

DESCRIPTION

TITLE OF INVENTION:

TOOTHBRUSH

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present disclosure relates to subjects included in Japanese Patent Application No. 2024-091050 filed dated on June 4, 2024, as a whole, the disclosure therein should be incorporated in this application explicitly by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] This invention relates to a toothbrush used for removing food particles and plaque from teeth.

2. Description of Related Art

[0003] Conventional toothbrushes, as disclosed in, for example, Patent Document 1 (Japanese Patent Application Laid-open No. 2024-054020), have a brush portion with a uniform height of brush hair and a shape in which the tips of the brush hair are aligned in a plane.

[0004] As described in Patent Document 1, if the brush hairs of the brush portion of a toothbrush are aligned in a plane, when trying to clean out the dirt by advancing the corresponding brush hair into the gaps between the teeth, there is a risk that the other brush hair will hit the side of the teeth and prevent themselves from advancing. For

this reason, when advancing the brush hairs into the gaps between the teeth, it is necessary to press down hard on the brush portion of the toothbrush.

[0005] According to a survey of oral care product manufacturers, the more people are conscious of trying to remove stains from their teeth, the harder they brush. Since dental practices provide instruction on brushing with the correct amount of pressure, most people understand that it is better to brush with the correct amount of pressure. The ideal brushing pressure (the force with which the brush is pressed against the teeth) is said to be around 150-200g, but few people are aware of this and practice it correctly, and when there is a strong desire to remove the dirt from the teeth, as mentioned above, the brushing pressure will naturally become stronger. If you repeatedly brush your teeth too hard, you may damage your gums or not be able to effectively remove the dirt.

[0006] Also, there are two general manners for holding a toothbrush: a “pen grip” where you hold the brush like you would hold a pen, and a “palm grip” where you hold the brush in the palm of your hand. It has been proven that brushing with light pressure is the best way to effectively remove dirt, and the pen grip manner is particularly recommendable as it is difficult to apply strong pressure while brushing.

[0007] Patent Document 2 (Japanese Patent Application Laid-open No. 6-84926) discloses a toothbrush with a circular cross-section of the handle to improve the ease of holding the toothbrush in a pen grip manner. In a pen grip manner, the toothbrush is held with only the thumb, index finger and middle finger, so that a circular shape is easier to hold and makes it easier to rotate the handle to change the position of the brush. In addition, Patent Document 3 (Japanese Patent Application Laid-open No. 2011-11014) discloses a toothbrush with a cross-section in the shape of an oval, where the part to be held between the thumb and forefinger is made thin, in order to correct the tendency to grip too tightly. Conversely, toothbrushes with a cross-section in the

shape of an oval or an ellipse, where the part to be held between the thumb and forefinger is made thick, are also commercially available.

[0008] As mentioned above, the pen-grip manner is suitable for holding the toothbrush when brushing with light pressure. However, because the grip is light, as described in Patent Document 2, if the cross-section is circular, the handle will rotate around the axis during toothbrushing, and the desired brushing position (brush position) will easily shift slightly, so that the overall brushing effect of the toothbrush was not necessarily high. In addition, as described in Patent Document 3, if the part that is picked up between the thumb and forefinger is thin and has parallel surfaces, it is easy to get tired, and the handle is also easy to misalign as it rotates up and down like a seesaw with the pick-up part as the fulcrum. This ease of misalignment is almost the same even for toothbrushes with an elliptical cross-section.

[0009] In addition, toothbrushes are generally consumable goods, and for hygiene reasons they are usually replaced regularly, or when the brush hairs on the brush portion become loose and uncomfortable to use, they are replaced with a new toothbrush. However, due to recent environmental concerns and the growing demand for luxury goods, there is a demand for toothbrushes, especially the handles, to be made in such a way that users can use their own personal toothbrushes for a long time, and only replace the worn-out brush part with a new one. In this trend, there is a need to be able to choose toothbrush handles with designs that match one's tastes or high-grade products. In order to meet this request, it is necessary to improve the design and give a sense of luxury to toothbrush handles.

SUMMARY OF THE INVENTION

[0010] This invention was made in light of the above points, and its purpose is to provide a toothbrush that is easy to hold and that can brush teeth with a light touch to achieve a high polishing effect (efficiency). Another purpose of this invention is to provide a toothbrush that can effectively enhance its design effect.

