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(54) **MANEUVERABLE BRISTLE TOOTHBRUSH**

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(57) **ABSTRACT**

The present invention provides a toothbrush having a bristle-carrying head portion (**30**) and a handle portion (**22**), said handle portion having a proximal end (**22***b*) and a distal end (**22***a*), said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles (**32***a*, **32***b*) embedded within said toothbrush head portion (**30**), wherein linear movement along the longitudinal axis of said handle portion (**22**) is redirected by said effecter to a three dimensional crescent shaped sweeping action of said maneuverable bristles.

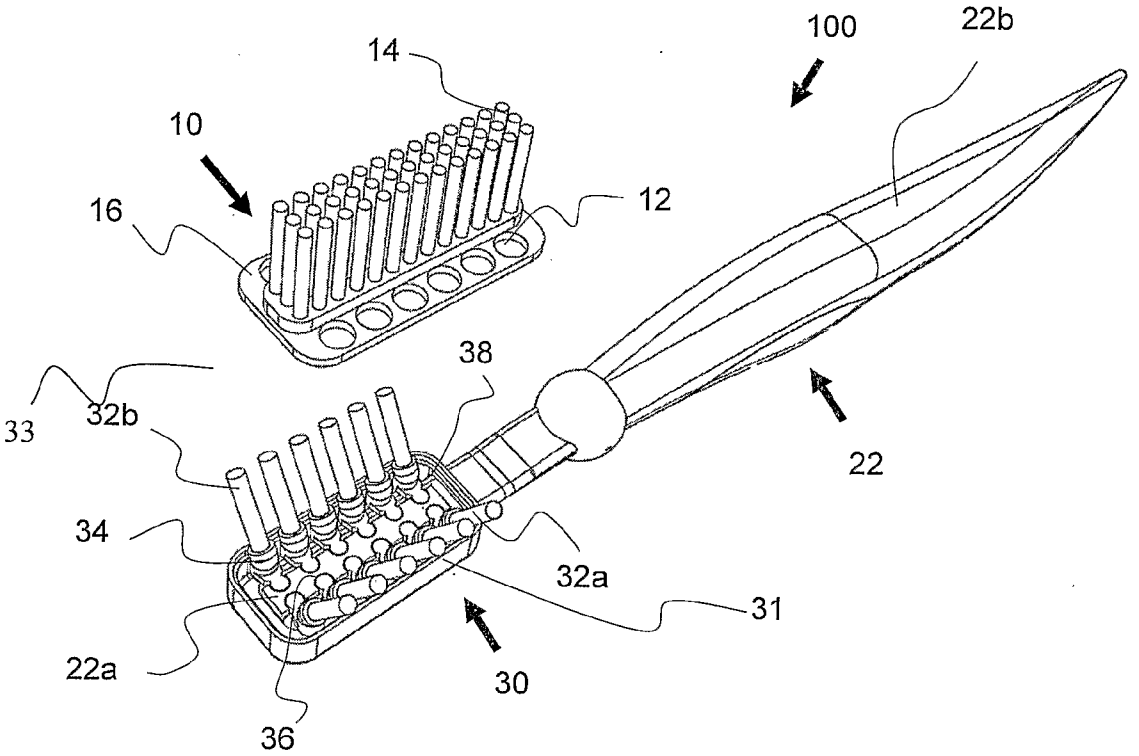


Fig.1

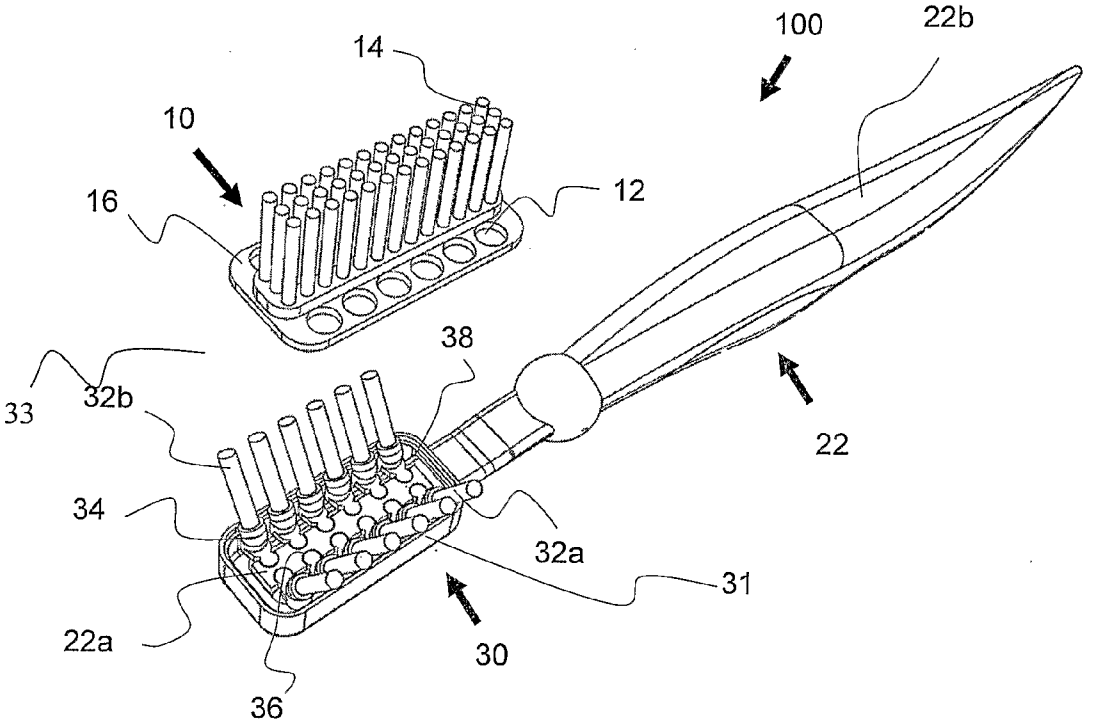


Fig.2

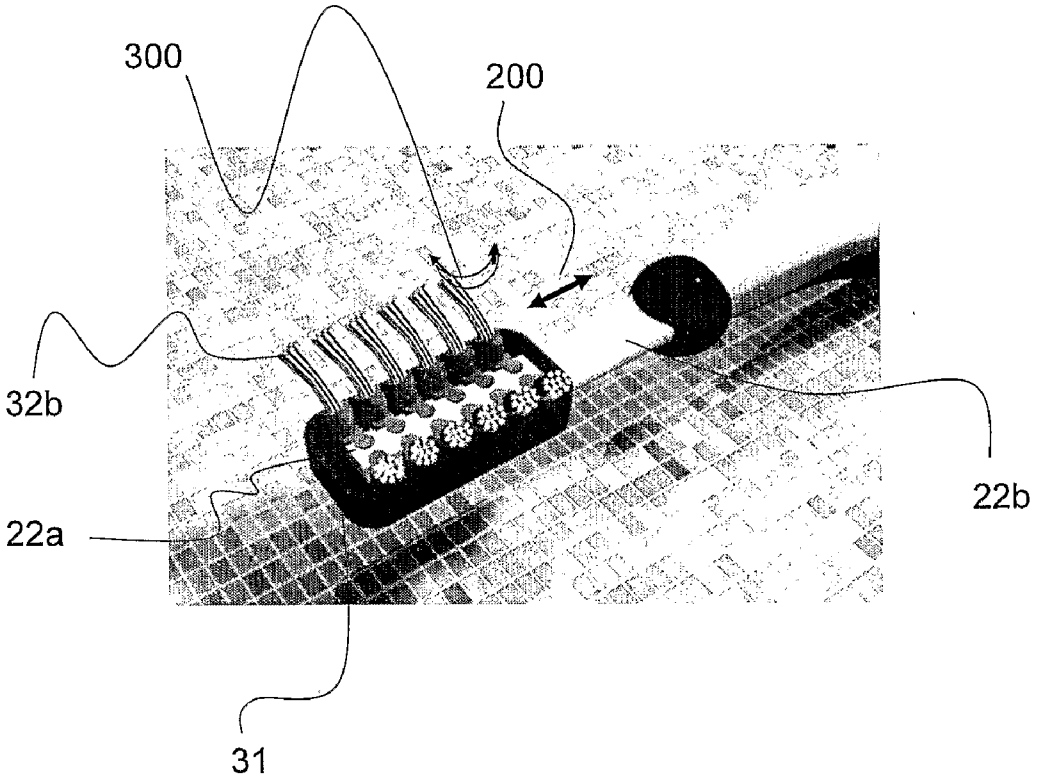


Fig. 3

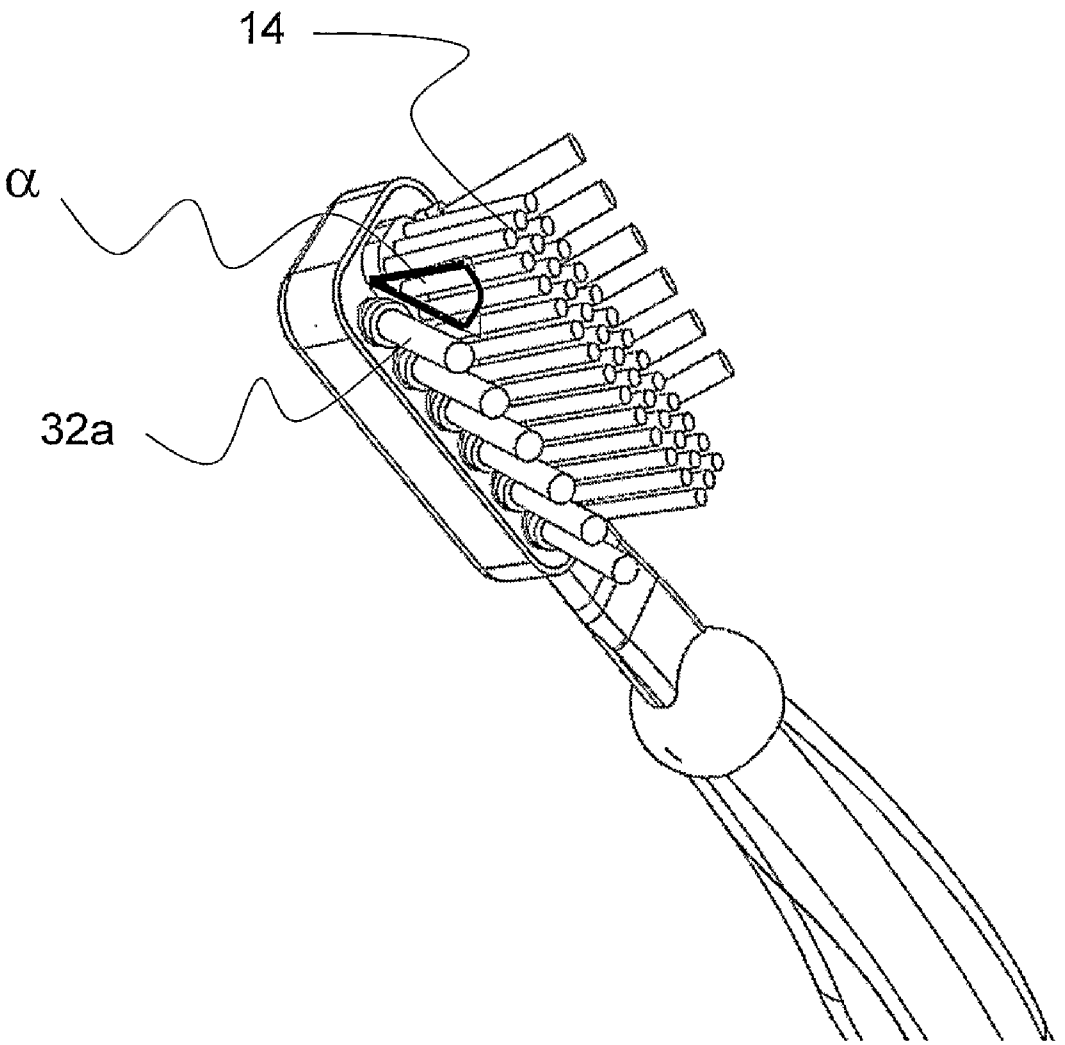


Fig. 4

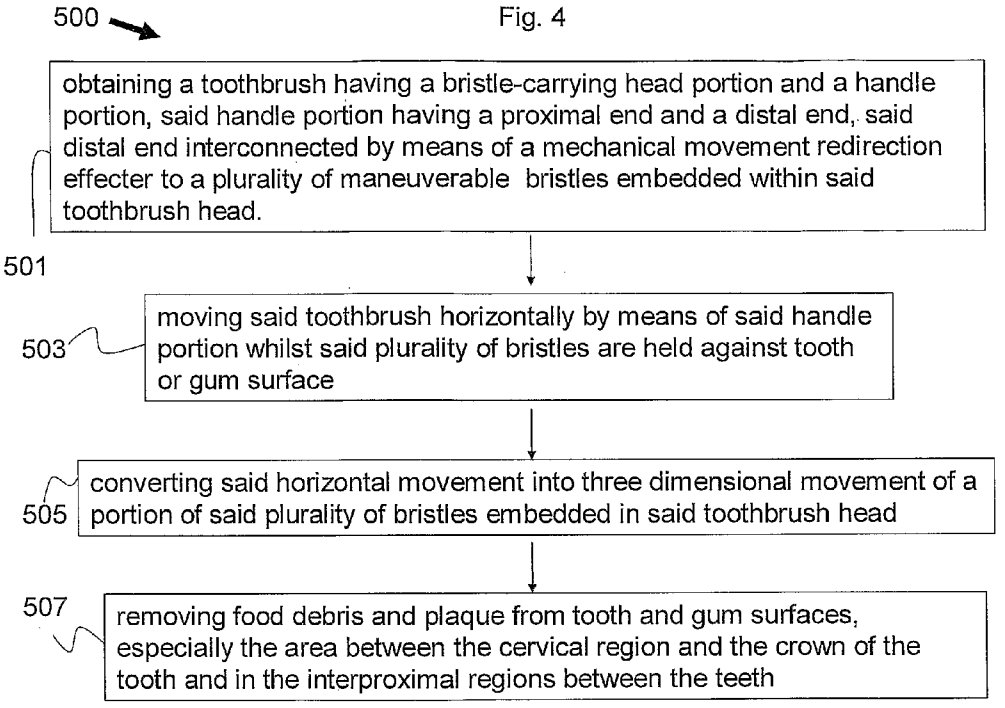

500
obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head.
501
moving said toothbrush horizontally by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface
503
converting said horizontal movement into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head
505
removing food debris and plaque from tooth and gum surfaces, especially the area between the cervical region and the crown of the tooth and in the interproximal regions between the teeth
507

