A toothbrush includes a brush portion, a handle, a suction cup pedestal and a flexible transition portion connecting a lower end of the handle to the suction cup pedestal. The handle, suction cup pedestal and flexible transition portion are constructed and arranged so that the toothbrush will normally be oriented in a substantially upright position when the suction cup pedestal is affixed to a horizontal surface. Advantageously, though, the flexible transition portion is sufficiently flexible so as to permit the toothbrush to be deflected when the suction cup pedestal is affixed to a horizontal surface so that the central longitudinal axis of the handle is at least 20 degrees from vertical. A novel packaging assembly for such a toothbrush is also disclosed.
SUCTION CUP TOOTHBRUSH WITH IMPROVED CHARACTERISTICS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

This invention relates to an improved dental care implement, such as a toothbrush. More specifically, this invention relates to toothbrush that is self-supporting on a smooth, nonporous surface so as to avoid contamination, and that is also constructed to be extremely durable and safe.

[0002] 2. Description of the Related Technology

It is a matter of good sense that a toothbrush should be kept out of contact with unhygienic surfaces. In the home, it is not uncommon for bathrooms to have sockets, typically built into a wall mounted cup holder, for holding one or more toothbrushes in an upright position. However, not all bathrooms have such receptacles, and a person cannot be assured of having a hygienic place to store his or her toothbrush, particularly while traveling. However, almost all bathrooms have at least one smooth, nonporous substantially horizontal surface such as a countertop to set things on.

[0005] U.S. Pat. No. 1,899,242 to McNab discloses a toothbrush holder including a sleeve that has a small, rubber suction cup that is designed to be attached to a vertical piece of glass such as a mirror or the wall of a bathroom. The attachment surface of the suction cup is substantially parallel to the axis of the handle of the toothbrush, meaning that it is designed to be attached to a vertical surface, not a horizontal surface.

[0006] One problem with an article such as that disclosed in McNab is that the bristles of the toothbrush will hang perilously close to the vertical surface, risking contamination. Another possible problem that could loom large in today’s litigious society is the possibility of the rubber suction cup becoming separated from the article after degradation and extended use, possibly posing a safety threat to infants or small children.

[0007] It is clear that there has existed a long and unfilled need in the prior art for an improved dental care implement that is self-supporting in a hygienic position for purposes of storage during nonuse, and that is durable and safe enough for consumer use.

SUMMARY OF THE INVENTION

[0008] Accordingly, it is an object of the invention to provide an improved dental care implement that is self-supporting in a hygienic position for purposes of storage during nonuse, and that is durable and safe enough for consumer use.

[0009] In order to achieve the above and other objects of the invention, a toothbrush that is constructed according to a first aspect of the invention includes a brush portion having a plurality of bristles thereon; a handle having an upper end that is connected to the brush portion and a lower end, the handle having a central, longitudinal axis; a suction cup pedestal; and a flexible transition portion connecting the lower end of the handle to the suction cup pedestal, the handle, suction cup pedestal and a flexible transition portion being constructed and arranged so that the toothbrush will normally be oriented in a substantially upright position when the suction cup pedestal is affixed to a horizontal surface, the flexible transition portion being sufficiently flexible so as to permit the toothbrush to be deflected when the suction cup pedestal is affixed to a horizontal surface so that the central longitudinal axis of the handle is at least 20 degrees from vertical.

[0010] A toothbrush and packaging assembly according to a second aspect of the invention includes a toothbrush including a brush portion having a plurality of bristles thereon; a handle having an upper end that is connected to the brush portion and a lower end, the handle having a central, longitudinal axis; a suction cup pedestal; and a flexible transition portion connecting the lower end of the handle to the suction cup pedestal; and a package for the toothbrush, the package being constructed and arranged so that the toothbrush is held within the package so that the suction cup pedestal is isolated from any lateral contact with the package, whereby the suction cup pedestal will be protected against forces that could deform the suction cup pedestal and thereby degrade the performance of the toothbrush.