[0011] In order to achieve the above objectives, the toothbrush (2-1) of the present invention is provided with a longitudinally extending handle (4), a brush hair attaching portion (6) formed at the tip of the handle (4), and a brush portion (8) comprising a plurality of brush hair bundles (20a, 20b) that are attached to the brush hair attaching portion (6), and the toothbrush is used to clean teeth (30) with the brush portion (8), wherein the handle (4) comprises; a grip portion (10) for being held by a hand; a neck portion (12) that is narrower in diameter than the grip portion (10) and that is positioned between the grip portion (10) and the brush hair attaching portion (6) to support the brush hair attaching portion (6). The brush portion (8) is formed in a mountain shape with the top at the center of the handle (4) in the longitudinal direction of the brush hair attaching portion (6).

[0012] According to the toothbrush of this invention, if you brush your teeth by placing the top of the brush portion's peaked portion against the gap between your teeth (the gap between your teeth) or the gap between your teeth and gums, the other brush hair of the brush portion will not interfere with the entering of brush hair, so that the brush hairs can easily reach the gaps between the teeth and the gaps between the teeth and the gums (including the periodontal pockets), making it easier to remove dirt and enhancing the effectiveness of tooth brushing.

[0013] In addition, the grip portion (10) of the toothbrush (2-1) described above may be configured such that the cross-section in the direction perpendicular to the longitudinal direction of the handle (4) has a triangular shape with the tip of the brush hair bundles (20a, 20b) at the apex. This allows the position of the handle to be accurately controlled even when the toothbrush is held lightly using the pen grip manner, and allows the user to brush his or her teeth effectively with the correct brushing pressure.

[0014] In addition, the above toothbrush (2-1) may be configured such that the cross-sectional area of the grip portion (10) gradually decreases toward the neck portion (12). This allows for a balance between the ease of handling due to the appropriate thickness and the ease of holding the toothbrush in the area where it is held using the pen grip manner.

[0015] In addition, the toothbrushes (2-2, 2-3) described above may be configured so that at least part of the surface of the grip portion (10) is decorated (16, 18). This allows the toothbrushes to be given a high-class feel, and has a differentiation which allows the user to have more freedom in choosing a toothbrush that is their own personal favorite.

[0016] In addition, the above toothbrushes (2-2, 2-3) may be configured so that the decoration may be lacquer (16), carved patterns or embossed patterns. This allows the toothbrushes to have a high-class feel that matches the user's preferences, and further enhances the freedom of choice when the user selects their own favorite toothbrush.

[0017] Further, in the toothbrushes (2-2, 2-3) described above, the neck portion (12) and brush hair attaching portion (6) may be formed as a single unit, and the neck portion (12) may be detachable from the grip portion (10). This makes it economical,

as when the brush portion deteriorates, there is no need to replace the grip portion which has been given a high-class feel.

[0018] In addition, in the toothbrushes (2-2, 2-3) described above, the brush hair attaching portion (6) may be provided in a structure that is detachable from the neck portion (12). This makes it more economical, as it is only necessary to replace the brush portion when it deteriorates, so as to ensure a minimum cost for exchange.

[0019] In the toothbrushes (2-1, 2-2, 2-3) described above, the brush portion (8) comprises: a central brush hair group (22) in which a plurality of brush hair bundles (20a) are arranged along the longitudinal direction in the center of the hair attaching portion (6); and a peripheral hair group (24) in which a plurality of hair bundles (20b) are arranged to surround the central hair bundle group (22) in the brush hair attaching portion (6). The central hair bundle group (22) may be taller than the peripheral hair bundle group (24), and the central hair bundle group (22) and the peripheral hair bundle group (24) may be configured to be formed in a mountain shape with an upward slope toward the rear end on the tip side and a downward slope toward the rear end on the neck side (12), with the center of the hair attaching portion (6) in the longitudinal direction serving as the boundary. This makes it easier for the brush hair to enter the gaps between the teeth and between the teeth and gums, and thus enhances the effectiveness of dirt removal.

