



US 20150150366A1

(19) **United States**

(12) **Patent Application Publication**

**Kim et al.**

(10) **Pub. No.: US 2015/0150366 A1**

(43) **Pub. Date: Jun. 4, 2015**

(54) **TOOTHBRUSH BRISTLES HAVING TIP WITH DOUBLE STRUCTURE AND TOOTHBRUSH COMPRISING SAME**

(30) **Foreign Application Priority Data**

Jun. 5, 2012	(KR)	10-2012-0060389
Jul. 11, 2012	(KR)	10-2012-0075609
May 8, 2013	(KR)	10-2013-0052148

(71) Applicant: **LG HOUSEHOULD & HEALTHCARE LTD.**, Seoul (KR)

**Publication Classification**

(72) Inventors: **Sung Jin Kim**, Daejeon (KR); **Mi Jeong Park**, Daejeon (KR); **Won Ho Ha**, Daejeon (KR); **In Ho Lee**, Daejeon (KR); **Sang Min Lee**, Daejeon (KR)

(51) **Int. Cl.**  
*A46B 9/02* (2006.01)  
*A46B 9/00* (2006.01)

(52) **U.S. Cl.**  
 CPC .. *A46B 9/02* (2013.01); *A46B 9/005* (2013.01)

(73) Assignee: **LG HOUSEHOLD & HEALTHCARE LTD.**, Seoul (KR)

(57) **ABSTRACT**

The present invention provides a toothbrush bristle comprising: a core area including a rubber elastic body; and a clad area which is formed around the circumference of the core area, and which includes a resin that is harder than the rubber elastic body, wherein a tip from which the core area is exposed is formed in an end portion thereof. Thus, since the tip is formed in the end portion which comes in contact with the gum such that the rubber elastic body is exposed therefrom, the invention provides the advantage of softly massaging the gums while brushing the teeth.