Fig. 5

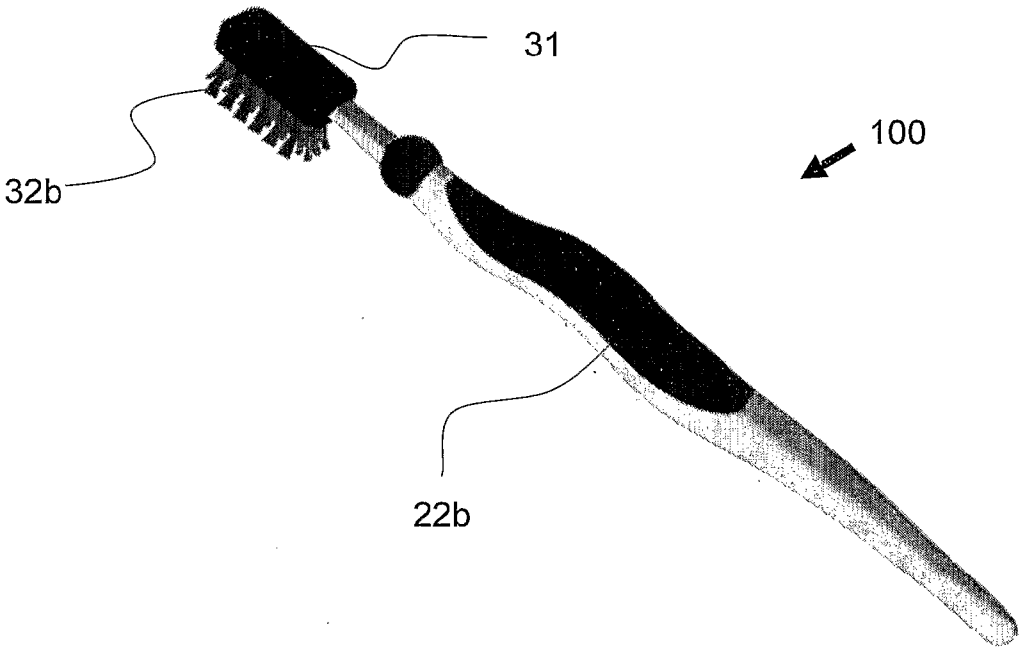


Fig. 6

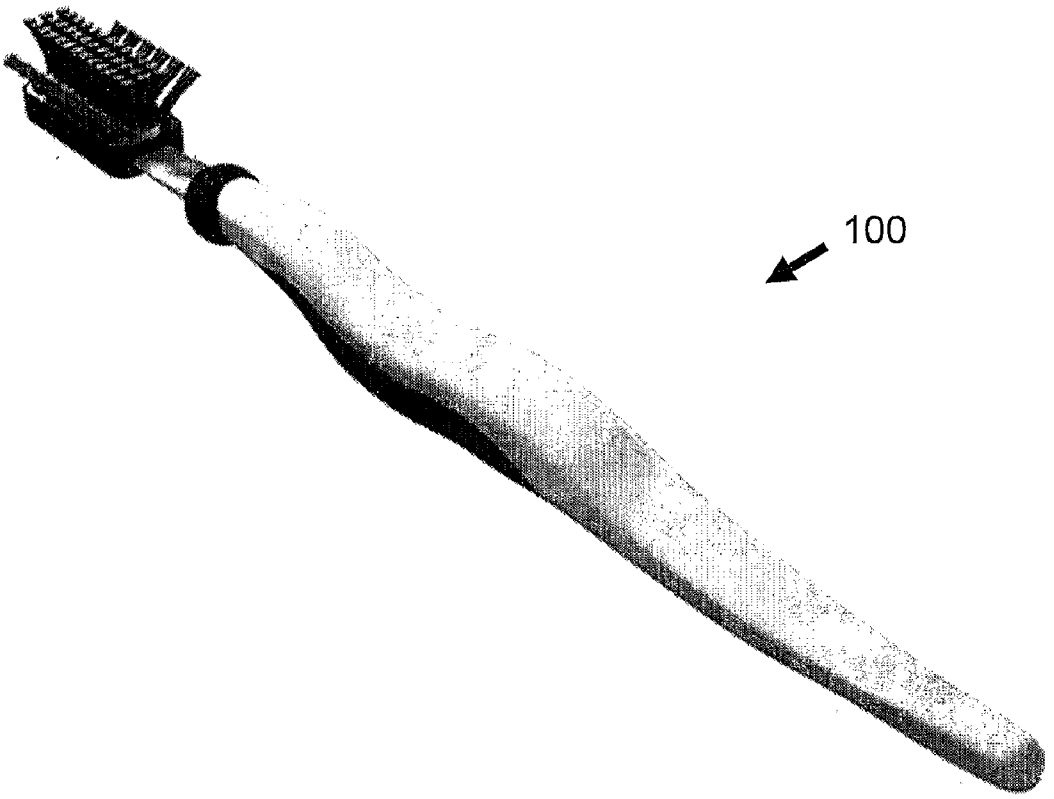


Fig. 7

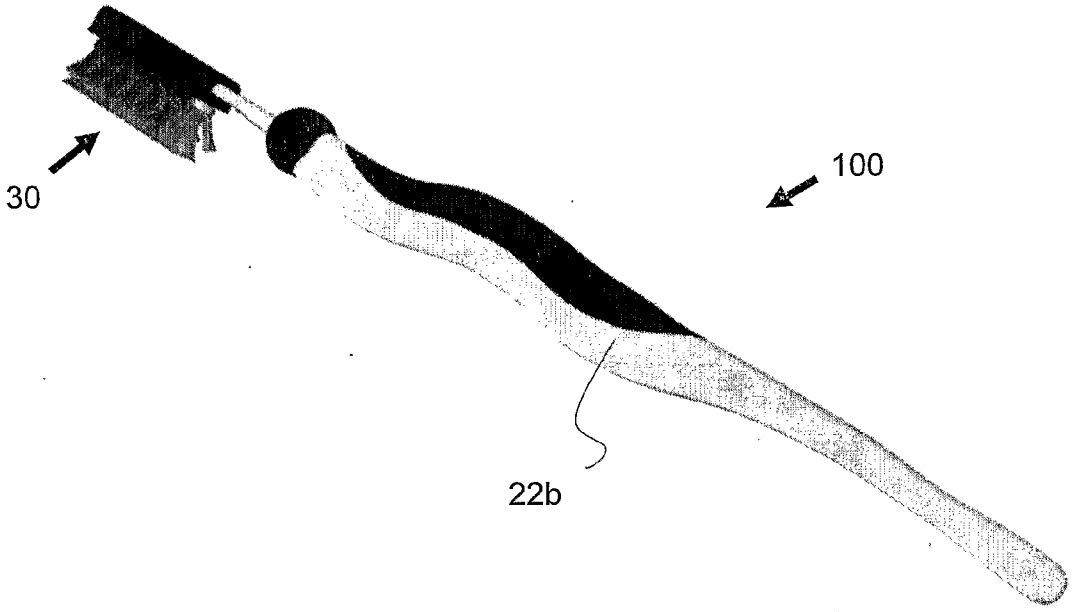


Fig. 8

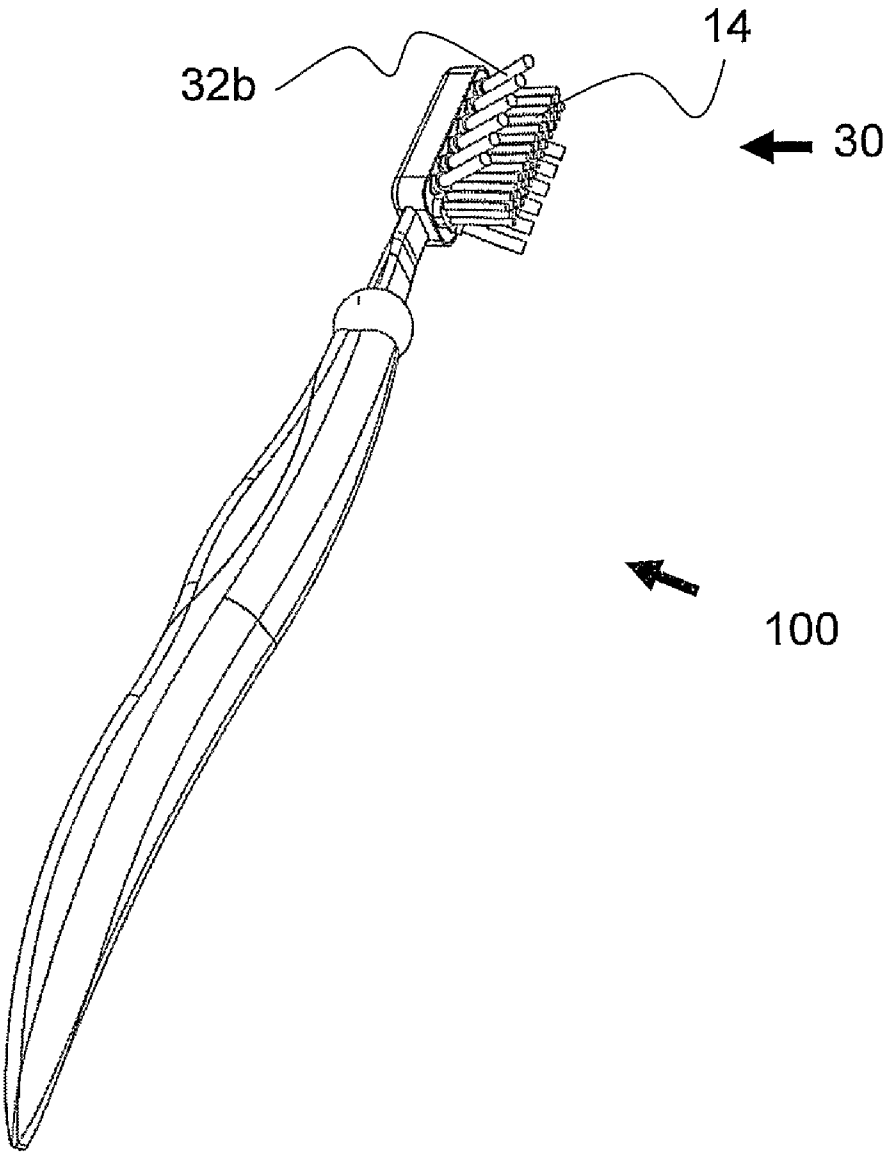


Fig. 9

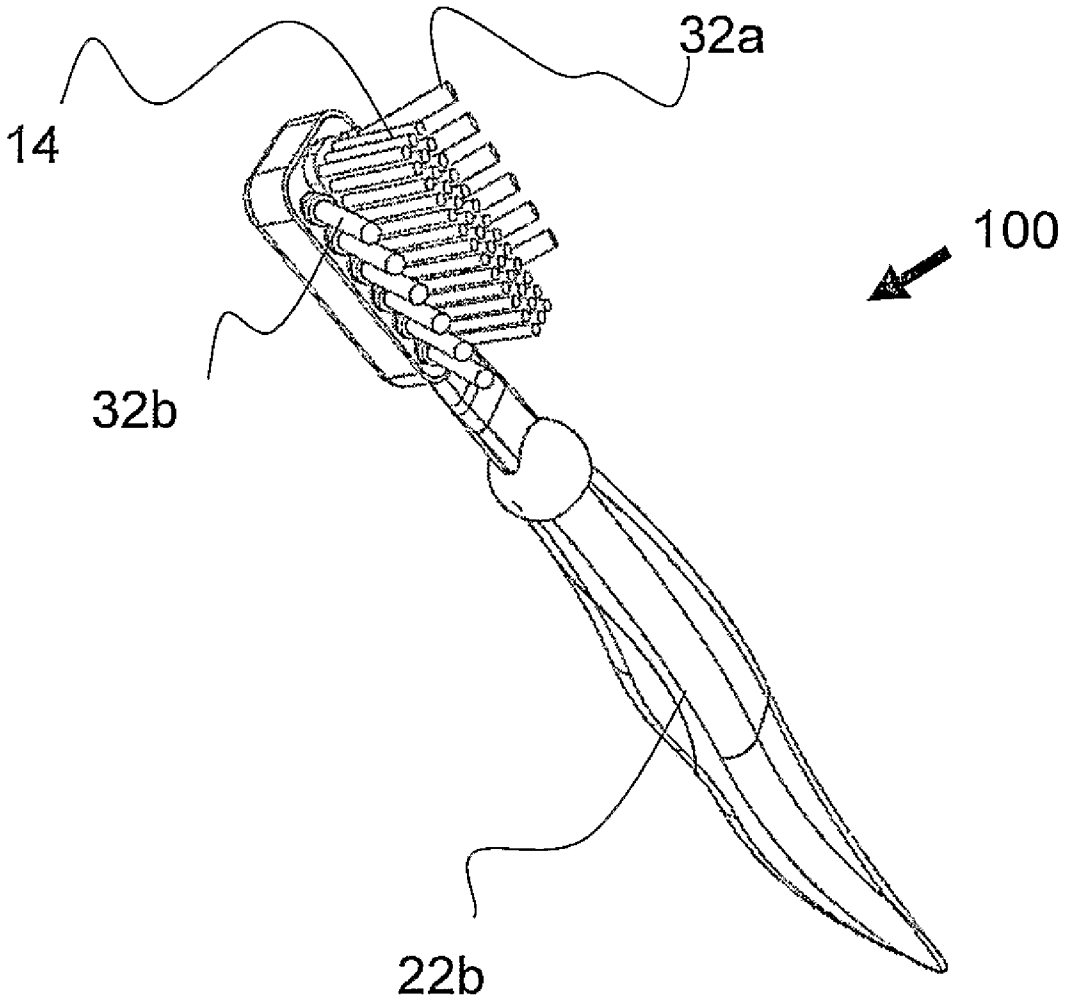


Fig. 10

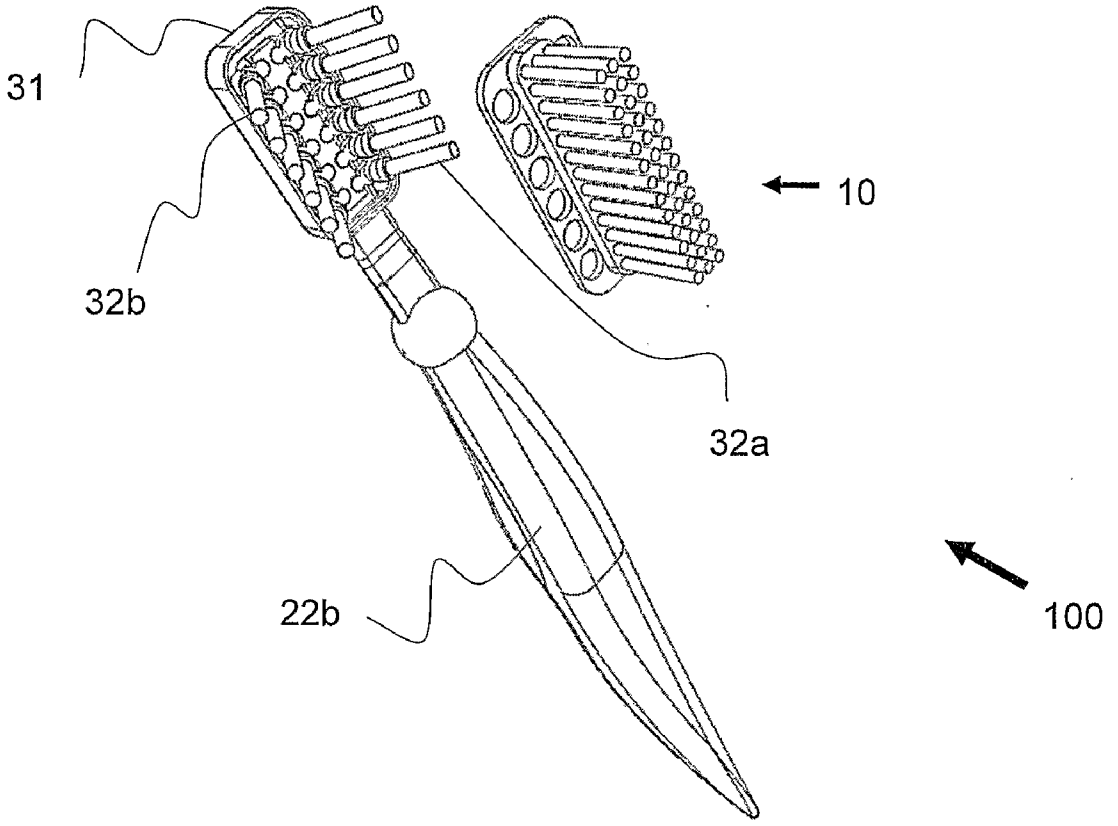


Fig. 11

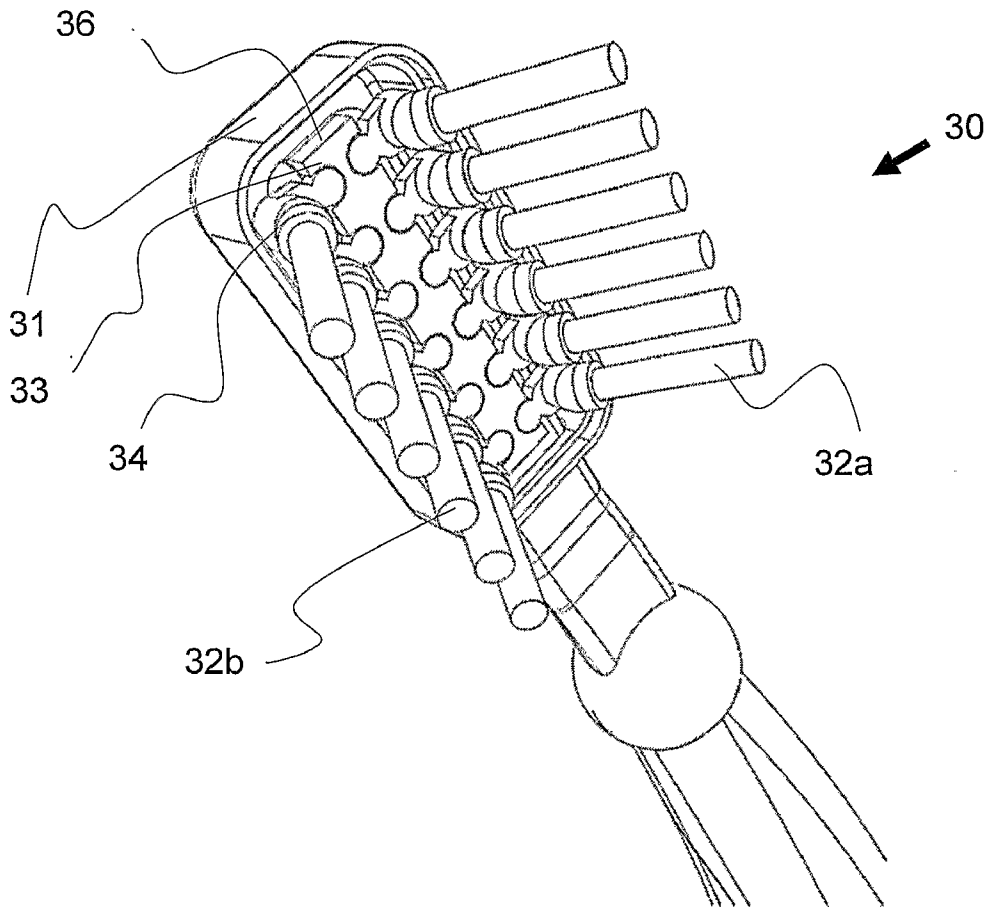


Fig. 12

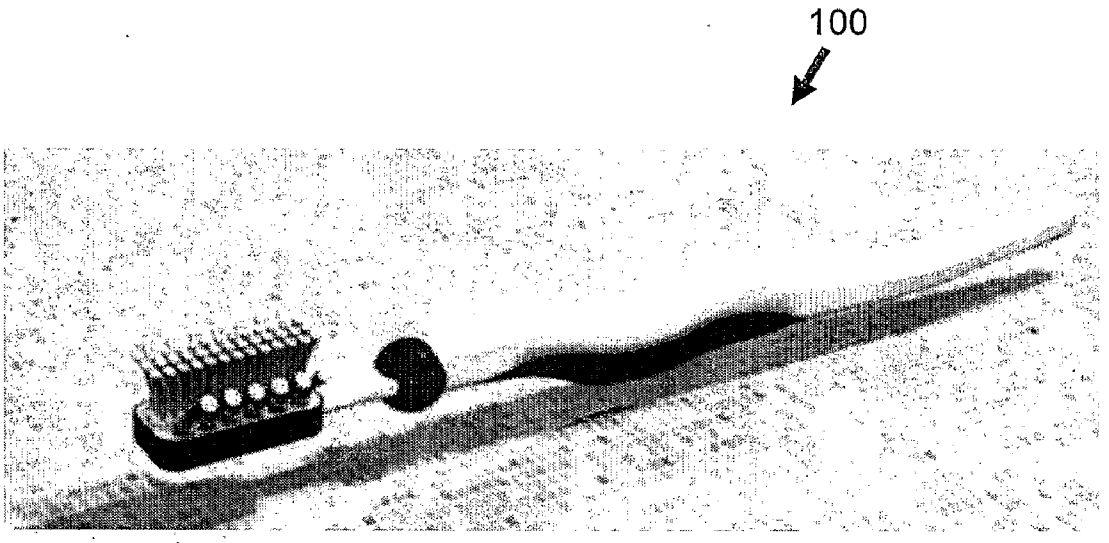


Fig. 13

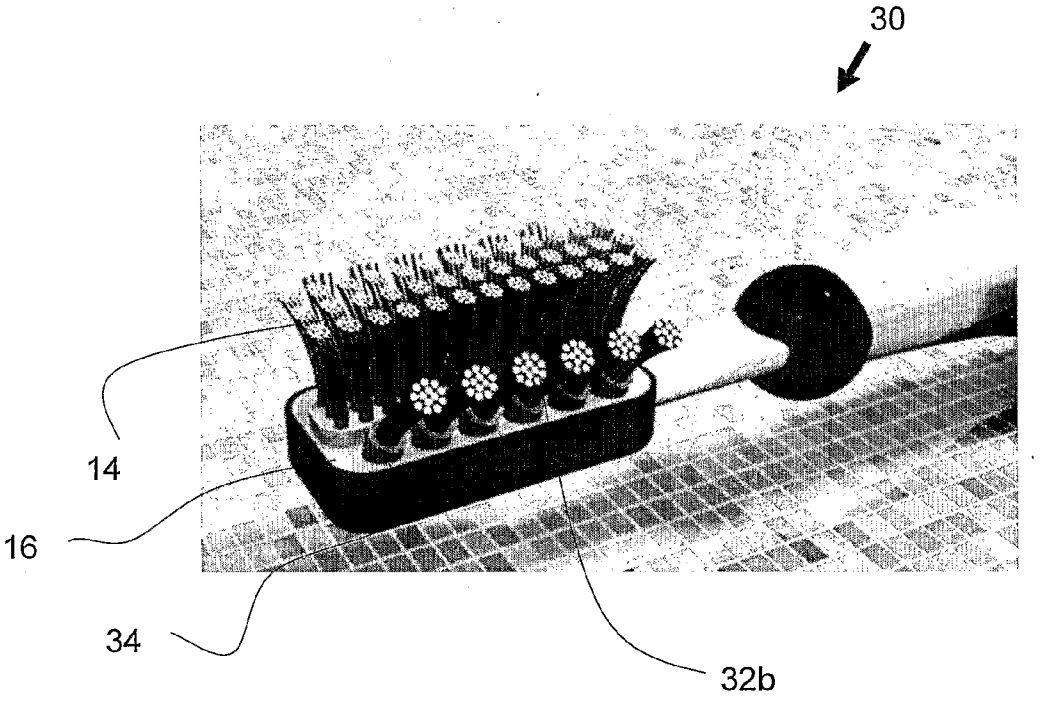


Fig. 14

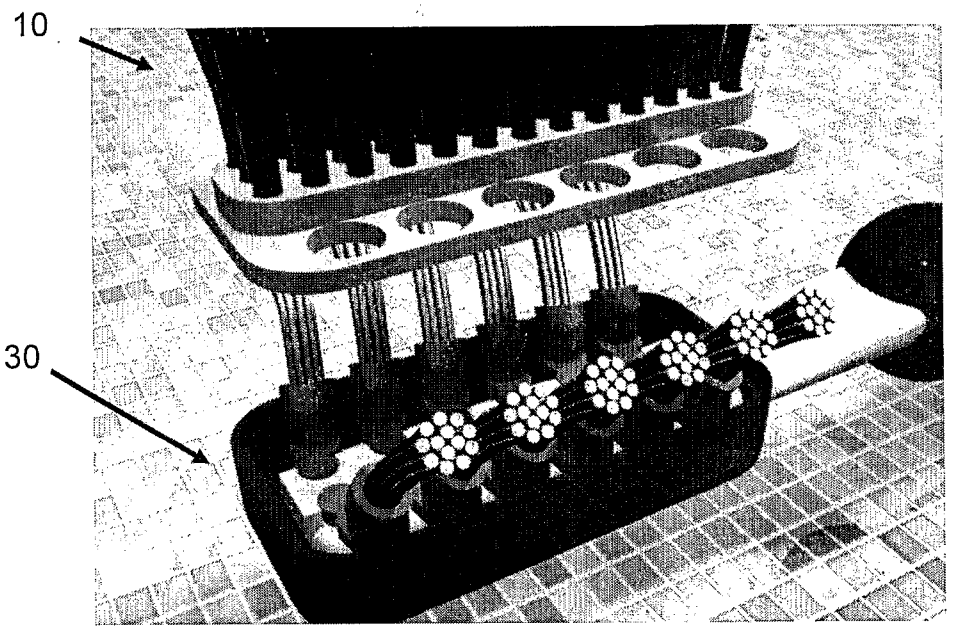


Fig. 15

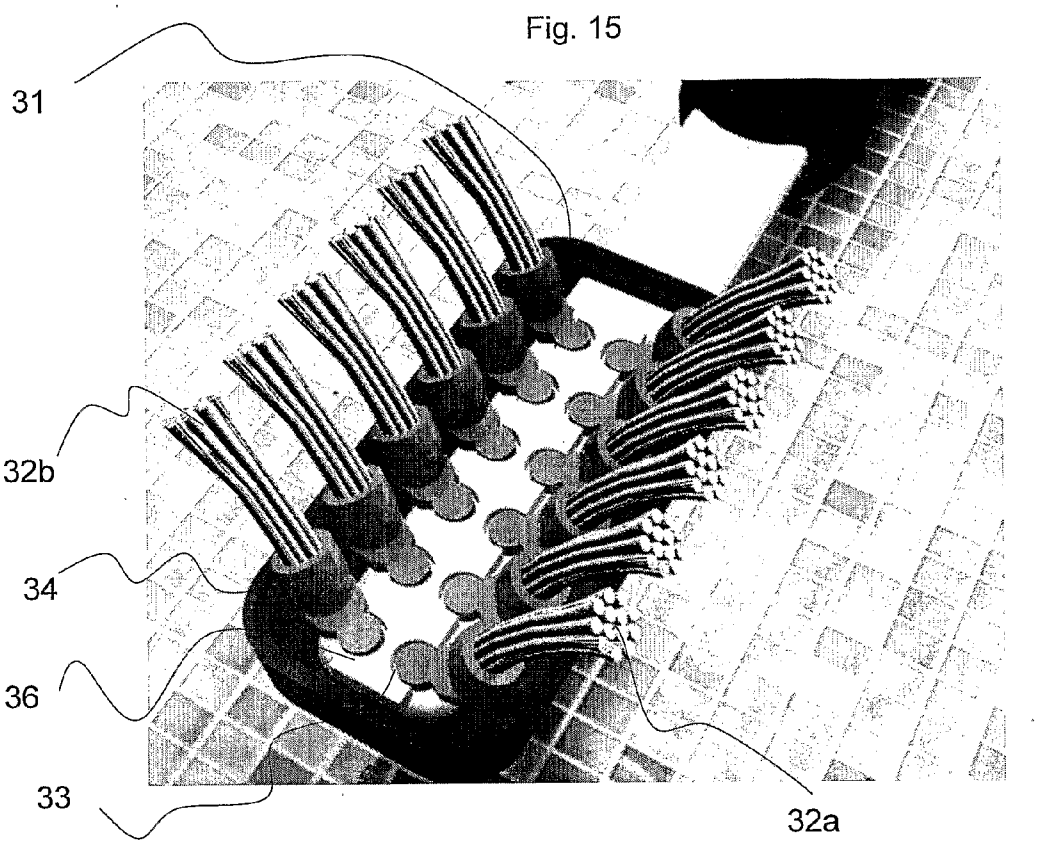


Fig. 16

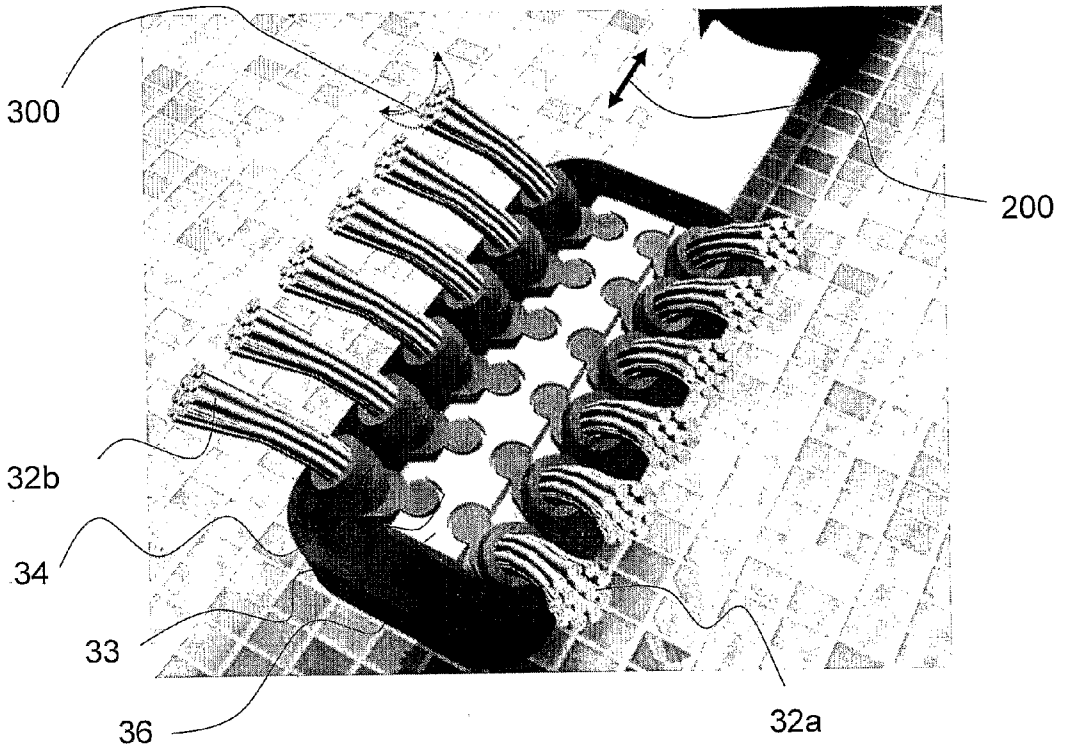


Fig. 17

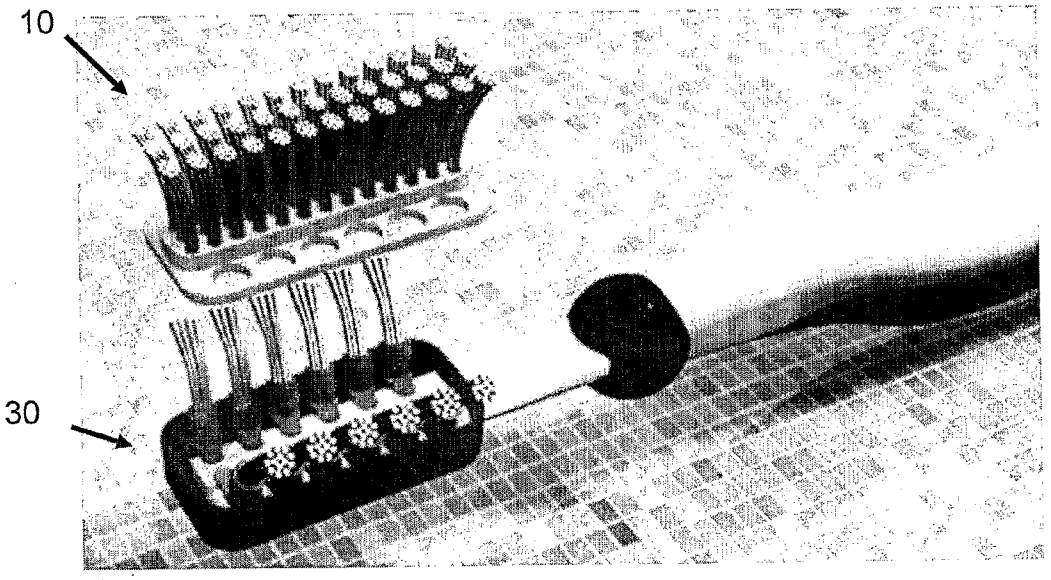


Fig. 18

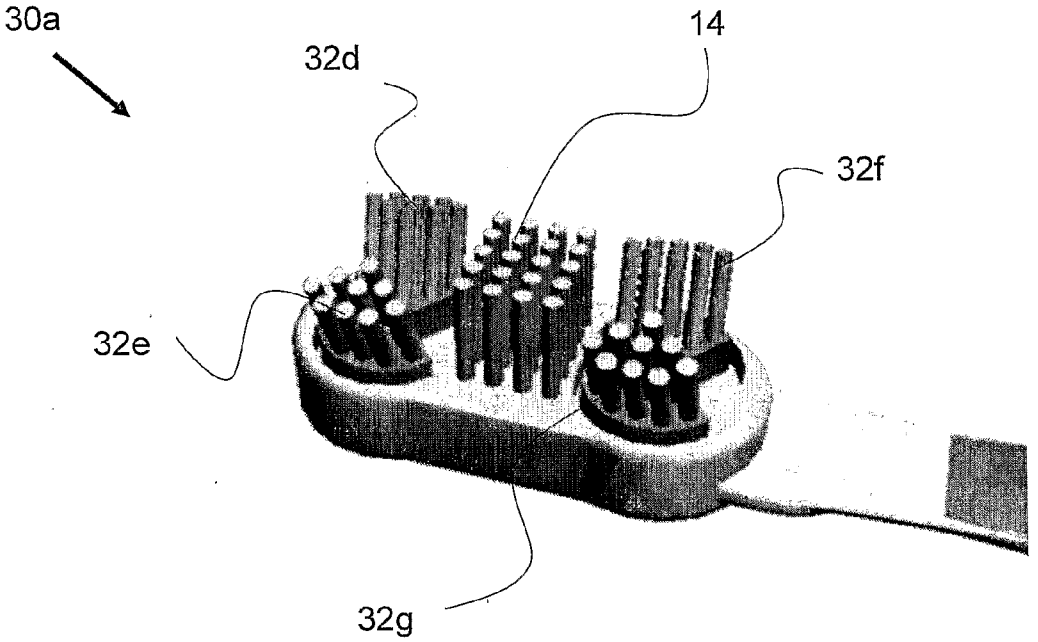


Fig. 19

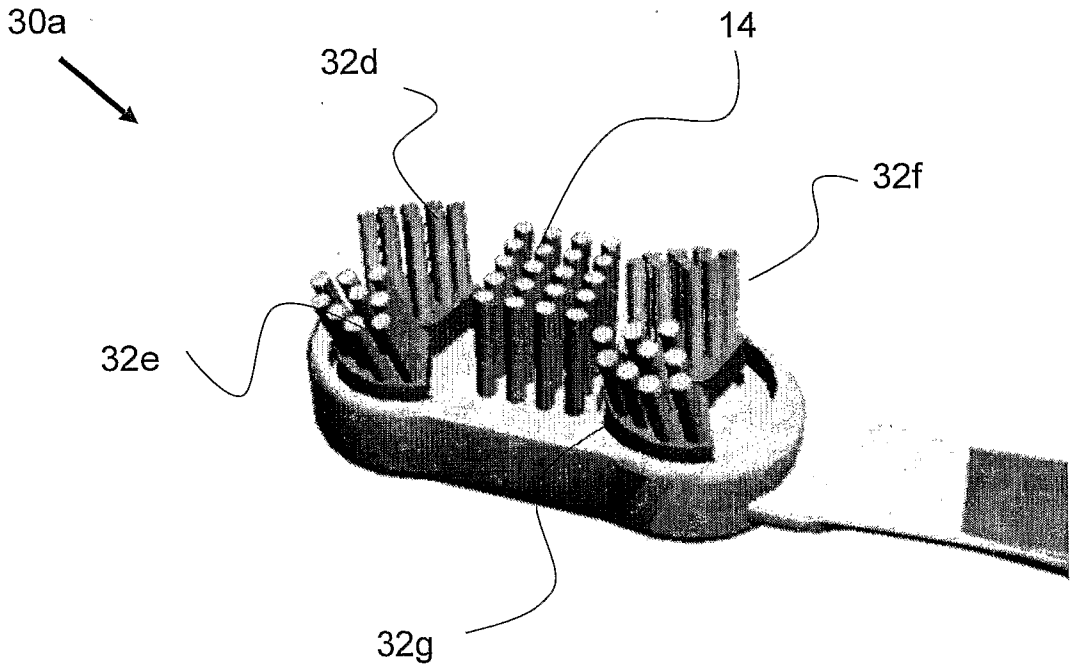


Fig. 20