[0011] According to a third aspect of the invention a toothbrush includes a brush portion having a plurality of bristles thereon; a handle having an upper end that is connected to the brush portion and a lower end, the handle having a central, longitudinal axis; a pedestal connected to the lower end of the handle, the pedestal having a maximum outer diameter and being constructed and arranged to support the toothbrush on a horizontal surface so that the central longitudinal axis of the handle will be substantially perpendicular to the horizontal surface, and wherein the handle is constructed to have a maximum outer dimension that is sufficiently less than the maximum outer diameter for an axial distance away from the pedestal so that the pedestal may operate as a stop abutting a users finger so as to secure a users grip on the toothbrush.

[0012] These and various other advantages and features of novelty that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is a perspective view of a toothbrush that is constructed according to a first embodiment of the invention;

[0014] FIG. 2 is a side elevational view of the toothbrush that is depicted in FIG. 1;

[0015] FIG. 3 is a cross-sectional view taken long lines 3-3 in FIG. 2;

[0016] FIG. 4 is a schematic depiction of a lower portion of the toothbrush shown in FIGS. 1-3 interacting with a underlying horizontal surface;

[0017] FIG. 5 is a diagrammatical depiction of the toothbrush that is shown in FIGS. 1-4 being gripped by a consumer;
FIG. 6 is a perspective view depicting a packaging assembly for the toothbrush shown in FIGS. 1-4;

FIG. 7 is a perspective view of a toothbrush that is constructed according to a second embodiment of the invention;

FIG. 8 is a diagrammatical side elevational view of the toothbrush that is depicted in FIG. 7, depicting the toothbrush being gripped by a consumer; and

FIG. 9 is a cross-sectional view taken along lines 9-9 in FIG. 8.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

Referring now to the drawings, wherein like reference numerals designate corresponding structure throughout the views, and referring in particular to FIG. 1, a toothbrush 10 constructed according to a preferred embodiment of the invention includes a brush port 12 having a plurality of bristles 14 thereon. Brush port 12 includes a brush head 16 to which the bristles 14 are secured in conventional fashion and further includes a shaft 18, which is of conventional shape and is unitary with brush head 16. In the preferred embodiment, brush head 16 and shaft 18 are fabricated from a translucent hard plastic material, which is preferably a tinted transparent material such as an ABS plastic.

As may further be seen in FIG. 1, toothbrush 10 includes a handle 20 that has an upper end 30 that is connected to the brush port 12, specifically shaft 18, and a lower end 32. Handle 20 has a central longitudinal axis 26, as may best be seen in FIG. 4. As shown in FIGS. 1-4, a suction cup pedestal 22 and flexible transition portion 24 are constructed and arranged so that the toothbrush 10 will normally be oriented in a substantially upright position when the suction cup pedestal 22 is affixed to a horizontal surface. In other words, the plane in which the lower rim of the suction cup pedestal 22 resides is substantially perpendicular to the central longitudinal axis 26 of the handle 20 when no force is being applied to bend the suction cup pedestal 22 with respect to the handle 20.

According to one advantageous feature of the invention, the flexible transition portion 24 and the suction cup pedestal 22 are fabricated and shaped to be sufficiently rigid so that if the suction cup pedestal 22 is affixed to a smooth nonporous vertical surface the toothbrush 10 including the handle 20 will extend away from the vertical surface so that the central longitudinal axis 26 is substantially perpendicular to the vertical surface. In other words, the weight of the toothbrush 10 will not be sufficient to cause significant flexure of the suction cup pedestal 22 and the flexible transition portion 24 when the toothbrush 10 is affixed to such a vertical surface. However, the suction cup pedestal 22 and flexible transition portion 24 are fabricated and shaped to permit significant flexure when suction cup pedestal 22 is affixed to a smooth, nonporous surface 28 and external force is applied, such as by a consumer, in a direction having a component that is perpendicular to the central longitudinal axis 26 of handle 20. Preferably, suction cup pedestal 22 and flexible transition portion 24 are sufficiently flexible to permit toothbrush 10 and specifically the longitudinal axis 26 of handle 20 to be deflected at an angle of at least 20 degrees from vertical when suction cup pedestal 22 is affixed to a horizontal surface 28, as shown in FIG. 4. More preferably, suction cup pedestal 22 and flexible transition portion 24 are sufficiently flexible to permit a deflection of at least 30 degrees and most preferably of 45 degrees or greater in such a situation. In addition, suction cup pedestal 22 is preferably constructed and arranged to attach to a smooth nonporous surface with sufficient strength to withstand such a deflection of 20 degrees and more and most preferably at least 30 degrees and at least 45 degrees, respectively.