(21) Appl. No.: **14/405,761**

(22) PCT Filed: **Jun. 4, 2013**

(86) PCT No.: **PCT/KR2013/004909**

§ 371 (c)(1),  
(2) Date: **Dec. 4, 2014**

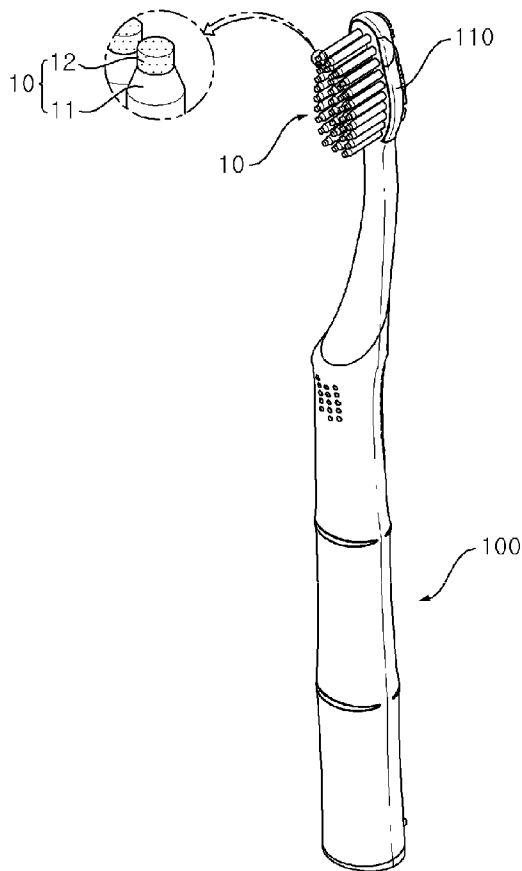


FIG. 1

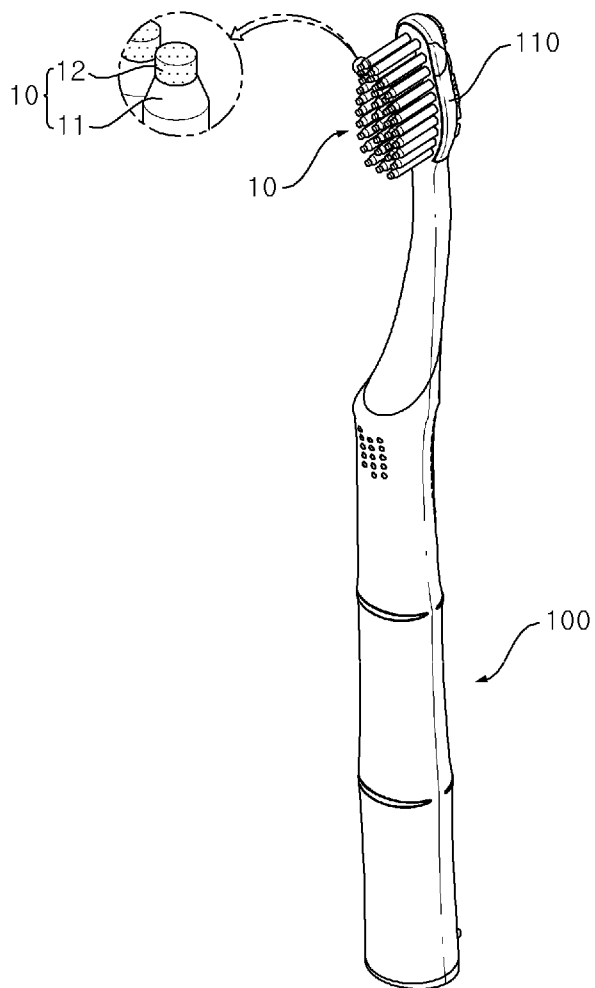


FIG. 2

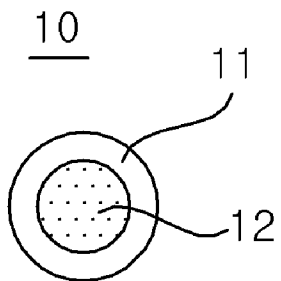


FIG. 3

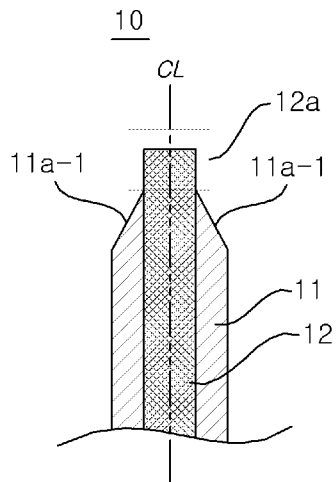


FIG. 4

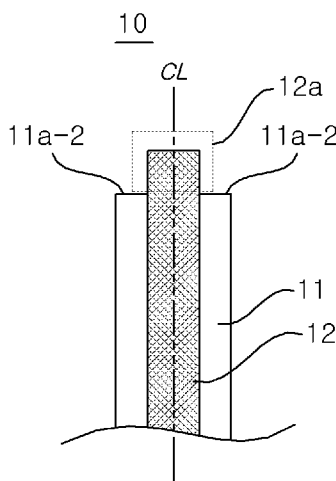


FIG. 5

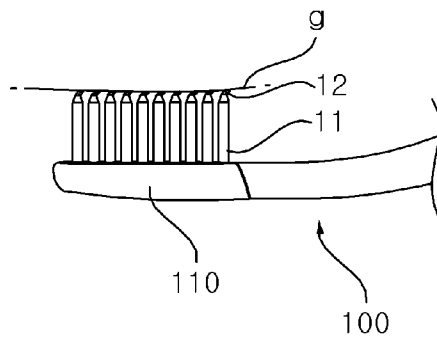


FIG. 6

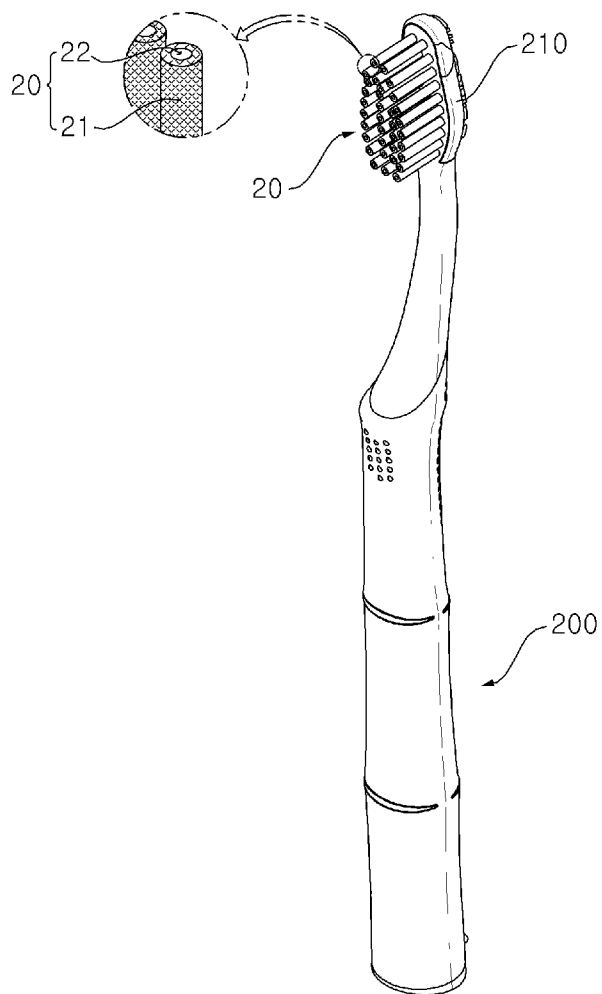
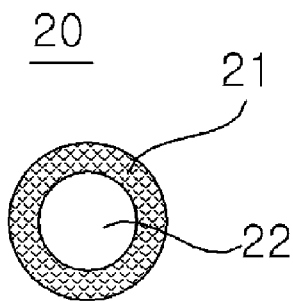


FIG. 7



**TOOTHBRUSH BRISTLES HAVING TIP WITH DOUBLE STRUCTURE AND TOOTHBRUSH COMPRISING SAME**

**TECHNICAL FIELD**

[0001] The present invention relates to toothbrush bristles and a toothbrush including the same, and to toothbrush bristles each having a tip with a double structure and a toothbrush including the same.

**BACKGROUND ART**

[0002] A typical toothbrush has a plurality of toothbrush bristles fixed to of a head connected to a handle. The toothbrush bristles perform functional operations of physically removing dental plaque, or applying cleaning solutions onto teeth so as to chemically brush the teeth, keep the teeth white, eliminate halitosis, and the like. The toothbrush bristle has some degrees of strength, and a fore-end of the toothbrush bristle is configured to be sharp. Therefore, there is a problem in that gums may be damaged by the toothbrush bristle while brushing the teeth using the toothbrush.

[0003] Meanwhile, it is important to manage the gums in order to improve a healthy mouth. Massage, which stimulates gum tissues, is effective in maintaining healthy gums. However, in the case of the toothbrush bristle made of resin such as polyester, there is a great risk that the gums will be damaged by a fore-end of the toothbrush bristle during a massage process.

**DISCLOSURE**

**Technical Problem**

[0004] Therefore, the present invention has been made in an effort to solve the aforementioned problem, and an object of the present invention is to provide toothbrush bristles capable of softly massaging gums while brushing teeth, and a toothbrush including the toothbrush bristles.

[0005] In addition, an object of the present invention is to provide toothbrush bristles having a smooth surface and excellent water repellency, and a toothbrush including the toothbrush bristles.

**Technical Solution**

[0006] In order to achieve the aforementioned object, a first invention provides a toothbrush bristle including: a core area which is made of silicone; and a clad area which is formed around the core area, and made of resin having greater rigidity than the silicone.

[0007] Preferably, as the first invention, a tip where the core area is exposed may be formed at an end of the toothbrush bristle.