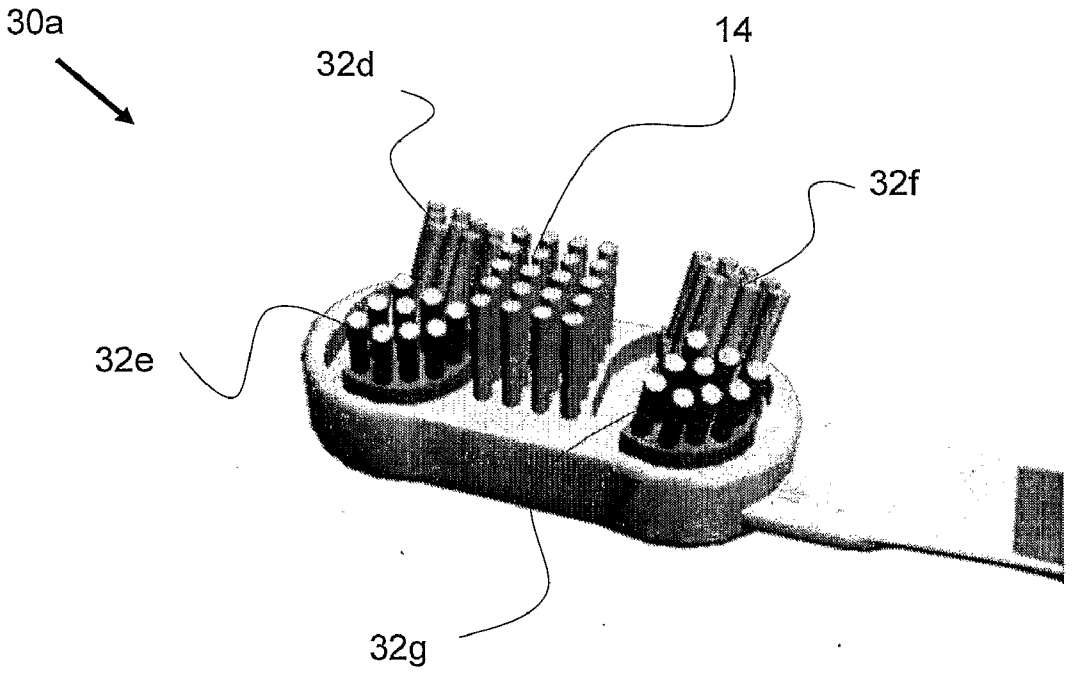


Fig. 21

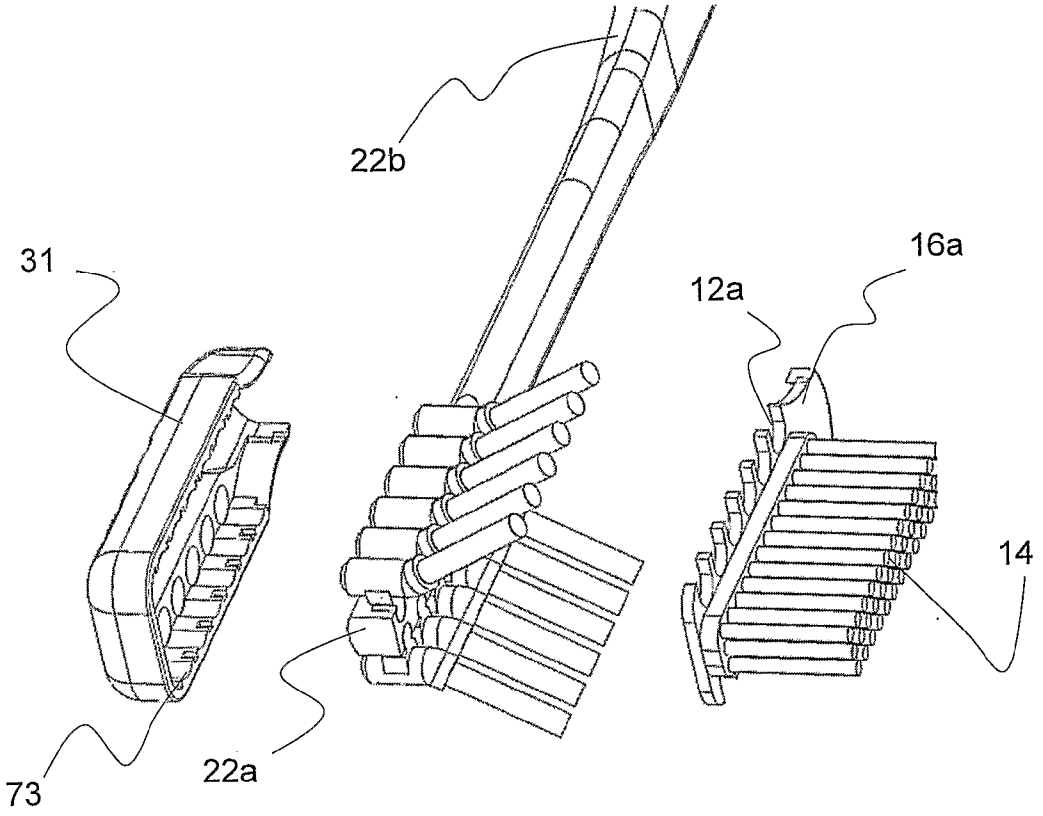


Fig. 22

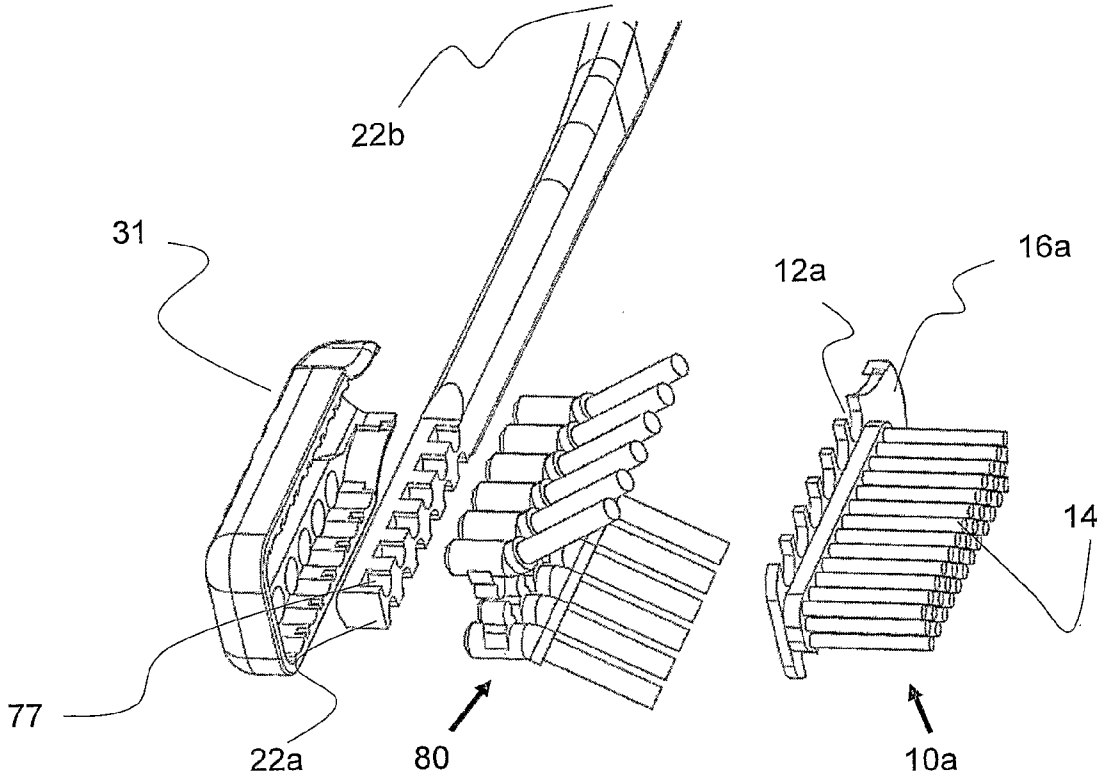


Fig. 23

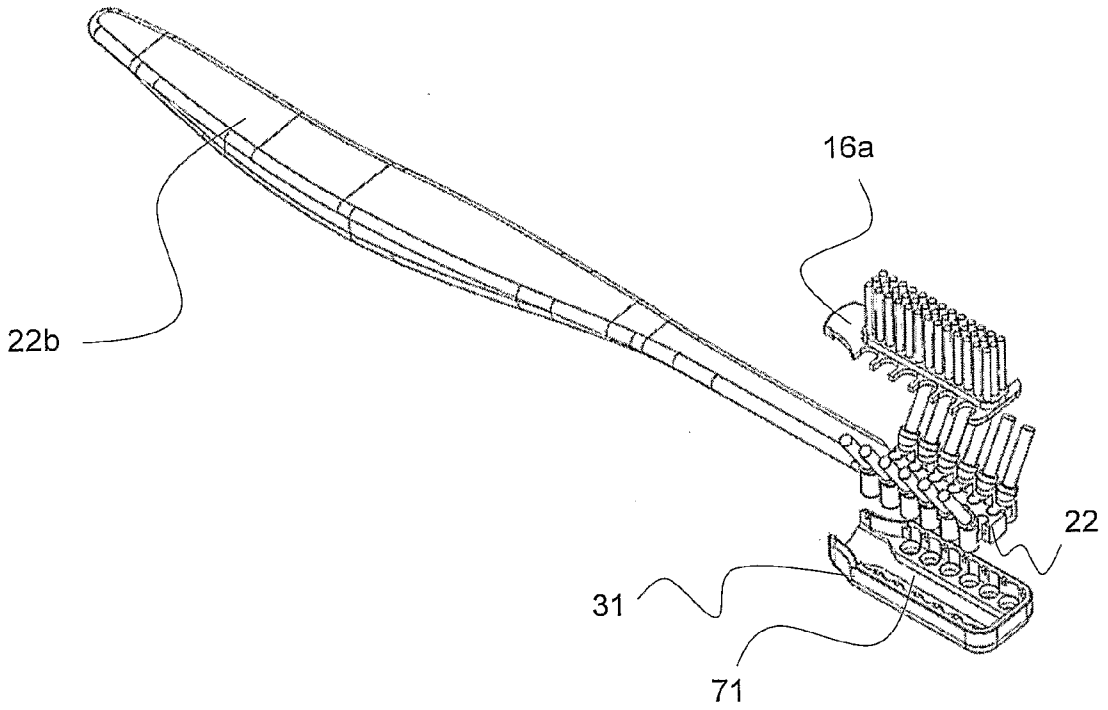


Fig. 24

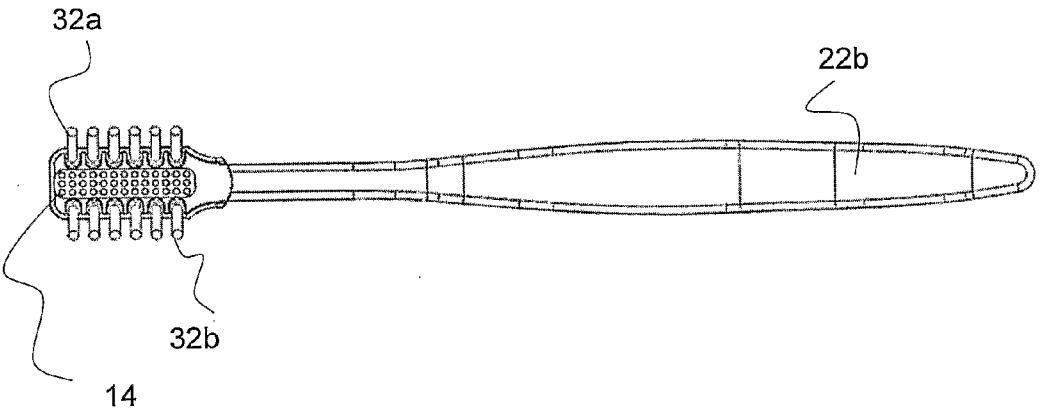


Fig. 25

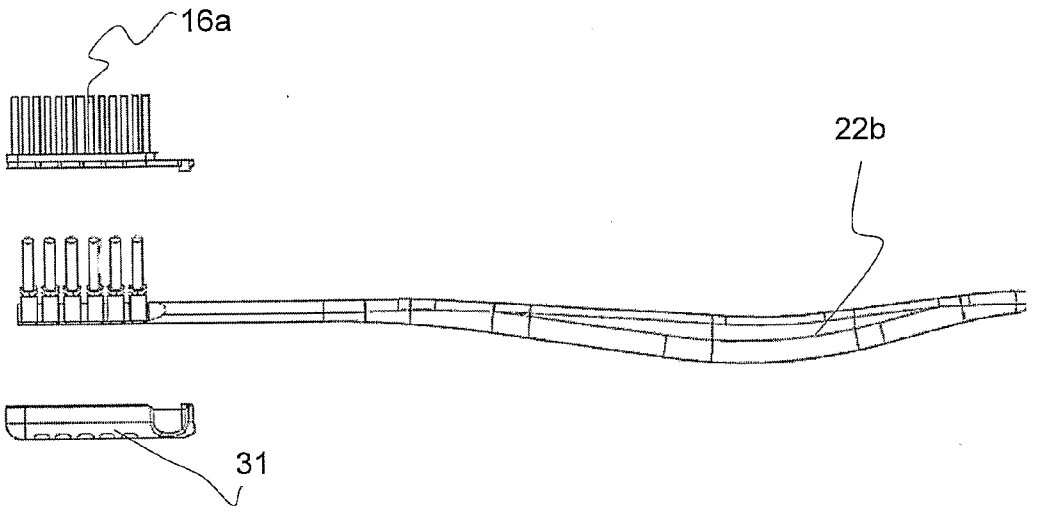
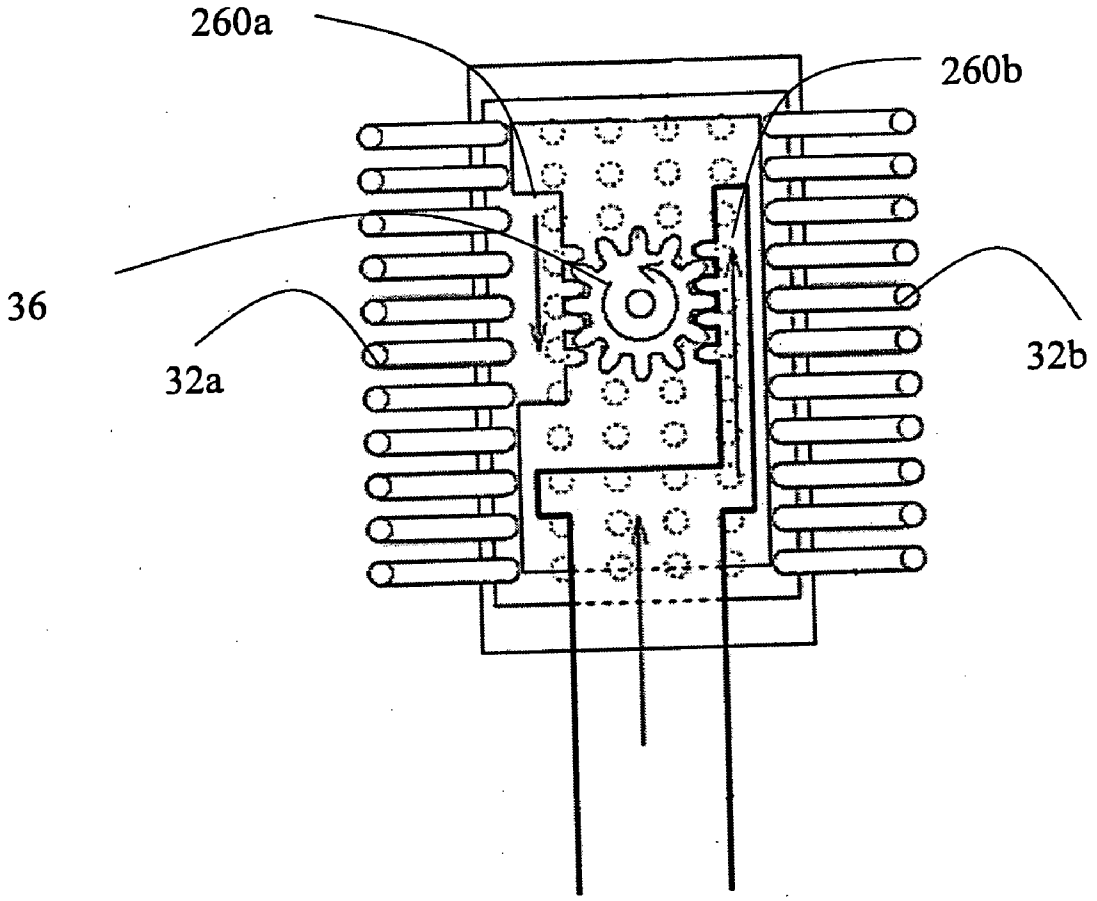


Fig. 26



MANEUVERABLE BRISTLE TOOTHBRUSH

FIELD OF THE INVENTION

[0001] The present invention generally pertains to a maneuverable-bristle toothbrush, and more specifically to manually maneuverable-bristle toothbrush.

BACKGROUND OF THE INVENTION

[0002] Regular tooth brushing is very important in preventing tooth decay and gum disease. Brushing your teeth removes the bacteria of dental plaque that promote tooth decay and that can cause gum disease. Brushing teeth