(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 925 234 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
28.05.2008 Bulletin 2008/22

(21) Application number: **06742015.8**

(22) Date of filing: **29.05.2006**

(51) Int Cl.:
A46B 15/00 *(2006.01)*

(86) International application number:
PCT/CN2006/001127

(87) International publication number:
WO 2007/019756 (22.02.2007 Gazette 2007/08)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

(30) Priority: **17.08.2005 CN 200520063463 U**

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(54) A COMPACT TYPE OZONE TOOTHBRUSH

(57) A compact type ozone toothbrush includes a handle portion and a bristle portion, **characterized in that** the toothbrush further includes an ozonizer and a circuit set inside the handle portion to work the ozonizer and includes batteries provided power to the circuit.

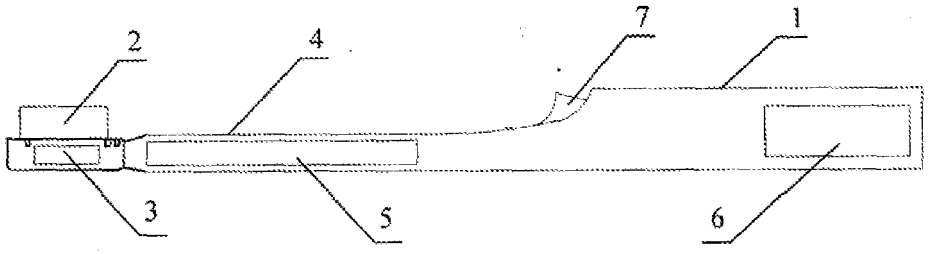

Fig.1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to toothbrush, more particularly, to a compact ozone toothbrush.

BACKGROUND OF THE INVENTION

[0002] There are different designs for ozone toothbrush with bactericidal functions. However, the current ozone toothbrushes have complicated structures and bad versatility, can't satisfy people's various demands of functions. For example, it is hard to be accepted that the brush head can't be changed conveniently, and the power consumption of the toothbrush by using battery only is so high. Meanwhile, the high cost is also hard to be accepted. So, the popularization and usage of the ozone toothbrush are affected directly. Furthermore, the conventional toothbrushes also have complicated structure and large size.

SUMMARY OF THE INVENTION

[0003] An aspect of the present invention is to provide an ozone toothbrush with compact structure, which enables a limited amount of ozone to be used in the toothbrush without leaking. Meanwhile, the defect of complicated structure of the conventional ozone toothbrush due to a need of pressurized gas is eliminated. And a sufficient flexibility for the structure of the toothbrush, such as recharging and oscillating, are also considered.

[0004] According to an aspect of the present invention, a compact ozone toothbrush is provided, comprising a handle portion and a bristle portion, wherein the compact ozone toothbrush also comprises an ozonizer and a circuit provided inside the handle portion to enable operation of the ozonizer.

[0005] Advantageously, the compact ozone toothbrush also comprises batteries used for power supply to the circuit, and a switch for controlling the power supply.

[0006] Advantageously, the handle portion further comprises a handle and a connecting pole, wherein the ozonizer is installed in the bristle portion or the connecting pole, and the circuit is placed in the connecting pole, and the batteries are placed in the handle.

[0007] Advantageously, the handle portion further comprises a handle and a connecting pole, wherein the ozonizer is installed in the bristle portion or the connecting pole, and the circuit and the batteries are placed in the handle.

[0008] Advantageously, the ozonizer comprises a metal discharge device, or an ozonizer tube, or a ceramic element.

[0009] Advantageously, the bristle portion comprises a base board, several binds of bristles on the base board, and when the ozonizer is installed in the bristle portion, the bristle portion also comprises a shell for receiving the ozonizer.

[0010] Advantageously, the base board is movably connected to the shell, and the shell is fixed to the handle portion.

[0011] Advantageously, the bristle portion further comprises an outer shell, forming a cavity with the base board to receive the ozonizer, and overflow vents or overflow slots are provided on the base board or the outer shell.

[0012] Advantageously, a removable battery cover or a removable battery box is provided at a free end of the handle portion.

[0013] Advantageously, the batteries are rechargeable batteries, and the compact ozone toothbrush also comprises induction coils wound around the handle portion, and an induction charging circuit connected between the induction coils and the rechargeable batteries.

[0014] Advantageously, the compact ozone toothbrush also comprises an oscillating unit powered by the batteries, which provides oscillation to the toothbrush, and the oscillating unit may be an eccentric motor.