[0008] Preferably, as the first invention, an end portion of the clad area may be formed to be inclined based on a centerline of the core area.

[0009] Preferably, as the first invention, a stepped area may be formed at an end portion of the clad area.

[0010] Preferably, as the first invention, the resin may be polyester.

[0011] Preferably, as the first invention, a toothbrush including the aforementioned toothbrush bristles may be provided.

[0012] In order to achieve the aforementioned object, another first invention provides a toothbrush bristle includ-

ing: a clad area which is made of silicone; and a core area which is formed inside the clad area, and made of resin having greater rigidity than the silicone.

[0013] Preferably, as another first invention, the resin may be any one of polyester, nylon, polypropylene, and polyethylene.

[0014] Preferably, as another first invention, a toothbrush including the aforementioned toothbrush bristles may be provided.

[0015] In order to achieve the aforementioned object, a second invention provides a toothbrush bristle including: a core area which is made of a first substance including a rubber elastic body; and a clad area which is formed around the core area, and made of a second substance including resin having greater rigidity than the rubber elastic body, in which a tip where the core area is exposed is formed at an end of the toothbrush bristle.

[0016] Preferably, as the second invention, the first substance may be a material made by synthesizing any one of silicone, polyester, polyethylene, and polypropylene with the rubber elastic body.

[0017] Preferably, as the second invention, a length of the tip may be within 0.01 mm to 6 mm.

[0018] Preferably, as the second invention, an end of the clad area may be formed to be inclined based on a centerline of the core area.

[0019] Preferably, as the second invention, the resin may be any one of polyester and nylon.

[0020] Preferably, as the second invention, a toothbrush including the aforementioned toothbrush bristles may be provided.

**Advantageous Effects**

[0021] According to the toothbrush bristles and the toothbrush including the toothbrush bristles according to the present invention, the clad area (outer layer) is made of a substance including resin, the core area (inner layer) is made of a first substance including a rubber elastic body, and the tip is configured so that the first substance is exposed at an end of the toothbrush bristle which comes into direct contact with gums, thereby providing an advantageous effect of softly massaging the gums while brushing teeth.

[0022] In addition, according to the toothbrush bristles and the toothbrush including the toothbrush bristles according to the present invention, the first substance includes silicone, thereby providing an advantageous effect of increasing wear resistance, surface smoothness, and water repellency.

**DESCRIPTION OF DRAWINGS**

[0023] FIG. 1 is a view illustrating configurations of toothbrush bristles according to a first exemplary embodiment of the present invention and a toothbrush including the toothbrush bristles.

[0024] FIG. 2 is a view illustrating a core area and a clad area of the toothbrush bristle illustrated in FIG. 1.

[0025] FIG. 3 is a view illustrating a first modified example of the core area and the clad area of the toothbrush bristle illustrated in FIG. 1.

[0026] FIG. 4 is a view illustrating a second modified example of the core area and the clad area of the toothbrush bristle illustrated in FIG. 1.

[0027] FIG. 5 is a view illustrating the core areas that are elastically deformed while coming into contact with the gums.

[0028] FIG. 6 is a view illustrating configurations of toothbrush bristles according to a second exemplary embodiment of the present invention and a toothbrush including the toothbrush bristles.

[0029] FIG. 7 is a view illustrating a core area and a clad area of the toothbrush bristle illustrated in FIG. 6.

DESCRIPTION OF MAIN REFERENCE NUMERALS OF DRAWINGS

- [0030] 11: Clad area
- [0031] 11a-1: Inclined surface
- [0032] 11a-2: Stepped area
- [0033] 12: Core area
- [0034] 12a: Tip

BEST MODE

[0035] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings. First, in denoting reference numerals to constituent elements of respective drawings, it should be noted that the same constituent elements will be designated by the same reference numerals although they are shown in different drawings. Further, hereinafter, an exemplary embodiment of the present invention will be described, but it is obvious that the technical spirit of the present invention is not restricted or limited thereto, but the exemplary embodiment of the present invention may be modified by a person with ordinary skill in the art to be variously carried out.