As may be seen in the cross-sectional view that is provided in FIG. 3, toothbrush 10 is preferably fabricated from a soft plastic material 36, a first hard plastic material 38 that is integrally molded with the soft plastic material 36 and a second hard plastic material 40, discussed above, from which the brush head 16 and shaft 18 of the brush port 12 are fabricated. Preferably, the soft plastic material 36 is bonded to the hard plastic material 38 at least in the area of interface between those materials that is closest to the suction cup pedestal 22. This permits forces that are generated by deflecting or twisting the suction cup pedestal 22 to be efficiently transmitted to and partially absorbed by the hard plastic material 38. In addition, the soft plastic material 36 and the hard plastic material 38 in the vicinity of the suction cup pedestal 22 are shaped without sharp edges or other potential points of stress concentration, so as to suppress potential crack initiation in the soft plastic material that might otherwise eventually occur after extended use of the toothbrush 10. Preferably, the soft plastic material 36 is a flexible elastomer material that is resistant to degradation as a result of heat, cold, exposure to sunlight and exposure to moist conditions. Soft plastic material 36 must also be fatigue resistant. In the preferred embodiment, soft plastic material 36 is a thermoplastic elastomer that is specially formulated for overmolding onto a variety of plastic substrates. Such a material is commercially available under the trademark TEKROND, composition identification 6000-35 from Teknor Apex Plastics Division. This specific material is characterized by a Shore hardness of 40/35, a specific gravity of 0.98, a tensile strength of 584 psi, and a tear strength of 96 pl. A tensile strength of at least 400 psi is considered necessary for this component. Hard plastic material 38 is preferably a material that is harder than soft plastic material 36 and that is also resistant to degradation as a result of heat, cold, exposure to sunlight and exposure to moist conditions. Hard plastic material 38 is preferably a material that is not electrically conductive, and is further preferably a material that will naturally bond to the soft plastic material 36. In the most preferred embodiment, hard plastic material 38 is polypropylene, such as which is commercially available as POLIFIN brand PP 1100N from Polifin PP Division of South Africa (www.polifin.com).

Referring briefly to the second embodiment of the invention that is depicted in FIGS. 7-9, it will be seen that this toothbrush 70 is also constructed from a hard plastic material 88 and an integrally molded soft plastic material 90. Hard plastic material 88 is preferably the same as hard plastic material 38 and soft plastic material 90 is preferably the same as soft plastic material 36. As may be seen in FIG. 9, which is a cross-sectional view through the toothbrush 70, the portion of the hard plastic material 88 that is closest to
the suction cup pedestal 82 is rounded and cup shaped, thus avoiding potential points of stress concentration and the area of interface between the hard and soft plastic materials at this critical location near the suction cup pedestal 82.

[0027] Referring now to FIG. 4, it will be seen that suction cup pedestal 22 has a maximum outer diameter D1, which in the preferred embodiment is positioned at the intersection of the sidewall of the suction cup pedestal 22 and the circular lower rim. Flexible transition portion 24 is substantially hourglass shaped, having a narrow waist and widened upper and lower portions that are unitary with the lower end 32 of handle 20 and the upper portion of suction cup pedestal 22, respectively. The maximum outer diameter D2 of flexible transition portion 24 is also depicted in FIG. 4. Preferably, the minimum outer diameter D2 of flexible transition portion 24 is no more than 80 percent of the maximum outer diameter D1 of the suction cup pedestal 22. More preferably, the minimum outer diameter D2 of flexible transition portion 24 is no more than 55 percent of the maximum outer diameter D1 of suction cup pedestal 22, and most preferably the minimum outer diameter D2 of flexible transition portion 24 is no more than about 40 percent of the maximum outer diameter D1 of suction cup pedestal 22. In addition, the minimum outer diameter D2 of flexible transition portion 24 is preferably axially separated from the maximum outer diameter D1 of suction cup pedestal 22 by a distance of at least 0.15 inches, this axial distance being measured when the suction cup pedestal 22 is not vacuum attached to any surface.