[0020] In addition, regarding the above toothbrushes (2-1, 2-2, 2-3), the number of hair bundles (20b) on the tip side of the peripheral hair bundle group (24) may be less than the number of hair bundles (20b) on the neck (12) side. This allows for effective brushing of narrow areas at the back of the mouth.

[0021] In the toothbrushes (2-1, 2-2, 2-3) described above, at least the brush hairs (h) of the central hair group (22) have a shape that tapers toward a point at the tip of the

hair group . According to this, it is possible to effectively remove dirt even in narrow places such as the gaps between teeth, and the tooth-brushing function can be improved.

[0022] In addition, regarding the toothbrushes (2-1, 2-2, 2-3) described above, the hardness of the central hair bundle group (22) and the peripheral hair bundle group (24) may be made different by making the thickness or quantity of the brush hair bundles (20a, 20b) to be mutually different. Accordingly, by selectively varying the hardness of the central brush hair group and the peripheral brush hair group according to conditions such as the degree of staining of the teeth and the state of the gums, it is possible to achieve both a further improvement in the effectiveness of tooth brushing and the maintenance of oral health through appropriate massage effects.

Effect of the Invention

[0023] According to the present invention, it is possible to provide a toothbrush that achieves a high cleaning effect even when brushing with light pressure. It is also possible to provide a toothbrush that effectively enhances design beauty.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a side view of a toothbrush according to a first embodiment of the present invention.

FIG. 2A- FIG. 2D provide diagrams that explain the structure of the handle of the toothbrush shown in FIG. 1. FIG. 2A is a plan view, FIG. 2B is a cross-sectional view of FIG. 2A along X-X line, FIG. 2C is a bottom view, and FIG. 2D provides end views of the cross-sectional illustrations at positions A-F in FIG. 2A.

FIG. 3 is an end view showing a cross-section of a toothbrush of FIG. 1, as seen from the tip when held in a pen grip manner.

FIG. 4 is a separated side view of the toothbrush according to a second embodiment.

FIG. 5 is another separated side view of the toothbrush according to the second embodiment.

FIG. 6 is a perspective view of the brush shown in FIG. 1.

FIGS. 7A and 7B provide detailed views of the toothbrush of the third embodiment, FIG. 7A is a plan view of the brush hair bundles seen from the tip side, FIG. 7B is a side view of the toothbrush shown in FIG. 7A.

FIGS. 8A and 8B provide enlarged views showing the shape of each individual brush hair in the brush portion, FIG. 8A is a figure of the brush portion of the toothbrush shown in FIGS. 7A and 7B, FIG. 8B is a figure of the brush portion of a conventional toothbrush.

FIGS. 9A and 9B provide views explaining the operation of the toothbrush action, FIG. 9A is a view of a brush portion of a toothbrush shown in FIG. 7B, FIG. 9B is a view of a brush portion of a conventional toothbrush.

DESCRIPTION OF THE EMBODIMENTS

[0025] In the following, description will be given to the embodiments of the present invention, with reference to the attached drawings.

[0026] [First Embodiment] As shown in FIG. 1, the toothbrush 2-1 of the present embodiment is a toothbrush that cleans teeth with the brush portion 8, which is made up of multiple brush hair bundles that are attached to the brush hair attaching portion 6, which is formed at the tip of the long handle 4. The handle 4 comprises: a grip portion 10 for holding the handle in the hand; a neck portion 12 that is positioned between the grip portion 10 and the brush hair attaching portion 6 and supports the

attaching portion 6, and that is thinner in diameter than the grip portion 10. The brush portion 8 is formed into a mountain-shaped configuration (i.e., the shape seen from the side of the tip of a group of hair bundles comprising multiple hair bundles) with the center of the attaching portion 6 at the top in the longitudinal direction (arrow Y direction) of the handle 4. The detailed configuration of the mountain-shaped brush portion 8 will be described later.

[0027] The purpose of this embodiment is to provide a toothbrush that can achieve a high brushing effect by precisely controlling the displacement of the handle 4 (and consequently the displacement of the brush portion 8 relative to the teeth) even when the handle 4 is held lightly in order to brush with the appropriate brushing pressure. For this reason, the grip portion 10 is such that its cross-section in the direction perpendicular to the longitudinal direction (arrow Y) of the handle 4 (arrow Z direction), has a triangular shape with the apex at the tip direction (arrow Z1) of the brush hair bundle.