[0036] FIG. 1 is a view illustrating configurations of toothbrush bristles according to a first exemplary embodiment of the present invention, and a toothbrush including the toothbrush bristles.

[0037] FIG. 1 clearly illustrates only a main characteristic part for conceptual and clear understanding of the present invention. As a result, various modifications to the illustrations are expected, and the scope of the present invention is not limited to specific shapes illustrated in the drawings.

[0038] Referring to FIG. 1, toothbrush bristles 10 according to a first exemplary embodiment of the present invention each include a clad area 11 which includes resin such as polyester, and a core area 12 which is made of silicone. That is, a single bristle of the toothbrush bristles 10 has a double structure with different materials. The plurality of toothbrush bristles 10 are fixed to a head 110 formed at an end portion of a handle 100. The silicone, which may be mixed in the form of rubber or resin, has soft and flexible characteristics, and is a material having high water repellency or water resistance against water.

[0039] The clad area 11 of the toothbrush bristle 10 is made of a material that has a greater strength than silicone. Therefore, the clad area 11 may be made of synthetic resin such as polyester.

[0040] FIG. 2 is a view illustrating a core area and a clad area of the toothbrush bristle illustrated in FIG. 1, FIG. 3 is a view illustrating a first modified example of the core area and the clad area of the toothbrush bristle illustrated in FIG. 1, and FIG. 4 is a view illustrating a second modified example of the core area and the clad area of the toothbrush bristle illustrated in FIG. 1.

[0041] Referring to FIG. 2, the core area 12 of the toothbrush bristle 10 may include a rubber elastic body. The rubber elastic body is a material having a great characteristic that can be deformed by external force and restored to an original shape when the external force is no longer applied. The rubber elastic body is also called an elastomer.

[0042] Specifically, the core area 12 may be made of a first substance including the rubber elastic body. Here, the first substance may be made by synthesizing silicone, polyester, polyethylene, polypropylene and the like with the rubber elastic body. In a case in which silicone is included as a material of the core area 12, wear resistance, surface smoothness, and water repellency may be improved.

[0043] The clad area 11 of the toothbrush bristle 10 may be made of a second substance including resin that has a greater strength than the rubber elastic body. Here, the second substance may be any one of polyester and nylon.

[0044] The toothbrush bristle 10 having the core area 12 and the clad area 11 may be manufactured by a discharge device having a nozzle with a double structure.

[0045] Meanwhile, referring to FIGS. 3 and 4 together, a tip 12a is formed at an end of the toothbrush bristle 10. Further, the clad area 11 is configured to be shorter than the core area 12 at the end of toothbrush bristle 10 so that the core area 12 is exposed. In this case, a length of the tip 12a may be within 0.01 mm to 6 mm. More preferably, the length of the tip 12a may be within 0.05 mm to 3 mm.

[0046] Here, in a case in which the length of the tip 12a is smaller than 0.01 mm, an essential function of the tip 12a, which softly massages the gums, deteriorates. In contrast, in a case in which the length of the tip 12a is greater than 6 mm, flexibility of the toothbrush bristle 10 is excessively increased, which causes a problem in that detergency and durability are degraded.

[0047] Meanwhile, as the first modified example of the clad area 11, an inclined surface 11a-1, which is formed to be inclined based on a centerline CL of the core area 12, may be formed at an end portion of the clad area 11. In other words, in a case in which the clad area 11 is formed in an annular shape, the end portion of the clad area 11 may be formed so that an outer diameter of the clad area 11 becomes smaller toward the end portion of the clad area 11.

[0048] Meanwhile, as the second modified example of the clad area 11, a stepped area 11a-2 may be formed at the end portion of the clad area 11.

[0049] The purpose of the aforementioned configuration is to minimize a level difference between the clad area 11 and the core area 12, and allow the toothbrush bristle 10 to softly come into contact with the teeth or gums.

