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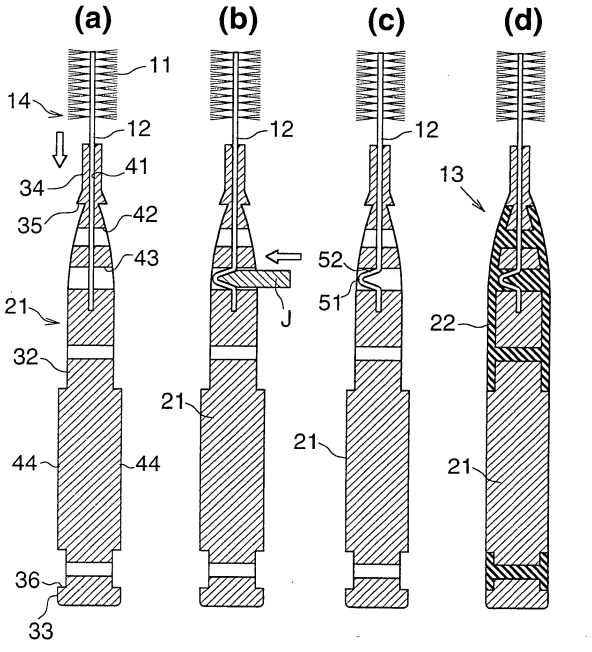
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(54) INTERDENTAL BRUSH AND METHOD OF PRODUCING THE SAME

(57) An interdental brush comprises bristles (11), a wire (12) with which the bristles (11) are twisted, and a handle (13) to which the wire is attached. The handle (13) is composed of a main body (21) and a sub-body (22). The main body (21) is provided with a longitudinal hole (41) into which a base part of the wire (12) is inserted, and a lateral hole (43) intersecting the longitudinal hole (41). A coming-off preventing bent portion (51) is formed at the base part of the wire (12) so as to be exposed to the lateral hole (43). The sub-body (22) is provided with an engagement portion (52) filling the lateral hole (43) so as to surround a periphery of the bent portion (51).

FIG. 5



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Description

TECHNICAL FIELD

[0001] The present invention relates to an interdental brush and a method of producing the same.

BACKGROUND OF THE INVENTION

[0002] As an interdental brush of this type, there is known one composed of bristles, a wire with which the bristles are twisted, and a handle to which the wire is attached, wherein a coming-off preventing bent portion is formed at the base part of the wire, and mounting of the wire to the handle is realized by insert resin molding (see, for example, Japanese Utility-model Application Laid-open No. 62-174423).

[0003] As for insert resin molding, the structure of a molding die is complicated and expensive, so the cost of equipment is high. Further, a work to set a wire to a mold requires time and effort, so it is troublesome. Accordingly, an interdental brush produced by insert resin molding is expensive.

[0004] An object of the present invention is to provide cheap interdental brushes and a producing method capable of producing them.

DISCLOSURE OF THE INVENTION

[0005] An interdental brush according to the present invention comprises: bristles; a wire with which the bristles are twisted; and a handle attached to the wire. The handle consists of a main body and a sub-body. The main body is provided with a longitudinal hole into which a base part of the wire is inserted, and a lateral hole intersecting the longitudinal hole. The base part of the wire is provided with a coming-off preventing bent portion formed to be exposed to the lateral hole. The sub-body is provided with an engagement portion filling the lateral hole so as to surround the periphery of the bent portion.

[0006] According to the interdental brush of this invention, it is possible to produce it by simple resin molding without using insert resin molding.

Therefore, cheap interdental brushes are provided.

[0007] Further, if a part of the surface of the main body is covered with the sub-body, and the discrimination properties of the main body and the sub-body are different to each other, it is possible to add visual appeal.

[0008] Further, if the main body and the sub-body are made of synthetic resin, fitting characteristics between resin are high, whereby it is possible to strengthen the bonding power between the main body and the sub-body.

[0009] Further, if a difference in discrimination properties results from at least one of color, gloss and material, the difference in discrimination properties can be changed easily.