[0028] The relative dimensions of diameters D1, D2 and the axial separation L1 between their locations has the effect of creating space for a user’s finger so that the user’s finger will tend to contact the upper surface of suction cup pedestal 22 when the user grips the lower end 32 of the handle 20 of the toothbrush 10.

[0029] The suction cup pedestal 22 thus becomes an effective stop abutting a user’s finger so as to secure a user’s grip on toothbrush 10. Also contributing to this effect is the fact that the maximum outer diameter of the toothbrush 10, including the flexible transition portion 24 and handle 20, in a direction away from the suction cup pedestal 22 is limited in its maximum outer diameter DHMAX for a distance of axial separation L2, with DHMAX and L2 being sufficient to create room for the user’s grip on the lower end 32 of handle 20 so that the upper surface of suction cup pedestal 22 may operate as an effective stop to the user’s grip. Preferably, handle 20 and flexible transition portion 24 are constructed so that DHMAX is no more than approximately 75 percent, and more preferably no more than 55 percent and most preferably 40 percent or less of the maximum outer diameter D1 of suction cup pedestal 22 for a distance L2 of at least 0.5 inches. More preferably, this is the case for a distance L2 of at least 0.75 inches, and even more preferably it is the case for a distance L2 that is at least one inch. Expressed in another way, the maximum outer diameter DHMAX is preferably no greater than approximately 0.2 in. less than the maximum outer diameter D1 of suction cup pedestal 22 for a distance L2 that is at least 0.5 inches, and more preferably for a distance L2 that is at least 0.75 inches and most preferably for a distance L2 that is at least one inch. More preferably, DHMAX is preferably no greater than approximately 0.4 in. less than the maximum outer diameter D1 of suction cup pedestal 22 for a distance L2 that is at least 0.5 inches, and more preferably for a distance L2 that is at least 0.75 inches and most preferably for a distance L2 that is at least one inch. In the most preferred embodiment, the maximum outer diameter D1 of the suction cup pedestal 22 is the widest portion of the entire toothbrush 10.

[0030] The fact that the suction cup pedestal 22 is fabricated from a soft elastomer material and the fact that it is relatively thin insures that it will feel comfortable and that it will deflect when contacted by a user’s finger, such as when it is functioning as a stop for the user’s finger.

[0031] One important aspect of the invention is the fact that the handle 20, suction cup pedestal 22 and flexible transition portion 24 are constructed, fabricated and designed so as to minimize the possibility of the suction cup pedestal 22 from becoming separated from the handle 20 after extended use. Premature separation of the suction cup pedestal 22 could present a safety risk, particularly for children, as well as diminishing the usefulness of the toothbrush 10. Accordingly, in the preferred embodiment the soft plastic material that makes up the suction cup pedestal 22 and the flexible transition portion 24 also extends into the handle 20 and this soft plastic material is unitary throughout for purposes of durability. In addition, the outer contours of the soft plastic material are intentionally rounded without sharp creases or edges so as to avoid potential points or areas of stress concentration on the outer surface as the suction cup pedestal 22 may be stressed by twisting, bending or pulling relative to handle 20. The internal contours and the interface areas between the soft and hard plastic materials are also made intentionally without sharp creases or edges for similar purposes, and, as mentioned above, the soft and hard plastic materials are preferably bonded to each other for purposes of durability. The hard plastic material and especially the soft plastic material are selected to maximize fatigue resistance and durability as well, particularly in conditions of heat, cold, sunlight and moistness. By this combination of design and materials the toothbrush 10 has been engineered to withstand severe punishment without failure, as exemplified by a strict testing regimen that has been conducted during product development tests. This testing regimen included subjecting a number of toothbrushes 10 to a thermal shock test that involved first exposure in the toothbrush 10 to temperatures of 140 degrees Fahrenheit (60 degrees Centigrade) at 90 percent relative humidity for eight hours and then to temperatures of four degrees Fahrenheit (−15.5 degrees Centigrade) for sixteen hours, and subsequently repeating this cycle for an additional two times. After this test, the samples were inspected to ensure that no visual change resulted.