[0050] The tip 12a is formed by processing the toothbrush bristle 10, which is manufactured to have a double structure, into fine bristle. Specifically, the tip 12a may be formed by immersing the toothbrush bristle 10, which is discharged to have a double structure, into an acid or alkali solution, and then tapering the toothbrush bristle 10. In addition, the tip 12a may be formed grinding the toothbrush bristle 10, which is discharged to have a double structure, using a grinder.

[0051] FIG. 5 is a view illustrating the core areas that are elastically deformed while coming into contact with the gums.

[0052] Referring to FIG. 5, the core area 12 is elastically deformed while coming into contact with the gums g, thereby softly massaging the gums.

[0053] FIG. 6 is a view illustrating configurations of toothbrush bristles according to a second exemplary embodiment of the present invention and a toothbrush including the toothbrush bristles, and FIG. 7 is a view illustrating a core area and a clad area of the toothbrush bristle illustrated in FIG. 6.

[0054] Referring to FIGS. 6 and 7 together, toothbrush bristles 20 according to a second exemplary embodiment of the present invention each include a clad area 21 which is made of silicone, and a core area 22 which is made of resin such as any one of polyester, nylon, polypropylene, and polyethylene. The plurality of toothbrush bristles 20 are fixed to a head 210 formed at an end portion of a handle 200.

[0055] In the second exemplary embodiment, the clad area 21 of the toothbrush bristle 20, which corresponds to an outer layer, is made of silicone, and as a result, there are advantages in that a surface of the toothbrush bristle is smoothly formed, and water repellency of the toothbrush bristle is increased.

[0056] Although the exemplary embodiment of the present invention has been described for illustrative purposes, those skilled in the art will appreciate that various modifications, changes and substitutions are possible, without departing from the scope and spirit of the invention. Accordingly, the exemplary embodiment disclosed in the present invention and the accompanying drawings are not intended to limit but illustrate the technical spirit of the present invention, and the scope of the technical spirit of the present invention is not limited by the exemplary embodiment and the accompanying drawings. The protection scope of the present invention should be construed based on the following appended claims and it should be appreciated that the technical spirit included within the scope equivalent to the claims belongs to the present invention.

- 1. A toothbrush bristle comprising:  
a core area which is made of silicone; and  
a clad area which is formed around the core area, and made of resin having greater rigidity than the silicone.
- 2. The toothbrush bristle of claim 1, wherein a tip where the core area is exposed is formed at an end of the toothbrush bristle.

3. The toothbrush bristle of claim 2, wherein an end portion of the clad area is formed to be inclined based on a centerline of the core area.

4. The toothbrush bristle of claim 2, wherein a stepped area is formed at an end portion of the clad area.

5. The toothbrush bristle of claim 1, wherein the resin is polyester.

6. A toothbrush comprising the toothbrush bristles according to claim 1.

7. A toothbrush bristle comprising:  
a clad area which is made of silicone; and  
a core area which is formed inside the clad area, and made of resin having greater rigidity than the silicone.

8. The toothbrush bristle of claim 7, wherein the resin is any one of polyester, nylon, polypropylene, and polyethylene.

9. A toothbrush comprising the toothbrush bristles according to claim 7.

10. A toothbrush bristle comprising:  
a core area which is made of a first substance including a rubber elastic body; and  
a clad area which is formed around the core area, and made of a second substance including resin having greater rigidity than the rubber elastic body,  
wherein a tip where the core area is exposed is formed at an end of the toothbrush bristle.

11. The toothbrush bristle of claim 10, wherein the first substance is a material made by synthesizing any one of silicone, polyester, polyethylene, and polypropylene with the rubber elastic body.

12. The toothbrush bristle of claim 10, wherein a length of the tip is within 0.01 mm to 6 mm.

13. The toothbrush bristle of claim 10, wherein an end of the clad area is formed to be inclined based on a centerline of the core area.

14. The toothbrush bristle of claim 10, wherein the resin is any one of polyester and nylon.

15. A toothbrush comprising the toothbrush bristles according to claim 10.

\* \* \* \* \*