[0010] Further, if the main body comprises a shoulder part, a tail part and a barrel part communicating the shoulder part and the tail part via a low step, the lateral hole is positioned in the barrel part, the sub-body covers the barrel part, and the boundaries between the surfaces of the shoulder part and the tail part and the surface of the sub-body adjacent thereto are flush with each other, it is possible to provide a smooth image in the handle as a whole, which contributes to improving the merchantability.

[0011] A method of producing an interdental brush according to the present invention comprises the steps of: forming, by primary resin molding, a main body of a handle having a longitudinal hole and a lateral hole intersecting the longitudinal hole; inserting a base part of a wire, with which bristles are twisted, into the longitudinal hole so as to be exposed to the lateral hole; forming a coming-off preventing bent portion at the base part of the wire via the lateral hole; and forming, by secondary resin molding, a sub-body of the handle such that a part thereof fills the lateral hole so as to surround the periphery of the bent portion.

[0012] According to the method of producing an interdental brush of the present invention, it is possible to produce bristles, a wire and an handle in different steps, which enables to produce an interdental brush in simple steps. Therefore, the cost of producing an interdental brush is low.

[0013] Further, if the step of forming the bent part is performed by inserting a rod-shaped jig J into the lateral hole and pressing the tip part of the jig J onto a to-be-bent portion of the base part of the wire, a part of the role of the jig for forming the bent portion is taken by the main body, and also forming of the bent part itself is easy

[0014] Further, if the same material is used in the primary resin molding and the secondary resin molding, the material cost can be saved, and also management of the producing steps can be easily carried out. However, different materials may be used in the primary resin molding and in the secondary resin molding.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a perspective view of an interdental brush according to the present invention.

Fig. 2 is a longitudinal sectional view taken along the line II-II of Fig. 1.

Fig. 3 is a longitudinal sectional view taken along the line III-III of Fig. 1.

Fig. 4 is an exploded perspective view showing a twisted wire with bristles of the interdental brush and the main body of a handle.

Fig. 5 is a producing process drawing of the interdental brush.

BEST MODE FOR CARRYING OUT THE INVENTION

[0016] Next, an embodiment of the present invention

will be explained with reference to the drawings.

[0017] In the explanation below, inside and outside are assumed to mean that, based on Figs. 1 to 3, the upper side is the front and the lower side is the outside. Further, left and right mean the right side and the left side of Fig. 2, and top and bottom mean the left side and the right side of Fig 3, respectively.

[0018] Referring to Figs. 1 to 3, a interdental brush is composed of nylon bristles 11, a stainless wire 12 and a handle 13 made of thermoplastic synthetic resin.

[0019] The bristles 11 are divided into plural bundles. The bundles of the bristles 11 are held by bundles in between the two-folded wire 12, which are twisted with the wire 12. Thereby, a twisted wire with bristles 14 having a tip part with the filled bristles 11 and a base part without the bristles 11 is configured.

[0020] The handle 13 consists of a main body 21 and a sub-body 22. The main body 21 and the sub-body 22 are formed by injection molding of polyethylene. Note that the main body 21 and the sub-body 22 may be made of the same material or different materials. As an example of using different materials, the main body 21 may be made of polyethylene, and the sub-body 22 may be made of synthetic resin having rubber characteristics such as EPDM, for example.

[0021] As shown in Fig. 4 in the clearest manner, the main body 21 is in a linear rod shape extending in the inside and outside direction as a whole, and is composed of a substantially inward conical shoulder part 31, a round rod-shaped barrel part 32, and a cylindrical tail part 33. From the inner end of the shoulder part 31, a narrow round rod-shaped neck part 34 is protruded toward the inner side.

[0022] At the boundary between the shoulder part 31 and the barrel part 32, there is formed a shoulder side step 35 which is lower than the shoulder part 31. At the boundary between the tail part 33 and the barrel part 32, there is formed a tail side step 36 which is lower than the tail part 33. The shoulder side step 35 is composed of dented U-shaped portions 37 opened to the tail part viewed from the up and down direction, and two protruded reverse U-shaped portions 38 communicating the tips of the both U-shaped parts 37. The tail side step 36 is formed of a ring part 39 continued around the whole periphery of the main body 21.