[0032] After the thermal shock test described above, several of the toothbrushes 10 were further tested by applying relative torque, including between the pedestal suction cup 22 and the handle 20, to the toothbrushes 10. Torque in the amount of 2.0, 3.0 and 4.0 lb-in was variously applied to samples of the toothbrushes 10 without failure. Several of the toothbrushes 10 were after the thermal shock test also given a tension test where various portions of the toothbrush 10, including the areas between the handle 20 and the suction cup pedestal 22, were placed under axial tension in the amounts of 10.0 and 15.0 lb. The toothbrushes 10 constructed according to the preferred embodiment successfully passed this test as well. The toothbrushes 10 were subjected to a compression test as well in the amounts of
10.0 to 15.0 lbf, which was also successful. In addition, a bite test was performed on the toothbrushes 10, including in the area of the suction cup pedestal 22 and the flexible transition portion 24. In those areas, bite tests of 25 and 50 lbf were performed, and these tests were successful.

[0033] Toothbrushes 10 in the preferred embodiment as described above and in subsequently described embodiments also exhibit impressive resistance to fatigue. In fact, toothbrushes 10 are designed to withstand a deflection (as measured by the relative positions of central longitudinal axis 26 and alternate position of axis 26 in FIG. 4) of at least 30 degrees for at least 5000 repetitions without failure, and more preferably for at least 10,000 repetitions without failure.

[0034] Toothbrushes 10 and suction cup pedestal 22 in particular are further preferably constructed so as to adhere to a horizontal, smooth nonporous surface to which it has been affixed without at least 3 lbf, and more preferably without at least 6 lbf, and to have a fatigue resistance in order to survive at least 1000 cycles of been affixed and pulled off of a surface. This force of adhesion is to be sufficient to permit the toothbrush 10 to remain affixed to a vertical smooth nonporous surface for at least one hour, more preferably for at least twelve hours, and most preferably for at least 24 hours.

[0035] As may be seen in FIGS. 2 and 3, toothbrush 10 includes a circumferential switching band including a pair of buttons 42 for actuating a light bulb 44 that is positioned within the handle 20. Light bulb 44 is optically exposed to a surface of the shaft 18 of brush portion 12, which, as discussed above, is fabricated from a tinted transparent material such as an ABS polymer. A battery 46 is also positioned within a space that is defined within the handle 20, with one contact of the battery 46 in being in abutment with one contact of the light bulb 44. The second end of the battery has, as is conventional, a second contact that is in communication with a helical conductive spring, which in turn is in electrical contact with a number of conductive elements that are disposed about the circumference of the battery 46 within the handle 20. A second number of conductive elements are in electrical connection with a second electrical contact area of the label 44, and these second number of conductive elements are put into electrical connection with the first number of conductive elements when pressure is applied to the circumferential switching band 48, such as by depressing the button 42. This completes the circuit between the battery 46 and the light bulb 44, thus causing the light bulb 44 to emit light that can be viewed by the user. This feature is especially attractive to young consumers.

[0036] Referring again to FIG. 3, it will be seen that toothbrush 10 has a center of mass 52 that is positioned toward the handle 20 with respect to the dimensional midpoint 54 of the toothbrush 10. In other words, the center of mass 52 is located in the lower part of the toothbrush 10. As a result, when the toothbrush 10 is dropped the lower portion of the toothbrush 10 will tend to rotate toward the bottom as the toothbrush 10 falls, making it likely that the first portion of the toothbrush 10 to strike an underlying surface will be the suction cup pedestal 22. If this feature is both entertaining and also has utility, making it easier for a consumer to set the suction cup pedestal 22 onto a smooth, nonporous horizontal surface.

[0037] Another advantageous feature of the invention is that structure is provided on the handle 20 in order to be a consumer in transmitting the necessary axial force to the handle 20 in order to effectively set the suction cup pedestal 22 onto a smooth nonporous surface, and to later remove the toothbrush 10 from the surface. In the embodiment that is shown in FIGS. 1-4, this structure is embodied as a plurality of ribs 53 that are molded out of the soft plastic materials 36 onto the outer surface of the handle 20.

