any conventional construction, such as a blister pack, which might include a hole **52** to permit the package to be hung for display purposes.

FIG. **13** illustrates a variation wherein the package **54** includes one or more toothbrushes **10** and a plurality of other components **56** which could be accessories or dispensers or other components. The components could include a small vial of mouthwash. Preferably, the package **50** or **54** would be hermetically sealed to assure freshness. Such hermetic sealing is particularly desired to prevent moisture from reaching gel capsule **32** and causing the capsule to burst.

As is apparent the present invention provides an oral care toothbrush which is preferably small in size and portable and can be conveniently used away from home under circumstances, such as travel, where water is not readily available.

The invention could be practiced with a combination of various components which do not involve "toothbrush" usage. In that sense the invention is an oral care device or the like, rather than strictly being a toothbrush. Where used as a toothbrush or the like, the invention may have the advantages, because of the size and configuration, to allow discreet hygienic use, such as no fingers in the mouth, adapting it to be readily used in public areas.

Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

What is claimed is:

1. An oral care toothbrush comprising a handle, a head mounted to one end of said handle, said head having an outer surface, a plurality of oral care elements in an oral care field extending outwardly from said outer surface, and said head having one or more depressions therein to accommodate an oral care material, wherein said one or more depressions in said head are cushioned.

2. The toothbrush of claim **1** further comprising a dispenser for said oral care material, said dispenser being located at least partially in said depression.

3. The toothbrush of claim **2** wherein said dispenser is a capsule, containing oral care material that is selected from the group consisting of a gel, mouthwash, toothpaste, tooth powder and flavored material.

4. The toothbrush of claim **3** wherein said capsule is at least partially surrounded by said oral care elements.

5. The toothbrush of claim **3** wherein said dispenser is detachably mounted to said head to permit replacement of said dispenser with another dispenser.

6. The toothbrush of claim **3** wherein said dispenser is a gel capsule, and said capsule being an impregnated bead which bursts upon exposure to moisture.

7. The toothbrush of claim **2** wherein at least two of said handle, said head and said dispenser are detachably connected together.

8. The toothbrush of claim **1** further comprising an oral care accessory mounted to an end of said handle opposite to said oral care head.

9. The toothbrush of claim **8**, wherein said accessory is selected from the group consisting of a toothpick, a rubber pick, a tongue cleaner, a floss holder, an interproximal brush and a swab.

10. The toothbrush of claim **1** wherein said oral care elements are integral with said head.

11. The toothbrush of claim **1** wherein at least some of said oral care elements has a length no greater than 6 mm.

12. The toothbrush of claim **1** wherein at least some of said oral care elements has a length no greater than 10 mm.

13. The toothbrush of claim **1** wherein at least some of said oral care elements has a root diameter no greater than 1.5 mm.

14. The toothbrush of claim **13** wherein at least some of said oral care elements taper from their root diameter toward

their outer end and have a diameter of no greater than 0.2 mm at a distance of no greater than 6 mm above said root diameter.

15. The toothbrush of claim **13** wherein at least some of said oral care elements taper from said root diameter, and the range of diameter at a distance above the root diameter is no greater than 1 mm at a distance of no greater than 10 mm.

16. The toothbrush of claim **15** wherein said range is no greater than 0.2 mm at a distance of no greater than 6 mm.

17. The toothbrush of claim **15** wherein said toothbrush has an overall length of no greater than 5 inches.

18. The toothbrush of claim **1** wherein at least some of said oral care elements has a root diameter no greater than 7 mm.

19. The toothbrush of claim **1** wherein said head has a maximum lateral dimension of no greater than 13 mm, and said toothbrush has an overall weight no greater than 3 grams.

20. The toothbrush of claim **1** wherein at least some of said oral care elements have a stiffness of less than 600 Mpa.

21. The toothbrush of claim **1** wherein at least some of said oral care elements comprise bristles made of a combination of a resilient and a more rigid material.

22. The toothbrush of claim **21** wherein said resilient material is TPE and said more rigid material is selected from the group consisting of LLDPE, EVA and polypropylene.

23. The toothbrush of claim **1** wherein at least some of said oral care elements comprise bristles made of a single material selected from the group consisting of TPE, LLDPE and EVA.

24. The toothbrush of claim **1** wherein said oral care elements comprise bristles containing an anti-bacterial material.

25. The toothbrush of claim **1** wherein said handle is made of a biodegradable material.

26. The toothbrush of claim **1** including an ornament mounted on said handle.

27. The toothbrush of claim **1** wherein said head is mounted at an angle of 0° to 90° with respect to the longitudinal axis of said handle.

28. The toothbrush of claim **27** wherein said cleaning element angle is 90°.

29. The toothbrush of claim **27** wherein said head angle is in the range of 30° to 60°.

30. The toothbrush of claim **27** wherein said cleaning elements are mounted at an angle of 60° to 90° with respect to said outer surface of said head.

31. The toothbrush of claim **1** wherein said head angle is in the range of 30°**0** to 60°.

32. The toothbrush of claim **1** wherein said cleaning elements are mounted at an angle of 60° to 90° with respect to said outer surface of said head.

33. The toothbrush of claim **32** wherein said cleaning elements are mounted at an angle of 60° to 90° with respect to said outer surface of said head.