[0023] A longitudinal hole 41 is formed from the tip of the neck part 34 up to the inner end of the barrel part 32 through the barrel part 32 in the inside and outside direction. The diameter of the longitudinal hole 41 has a size enabling the twisted wire with bristles 14 to be inserted loosely. Two lateral holes 42 and 43 are formed, in parallel in the inside and outside direction, intersecting the longitudinal hole 41 so as to penetrate the barrel part 32 in the up and down direction.

[0024] At positions outside the two lateral holes 42 and 43, rectangle ridges 44 longitudinal in the inside and outside direction are formed on the both upper and lower side faces of the barrel part 32, and on both of the left and right side faces of the barrel part 32, circular protrusions 45 are formed, three for each side, in parallel in the inside and outside direction.

[0025] In the longitudinal hole 41, the base part of the twisted wire with bristles 14 is inserted so as to be exposed to the two lateral holes 42 and 43. At a position facing the outside lateral hole 43 of the base part, a V-shaped bent portion 51 is formed.

[0026] The sub-body 22 is formed so as to cover the whole surface of the barrel part 32. A part of the sub-body 22 fills the two lateral holes 42, and 43. In the outside lateral hole 43, the periphery of the bent portion 51 is surrounded by the sub-body 22 which constitutes an engagement portion 52 with respect to the bent portion 51. Further, at the shoulder side step 35 and the tail side step 36, the steps are embedded with the sub-body 22. Thereby, the boundaries between the surfaces of the shoulder part 31 and the tail part 33 and the surface of the sub-body 22 adjacent thereto are flush with each other. Further, the tip parts of the ridges 44 and the protrusions 45 are exposed to the surface of the sub-body 22.

[0027] The colors of the resin forming the main body 21 and the sub-body 22 differs to each other. For example, if the main body 21 is blue and the sub-body 22 is white in color, the handle 13 is colored with fresh two-tone colors.

[0028] Since the engagement portion 52 is fixed to the bent portion 51, there is no need to worry about the twisted wire with bristles 14 coming off from the handle 13 at all, even if a tensile force or a torsion force is acted on the twisted wire with bristles 14 when the interdental brush is used.

[0029] Next, a method of producing the interdental brush will be explained with reference to Fig. 5. First, the main body 21 is made by primary molding. Here, the longitudinal hole 41 and the lateral holes 42 and 43 are formed at the same time. Next, the base part of the twisted wire with bristles 14, which has been formed by molding separately, is inserted into the lateral holes 42 and 43. Then, a rod-shaped jig J is inserted into the lateral holes 42 and 43, and the tip of the jig J presses a part to be the bent portion 51 of the base part of the twisted wire with bristles 14 so as to deform the part to form the bent portion 51. Finally, after the jig J is removed from the lateral holes 42 and 43, the sub-body 22 is formed by secondary molding. The main body 21 and the sub-body 22 are fixed to each other, so there is no need to worry about separation.

Claims

1. An interdental brush comprising:

bristles 11;
a wire 12 with which the bristles 11 are twisted; and
a handle 13 attached to the wire, wherein

the handle 13 is composed of a main body 21 and a sub-body 22,
the main body 21 is provided with a longitudinal hole 41 into which a base part of the wire 12 is inserted, and a lateral hole 43 intersecting the longitudinal hole 41,
the base part of the wire 12 is provided with a coming-off preventing bent portion 51 formed so as to be exposed to the lateral hole 43, and
the sub-body 22 is provided with an engagement portion 52 filling the lateral hole 43 so as to surround a periphery of the bent portion 51.

2. The interdental brush as claimed in claim 1, wherein a part of a surface of the main body 21 is covered with the sub-body 22, and discrimination properties of the main body 21 and the sub-body 22 are different to each other.

3. The interdental brush as claimed in claim 2, wherein the main body 21 and the sub-body 22 are made of synthetic resin.

4. The interdental brush as claimed in claim 2, wherein a difference in the discrimination properties results from at least one of color, gloss and material.

5. The interdental brush as claimed in claim 1, wherein the main body 21 comprises a shoulder part 31, a tail part 33 and a barrel part 32 communicating the shoulder part 31 and the tail part 33 via a low step, the lateral hole 43 is positioned in the barrel part 32, the sub-body 22 covers the barrel part 32, and boundaries between surfaces of the shoulder part 31 and the tail part 32 and a surface of the sub-body 22 adjacent thereto are flush with each other.