[0015] The ozone toothbrush provided in the present invention has the following prominent advantages: since the generated ozone is directly applied to the bristle portion of the toothbrush, no gas-pressurized equipment is needed, thus the size of the ozone toothbrush may be very small. Meanwhile, a sufficient flexibility for the structure are also considered, for example, the brush head is changeable, the batteries are rechargeable, and the toothbrush is vibratile.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1 is a structural diagram of the compact ozone toothbrush according to a first embodiment of the present invention.

Fig. 2 is a structural diagram of the compact ozone toothbrush according to a second embodiment of the present invention.

Fig. 3 is a structural diagram of the compact ozone toothbrush according to a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0017] As shown in Fig.1, the compact ozone toothbrush according to the first embodiment of the present invention comprises a handle portion and a bristle portion 2. An ozonizer 3 is installed inside the bristle portion 2. The handle portion further comprises a handle 1 and a connecting pole 4. A driving circuit 5 of the ozonizer 3 is placed inside the connecting pole 4. Batteries 6 are used for power supply to the driving circuit 5, and a switch 7 is used to control the power supply of the batteries. Both of the batteries 6 and the switch 7 are placed in the handle 1. The ozonizer may be a metal discharge device, or an

ozonizer tube, or a ceramic element. The batteries may be rechargeable batteries. Induction coils (not shown) are wound around the handle portion, and an induction charging circuit used to charge the rechargeable batteries through a outside induction equipment is connected between the induction coils and the rechargeable batteries.

[0018] As shown in Fig.2, the compact ozone toothbrush according to the second embodiment of the present invention comprises a handle portion and a bristle portion 2. The handle portion further comprises a handle 1 and a connecting pole 4. An ozonizer 3 is installed inside the connecting pole 4. A driving circuit 5 of the ozonizer 3 and batteries as well as a switch 7 for controlling the power supply to the batteries are all placed inside the handle 1.

[0019] As shown in Fig.3, the compact ozone toothbrush according to the third embodiment of the present invention comprises a handle portion and a bristle portion 2. An ozonizer 3 is installed inside the bristle portion 2. The handle portion further comprises a handle 1 and a connecting pole 4. A driving circuit 5 of the ozonizer 3 and batteries are placed inside the handle 1. A switch 7 for controlling power supply to the batteries is also installed inside the handle 1. The bristle portion 2 comprises a base board 21 and several binds of bristles 22 provided on the base board 21, and when the ozonizer is installed inside the bristle portion 2, the bristle portion 2 also comprises a shell 23 used for receiving the ozonizer 3. In another word, the shell 23 is a hollow cavity for receiving the ozonizer 3. Here, two electrodes and connecting wires (not shown) are connected to the driving circuit 5 through the connecting pole.

[0020] In another embodiment, the base board is movably connected to the shell, and the shell is immovably connected to the handle portion.

[0021] In a further embodiment, the bristle portion also comprises an outer shell, forming a cavity with the base board for receiving the ozonizer, and overflow vents or overflow slots are ptovided on the base board or the outer shell. A removable battery cover or a removable battery box is provided at a free end of the handle portion.

[0022] In another embodiment, a oscillating equipment may be provided in the handle. The oscillating equipment may be a eccentric motor. In this way, double functions of oscillation and massage are provided.

Claims

1. A compact ozone toothbrush, comprising a handle portion and a bristle portion, wherein the compact ozone toothbrush also comprises an ozonizer and a circuit provided inside the handle portion to enable operation of the ozonizer.

2. The compact ozone toothbrush according to claim 1, wherein the compact ozone toothbrush also comprises batteries used for power supply to the circuit

3. The compact ozone toothbrush according to claim 2, wherein the compact ozone toothbrush also comprises a switch for controlling the power supply.

4. The compact ozone toothbrush according to claim 2, wherein the handle portion further comprises a handle and a connecting pole, wherein the ozonizer is installed in the bristle portion or the connecting pole, and the circuit is placed in the connecting pole, and the batteries are placed in the handle.

5. The compact ozone toothbrush according to claim 2, wherein the handle portion further comprises a handle and a connecting pole, wherein the ozonizer is installed in the bristle portion or the connecting pole, and the circuit and the batteries are placed in the handle.

6. The compact ozone toothbrush according to any one of claims 1-5, wherein the ozonizer comprises a metal discharge device, or an ozonizer tube, or a ceramic element.

7. The compact ozone toothbrush according to claim 6, wherein the bristle portion comprises a base board, several binds of bristles on the base board, and when the ozonizer is installed in the bristle portion, the bristle portion also comprises a shell for receiving the ozonizer.

8. The compact ozone toothbrush according to claim 7, wherein the base board is movably connected to the shell, and the shell is fixed to the handle portion.