is a simple task, but lots of people brush their teeth incorrectly, either skipping around so much that they don't really clean anything, or rubbing so hard that they actually damage their teeth and gums. No matter how good you try to brush your teeth, some bacteria will always be left behind. The growth of dental plaque starts again the moment you stop brushing your teeth and remove the toothbrush from your mouth. That is why you should be very careful to use proper tooth brushing techniques so that the percentage of bacteria left behind will be the lowest possible.

[0003] Proper brushing is essential for cleaning teeth and gums effectively. In order to do so, one must obtain a toothbrush with soft, nylon, round-ended bristles that will not scratch and irritate teeth or damage gums, and apply the following succession of actions: (1) Place bristles along the gum line at a 45-degree angle. Bristles should contact both the tooth surface and the gum line. (2) Gently brush the outer tooth surfaces of 2-3 teeth using a vibrating back & forth rolling motion. Move brush to the next group of 2-3 teeth and repeat. (3) Maintain a 45-degree angle with bristles contacting the tooth surface and gumline. Gently brush using back, forth, and rolling motion along all of the inner tooth surfaces. (4) Tilt brush vertically behind the front teeth. Make several up & down strokes using the front half of the brush. (5) Place the brush against the biting surface of the teeth & use a gentle back & forth scrubbing motion. Brush the tongue from back to front to remove odor-producing bacteria.

