

Other kinds

Japanese to English Translation of a Toothbrush Patent *

Jerre BUSH

(Received 15 July 2009)

19: Japan Patent Office (JP)

11: Public Patent Disclosure Bulletin No.: 2001-8733 (P2001-8733 A)

12: Public Patent Disclosure Bulletin (A)

43: Public Patent Disclosure Bulletin Date: January 16, 2001

Request for Examination: Not yet made

Number of Claims: 5

Total Pages: 3

51: Int. Cl. 7: A 46 B 5/00, A 61 C 17/22

Identification Code: Not applicable

FI: A 46 B 5/00 B, 13/02 700

Theme Code (Reference): 3 B 202

21: Patent Application No.: Hei 11 – 182627

22: Application Date: June 29, Hei 11 (1999)

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* なお本稿は、その原著作物（特開2001-8733公開特許公報）に関して、原著作権者（NECトーキン株式会社）から、許諾（平成21年11月4日付 文書番号：研開（知財）L09-029）を得ている。この許諾には、本誌の頒布を受けた者が、本稿の全てまたは一部を、学術教育目的のために直接または公衆送信により再頒布することが含まれている。

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F Term (Reference): 3B202, AA06, AB15, BA02, BE10, CA01, CA05

54: Title of the Invention: Tooth Brush

57: Abstract

Problems to be solved by the invention:

To obtain a toothbrush which sustains constant force when brushing teeth, without damaging elasticity, and which reduces the burden on gums caused by brushing too hard, while making a connecting portion of a handle section and a polishing section of the toothbrush narrower for ease of brushing, and to be able to reach areas such as the back teeth and the nooks and crannies.

Means of solving the problems:

To make a toothbrush in which a highly elastic metal alloy, nickel-titanium alloy, is used to make a connecting portion 1 of a handle section 2a and a polishing section 3a of the toothbrush, and the connecting portion 1 is coated with an elastic material.

Claims:

What is claimed is:

1. A toothbrush characterized by the use of a highly elastic metal alloy coated with an elastic material in at least a connecting portion between a handle section and a polishing section of the toothbrush.
2. A toothbrush characterized by the highly elastic metal alloy referred to in Claim 1 having a circular cross-sectional configuration.
3. A toothbrush characterized by the highly elastic metal alloy referred to in Claim 1 having a semi-elliptical cross-sectional configuration.
4. A toothbrush characterized by the highly elastic metal alloy referred to in any of Claims 1 to 3 being a nickel-titanium alloy.

5. A toothbrush characterized by the elastic material referred to in the toothbrushes described in any of Claims 1 to 4 being either plastic or rubber.

Background to the invention:

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Technical Field of the Invention:

The present invention relates to the structure of a toothbrush.

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Prior art:

In general, a handle section and a polishing section of a toothbrush have been shaped as one formation using plastic or the like. Also, variations of this formation have been devised to allow the toothbrush to reach the back teeth and to sustain constant force when brushing teeth. Toothbrushes have been made using a zig-zag design to provide elasticity and the connecting portion has been made narrower in order to brush the back teeth and the nooks and crannies.

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Problems to be solved by the invention:

Conventional toothbrushes have had the following problems. Namely, in order for a connecting portion to have elasticity, it was made with a zig-zag design, and for the sake of gaining sufficient elasticity it was made wider, which made it difficult to reach the back teeth when brushing. On the other hand, in order to reach the back teeth and to maintain constant force when brushing, the material of this connecting portion had to be narrowed, and it could not keep sufficient elasticity. Whatever the case, there was a problem of not keeping the appropriate amount of elasticity in the connecting portion.

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Accordingly, the problem of the present invention is to offer a toothbrush which can sustain constant force when brushing, without damaging elasticity, and which reduces the burden on gums caused by brushing too hard, and in which the connecting portion of the handle section and the polishing section of the toothbrush can be narrowed for ease of brushing, and to be able to brush the back teeth and the nooks and crannies.

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Means of solving the problems:

The present invention uses a superelastic-treated highly elastic metal alloy in a connecting portion of a handle section and a polishing section of a toothbrush. Accordingly, this invention offers a toothbrush in which brushing force remains constant, without damaging elasticity, and which reduces the burden on gums that comes from brushing too hard, and by narrowing the connecting portion of the toothbrush, brushing is made easier, and reaching the back teeth and the nooks and crannies is made possible.

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Here, as a highly elastic metal alloy, nickel-titanium alloy is used, as it is also used in the material of such items as mobile phone antennas, glasses frames, and catheter guide wire.

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In this way, because of the distinctively flexible elasticity of the highly elastic metal alloy, it is possible to brush teeth with constant force, and reduce the burden on gums caused by brushing too hard. Also, the cross-section of the aforementioned highly elastic metal alloy consists of a small, fine material for the purpose of gaining elasticity for brushing teeth, and to be able to brush the back teeth and the nooks and crannies.