9. The compact ozone toothbrush according to claim 7, wherein the bristle portion further comprises an outer shell, forming a cavity with the base board to receive the ozonizer, and overflow vents or overflow slots are provided on the base board or the outer shell.

10. The compact ozone toothbrush according to claim 7, wherein a removable battery cover or a removable battery box is provided at a free end of the handle portion.

11. The compact ozone toothbrush according to claim 6, wherein the batteries are rechargeable batteries, and the compact ozone toothbrush also comprises induction coils wound around the handle portion, and an induction charging circuit connected between the induction coils and the rechargeable batteries.

12. The compact ozone toothbrush according to any one of claims 1-5, wherein the compact ozone toothbrush further comprises an oscillating unit provided inside

the handle.

13. The compact ozone toothbrush according to claim 12, wherein the oscillating unit comprises an eccentric motor.

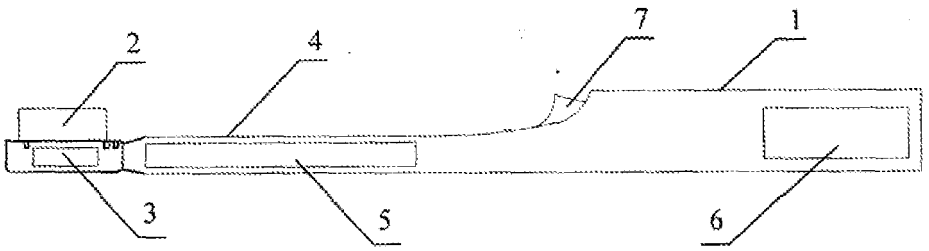

Fig.1

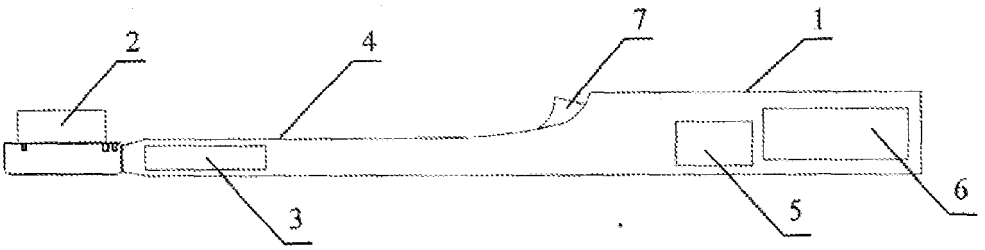

Fig.2

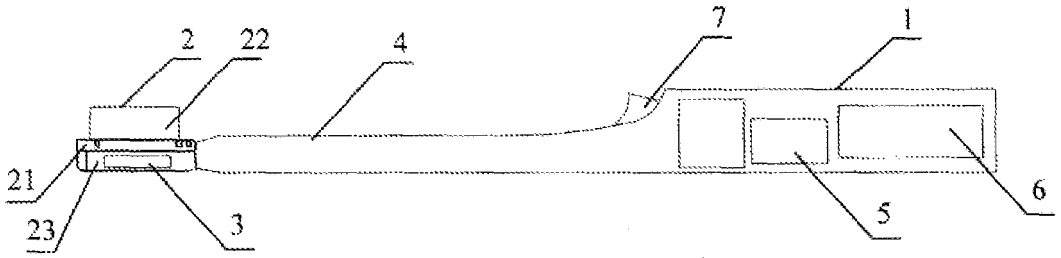

Fig.3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2006/001127

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.[8] A46B 15/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl.[8] A46B 15/00 , A46B 11/+

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

ALL OF CHINESE PATENT DOCUMENTS

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CPRS,EPODOC,WPI,PAJ,CNKI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US5921251A ((CERA-N) CERAMATEC INC, (MICR-N) MICROLIN LC) 13. Jul.1999 description column 2 line 60 to column 6 line24, Fig.1, 3, 5	1-11
Y		12, 13
Y	CN2131484Y (YANG, Ji Qin) 5. May. 1993 description page 2 line 8 to line 17 ,Fig 1	12, 13
A		1-11
A	CN2540928Y (CHEN, Qing Fu) 26. Mar. 2003 the whole document	1-13
A	CN2525960Y (LI, Xiao Min) 18. Dec. 2002 the whole document	1-13

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8.Aug.2006 (08.08.2006)	14 · SEP 2006 (14 · 09 · 2006)
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer CHEN, Li Telephone No. (86-010)62085720

Form PCT/ISA /210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2006/001127

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
US5921251A	13.Jul.1999	JP2001513345T	4.Sep.2001
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CN2131484Y	5. May. 1993	none	
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Form PCT/ISA /210 (patent family annex) (April 2005)