6. The interdental brush as claimed in claim 2, wherein the main body 21 comprises a shoulder part 31, a tail part 33 and a barrel part 32 communicating the shoulder part 31 and the tail part 33 via a low step, the lateral hole 43 is positioned in the barrel part 32, the sub-body 22 covers the barrel part 32, and boundaries between surfaces of the shoulder part 31 and the tail part 32 and a surface of the sub-body 22 adjacent thereto are flush with each other.

7. The interdental brush as claimed in claim 3, wherein the main body 21 comprises a shoulder part 31, a tail part 33 and a barrel part 32 communicating the shoulder part 31 and the tail part 33 via a low step, the lateral hole 43 is positioned in the barrel part 32, the sub-body 22 covers the barrel part 32, and boundaries between surfaces of the shoulder part 31 and the tail part 32 and a surface of the sub-body 22 adjacent thereto are flush with each other.

8. The interdental brush as claimed in claim 4, wherein the main body 21 comprises a shoulder part 31, a tail part 33 and a barrel part 32 communicating the shoulder part 31 and the tail part 33 via a low step, the lateral hole 43 is positioned in the barrel part 32, the sub-body 22 covers the barrel part 32, and boundaries between surfaces of the shoulder part 31 and the tail part 32 and a surface of the sub-body 22 adjacent thereto are flush with each other.

9. A method of producing an interdental brush comprising the steps of:

forming, by primary resin molding, a main body 21 of a handle 13 having a longitudinal hole 41 and a lateral hole 43 insecting the longitudinal hole 41;
inserting a base part of a wire 12, with which bristles 11 are twisted, into the longitudinal hole 41 so as to be exposed to the lateral hole 43;
forming a coming-off preventing bent portion 51 at the base part of the wire 12 via the lateral hole 43; and
forming, by secondary resin molding, a sub-body 22 of the handle 13 such that a part thereof fills the lateral hole 43 so as to surround a periphery of the bent portion 51.

10. The method of producing the interdental brush as claimed in claim 9, wherein the step of forming the bent portion 51 is performed by inserting a rod-shaped jig J into the lateral hole 43 and pressing a tip part of the jig J onto a to-be-bent portion of the base part of the wire 12.

11. The method of producing the interdental brush as claimed in claim 9, wherein the same material is used in the primary resin molding and the secondary resin molding.

12. The method of producing the interdental brush as claimed in claim 10, wherein the same material is used in the primary resin molding and the secondary resin molding.