[0004] In view of conventional manual-operated toothbrushes, different brushing methods can be practiced using a single toothbrush according to the different manner in which the toothbrush is held or moved. However, the action of brushing the teeth must be sustained more than 20 minutes in accordance with a proper tooth-cleaning process in order to secure sufficient cleaning effectiveness. This is inconvenient for brushing because of such a considerable period of time.

[0005] Meanwhile, electric toothbrushes are constructed to require less time for brushing than the manually operated toothbrushes, in consideration of respective movements dictated by, for example, the rolling process and/or the bath process, to be specific, one of the movement by the rolling process and the movement by the bath process, or otherwise a changeover between the former and the latter. Yet electric toothbrushes are generally cumbersome and costly to maintain.

[0006] U.S. Pat. No. 6,453,499 discloses a toothbrush having a handle that can move relative to a head portion equipped with rotatable bristle assemblies. The rotation of the bristles of the bristle assemblies is effected by a manual operable drive member consisting of a rack and a plurality of mating pinions from which the bristle extend. U.S. Pat. No. 5,276,932 discloses improvements to a manually operated, rotary bristle toothbrush. A thumb actuated mechanism is slidably and longitudinally mounted in an essentially hollow, elongate handle and a part of the mechanism, a rack, is caused to engage at least one compound pinion/spur gear in order to convert longitudinally reciprocative motion to rotary motion that is shunted toward the head of the toothbrush.

[0007] U.S. Pat. No. 5,528,786 discloses a toothbrush comprising an elongated handle, a bristle support member articulately mounted on one end of the handle so as to be constrained, in use, into limited reciprocal movement with respect to the handle and in a direction of longitudinal axis of the handle. The toothbrush further comprising a plurality of bristle tuft arrays pivotally mounted on the support member about at least one pivotal axis substantially parallel to the longitudinal axis and articulately coupled to the one end of the handle so that the limited reciprocal movement of the support member gives rise to limited pivotal lateral rocking of the bristle arrays.

[0008] While U.S. Pat. No. 6,453,499 and U.S. Pat. No. 5,276,932 of rotational circular movement of bristles neither enables the top down recommended brush movement nor do they enable brushing at the recommended 45 degree angle. U.S. Pat. No. 5,528,786 enables the recommended up down movement as well as the recommended 45 degree angle, however it restricts the movement of the bristle rows to this up down motion.

[0009] It is therefore a long felt need to provide a manually operated, non-electrical, toothbrush that achieves a 45 degree angle of contact between bristles and the surface of the tooth and gum, provides the recommended up-down motion of bristles combined with a circular movement, such that a brushing session is considerably shortened and the pressure applied is significantly reduced.

SUMMARY OF THE INVENTION

[0010] It is one object of the present invention to provide a toothbrush having a bristle-carrying head portion (**30**) and a handle portion (**22**), said handle portion having a proximal end (**22***b*) and a distal end (**22***a*), said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles (**32***a*, **32***b*) embedded within said toothbrush head portion (**30**), wherein linear movement along the longitudinal axis of said handle portion (**22**) is redirected by said effecter to a three dimensional crescent shaped sweeping action of said maneuverable bristles.

[0011] It is another object of the present invention to provide the toothbrush as defined above, wherein said plurality of maneuverable bristles are firmly held by rings composed of a flexible material, said rings attached to the inner side of said head portion of said toothbrush; further wherein said effecter is interconnected to said distal end of said handle portion, comprises grooves matching said rings.

[0012] It is another object of the present invention to provide the toothbrush as defined above, wherein said plurality of maneuverable bristles are firmly held by at least one cogwheel ring attached to the inner side of said head portion of said toothbrush, said effecter comprises grooves and matching transmission cogwheels, such that said linear movement of said handle portion is redirected into a three dimensional crescent shaped sweeping motion of said maneuverable bristles.

[0013] It is another object of the present invention to provide the toothbrush as defined above, wherein said plurality

of bristles are organized into at least two lengthwise rows, said lengthwise rows are divided into at least one stationary mid row sandwiched between at least one maneuverable outer row on either side.

[0014] It is another object of the present invention to provide the toothbrush as defined above, wherein said mid row of bristles is dispensable and replaceable.

[0015] It is another object of the present invention to provide the toothbrush as defined above, wherein said mid row is carried on a bridge structure attached to said toothbrush head by a conventional click and snap mechanism.

[0016] It is another object of the present invention to provide the toothbrush as defined above, wherein said maneuverable outer rows are slanted at an angle of about 45 degrees with respect to said stationary row.

[0017] It is another object of the present invention to provide the toothbrush as defined above, wherein said bristles are characterized by equal length.

[0018] It is another object of the present invention to provide the toothbrush as defined above, wherein said bristles populating said stationary row of bristles are shorter than said bristles populating said maneuverable outer rows of bristles.

[0019] It is another object of the present invention to provide the toothbrush as defined above, wherein the removal of food debris and health of gums is less than or equal to 2 on the Tureski Index.

[0020] It is another object of the present invention to provide the toothbrush as defined above, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Caries Prevalence Index.

[0021] It is another object of the present invention to provide the toothbrush as defined above, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Gingival Index of Loe and Silness.

[0022] It is another object of the present invention to provide the toothbrush as defined above, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Quigley Hein Index.

[0023] It is another object of the present invention to provide the toothbrush as defined above, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Plaque Index of Silness-Loe.

[0024] It is another object of the present invention to provide the toothbrush as defined above, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

[0025] It is another object of the present invention to provide the toothbrush as defined above, especially adapted such that food debris removal and health of gum is achieved within less than 7 strokes to each area.

[0026] It is another object of the present invention to provide the toothbrush as defined above, especially adapted such that food debris removal and health of gum is achieved within less than 1 minute of brushing.

[0027] It is another object of the present invention to provide the toothbrush as defined above, especially adapted such that the reduced degree of pressure applied by the user prolongs the recommended lifespan of said toothbrush to more than 3 months.

[0028] It is another object of the present invention to provide the toothbrush as defined above, wherein said bristles have a Shore A hardness in the range of about 30 to about 80 units.

[0029] It is another object of the present invention to provide a method of tooth and gum hygiene for removing food debris and plaque from teeth and maintaining healthy gums. The method comprises steps selected inter alia from:

[0030] a. obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head;

[0031] b. moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface;

[0032] c. redirecting said linear movement along the axis of the handle portion into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and,

[0033] d. removing food debris and plaque from tooth and/or gum surfaces and/or gingival pockets, especially in the area between the cervical region and the crown of the tooth and in the interproximal regions between the teeth.

[0034] It is another object of the present invention to provide the method as defined above, wherein the outer maneuverable rows of bristles having been slanted at a 45 degree angle with respect to stationary mid row, come into contact with surface of the teeth and gum at a 45 degree angle.

[0035] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average is less than or equal to 2 on the Tureski Index.

[0036] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Caries Prevalence Index.

[0037] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Gingival Index of Loe and Silness.

[0038] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Quigley Hein Index.

[0039] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Plaque Index of Silness-Loe.

[0040] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

[0041] It is another object of the present invention to provide the method as defined above, wherein said food debris removal and health of gum is achieved within less than 7 strokes to each area.

[0042] It is another object of the present invention to provide the method as defined above, wherein said food debris removal and health of gum is achieved within less than 1 minute of brushing.

[0043] It is another object of the present invention to provide the method as defined above, where in said bristles Shore A hardness in the range of about 30 to about 80 units.

[0044] It is another object of the present invention to provide a method of tooth and gum hygiene for removing food debris and plaque from teeth and maintaining healthy gums. The method comprising steps selected inter alia from:

[0045] a. obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head;

[0046] b. moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface;

[0047] c. redirecting said linear movement into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and thereby efficiently;

[0048] d. removing food debris and plaque from tooth and gum surfaces, especially in the area between the cervical region and the crown of the tooth, in the gingival pockets, and in the interproximal regions between the teeth;

[0049] wherein said hygiene is achieved in less than 7 brush strokes to each area in the mouth.

[0050] It is another object of the present invention to provide the method as defined above, wherein the outer maneuverable rows of bristles having been slanted at a 45 degree angle with respect to stationary mid row, come into contact with surface of the teeth and gum at a 45 degree angle.

[0051] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average is less than or equal to 2 on the Tureski Index.

[0052] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Caries Prevalence Index.

[0053] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Gingival Index of Loe and Silness.

[0054] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Quigley Hein Index.

[0055] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Plaque Index of Silness-Loe.

[0056] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

[0057] It is another object of the present invention to provide the method as defined above, where in said bristles Shore A hardness in the range of about 30 to about 80 units.

[0058] It is another object of the present invention to provide a method of tooth and gum hygiene for removing food debris and plaque from teeth and maintaining healthy gums. The method comprising steps selected inter alia from:

[0059] a. obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head;

[0060] b. moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface;

[0061] c. redirecting said linear movement into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and thereby efficiently;

[0062] d. removing food debris and plaque from tooth and gum surfaces, especially in the area between the cervical region and the crown of the tooth, in the gingival pockets and in the interproximal regions between the teeth;

[0063] wherein said hygiene is achieved in less than about 1 minute.

[0064] It is another object of the present invention to provide the method as defined above, wherein the outer maneuverable rows of bristles having been slanted at a 45 degree angle with respect to stationary mid row, come into contact with surface of the teeth and gum at a 45 degree angle.

[0065] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average is less than or equal to 2 on the Tureski Index.

[0066] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Caries Prevalence Index.

[0067] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Gingival Index of Loe and Silness.

[0068] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Quigley Hein Index.

[0069] It is another object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Plaque Index of Silness-Loe.

[0070] It is still an object of the present invention to provide the method as defined above, wherein the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

[0071] It is lastly an object of the present invention to provide the method as defined above, where in said bristles Shore A hardness in the range of about 30 to about 80 units.

BRIEF DESCRIPTION OF THE FIGURES

[0072] In order to better understand the invention and its implementation in practice, a plurality of embodiments will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which

[0073] FIG. **1** illustrates an exploded view of a preferred embodiment of a preferred embodiment said toothbrush, wherein a handling means is interconnected by means of a motion transmission means to a brushing means, such that said linear movement along the longitudinal axis of said handle portion is converted to crescent shaped movement of the outer bristle rows of said brushing means.

[0074] FIG. **2** illustrates a top view of a preferred embodiment of the present invention, demonstrating the conversion of linear movement along the longitudinal axis of the handle into crescent shaped three-dimensional sweeping movement of the maneuverable rows of bristles.

[0075] FIG. **3** illustrates a top view of preferred embodiment of the present invention, wherein maneuverable rows of bristles are slanted at a predetermined angle with respect to the rows of stationary bristles.

[0076] FIG. **4** illustrates a diagram of the method for redirecting linear movement along the longitudinal axis of the handle portion into three dimensional sweeping movement of maneuverable bristles thereby removing food debris and plaque from tooth and gum surfaces, especially in the area between the cervical region and the crown of the tooth, in the gingival pockets, and in interproximal regions between the teeth.

[0077] FIG. **5** illustrates a top view of the back of a preferred embodiment of the toothbrush of the present invention.

[0078] FIG. **6** yet another view of the front side of a preferred embodiment of the toothbrush of the present invention.

[0079] FIG. **7** illustrates a side view of a preferred embodiment of the toothbrush of the present invention.

[0080] FIG. **8** illustrates yet another side view of a preferred embodiment of the toothbrush of the present invention.

[0081] FIG. **9** illustrates yet another top view of a preferred embodiment of the toothbrush of the present invention.

[0082] FIG. **10** illustrates yet another exploded view of a preferred embodiment of the toothbrush of the present invention.

[0083] FIG. **11** illustrates an enlarged top view of a preferred embodiment of the brush head of the present invention.

[0084] FIG. **12** illustrates yet another top view of a preferred embodiment of the toothbrush of the present invention.

[0085] FIG. **13** illustrates an enlarged top view of a preferred embodiment of the brush head of the present invention.

[0086] FIG. **14** illustrates an exploded view of a preferred embodiment of the brush head of the present invention.

[0087] FIG. **15** illustrates an enlarged top view of a preferred embodiment of the brush head of the present invention.

[0088] FIG. **16** illustrates yet another enlarged top view of a preferred embodiment of the brush head of the present invention.

[0089] FIG. **17** illustrating yet another exploded view of a preferred embodiment of the brush head of the present invention.

[0090] FIG. **18-20** illustrate a top view of a preferred embodiment the maneuverable bristle head of the present invention, wherein the movement of the handle portion of the toothbrush is redirected by means of a movement redirection effecter so as to enable the clockwise rotation of maneuverable bristle clusters and the counterclockwise rotation of matching maneuverable bristle, and additionally demonstrates that said clusters are especially adapted to be slanted with respect to stationary bristles contained within said bristle head.

[0091] FIG. **21-25** illustrate a plurality of exploded views of preferred embodiments of the present invention.

[0092] FIG. **26** illustrates another embodiment of the toothbrush.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0093] The following description is provided, alongside all chapters of the present invention, so as to enable any person skilled in the art to make use of said invention and sets forth the best modes contemplated by the inventor of carrying out this invention. Various modifications, however, will remain apparent to those skilled in the art, since the generic principles of the present invention have been defined specifically to provide maneuverable-bristle toothbrush.

[0094] The term "about" refers hereinafter to a range of 25% below or above the referred value.

[0095] The term 'Tureski Index' refers hereinafter to an index defining plaque adhesion to the tooth surface with a range consisting of: (1) no plaque, (2) plaque in the cervical region—non continual, (3) continual plaque with a width of up to 1 mm in the cervical region, (4) plaque covering ⅔ of the height of the tooth (5) plaque covering over ⅔ of the height of the tooth.

[0096] The term 'Community Periodontal Index' refers hereinafter to an index defining the caries prevalence with a range consisting of: (0) healthy, (1) bleeding observed directly or by using a mouth mirror after probing (2) calculus detected during probing but all of the black band on the probe visible (3) shallow pockets 4-5 mm gingival margin within the black band of the probe (4) deep pockets 6 mm black band on the probe not visible.