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Namely, the present invention is a toothbrush in which the connecting portion of the handle section and the polishing section of the toothbrush is a highly elastic metal alloy, and the connecting portion is coated with an elastic material.

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And, the present invention is a toothbrush in which the cross-sectional configuration of the aforementioned highly elastic metal alloy is a circular shape.

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And, the present invention is a toothbrush in which the cross-sectional configuration of the aforementioned highly elastic metal alloy is a semi-elliptical shape.

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And, the present invention is a toothbrush of the aforementioned highly elastic metal alloy, which is nickel-titanium alloy.

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And, the present invention, pertaining to the aforementioned toothbrush, is a toothbrush which uses a rubber or resin elastic material.

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Embodiments of the invention:

Below, the drawings are used to explain the embodiments of the present invention.

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Embodiments of the invention 1:

Fig. 1 shows the embodiments of a toothbrush according to the present invention. According to Fig. 1, a toothbrush 10 is constructed from a connecting portion 1, which connects a handle section 2a and a polishing section 3a.

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The connecting portion 1 connects the handle section 2a and the tooth polishing section 3a, which constitutes one toothbrush. These connections are joined by a caulking or binding material.

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A cross-sectional diagram of the connecting portion of the toothbrush 10 in Fig. 1 is shown in Fig. 2. The connecting portion 1a is formed using a highly elastic metal alloy 4 in the center, which is coated with an elastic material 5. Here an elastic material 5, such as rubber or resin, is used.

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The highly elastic metal alloy 4, as a black color or, after being descaled, as a grey color, was not suitable to be used in the mouth, nor was it a proper design. Accordingly, coating this portion with a material such as rubber or resin makes it possible to be used as a toothbrush.

0018

Here, nickel-titanium alloy has been chosen as the highly elastic metal alloy 4. In this cross-section, a narrowing treatment process called wire drawing is applied using holed dice, and this cross-section is a round wire rod. 5 is an elastic material which coats the highly elastic metal alloy 4, which forms the connecting portion 1 a.

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On the other hand, Fig. 3 is a cross-sectional view of another example of the connecting portion of the toothbrush 10 in Fig. 1. A connecting portion 1 b is formed with a highly elastic metal alloy 6 in the center, and is coated with an elastic material 7.

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The Fig. 3 example is a cross-sectional view of the semi-elliptical shape of the highly elastic metal alloy 6. Here, nickel-titanium alloy has been chosen as the highly elastic metal alloy 6. In the same way, the aforementioned highly elastic metal alloy 4 and 6 used in Fig. 2 and Fig. 3 respectively, is coated with the elastic material 5 or 7, therefore rust does not occur due to moisture, and it can be used in the mouth. Also, durability against repeated bending is superior to that of conventional elastic materials, and the plastic deformation stress value is around 5% higher.

0021 Embodiments of the invention 2:

Fig. 4 shows an example of an electric-powered toothbrush according to the embodiments of the present invention. According to Fig. 4, an electric-powered toothbrush 11 is constructed with a handle section 2 b, a polishing section 3 b, and a connecting portion 8, and a battery 9 is mounted in the handle section 2 b.

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Fig. 5 shows a cross-sectional view of the connecting portion of the electric-powered toothbrush in Fig. 4. A connecting portion 8 is designed with a highly elastic metal alloy 13 in the center, and this portion is coated with an elastic material 5, and a wire cord or such is embedded in the elastic material 5.

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Effects of the invention:

As stated above, the present invention offers a toothbrush which can sustain constant force when brushing teeth, without damaging elasticity, and which reduces the burden on the gums as a result of brushing too hard, and in which a connecting portion of a handle section and a polishing section has been narrowed for ease of brushing and to reach the back teeth and the nooks and crannies.

Brief description of the drawings:

Fig. 1 is an external view of the toothbrush according to this embodiment of the invention.

Fig. 2 is a cross-sectional view A-A' of the connecting portion of the toothbrush shown in Fig. 1.

Fig. 3 is a cross-sectional view A-A of another embodiment of the connecting portion of the toothbrush shown in Fig. 1.

Fig. 4 is an external view of an electric toothbrush according to this embodiment of the invention.

Fig. 5 is a cross-sectional view B-B of the connecting portion of the toothbrush shown in Fig. 2 [sic].

Description of the symbols:

- 1, 1a, 1b, 8 Connecting portion
- 2a, 2b Handle section
- 3a, 3b Polishing section
- 4, 6, 13 Highly elastic metal alloy
- 5, 7, 12 Elastic material
- 9 Battery
- 10 Toothbrush
- 11 Electric-powered toothbrush