[0028] Referring to FIG. 2A-FIG. 2D, the following description will be given in detail to the shape of the toothbrush 2-1 excluding the brush portion 8. FIG. 2A is a plan view, FIG. 2B is a cross-sectional view of FIG. 2A along X-X line, FIG. 2C is a bottom view, and FIG. 2D provides end views for respective cross-sections at positions A, B, C, D, E, and F in FIG. 2A. As is clear from FIG. 2D, the grip portion 10 has a shape in which the cross-sectional area gradually decreases toward the neck portion 12.

[0029] The grip portion 10 of the toothbrush 2-1 of this embodiment has a shape that is particularly suitable for holding with a pen grip manner, and the position for holding with a pen grip manner is a portion D near the neck portion 12 of the grip portion 10 in FIG. 2A-FIG. 2D, and the cross-sectional shape has a triangular shape T with the tip of the brush hair bundle (in the direction of the arrow Z1) as the apex S1.

The triangular shape T has slanted sides T1 and T2, which are composed of arcs with small curvature, and also has a base T3. The reference numerals S2 and S3 indicate the tops on the side of the base T3. Each of the tops S1, S2, and S3 is rounded rather than pointed, and the curvature of the top S1 is greater than those of the tops S2 and S3. The triangular shape T gradually decreases in cross-sectional area towards the side of the neck portion 12, and the sharpness of the apex S1 increases in line with this. When viewed from the side of the neck portion 12, the base of the triangular shape T (T3) is the part supported by the middle finger, and the oblique side T1 is the part supported by the thumb, and the oblique side T2 is the part supported by the index finger. In FIG. 2A, the double-dotted line L1 indicates the width variation of the ridge line of the apex S1. The single-dotted line L2 in FIGS. 2B and 2D indicate the reference position in the direction of the tip of the brush hair bundle (in the direction of the arrow Z1).

[0030] As is clear from FIG. 2D, the neck portion 12 is formed into a square shape in its cross-sectional area that gradually decreases towards the brush hair attaching portion 6, when the brush portion 8 is pressed against the teeth, the brush portion becomes narrower than the grip portion 10 so that it can flex (elastic deformation). This allows the brush portion 8 to flex (elastic deformation) when it comes into contact with the teeth. As shown in FIG. 2A, the brush hair attaching portion 6 has multiple pores 14 for attaching the brush hairs. Specifically, the pores 14 comprises: central pores 14a, indicated by black circles, which are arranged at equal intervals along the longitudinal direction in the center of the width direction of the brush hair attaching portion 6; and 17 (seventeen) peripheral pores 14b, indicated by white circles, which are arranged to surround these central pores 14a. In this embodiment, the grip portion 10,

neck portion 12 and brush portion 6 are molded (formed) as a single piece from polyethylene terephthalate resin (synthetic resin).

[0031] FIG. 3 shows a toothbrush 2-1 held in a pen-grip manner at position D in FIG. 2A at the grip portion 10, and the figure itself is a cross-sectional end view seen from the side of the brush hair attaching portion 6. The base of the triangle T3 is supported by the middle finger F3, and the oblique side T1 is supported by the thumb F1 and the oblique side T2 is supported by the index finger F2. Even if the grip portion 10 is held lightly in a pen grip manner, it will not rotate around the axis and will not have position shift because it has a triangular cross-section. Also, even if the grip portion 10 tries to move upwards, it will not move because the thumb F1 and index finger F2 are touching each other at an angle pointing downwards. In other words, the grip portion 10 is held in a position where it cannot move in the grip space surrounded by the thumb F1, index finger F2 and middle finger F3, and can only be moved by the user's hand movement. As a result, the position of the brush head 8 relative to the teeth can be precisely controlled during tooth brushing without the user having to think about it, and thus a high level of brushing effectiveness can be achieved. In addition, the grip portion 10 is not thin and not flat like the grip portion in Patent Document 3, but has a thickness similar to a round bar as a whole, so that it is easy for the grip portion 10 to be held, without having the hand to feel tired.

