

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 February 2008 (07.02.2008)

PCT

(10) International Publication Number
WO 2008/015616 A2

(51) International Patent Classification:

A46B 5/00 (2006.01)

(21) International Application Number:

PCT/IB2007/052931

(22) International Filing Date: 24 July 2007 (24.07.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

BO2006A000577 31 July 2006 (31.07.2006) IT

(71) Applicant and

(72) Inventor: SERRA, Annalisa [IT/IT]; Via Lucchesi 3,
I-44100 Ferrara (IT).

(74) Agent: MANZELLA, Giovanni; C/o Manzella & Asso-
ciati S.a.s., Via Nosadella 9, I-40123 Bologna (IT).

(81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,

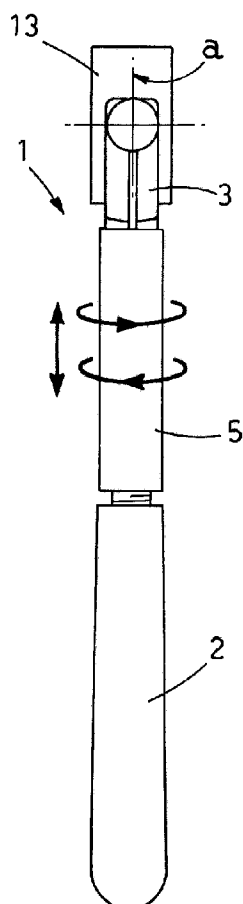
AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG,
ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL,
IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK,
LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW,
MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL,
PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,
PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished
upon receipt of that report

(54) Title: TOOTH-CARE DEVICE



(57) Abstract: The tooth-care device consists of a gripping handle (2) presenting a distal portion (3) equipped with an array of bristles (4). The bristles array (4) is connected in a revolving way to the handle (2) through a mount (13) assembled rotatably suitable to allow the said bristles array (4) to rotate with respect to the handle (2) in a plurality of predetermined angular usage positions (a, b, c, d), with respect to an axis parallel to the direction of the bristles (4).

WO 2008/015616 A2

Description

TOOTH-CARE DEVICE

Technical Field

- [1] The present invention relates to a device for the tooth care.

Background Art

- [2] Devices for the tooth care, better known as toothbrushes, have been known for a long time already. These devices consist of a handle presenting a portion equipped with an array of bristles suitable to allow the teeth brushing.
- [3] It is likewise known that, to effectively clean the teeth, the toothbrush has to easily reach all the parts of the set of teeth. In particular, it is preferable that the toothbrush operates the brushing of the front and back surface of each tooth operating with reciprocating motion along a vertical direction.
- [4] To better satisfy this requirement, various forms of toothbrushes different from the traditional toothbrushes have been proposed. For instance, U.S. Pat. No. 5,305,491 illustrates a toothbrush comprising an end portion with the bristles arranged so that they simultaneously approach each tooth on three sides, the upper side and the opposite vertical surfaces. This toothbrush has a very complex shape and does not solve the problem of the cleaning in an effective way, since it does not allow the bristles to treat the teeth in the correct brushing direction.
- [5] U.S. pat. No. 4,829,621 illustrates a toothbrush elastically deformable in an intermediate area comprised between the handle and the bristled portion. This toothbrush allows orientating the bristled portion on a plane that contains the longitudinal direction of the bristles. Even this toothbrush does not allow operating the cleaning of the teeth in an effective way, since the bristles cannot be arranged in the correct way to vertically brush the inner side of the teeth.

Disclosure of Invention

Disclosure

- [6] The aim of the present invention is to overcome the cited drawback by devising a device for the tooth care which enables to carry out an effective cleaning of all the teeth of the mouth, in particular the portion of teeth facing the inside of the mouth.
- [7] Within this aim, an object of the claimed invention is to provide a device for the tooth care of simple, practical structural conception, equipped with certainly reliable functioning, of versatile use, and also of relatively economical cost.
- [8] The cited aims are reached, according to the claimed invention, by the tooth-care device, of the type including a gripping handle presenting a distal portion equipped with an array of bristles, which is characterized in that the said array of bristles is

assembled on a mount connected in a revolving way to the said distal portion through coupling means suitable to allow the said mount to rotate with respect to the said distal portion in a plurality of predetermined angular usage positions, with respect to an axis parallel to the said direction of the bristles. The device is also characterized in that it includes locking means suitable to selectively lock the said mount of the bristles in one of the said predetermined angular positions.