34. An oral care toothbrush comprising a handle, a head attached to one end of said handle via a snap fitting, said head having an outer surface having an oral care material indentation, a plurality of oral care elements in an oral care field extending outwardly from said outer surface, said toothbrush having an overall length no greater than 5 inches, and said oral care elements extending outwardly from said outer surface of said head a distance no greater than 10 mm, wherein at least some of said oral care elements comprise bristles made of a combination of a resilient and a more rigid material, wherein said resilient material is TPE and said more rigid material is selected from the group consisting of LLDPE, EVA and polypropylene.

35. The toothbrush of claim **34** wherein at least some of said oral care elements have a length no greater than 6 mm.

36. The toothbrush of claim **34** wherein said oral care elements are integral with said head.

37. The toothbrush of claim **34** wherein at least some of said oral care elements has a root diameter no greater than 1.5 mm.

38. The toothbrush of claim **34** wherein at least some of said oral care elements has a root diameter no greater than 7 mm.

39. The toothbrush of claim **34** wherein at least some of said oral care elements taper from their root diameter toward their outer end and have a diameter of no greater than 0.2 mm at a distance of no greater than 6 mm above said root diameter.

40. The toothbrush of claim **34** wherein at some of said oral care elements taper from said root diameter, and the range of diameter at a distance above the root diameter is no greater than 1 mm at a distance of no greater than 10 mm.

41. The toothbrush of claim **40** wherein said range is no greater than 0.2 mm at a distance of no greater than 6 mm.

42. The toothbrush of claim **34** wherein at least some of said oral care elements have a stiffness of less than 600 MPa.

43. The toothbrush of claim **34** wherein said head has a maximum lateral dimension of no greater than 13 mm, and said toothbrush has an overall weight no greater than 3 grams.

44. The toothbrush of claim **34** wherein said head has a maximum lateral dimension of no greater than 13 mm.

45. The toothbrush of claim **34** wherein said head is mounted at an angle of 0° to 90° with respect to the longitudinal axis of said handle.

46. The toothbrush of claim **34** including a dispenser containing an oral care material in said head within said cleaning field.

47. The toothbrush of claim **46** wherein said oral care material is selected from the group consisting of a gel, mouthwash, toothpaste, tooth powder, and flavored material.

48. The toothbrush of claim **47** wherein said dispenser is a capsule containing said oral care material, said capsule being at least partially surrounded by said oral care elements.

49. The toothbrush of claim **46** wherein said dispenser is detachably mounted to said head to permit replacement of said dispenser with another dispenser.

50. The toothbrush of claim **46** wherein said head and said dispenser are detachably connected together.

51. The toothbrush of claim **34** wherein said handle is made of a biodegradable material.

52. The toothbrush of claim **34** including an ornament mounted on said handle.

53. A toothbrush comprising a handle, a head attached to one end of said handle, and at least one oral care cleaning element extending outwardly from said head, said head including a cushioned gel capsule receiving depression, and said at least one oral care cleaning element being integrally molded with said head.

54. The toothbrush of claim **53**, wherein the at least one oral care element extends outwardly from said head a distance no greater than 10 mm.

55. The toothbrush of claim **54**, wherein the head has a round shape.

56. The toothbrush of claim **53**, further comprising a toothpick formed on said handle opposite said head.

57. A toothbrush comprising:
a handle,
a head provided on one end of said handle and a toothpick provided on the opposite end of said handle;
at least one oral care cleaning element extending outwardly from said head, and
an oral care material inserted into a concave depression in said head.

58. The toothbrush of claim 57, said toothbrush having an overall length no greater than 5 inches.

59. The toothbrush of claim 58, the head being sized to clean one tooth at a time.

60. The toothbrush of claim 59, the at least one oral care cleaning element comprising a plurality of bristles.

61. The toothbrush of claim 60, the handle further comprising grip-enhancing features along a central portion thereof.

62. An oral care toothbrush comprising a handle, a head mounted to one end of said handle, said head having an outer surface, a plurality of oral care elements in an oral care field extending outwardly from said outer surface, and said head having one or more depressions therein to accommodate an oral care material, wherein at least some of said oral care elements comprise bristles made of a combination of a resilient and a more rigid material; wherein said resilient material is TPE and said more rigid material is selected from the group consisting of LLDPE, EVA and polypropylene.

63. The toothbrush of claim 62 further comprising a dispenser for the oral care material, the dispenser being located at least partially in said depression.

64. The toothbrush of claim 63 wherein said dispenser is detachably mounted to said head to permit replacement of said dispenser with another dispenser.

65. The toothbrush of claim 63, wherein said dispenser comprises a rupturable capsule which bursts upon exposure to moisture or pressure.

66. The toothbrush of claim 62 further comprising an oral care accessory mounted to an end of said handle opposite to said head.

67. The toothbrush of claim 66, wherein said accessory is selected from the group comprising of a toothpick, a rubber pick, a tongue cleaner, a floss holder, an interproximal brush and a swab.

68. The toothbrush of claim 62 wherein at least some said oral care elements are integral with the head.

69. The toothbrush of claim 62 wherein at least some of oral care elements have a stiffness of less than 600 Mpa.

70. The toothbrush of claim 62 further comprising a capsule, containing said oral care material that is selected from the group comprising of a gel, mouthwash, toothpaste, toothpowder and flavored material.

71. The toothbrush of claim 70 wherein said capsule is at least partially surrounded by said oral care elements.

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