FIG. 1

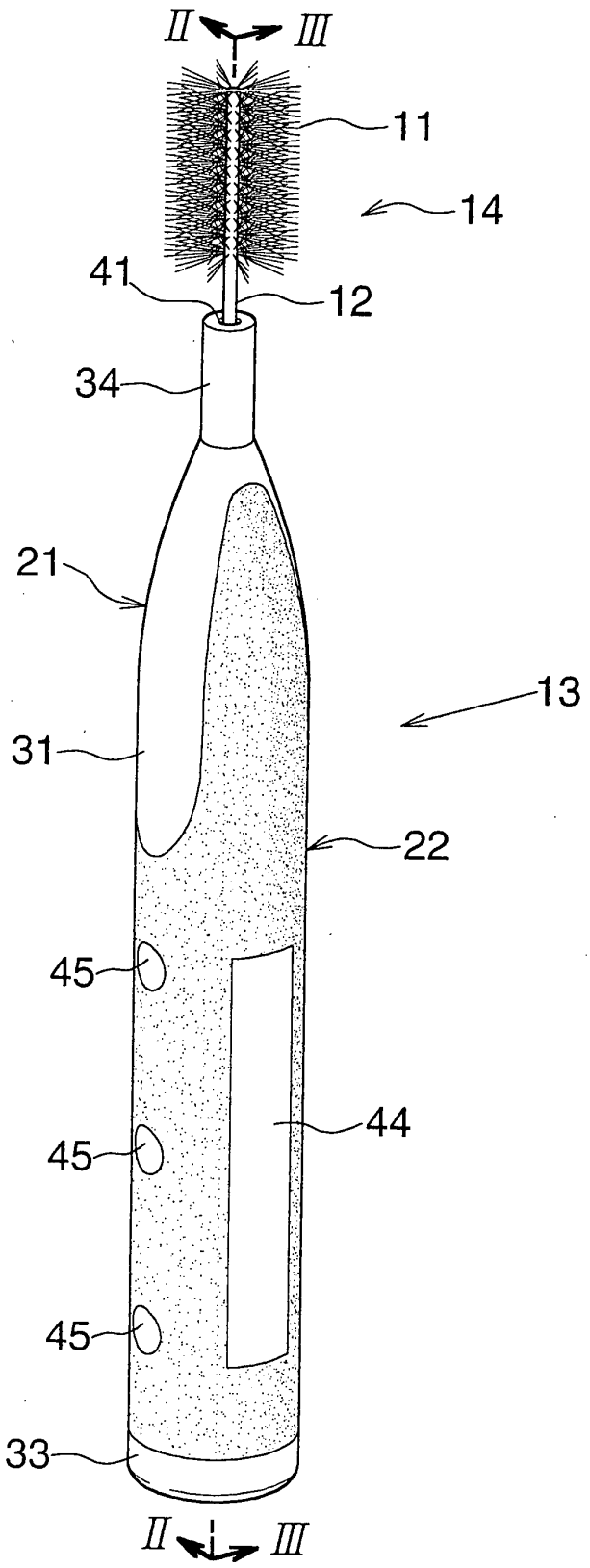


FIG. 2

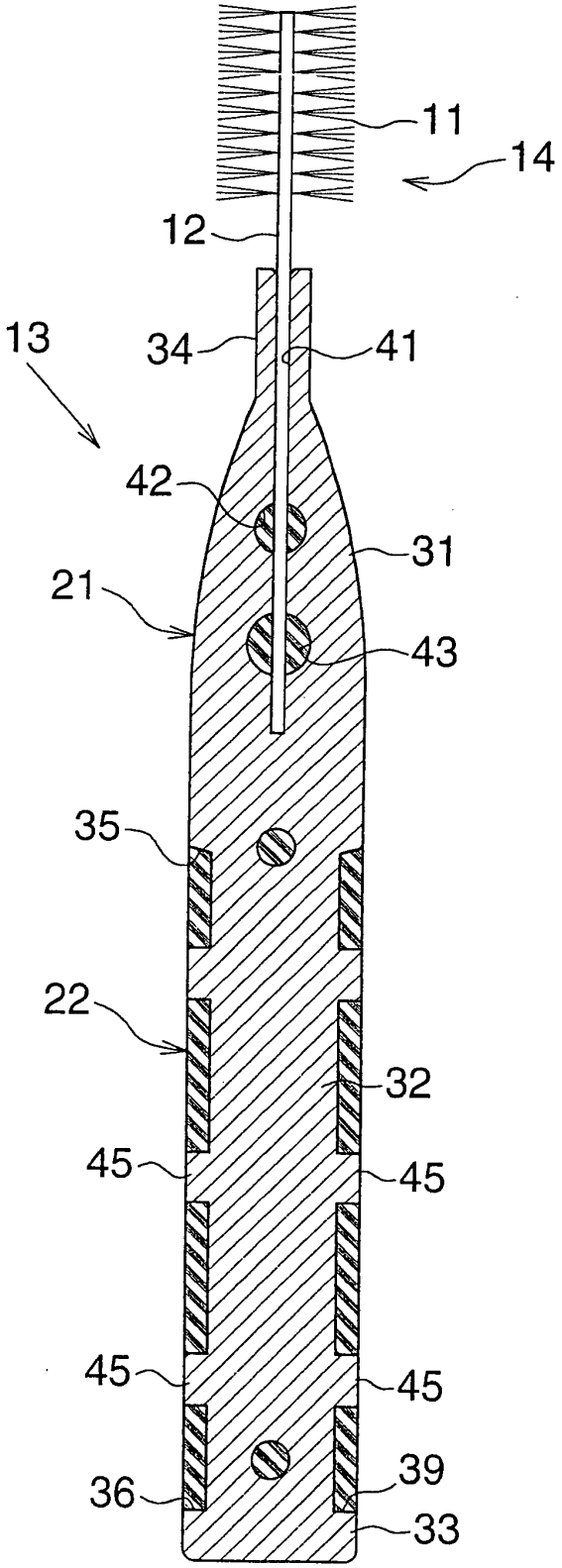