[0097] The term 'Gingival Index of Loe and Silness' refers hereinafter to an index describing the clinical severity of the gingival inflammation as well as its location, with a range consisting of: (0) appearance normal, no bleeding, no inflammation (1) slight change in color and mild edema with slight change in texture, no bleeding, mild inflammation (2) redness hypertrophy edema glazing, bleeding on probing/pressure, moderate inflammation (3) marked redness hypertrophy edema ulceration, spontaneous bleeding, severe inflammation.

[0098] The term 'Quigley Hein Index' refers hereinafter to an index defining plaque covering the tooth surface, consisting of: (0) no plaque (1) separate flecks of plaque at the cervical margin of the tooth (2) a thin continuous band of plaque (up to 1 mm) at the cervical margin of the tooth (3) a band of plaque wider than 1 mm but covering less than onthird of the crown of the tooth (4) plaque covering at lean ⅓ but less than ⅔ of the crown of the tooth (5) plaque covering ⅔ or more of the crown of the tooth.

[0099] The term 'Plaque Index of Silness-Loe' refers hereinafter to an index defining plaque covering the tooth surface, consisting of the following range: (0) no plaque (1) a film of plaque adhering to the free gingival margin and adjacent area of the tooth. The plaque may be seen in situ only after appli-

cation of disclosing solution or by using the probe on the tooth surface (2) moderate accumulation of soft deposit within the gingival pocket, or the tooth and gingival margin which can be seen with the naked eye (3) abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.

[0100] The term 'Oral Hygiene Index Simplified OHI-S' refers hereinafter to an index defining oral hygiene consisting of the following range: (0) no calculus present (1) supragingival calculus covering not more than ⅓ of the exposed tooth surface (2) supragingival calculus covering more than ⅓ but no more than ⅔ of the exposed tooth surface or the presence of individual flecks of subgingival around the cervical portion of the tooth or both (3) supragingival calculus covering more than ⅔ of the exposed tooth surface or a continuous heavy band of subgingival caculus around the cervical portion of the tooth or both.

[0101] The term 'motion redirection transmission means' refers hereinafter to a means that redirects a particular vectored motion to an alternative vector of motion.

[0102] The term 'Shore A test' refers hereinafter to a durometer test according to the ASTM D2240 type A scale. The A scale is for softer plastics, while the D scale is for harder ones. However, the ASTM D2240-00 testing standard calls for a total of 12 scales, depending on the intended use; types A, B, C, D, DO, E, M, O, OO, OOO, OOO-S, and R. Each scale results in a value between 0 and 100, with higher values indicating a harder material.

[0103] The most natural brushing methods used by patients uneducated in tooth brushing are horizontal strokes at 90-degrees to tooth. The effect is supra gingival cleansing and gingival stimulation.

[0104] The Charters method teaches brushing at 90-degrees sweeping occlusally and circular vibratory, affecting supragingival cleansing, gingival stimulation, inter proximal cleansing.

[0105] The Bass method teaches brushing at 45-degree apex in sulcus sweeping occlusally and vibratory horizontal jiggle, affecting subgingival cleansing, gingival stimulation.

[0106] The average brushing time in conducted studies is approximately 1 minute, even though these individuals claimed that they usually brushed for 2 or 3 minutes. These results demonstrate that people greatly overestimate their efforts or else are telling professionals what they would like them to believe. An alternative method for assessing brushing has been to count the number of strokes, suggesting that effective brushing should apply 5-10 strokes in each area.

[0107] A study conducted in vitro has shown that tooth rush design has more effect on interproximal plaque than the brushing technique. Most studies demonstrate little significant difference in effectiveness of the different techniques whether used by children or adults. A survey of oral hygiene habits among children in 22 European countries and Canada revealed that flossing was rare; the highest level 25% was found among Canadian adolescents. The problem is therefore clearly cultural and the solution needs to be found at the community level. Whichever technique achieves optimal oral hygiene is the best and should be recommended. The dentist or hygienist can only ascertain this by direct continued observation.

[0108] According to the Canadian Dental Hygienists Association rechargeable toothbrushes with oscillating, rotating (with or without pulsating action) mode of action have been shown to be more effective in removing plaque and improving gingival outcomes than manual toothbrushes currently available. While the ideal force of tooth brushing has not been determined, excessive force may be linked with gingival trauma.

[0109] Tooth brushing is known to cause bacteraemias, which could theoretically potentially lead to the development of ineffective endocarditis. It is therefore paradoxical that tooth brushing in not thought to cause infective endocarditis.

[0110] Studies suggest that improvements in toothbrush design will be a more important contribution to the attainment of effective interproximal brushing than the development of new brushing techniques.

[0111] Studies have found that subjects who directed the bristles of the toothbrush vertically towards the tooth surfaces had a high efficacy of plaque removal, good gingival condition and good dental health behavior. Thus, it is important to direct the bristles vertically toward the tooth surfaces for effective plaque removal.

[0112] Comparison of modified Bass technique with normal tooth brushing practices for efficacy in supragingival plaque removal show that the modified Bass technique was significantly more effective in removing supragingival plaque than normal tooth brushing practices both in all bucall and lingual sites.

[0113] Studies show that the modest gingival recession and reduction width of attached gingival seen with the scrub method and increased stiffness of toothbrush bristles were accompanied by increased damage to the soft gingival tissues.

[0114] Studies show that tooth brushing at certain forces and durations enhanced the proliferative activity and procollagen synthesis of gingival fibroblasts.

[0115] In junctional epithelium stimulated with a toothbrush, the PCNA-positive basal cell ration is more sensitive to tooth brushing force than to duration. Interproximally a V-shaped toothbrush is much better at plaque removal than a straight one.

[0116] The Bass brushing technique was the first to focus on the removal of plaque and debris from the gingival sulcus by the combined use of a soft toothbrush and unwaxed dental floss. In the Bass technique the toothbrush is positioned in the gingival sulcus at a 45-degree angle to the tooth apex. The bristles are then gently pressed to enter the sulcus.

[0117] The manufacturer recommended lifespan of a conventional manual toothbrush is 3 months.

[0118] The use of excessive brushing force has been shown to be a major cause of gingival abrasion. To aid in preventing over-vigorous brushing, the Philips/Jordan electric toothbrush incorporates a Controlled Pressure system (CPS) that causes the brush head to flex back when a toothbrushing force (TBF) in excess of a pre-determined threshold is exerted against the teeth or soft tissues. Two studies (I/II) were conducted to determine whether this mechanical feedback system is sufficiently sensitive to enable users to control their brushing behavior. In Study I, the learning pattern of brushing behavior as a response to the feedback system was evaluated. Seventeen subjects were asked to brush their teeth under observation at least twice a day for a two-week period. During these observations, the number of clicks, as well as the time the brush was pushed "through the click" were recorded. Ten of seventeen volunteers demonstrated a clear learning behavior; the mean number of clicks/minute (for all subjects) was reduced from 10 to 4 after 10 sessions of brushing, and then to 2 or 3 clicks at the end of two weeks. In Study II, 46 subjects used the electric toothbrush with the CPS click force set at various levels between 150-420 g (at 30 g intervals). After a

4-week learning period, the mean TBF was determined in each subject. TBF was most strongly influenced at pre-set click forces between 180 and 270 g. The mean TBF was lowest (about 80 g) when the threshold was set at 210 or 240 g; it then increased (to about 130-140 g TBF) both for smaller and larger values of the threshold setting. Hence, both studies indicate that the Controlled Pressure system is a functional feature that can be used to control the habitual brushing force in a learning period of less than 2 weeks.

[0119] People who brush their teeth for longer and harder than is necessary may not be making them any cleaner, and could be causing permanent damage, according to new research.

[0120] A study using electric toothbrushes by the University of Newcastle upon Tyne, UK, found that when researchers increased the length of people's brushing regime and the pressure they applied to their teeth, the removal of harmful bacteria was only improved up to a point. Beyond that point, say experts from Newcastle University's School of Dental Sciences and the Centre for Health Services Research, who carried out the study, the risk of causing oral health problems, such as the abrasion of tooth enamel or gums, gets bigger. Yet the experts also say that while people are able to time how long they brush their teeth for, it is extremely difficult for them to accurately gauge how much pressure they should apply without seeking professional advice. Similar results would be expected if the study was carried out using ordinary toothbrushes, say researchers. The research, published in the Journal of Clinical Periodontology *, found that two minutes and 150 grams (about the weight of an orange) was the optimum time and pressure for the average person's brushing regime. Twelve volunteers took part in the four-week study, which examined **16** combinations of brushing times (30, 60, 120 and 180 seconds) and pressure (75, 150, 225 and 300 grams). The volunteers were trained how to use an oscillating electric toothbrush, which was wired up to a computer that took time and pressure measurements. Brushing your teeth helps remove and prevent plaque, the bacteria-ridden, glue-like substance which can form on teeth and gums when bits of food are left in the mouth. It causes dental problems such as gingivitis and periodontal disease. Researchers recorded the levels of plaque before and after brushing and found that plaque removal steadily improved as brushing times and pressure were increased. However, their results showed that when people brushed for longer than two minutes, at a pressure higher than 150 grams, they were not removing any additional plaque.

[0121] It is widely appreciated that people cause serious damage to their teeth and gums by brushing. too hard, and there have been a number of designs of toothbrush aimed at overcoming this problem. Several studies have arrived at the conclusion that excessive pressure during brushing leads to recession on premolars, and also gingival recession, which exposes the underlying cementum, often leading to hypersensitivity, loss of aesthetics, and may be a factor in root caries and root surface abrasion, leading to root fillings.

[0122] Two laboratory testing procedures, predictive of clinical efficacy and safety, have been used to evaluate two battery-powered toothbrushes (a new prototype, Crest SpinBrush Pro and a commercially available product, Crest SpinBrush) and a standard manual toothbrush (Oral-B Indicator). Interproximal access efficacy (IAE) and depth of deposit removal (DDR) have been evaluated in laboratory methods using pressure-sensitive paper placed around simulated anterior and posterior teeth at a brushing pressure of 250 g with horizontal or vertical brushing motions.

[0123] Reference is made now to FIG. **1**, illustrating an exploded view of a preferred embodiment of maneuverable-bristle toothbrush **100**, comprising a proximal end **22***b* of the handle portion extending outwardly through recess **38** in rectangular foundation **31** of brush head **30**, said distal end **22***a* of said handle interconnected by means of motion redirection transmission effecter **36** fashioned with a plurality of grooves **33**, inhabiting plurality of matching rings **34** that clutch maneuverable rows of bristles **32***a* and **32***b*, and additionally illustrating stationary bristles brush attachment **10** comprising foundation element **16**, said foundation element populated by a plurality of stationary rows of bristles **14** and perforated by a plurality of holes **12** matching the position of bristles within said maneuverable rows of bristles, said stationary bristles brush attachment adapted to be attached by conventional snap and click means (not shown) to said rectangular foundation, such that said maneuverable rows of bristles protrude thorough said holes.

[0124] Reference is now made to FIG. **2** illustrating a top view of a preferred embodiment of the present invention wherein linear movement **200** activated by linear movement along the longitudinal axis of the proximal end **22***b* of the handle is transferred by means of a motion redirection effecter cogwheel mechanism (not shown) interconnected to the distal end **22***a* of said handle, into crescent shaped sweeping motion **300** of maneuverable bristle row **32***a*, attached to rings **34** adapted (not shown) to match said cogwheel mechanism.

[0125] Reference is now made to FIG. **3** illustrating a to view of a preferred embodiment of the present invention, wherein maneuverable row outer row of bristles **32***a* is set at a α degree angle with respect to stationary row of bristles **14**. α preferably, but not necessarily, being 45 degrees.

[0126] According to another embodiment of the present invention the said plurality of maneuverable bristles are firmly held by rings composed of a flexible material, said rings attached to the inner side of said head portion of said toothbrush, and said effecter interconnected to said distal end of said handle portion is adapted with grooves matching said rings, such that movement of said handle portion distorts said flexible rings thereby redirecting linear movement along the longitudinal axis of the handle portion of said toothbrush into movement to a three dimensional crescent shaped sweeping action of said maneuverable bristles.

[0127] According to another embodiment of the present invention the plurality of maneuverable bristles are firmly held by cogwheel rings attached to the inner side of said head portion of said toothbrush, said effecter having been fashioned with grooves and matching transmission cogwheels, such that movement of said handle portion redirects said movement thereby redirecting linear movement along the axis of the handle portion movement to a three dimensional crescent shaped sweeping action of said maneuverable bristles.

[0128] It is within the scope of the present invention that said plurality of bristles are organized into lengthwise rows, said lengthwise rows divided into at least one stationary mid row sandwiched between at least one maneuverable outer row on either side.

[0129] It is within the scope of the present invention that said mid row of bristles is dispensable and replaceable.

[0130] It is within the scope of the present invention that said mid row is carried on a bridge structure attached to said toothbrush head by a conventional click and snap mechanism.

[0131] It is within the scope of the present invention that said maneuverable outer rows are slanted at an angle of 45 degrees with respect to said stationary row.

[0132] It is within the scope of the present invention that said bristles that populate said plurality of rows are of equal length.

[0133] It is within the scope of the present invention that said bristles that populate said stationary row of bristles are shorter than said bristles that populate said maneuverable outer rows of bristles.

[0134] It is within the scope of the present invention that the removal of food debris and health of gums is less than or equal to 2 on the Tureski Index.

[0135] It is within the scope of the present invention that the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Caries Prevalence Index.

[0136] It is within the scope of the present invention that the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Gingival Index of Loe and Silness.

[0137] It is within the scope of the present invention that the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Quigley Hein Index.

[0138] It is within the scope of the present invention that the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Plaque Index of Silness-Loe.

[0139] It is within the scope of the present invention that the removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

[0140] It is within the scope of the present invention that said toothbrush is especially adapted such that food debris removal and health of gum is achieved within less than 7 strokes to each area.

[0141] It is within the scope of the present invention that said toothbrush is especially adapted such that food debris removal and health of gum is achieved within less than 1 minute of brushing.

[0142] It is within the scope of the present invention that said toothbrush is especially adapted such that the reduced degree of pressure applied by the user prolongs the recommended lifespan of said toothbrush to more than 3 months.

[0143] It is within the scope of the present invention that said bristles have a Shore A hardness in the range of about 30 to about 80 units.

[0144] Reference is now made to FIG. **4**, illustrating one possible method **300** for redirecting linear movement along the longitudinal axis of the handle portion of a toothbrush into three dimensional movement of a plurality of maneuverable bristles. The method comprises steps selected inter alia from:

(a) obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head—step **501**.