[0038] Another aspect of the invention is depicted in FIG. 6, which shows a preferred package assembly 56 for packaging a toothbrush 10 for retail to a consumer. Package assembly 56 is conventional in that it includes a stiff backing member 58 having a hook 60 defined in an upper end thereof, and that it is approximately one inch in width so as to be compatible with standard one-inch racks in retailing establishments. A blister pack 62 that is generally contoured for the toothbrush 10 is integral with the backing 58, as is also conventional. Most advantageously, however, blister pack 62 is configured, shaped and sized so as to protect the suction cup pedestal 22 against any lateral and axial contact with the package assembly 56 when it is in the package assembly 56. In the preferred embodiment, blister pack 62 is configured so that the handle 20 of the toothbrush 10 will settle downwardly into the blister pack 62 so as to contact at least two contact points 64 on the interior of the blister pack 62, thus suspending the toothbrush 10 so that the suction cup pedestal 22 is suspended within a protective volume 66 that is defined by the very bottom of the blister pack 62. By protecting the suction cup pedestal 22 against deformation during handling and transport, the long-term performance of the toothbrush 10 will be assured.

[0039] A toothbrush 70 that is constructed according to a second preferred embodiment of the invention is shown in FIGS. 7-9. A toothbrush 70 includes a brush portion 72 having a plurality of bristles 74 that are mounted to a brush head 76 that is unitary with a shaft 78. Toothbrush 70 further includes a handle 80, a suction cup pedestal 82 and a flexible transition portion 84 connecting the suction cup pedestal 82 to the handle 80. Toothbrush 70 differs from toothbrush 10 mainly in the fact that it does not include any electrical components. The suction cup pedestal 82 and the flexible transition portion 84, while not dimensionally identical to the suction cup pedestal 22 and flexible transition portion 24 in the first embodiment, share all of the mechanical characteristics that are described above with reference to the first embodiment. Accordingly, for reasons of brevity, the entire recitation of these characteristics and properties will not be repeated.

[0040] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts within the principles of the invention to the full extent indicated by the breadth of general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A toothbrush comprising:
   a brush portion having a plurality of bristles thereon;
   a handle having an upper end that is connected to said brush portion and a lower end, said handle having a central, longitudinal axis;
   a suction cup pedestal; and
a flexible transition portion connecting said lower end of said handle to said suction cup pedestal, said handle, suction cup pedestal and flexible transition portion being constructed and arranged so that said toothbrush will normally be oriented in a substantially upright position when said suction cup pedestal is affixed to a horizontal surface, said flexible transition portion being sufficiently flexible so as to permit said toothbrush to be deflected when said suction cup pedestal is affixed to a horizontal surface so that said central longitudinal axis of said handle is at least 20 degrees from vertical.

2. A toothbrush according to claim 1, wherein said flexible transition portion is sufficiently flexible so as to permit said toothbrush to be deflected when said suction cup pedestal is affixed to a horizontal surface so that said central longitudinal axis of said handle is at least 30 degrees from vertical.

3. A toothbrush according to claim 2, wherein said flexible transition portion is sufficiently flexible so as to permit said toothbrush to be deflected when said suction cup pedestal is affixed to a horizontal surface so that said central longitudinal axis of said handle is at least 45 degrees from vertical.

4. A toothbrush according to claim 1, wherein said suction cup pedestal is constructed and arranged to have a suction force that is sufficient to remain affixed to a smooth, non-porous horizontal surface when said toothbrush is deflected so that said central longitudinal axis of said handle is at least 20 degrees from vertical.

5. A toothbrush according to claim 1, wherein said suction cup pedestal has a maximum outer diameter and said flexible transition portion has a minimum outer diameter, and wherein said maximum outer diameter of said flexible transition portion is no more than 80 percent of said maximum outer diameter of said suction cup pedestal.

6. A toothbrush according to claim 5, wherein said minimum outer diameter of said flexible transition portion is no more than 55 percent of said maximum outer diameter of said suction cup pedestal.

7. A toothbrush according to claim 5, wherein said minimum outer diameter of said flexible transition portion is axially separated from said maximum outer diameter of said suction cup pedestal by a distance of at least 0.15 in.