[0032] [Second Embodiment] The following description will be given to second embodiment with reference to FIGS. 4 and 5. Parts that are the same as or can be considered the same as the first embodiment are indicated with the same reference numerals, and the explanations of the structure and functions that have already been made will be omitted as appropriate. This is also the case for the other embodiments below.

[0033] In this embodiment, at least part of the surface of the grip portion 10 is decorated. As shown in FIG. 4, the toothbrush 2-2 has a neck portion 12 and a brush hair attaching portion 6 which have been molded (formed) as a single unit, and the neck portion 12 is detachable from the grip portion 10. Lacquer 16 is formed on the entire surface of the grip portion 10 as a decoration to give it a high-class feel. The design of the lacquer 16 may be selected as appropriate according to the user's preferences, or it may be customized as a special product for the user. This makes it possible to differentiate the product from conventional disposable toothbrushes and the like, and enables the user to select a toothbrush (so-called "favorite toothbrush") that matches their own preferences. In addition, the colors and patterns of lacquer 16 can be selected as appropriate. Further, lacquer 16 may also be formed using seals or stickers attached to the grip portion 10.

[0034] On the other hand, replacing the grip portion 10, which has been decoratively finished to have a sense of luxury as the brush 8 deteriorates, together with the brush portion 8 will be considered wasteful and has a large impact on the environment. Therefore, in the toothbrush 2-2 of this embodiment, the grip portion 10 is detachable so that only the parts excluding the grip portion 10 are necessary to be replaced. A male screw 12a is integrally molded at the rear end of the neck portion 12, and a female screw 10a that screws onto the male screw 12a is integrally molded at the tip of the grip portion 10. The arrangement of the male screw 12a and female screw 10a between the neck portion 12 and grip portion 10 may also be reversed.

[0035] As shown in FIG. 5, the toothbrush 2-3 has a grip portion 10 and neck portion 12 which are molded together, and the brush hair attaching portion 6 is detachable from the neck portion 12. A geometric pattern 18 is formed on the entire surface of the grip portion 10 as a decorative element to give a high-class feel. The

geometric pattern 18 itself can be selected as appropriate according to the user's preferences, and this makes it possible to differentiate it from conventional products, and it also makes it possible to increase the degree of freedom in product selection when the user selects their own favorite toothbrush. Since it would be a waste of money to replace the grip portion 10, which has been finished to give a sense of luxury (as the brush portion 8 deteriorates), it is designed to be removable so that only the brush hair attaching portion 6 need to be replaced. The male screw 6a is integrally molded at the rear end of the brush hair attaching portion 6, and the female screw 12b, which screws onto the male screw 6a, is integrally molded at the tip of the neck portion 12. The arrangement of the male screw 6a and female screw 12b between the brush hair attaching portion 6 and the neck portion 12 may be reversed. The geometric pattern 18 may be formed using a sticker or seal. In this embodiment, the geometric pattern 18 is formed only on the grip portion 10, but it may also be formed continuously on the entire surface of the neck portion 12.

[0036] The decoration applied to the surface of the grip portion 10 may be a carved pattern or a pattern with bumps and hollows. The grip portion 10 may also be made of wood or bamboo, and this makes it easy to form carved patterns or patterns with bumps and hollows.

[0037] Also, although it is omitted from the illustration, if a cover is provided to cover the brush hair attaching portion 6 of the toothbrush 2-3, the surface of the cover may be decorated with lacquer 16 or geometric patterns 18 and the like, and if a case is provided to store the toothbrush 2-3, the surface of the case may be decorated with lacquer 16 or geometric patterns 18 or the like.

[0038] [Third Embodiment] The following description will be given to the third embodiment (details of the brush portion 8 common to toothbrushes 2-1, 2-2, and 2-3),