(b) moving said toothbrush linearly along the longitudinal axis of said handle portion whilst said plurality of bristles are held against tooth or gum surface—step **503**.

(c) redirecting said linear movement along the longitudinal axis of said handle portion into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and thereby efficiently—step **505**.

(d) removing food debris and plaque from tooth and gum surfaces, especially the area between the cervical region and the crown of the tooth, the gingival pockets, and in the interproximal regions between the teeth—step **507**.

[0145] It is yet another objective of the present invention to disclose a method for redirecting linear movement along the axis of the handle portion into three dimensional movement of a plurality of maneuverable bristles carried by a brush head, by means of a movement redirection effecter that interconnects a handle portion of said toothbrush with said maneuverable bristles, comprising: obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head; moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface; redirecting said linear movement along the axis of the handle portion into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and thereby efficiently; removing food debris and plaque from tooth and gum surfaces, especially in the area between the cervical region and the crown of the tooth, the gingival pockets, and in the interproximal regions between the teeth.

[0146] It is yet another objective of the present invention to disclose a method of tooth and gum hygiene that removes food debris and plaque from teeth and maintains healthy gums, wherein said hygiene is achieved in less than 7 brush strokes to each area in the mouth, comprising: obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head; moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface; redirecting said linear movement into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and thereby efficiently; removing food debris and plaque from tooth and gum surfaces, especially in the area between the cervical region and the crown of the tooth, the gingival pockets, and in the interproximal regions between the teeth.

[0147] It is yet another objective of the present invention to disclose a method of tooth and gum hygiene that removes food debris and plaque from teeth and maintains healthy gums, wherein said hygiene is achieved in less than 1 minute, comprising:

obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head; moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface; redirecting said linear movement into three dimen-

sional movement of a portion of said plurality of bristles embedded in said toothbrush head; and thereby efficiently; removing food debris and plaque from tooth and gum surfaces, especially in the area between the cervical region and the crown of the tooth, the gingival pockets, and in the interproximal regions between the teeth.

[0148] Reference is now made to FIG. **5**, illustrating a top view of the back of toothbrush **100** wherein handle portion **22***b* is interconnected at its distal end (not shown) to redirection of movement effecter (not shown) that affects the movement of maneuverable bristles **32***b*.

[0149] Reference is now made to FIG. **6**, illustrating yet another view of the front side of tooth brush **100**.

[0150] Reference is now made to FIG. **7**, illustrating a side view of toothbrush **100** wherein handle portion **22***b* is interconnected to movement redirection effecter (not shown) thereby affecting the movement of maneuverable bristles within brush head **30**.

[0151] Reference is now made to FIG. **8**, illustrating yet another side view of toothbrush **100** wherein maneuverable bristles **32***b* are slanted with regard to stationary bristles **14**.

[0152] Reference is now made to FIG. **9**, illustrating yet another top view of toothbrush **100** wherein handle portion **22***b* is interconnected at its distal end (not shown) to redirection of movement effecter (not shown) that affects the movement of maneuverable bristles **32***b*, whilst stationary bristles **14** remain stationary.

[0153] Reference is now made to FIG. **10**, illustrating yet another exploded view of toothbrush **100** comprising handle portion **22***b* interconnected by means of movement effecter **36** to maneuverable bristles **32***b*, and additionally comprising a stationary bristle brush attachment **10**.

[0154] Reference is now made to FIG. **11** illustrating an enlarged top view of brush head **30** comprising rectangular foundation **31** that holds movement redirection effecter **36** fashioned with a plurality of grooves **33**, inhabiting plurality of matching rings **34** that clutch maneuverable rows of bristles **32***a* and **32***b*.

[0155] Reference is now made to FIG. **12** illustrating yet another top view of toothbrush **100**.

[0156] Reference is now made to FIG. **13**, illustrating yet another top view of brush head portion **30** wherein rings **34** clutch maneuverable bristles **32***b* and stationary bristles **14** are set in foundation element **16** stationary bristle brush attachment **10**.

[0157] Reference is now made to FIG. **14** illustrating an exploded view of bristle head **30** and stationary bristle brush attachment **10**.

[0158] Reference is now made to FIG. **15** illustrating an enlarged top view of bristle head **30** wherein rectangular foundation **31** holds motion redirection transmission effecter **36** fashioned with a plurality of grooves **33**, inhabiting plurality of matching rings **34** that clutch maneuverable rows of bristles **32***a* and **32**.

[0159] Reference is now made to FIG. **16** illustrating yet another enlarged top view of bristle head **30** wherein motion **200** is redirected by means of motion redirection effecter **36** into crescent shaped sweeping motion **300** of maneuverable bristle row **32***a*, attached to rings **34**, said rings having extensions that are set into grooves **33**.

[0160] Reference is now made to FIG. **17** illustrating yet another exploded view of bristle head **30** and stationary bristle brush attachment **10**.

[0161] Reference is now made to FIG. **18** illustrating a top view of a preferred embodiment **30***a* of the maneuverable bristle head of the present invention, wherein the movement of the handle portion of the toothbrush (not shown) is redirected by means of a movement redirection effecter (not shown) so as to enable the clockwise rotation of maneuverable bristle clusters **32***d* and **32***f* and the counterclockwise rotation of maneuverable bristle clusters **32***e* and **32***g*, and additionally demonstrating that said clusters are especially adapted to be slanted with respect to stationary bristles **14**.

[0162] Reference is now made to FIG. **19** illustrating yet another top view of a preferred embodiment **30***a* of the maneuverable bristle head of the present invention, wherein the movement of the handle portion of the toothbrush (not shown) is redirected by means of a movement redirection effecter (not shown) so as to enable the clockwise rotation of maneuverable bristle clusters **32***d* and **32***f* and the counterclockwise rotation of maneuverable bristle clusters **32***e* and **32***g*, and additionally demonstrating that said clusters are especially adapted to be slanted with respect to stationary bristles **14**.

[0163] Reference is now made to FIG. **20** illustrating yet another top view of a preferred embodiment **30***a* of the maneuverable bristle head of the present invention, wherein the movement of the handle portion of the toothbrush (not shown) is redirected by means of a movement redirection effecter (not shown) so as to enable the clockwise rotation of maneuverable bristle clusters **32***d* and **32***f* and the counterclockwise rotation of maneuverable bristle clusters **32***e* and **32***g*, and additionally demonstrating that said clusters are especially adapted to be slanted with respect to stationary bristles **14**.

[0164] Reference is now made to FIG. **21** illustrating an exploded side view of the present invention wherein stationary bristles **14** are attached to foundation element **16***a*, fashioned with recesses **12***a*, adapted to allow conventional click and snap attachment to maneuverable bristle effecter **80**, said maneuverable bristle effecter further adapted to be attached to the distal end **22***a* of handle portion **22** such that movement of said handle portion induces movement of maneuverable bristles within said maneuverable bristle effecter, and rectangular foundation **31** fashioned on its inner portion **73** with grooves that inversely match said maneuverable bristle effecter.

[0165] Reference is now made to FIG. **22** illustrating yet another exploded side view of the present invention wherein stationary bristles **14** are attached to foundation element **16***a*, fashioned with recesses **12***a*, adapted to allow conventional click and snap attachment to maneuverable bristle effecter **80**, said effecter adapted to be held within grooves **77** fashioned in handle portion **22** such that movement of handle **22** induces movement of maneuverable bristles.)

[0166] Reference is now made to FIG. **23** illustrating yet another exploded view of the present invention wherein foundation element **16***a* is adapted for snap and click attachment the distal end **22***a* of handle portion **22**, and rectangular foundation **31** is especially adapted with groove **71** in order to allow for the sliding movement of handle portion **22**.

[0167] Reference is now made to FIG. **24** illustrating yet another to view of the present invention comprising stationary bristles **14** sandwiched between maneuverable bristle row **32***a* and **32***b* interconnected (not shown) to handle portion **22**, such that movement of said handle induces movement of said maneuverable bristle rows.

[0168] Reference is now made to FIG. **25** illustrating yet another exploded side view of the present invention wherein foundation element **16***a* is adapted for click and snap attachment to maneuverable bristle effecter **80**, said bristle effecter interconnected to handle portion **22**, and said bristle effecter further adapter to be inserted in rectangular foundation **31**.

[0169] It should be pointed out that the present invention may be applied to any toothbrush that mechanically transfers movement of a handle portion, by means of a movement redirection effecter, into three dimensional crescent shaped sweeping action of maneuverable bristles interconnected thereto.

[0170] Reference is made now to FIG. **26**, illustrating another embodiment of the toothbrush **200** according to the present invention.

[0171] According to said embodiment, the maneuverable rows of bristles **32***a* and **32***b* are inter connected via a motion redirection transmission effecter **36** (which according to this embodiment is a single cogwheel).

[0172] More specifically, the maneuverable rows of bristles **32***b* is coupled to a toothed effecter **260***b*, which is in mechanical communication with said motion redirection transmission effecter **36**. Said toothed effecter **260***b* is coupled to the proximal end **22***b* such that linear movement along the longitudinal axis of the handle portion results in a similar linear movement of said toothed effecter **260***b* (and the three dimensional crescent shaped sweeping action of said maneuverable bristles **32***b*).

[0173] The maneuverable rows of bristles **32***a* is also coupled to toothed effecter **260***a* which is also in mechanical communication with said motion redirection transmission effecter **36** In such a manner, the linear movement of said toothed effecter **260***b* result in an opposite linear movement of the toothed effecter **260***a* (by means of said motion redirection transmission effecter **36**) such that said maneuverable bristles **32***a* are swept in a three dimensional crescent shaped motions.

1. A toothbrush having a bristle-carrying head portion (**30**) and a handle portion (**22**), said handle portion having a proximal end (**22***b*) and a distal end (**22***a*), said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles (**32***a*, **32***b*) embedded within said toothbrush head portion (**30**), wherein linear movement along the longitudinal axis of said handle portion (**22**) is redirected by said effecter to a three dimensional crescent shaped sweeping action of said maneuverable bristles.

2. The toothbrush according to claim **1**, wherein said plurality of maneuverable bristles are firmly held by rings composed of a flexible material, said rings attached to the inner side of said head portion of said toothbrush; further wherein said effecter is interconnected to said distal end of said handle portion, comprises grooves matching said rings.

3. The toothbrush according to claim **1**, wherein said plurality of maneuverable bristles are firmly held by at least one cogwheel ring attached to the inner side of said head portion of said toothbrush, said effecter comprises grooves and matching transmission cogwheels, such that said linear movement of said handle portion is redirected into a three dimensional crescent shaped sweeping motion of said maneuverable bristles.

4. The toothbrush according to claim **1**, wherein said plurality of bristles are organized into at least two lengthwise rows, said lengthwise rows are divided into at least one stationary mid row sandwiched between at least one maneuverable outer row on either side.

5. The toothbrush according to claim **4**, wherein said mid row of bristles is dispensable and replaceable.

6. The toothbrush according to claim **4**, wherein said mid row is carried on a bridge structure attached to said toothbrush head by a conventional click and snap mechanism.

7. The toothbrush according to claim **4**, wherein said maneuverable outer rows are slanted at an angle range of about 35-55 degrees with respect to said stationary row.

8. The toothbrush according to claim **4**, wherein said bristles are characterized by equal length.

9. The toothbrush according to claim **4**, wherein said bristles populating said stationary row of bristles are shorter than said bristles populating said maneuverable outer rows of bristles.

10. The toothbrush according to claim **4**, wherein the removal of food debris and health of gums is less than or equal to 2 on the Tureski Index.

11. The toothbrush according to claim **4**, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Caries Prevalence Index.

12. The toothbrush according to claim **1**, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Gingival Index of Loe and Silness.

13. The toothbrush according to claim **1**, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Quigley Hein Index.

14. The toothbrush according to claim **1**, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Plaque Index of Silness-Loe.

15. The toothbrush according to claim **4**, wherein removal of food debris and health of gums on average meets a standard of less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

16. The toothbrush according to claim **1**, especially adapted such that food debris removal and health of gum is achieved within less than 7 strokes to each area.

17. The toothbrush according to claim **4**, wherein said plurality of bristles are further characterized by at least one group of stationary bristles and at least one group of maneuverable bristles.

18. The toothbrush according to claim **1**, especially adapted such that the reduced degree of pressure applied by the user prolongs the recommended lifespan of said toothbrush to more than 3 months.

19. The toothbrush according to claim **1** wherein said bristles have a Shore A hardness in the range of about 30 to about 80 units.

20. A method of tooth and gum hygiene for removing food debris and plaque from teeth and maintaining healthy gums, said method comprising steps:

a. obtaining a toothbrush having a bristle-carrying head portion and a handle portion, said handle portion having a proximal end and a distal end, said distal end interconnected by means of a mechanical movement redirection effecter to a plurality of maneuverable bristles embedded within said toothbrush head;
b. moving said toothbrush linearly along the longitudinal axis of said handle portion by means of said handle portion whilst said plurality of bristles are held against tooth or gum surface;

c. redirecting said linear movement along the axis of the handle portion into three dimensional movement of a portion of said plurality of bristles embedded in said toothbrush head; and,

d. removing food debris and plaque from tooth and/or gum surfaces and/or gingival pockets, especially in the area between the cervical region and the crown of the tooth and in the interproximal regions between the teeth.

21. The method according to claim **20**, wherein the outer maneuverable rows of bristles having been slanted at a 45 degree angle with respect to stationary mid row, come into contact with surface of the teeth and gum at a 45 degree angle.

22. The method according to claim **20**, wherein the removal of food debris and health of gums on average is less than or equal to 2 on the Tureski Index.

23. The method according to claim **20**, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Caries Prevalence Index.

24. The method according to claim **20**, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Gingival Index of Loe and Silness.

25. The method according to claim **20**, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Quigley Hein Index.

26. The method according to claim **20**, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Plaque Index of Silness-Loe.

27. The method according to claim **20**, wherein the removal of food debris and health of gums on average meets a standard selected from a group consisting of: less than or equal to 1 on the Oral Hygiene Index Simplified OHI-S.

28. (canceled)

29. (canceled)

30. The method according to claim **20**, where in said bristles Shore A hardness in the range of about 30 to about 80 units.

31-48. (canceled)

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