8. A toothbrush according to claim 1, wherein said suction cup pedestal has a maximum outer diameter, and wherein said flexible transition portion and said handle are constructed so that said toothbrush has a maximum outer dimension that is sufficiently less than said maximum outer diameter for an axial distance away from said suction cup pedestal so that said suction cup pedestal may operate as a stop abutting a user’s finger so as to secure a user’s grip on said toothbrush.

9. A toothbrush according to claim 8, wherein said axial distance is at least 0.5 inches.

10. A toothbrush according to claim 9, wherein said axial distance is at least 0.75 inches.

11. A toothbrush according to claim 10, wherein said axial distance is at least one inch.

12. A toothbrush according to claim 8, wherein said maximum outer dimension of said toothbrush is no more than approximately 75 percent of said maximum outer diameter of said suction cup pedestal for an axial distance away from said suction cup pedestal, and wherein said axial distance is at least 1.0 inches.

13. A toothbrush according to claim 8, wherein said maximum outer dimension of said toothbrush is no more than approximately 0.2 in. less than said maximum outer diameter of said suction cup pedestal for an axial distance away from said suction cup pedestal, and wherein said axial distance is at least 1.0 inches.

14. A toothbrush according to claim 13, wherein said maximum outer dimension of said toothbrush is no more than approximately 0.4 in. less than said maximum outer diameter of said suction cup pedestal for an axial distance away from said suction cup pedestal, and wherein said axial distance is at least 1.0 inches.

15. A toothbrush according to claim 1, wherein said suction cup pedestal has a maximum outer diameter, and wherein said maximum outer diameter of said suction cup pedestal is also a maximum outer dimension of said toothbrush.

16. A toothbrush according to claim 1, wherein said handle, said flexible transition portion and said suction cup pedestal are fabricated from a hard plastic material and a soft plastic material that is softer than hard plastic material and that is integrally molded with said hard plastic material, said soft plastic material forming said suction cup pedestal.

17. A toothbrush according to claim 16, wherein said soft plastic material is bonded to said hard plastic material in at least the area of interface between said materials that is closest to said suction cup pedestal, whereby forces generated by deflecting or twisting said suction cup pedestal with respect to said handle will be more efficiently transmitted to and absorbed by said hard plastic material.

18. A toothbrush according to claim 16, whereby an area of interface between said soft plastic material and said hard plastic material that is closest to said suction cup pedestal is constructed without sharp edges, whereby points of stress concentration are avoided that might contribute to crack initiation in said soft plastic material when said suction cup pedestal is deflected or twisted with respect to said handle.

19. A toothbrush according to claim 1, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand without failure twisting of at least 2.0 lbf-in.

20. A toothbrush according to claim 19, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand without failure twisting of at least 3.0 lbf-in.

21. A toothbrush according to claim 1, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand without failure axial tension of at least 10.0 lbf.

22. A toothbrush according to claim 21, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand without failure axial tension of at least 15.0 lbf-in.

23. A toothbrush according to claim 1, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand without failure a bite test of at least 25 lbf.

24. A toothbrush according to claim 23, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand without failure a bite test of at least 50 lbf.

25. A toothbrush according to claim 2, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand a deflection to 30 degrees for at least 5000 repetitions without failure.
26. A toothbrush according to claim 25, wherein both said flexible transition portion and said suction cup pedestal are constructed and arranged so as to be able to withstand a deflection to 30 degrees for at least 10,000 repetitions without failure.

27. A toothbrush according to claim 1, wherein said suction cup pedestal is constructed and arranged so as to adhere to a smooth, nonporous surface to which it has been affixed with at least 3 lbf.

28. A toothbrush according to claim 27, wherein said suction cup pedestal is further constructed and arranged so as to be able to withstand affixation and removal to and from a smooth, nonporous surface at least 1000 times without failure.

29. A toothbrush according to claim 1, wherein said toothbrush has a center of mass that is located toward said suction cup pedestal from a dimensional midpoint of said toothbrush, whereby when said toothbrush is dropped said suction cup pedestal will tend to strike an underlying surface first.