with reference to FIG. 6- FIG. 9. Brush portion 8 is formed with the aim of more effectively cleaning the gaps between teeth and between teeth and gums by brushing for a short time and with light acting force. FIG. 6 is a perspective view of the brush portion 8. The brush portion 8 includes: a central brush hair group 22, in which multiple (in this case, six) brush hair bundles 20a are arranged along the longitudinal direction (arrow Y direction) in the center of the width direction (arrow W direction) of the brush hair attaching portion 6; and a peripheral brush hair group 24 in which multiple (in this case, seventeen) brush hair bundles 20b are arranged surrounding the central brush hair group 22 in the brush hair attaching portion 6. The central brush hair group 22 has a greater height in the direction of the tip of the brush hair group (in the direction of arrow Z1) than the peripheral hair group 24, and the central hair group 22 and peripheral hair group 24 are formed into a mountain shape (pyramid shape) with a slope from the tip to the rear side and a slope from the neck portion 12 to the rear side, with the center of the brush hair attaching portion 6 as the dividing line in the longitudinal direction (in the direction of arrow Y), and with the central part of the hair attaching portion 6 being a mountain-shaped (pyramid-shaped) formation with a slope from the tip to the rear end and a slope from the neck portion 12 to the rear end (see FIG. 7B). The height of each brush hair bundle 20a in the central bundle group 22 differs from each other due to the mountain-shaped formation, but this is not used to distinguish between reference numerals. The same is true for each brush hair bundle 20b in the peripheral brush hair bundle group 24.

[0039] FIG. 7A is a plan view of the brush hair bundles 20a and 20b seen from the brush hair bundle tip side. The number of brush hair bundles on the tip side (arrow Y1 side) of the peripheral hair group 24 is less than the number of brush hair bundles on the neck portion 12 side (arrow Y2 side). In other words, there are three brush bundles

20b on the neck side 12, but only two on the tip side. This makes the tip side of the brush portion 8 narrower, making it easier to clean the back of the teeth. As shown in FIG. 7B, both the central brush hair bundles 22 and the peripheral brush hair bundles 24 are formed so that they have a step t while maintaining a mountain shape, and the step t is about 3 mm. The gradient of the central brush hair bundles 22 and the peripheral brush hair bundles 24 are the same as each other.

[0040] Each brush hair h that makes up the bundle 20a of the central brush hair bundle 22 and the brush hair bundle 20b of the peripheral bundle 24 is made of nylon and has normal hardness. In addition, the shape of each brush hair h is conical, tapering towards the tip, as shown in FIG. 8A. In this embodiment, each brush hair is respectively processed to form a tapered shape. FIG. 8B shows the shape of the brush hair h_1 in a conventional toothbrush, and the reference numeral 26 indicates the brush portion of a conventional toothbrush. In this conventional toothbrush, the entire brush has the same thickness right up to the tip. In contrast, in the brush portion 8 of the present embodiment, as shown in FIG. 8A, by making thinner the tip of the brush hair h , it is possible to make the tip of the brush hair h to penetrate deep into the gaps between the teeth, for example, and to enhance the functions of scraping out food residue, thus effectively removing plaque.

[0041] The following description will be given to the advantages of the brush portion 8 with a mountain-shaped profile (common to the first and second embodiments). In FIGS. 9A and 9B, the reference numeral 28 indicates the gum, and the reference numeral 30 indicates the teeth. In addition, the reference numeral 32 indicates the brush portion of a conventional toothbrush. As shown in FIG 9B, the tip of the conventional brush portion 32 hits the tooth 30 because the height of the brush hair group is the same everywhere, and it cannot enter the inter-tooth gaps T_g . This

is because the surrounding brush hairs block the entry of the brush hair corresponding to the inter-tooth gaps Tg, and in order to get them into the inter-tooth gaps Tg, the brush head has to be pressed down hard, which causes the other parts that do not correspond to the inter-tooth gaps Tg to hit the side of the tooth 30 hard. This causes the brushing pressure to exceed the appropriate level, and the gums will be damaged or the dirt cannot be removed effectively.

[0042] In contrast, the brush portion 8 of the toothbrushes 2-1, 2-2, and 2-3 of the present invention are formed in a mountain shape, so that as shown in FIG 9A, the brush at the top of the mountain shape of the central brush hair group 22 can easily enter the inter-tooth gaps Tg, and the dirt in the inter-tooth gaps Tg can be scraped out with an easy light brushing. As there is a step between the central hair group 22 and the peripheral hair group 24, the peripheral hair group 24 does not obstruct the central hair group 22 when the top of the central hair group 22 enters the inter-dental space Tg. Only when the central hair group 22 is in a slightly bent state as tooth brushing progresses, do the brush hair of the peripheral hair group 24 come into contact with the surface of tooth 30. In this way, the two-stage contact of the brush due to the mountain-shaped configuration allows for effective tooth brushing. Combined with the tapered shape of the brush described in FIG. 8A, this allows for the effective removal of dirt with the appropriate brushing pressure.