FIG. 3

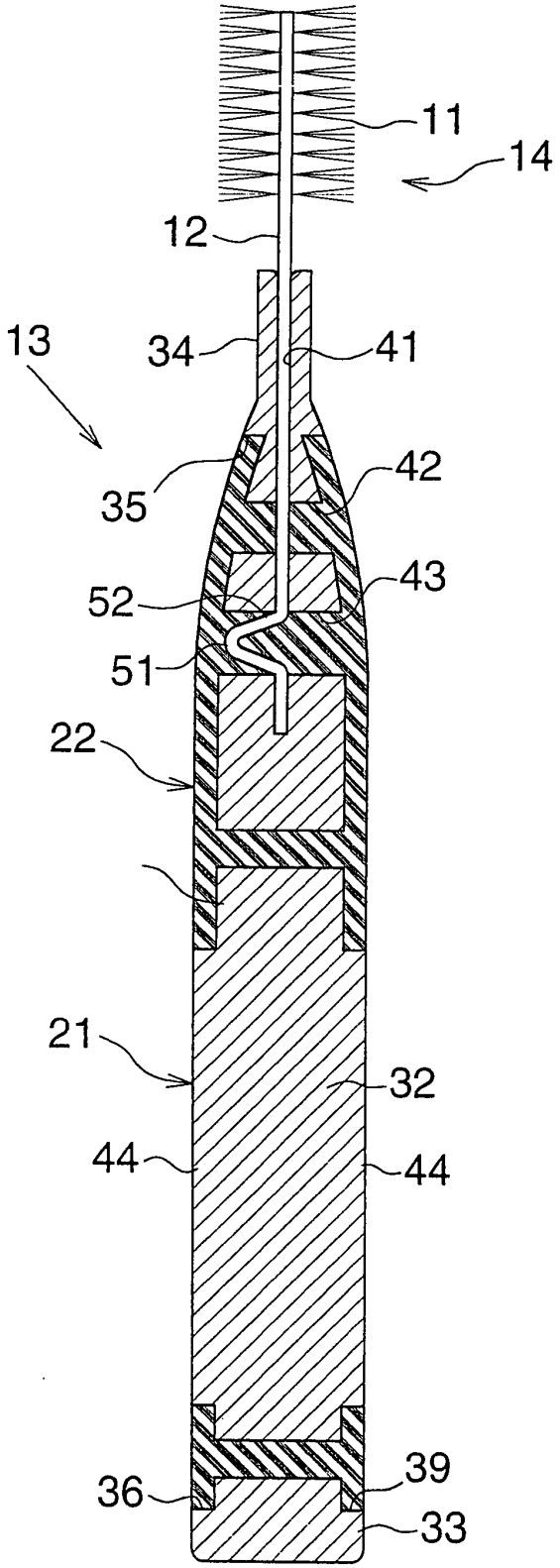


FIG. 4