30. A toothbrush according to claim 1, further comprising gripping means on said handle for aiding a consumer in transmitting the necessary axial force to said handle in order to effectively set said suction cup pedestal onto a smooth, nonporous surface and to remove said toothbrush from said surface.

31. A toothbrush according to claim 3, further comprising gripping means on said handle for aiding a consumer in transmitting the necessary axial force to said handle in order to effectively set said suction cup pedestal onto a smooth, nonporous surface and to remove said toothbrush from said surface.

32. A toothbrush according to claim 1, wherein said suction cup pedestal is capable of adhering to a smooth, nonporous surface with sufficient force and said flexible transition portion is sufficiently stiff as to permit said toothbrush to remain affixed to said vertical smooth nonporous surface for at least one hour.

33. A toothbrush according to claim 3, wherein said suction cup pedestal is capable of adhering to a smooth, nonporous surface with sufficient force and said flexible transition portion is sufficiently stiff as to permit said toothbrush to remain affixed to said vertical smooth nonporous surface for at least 12 hours.

34. A toothbrush according to claim 1, wherein said suction cup pedestal is capable of adhering to a smooth, nonporous surface with sufficient force and said flexible transition portion is sufficiently stiff as to permit said toothbrush to remain affixed to said vertical smooth nonporous surface for at least 24 hours.

35. A toothbrush according to claim 4, wherein said suction cup pedestal is capable of adhering to a smooth, nonporous surface with sufficient force and said flexible transition portion is sufficiently stiff as to permit said toothbrush to remain affixed to said vertical smooth nonporous surface for at least 24 hours.

36. A toothbrush and packaging assembly comprising:

a toothbrush including a brush portion having a plurality of bristles thereon; a handle having an upper end that is connected to said brush portion and a lower end, said handle having a central, longitudinal axis; a suction cup pedestal; and a flexible transition portion connecting said lower end of said handle to said suction cup pedestal; and

a package for said toothbrush, said package being constructed and arranged so that said toothbrush is held within said package so that said suction cup pedestal is isolated from any lateral contact with said package, whereby said suction cup pedestal will be protected against forces that could deform said suction cup pedestal and thereby degrade the performance of said toothbrush.

37. A toothbrush and packaging assembly according to claim 36, wherein said package is further constructed and arranged to isolate said suction cup pedestal against any axial contact with said package as well.

38. A toothbrush and packaging assembly according to claim 36, wherein said package is constructed and arranged to be displayed on a marketing rack, and wherein said package bears against said handle of said toothbrush so as to suspend said suction cup pedestal within a package that is defined within said package.

39. A toothbrush comprising:

a brush portion having a plurality of bristles thereon;

a handle having an upper end that is connected to said brush portion and a lower end, said handle having a central, longitudinal axis;

a pedestal connected to said lower end of said handle, said pedestal having a maximum outer diameter and being constructed and arranged to support said toothbrush on a horizontal surface so that said central longitudinal axis of said handle will be substantially perpendicular to the horizontal surface, wherein said handle is constructed to have a maximum outer dimension that is sufficiently less than said maximum outer diameter for an axial distance away from said pedestal so that said pedestal may operate as a stop abutting a users finger so as to secure a users grip on said toothbrush.

40. A toothbrush according to claim 39, wherein said pedestal is fabricated from a soft elastomeric material, whereby it will feel comfortable against a users finger when operating as a stop.

41. A toothbrush according to claim 40, wherein said pedestal is further fabricated to be relatively thin so as to flex when contacted by a users finger.

42. A toothbrush according to claim 39, wherein said maximum outer dimension is no more than 55 percent of said maximum outer diameter.

43. A toothbrush according to claim 39, wherein said maximum outer dimension is no more than 45 percent of said maximum outer diameter.

44. A toothbrush according to claim 44, wherein said axial distance is at least 0.5 inches.

45. A toothbrush according to claim 44, wherein said axial distance is at least one inch.

46. A toothbrush according to claim 39, further comprising a flexible transition portion interposed between said handle and said pedestal, said flexible transition portion being sufficiently flexible so as to permit said toothbrush to be deflected when said pedestal is held against a horizontal surface so that said central longitudinal axis of said handle is at least 20 degrees from vertical.