[0043] By varying the thickness or quantity (number of brush hairs) of the brush hair bundles, it is possible to make a difference in the hardness of the central brush hair group 22 and the peripheral brush hair group 24. For example, if the teeth are very dirty, the hardness of the central brush hair group 22 can be increased, and if gingivitis is present, the hardness of the peripheral brush hair group 24 can be decreased. The hardness of the central brush hair group 22 and the peripheral brush hair group 24 may

be made different depending on the difference in the material of the brush hairs. It is also possible to make the color of the central brush hair group 22 and the peripheral brush hair group 24 to be different from each other. By making the color of the central brush hair group 22 and the peripheral brush hair group 24 to be different from each other, it is possible to improve the design of the brush portion 8.

[0044] The above describes the embodiments of the present invention, but the present invention is not limited to the above embodiments, and various changes are possible within the scope of the technical ideas described in the claims, specifications, and drawings. For example, the materials of the grip portion 4 and brush portion 8 are not limited to the above descriptions. Also, the arrangement pattern (arrangement pattern of brush hair bundles) of the central hole 14a and the peripheral hole 14b of the pores 14 in the brush hair attaching portion 6 is not limited to the above. Moreover, the attachment and detachment structure in the second embodiment is not limited to screws, but can also be formed by using snap engagement or the like.

CLAIMS

Claim 1:

A toothbrush comprising: a long handle; a brush hair attaching portion formed at the tip of the handle; and a brush portion consisting of a plurality of brush hair bundles that are attached to the brush hair attaching portion, thereby forming the toothbrush capable of cleaning teeth with the brush portion;

wherein the handle includes; a grip portion to be held in a hand; a neck portion that is located between the grip portion and the brush hair attaching portion, and that supports the brush hair attaching portion and has a diameter smaller than that of the grip portion;

wherein the brush portion is formed in a mountain shape with the center of the brush hair portion in the longitudinal direction of the handle as the peak, and the grip portion has cross sections perpendicular to the longitudinal direction of the handle, the cross sections include triangular portions with the tip at the apex thereof.

Claim 2:

The toothbrush according to claim 1, wherein the grip portion has a shape in which the cross-sectional area gradually decreases toward the neck portion.

Claim 3:

The toothbrush according to claim 1, wherein the surface of at least a part of the grip portion is decorated.

Claim 4:

The toothbrush according to claim 3, wherein the decoration is a decoration lacquer.

Claim 5:

The toothbrush according to claim 3 or 4, wherein the neck portion and the brush hair attaching portion are integrally formed together, while the neck portion is detachable from the grip portion.

Claim 6:

The toothbrush according to claim 3 or 4, wherein the brush hair attaching portion is detachable from the neck portion.

Claim 7:

The toothbrush according to claim 1, wherein
in the brush portion comprises: a central brush hair group in which a plurality of brush hair bundles are arranged along the longitudinal direction in the center of the brush hair portion; and a peripheral brush hair group in which a plurality of brush hair bundles are arranged to surround the central brush hair group in the brush hair portion,
the central brush hair group is taller than the peripheral brush hair group, and the central brush hair group and the peripheral brush hair group are formed in a mountain shape with the tip side sloping upward toward the back end and the neck side sloping downward toward the back end, and with the center of the brush hair attaching portion in the longitudinal direction as the dividing line.

Claim 8:

The toothbrush according to claim 7, wherein the number of brush hair bundles on the tip side of the peripheral hair bundle group is less than the number of hair bundles on the neck side.

Claim 9:

The toothbrush according to claim 7, wherein among the central hair bundle group and the peripheral hair bundle group, at least the hair of each hair bundle of the central hair bundle group is shaped to taper conically toward the tip.

Claim 10:

The toothbrush according to claim 7, wherein the hardness of the central hair bundle group and the peripheral hair bundle group are mutually different by varying the thickness or the amount of hair of the hair bundles.