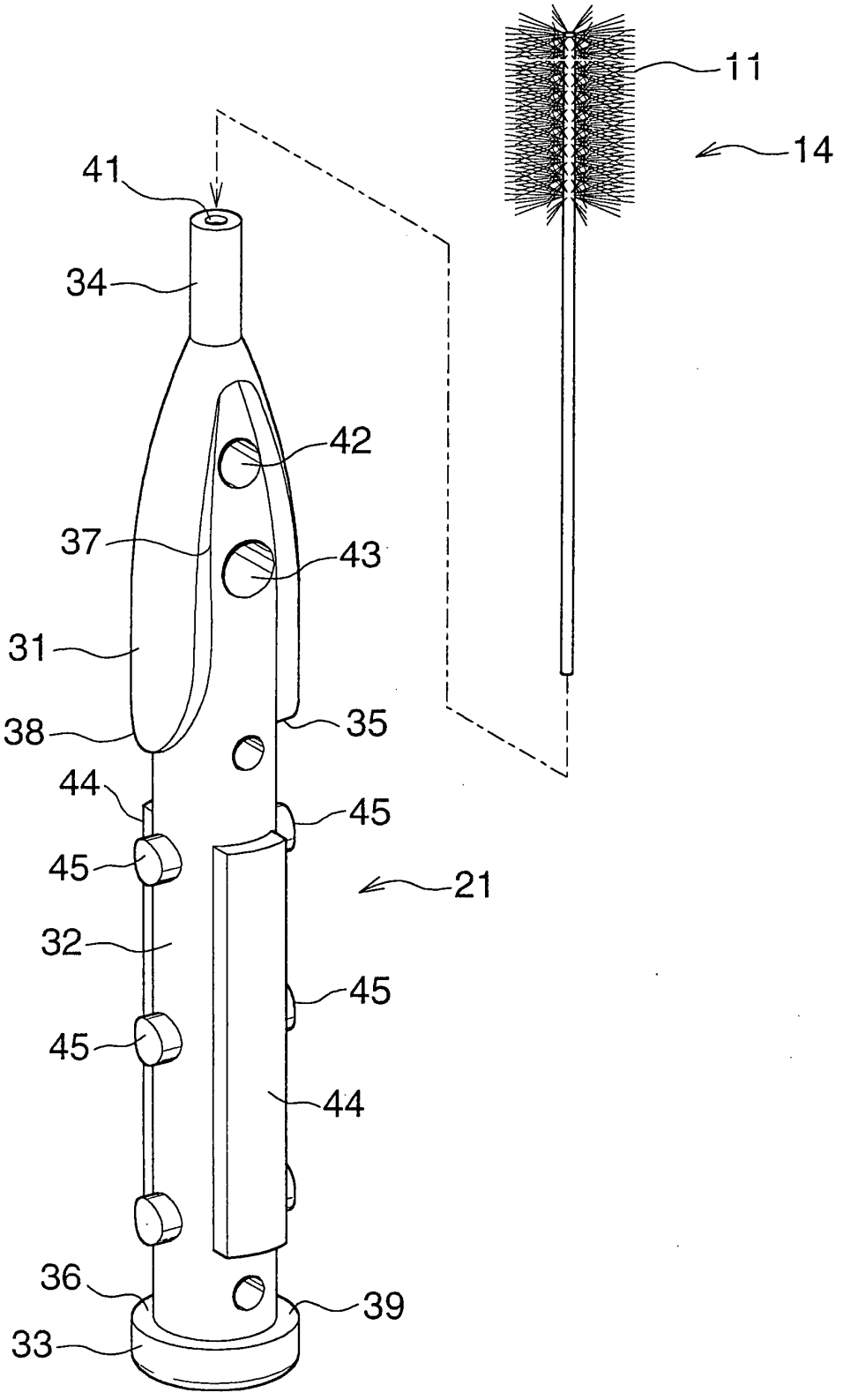
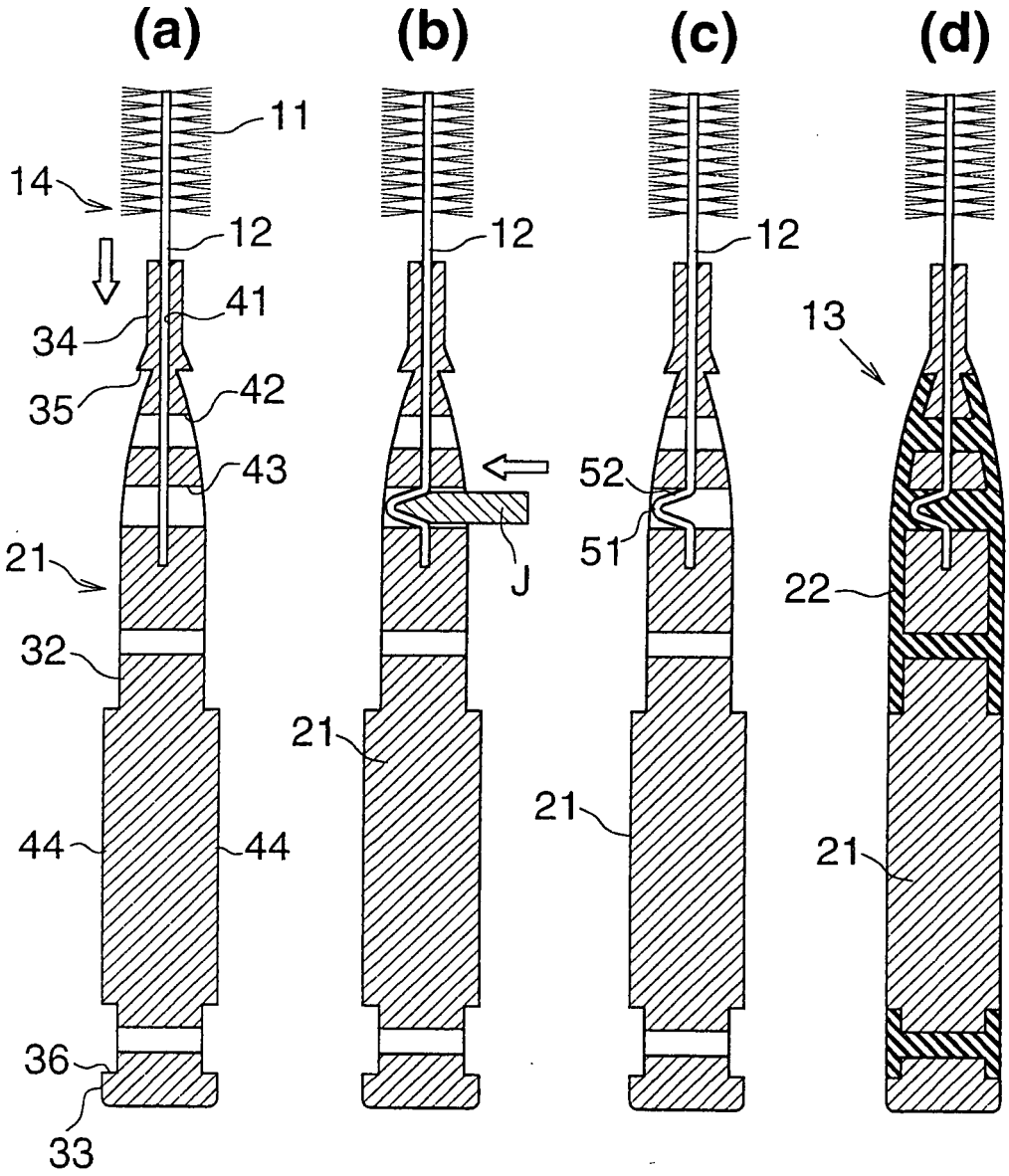


FIG. 5


(a)
(b)
(c)
(d)
11
14
12
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/007004

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] A46B5/00

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[7] A46B1/00-9/12, A61C15/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2004
Kokai Jitsuyo Shinan Koho 1971-2004 Jitsuyo Shinan Toroku Koho 1996-2004

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 10-155546 A (Nisshin Kinzoku Kabushiki Kaisha), 16 June, 1998 (16.06.98), Full text; all drawings (Family: none)	1-12
A	JP 10-313944 A (Kabushiki Kaisha GC Dental Products), 02 December, 1998 (02.12.98), Par. Nos. [0002] to [0003]; Fig. 2 (Family: none)	1-12
A	JP 3049165 U (Kabushiki Kaisha Mana), 02 June, 1998 (02.06.98), Par. Nos. [0014] to [0020]; Fig. 1 (Family: none)	1-12

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

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Date of the actual completion of the international search	Date of mailing of the international search report
17 August, 2004 (17.08.04)	07 September, 2004 (07.09.04)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/007004

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-538916 A (John O. Butler Co.), 19 November, 2002 (19.11.02), Full text; all drawings & WO 00/56185 A1 & US 6446640 B1	1-12
A	JP 2003-513700 A (Westone Products Ltd.), 15 April, 2003 (15.04.03), Full text; all drawings & WO 01/34058 A1 & US 6325626 B1	1-12

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