Description of Drawings

[9] Description details of the invention will be further evident in the illustrations of a preferred embodiment of the claimed tooth-care device illustrated in the guideline drawings attached, wherein:

- fig. 1 illustrates a rear view of the claimed device;
- fig. 2 illustrates a lateral view of the same device;
- fig. 3 illustrates a rear view of a different embodiment of the same device;
- fig. 4, 5 and 6 respectively illustrate a view of the mount means of the array of bristles in the above-mentioned predetermined angular positions;
- fig. 7 and 8 illustrate a longitudinal sectional view of the locking means respectively in the locked and unlocked configuration;
- fig. 9 illustrates a sectional view of a detail of the locking means of the mount of the bristles according to trace IX-IX of fig. 7;
- fig. 10 illustrates a sectional detail of the threaded connection between the collar of the locking means and the handle;
- fig. 11 illustrates a sectional detail of a different embodiment of the connection between the collar of the locking means and the handle;

Best Mode

[10] With reference to such figures, 1 refers to the claimed tooth-care device. The device 1 consists of a gripping handle 2 having a distal portion 3 equipped on the upper side with an array of bristles 4 for the cleaning of the teeth through brushing. The bristles 4 are arranged substantially parallel to a direction perpendicular to the longitudinal axis of the distal portion 3. The bristles 4 are borne by a mount means 13 assembled rotatably with respect to the distal portion 3 along an axis parallel to the direction of the bristles 4. The mount 13 is provided with coupling means 14 at the back, suitable to fasten the mount 13 to the distal portion 3 of the handle 2. Such coupling means 14 are preferably constituted by turning mating means including a pin 15 with octagonal profile, equipped with a threaded hole 15a along its longitudinal axis. The distal portion 3 is preferably shaped by two parallel tines 3a, 3b adequately spaced.

[11] The inner surfaces of the said tines 3a, 3b form two undercuts adequately shaped in order to define together a seat 25 with octagonal profile suitable to hold the pin 15. In

the mated configuration the pin 15 is hold in seat inside the octagonal profile by a screw mean 16. Clearly, it is possible to provide that the coupling means 14 are realized in a different way, for instance through removable slide, friction or ratchet gear means.

- [12] In practice, the array of bristles 4 can be oriented in a plurality of configurations differently angled with respect to the distal portion 3, further than an aligned configuration of the traditional type. In particular, the octagonal shape of the pin 15 allows to arrange the mount 13 of the bristles 4 in four different predetermined angular positions: a first position a) aligned to the axis of the handle (fig. 1); a second position b) oriented at 45° with respect to the axis of the handle, particularly effective for the cleaning of the inner surface of the premolars and of the left lower molars and the right upper ones (fig. 4); a third position c) oriented at 90° with respect to the axis of the handle, which allows an easy access to the inner surface of the incisors and of the lower and upper canine teeth (fig. 5); a fourth position d) oriented at 135° with respect to the axis of the handle, to facilitate the cleaning of the inner surface of the molars and of the right lower premolars and of the left upper ones (fig. 6).
- [13] The distal portion 3 is rigidly connected to the handle 2 and it is equipped with adequate locking means 19 suitable to selectively lock the mount 13 of the bristles 4 in one of the said predetermined angular position in operational phase. More in detail, according to an embodiment of the invention, the locking means 19 comprise a movable collar 5, with cylindrical shape, assembled coaxial externally to the distal portion 3, suitable to slide between a lifted engaged position and a lowered disengaged configuration. In the embodiment illustrated in fig. 10 the inner surface of the collar 5 is threaded and it is suited to be screwed onto the terminal portion of the handle 2. The rotation of the collar 5 causes its axial shift, in the usage configuration, to a lifted position, engaging the tines 3a, 3b below, for friction. The tines 3a, 3b shape, in the area 18 of contact with the collar 5, a conical profile conjugated with a conical bevel 17 of the same collar 5. The collar 5, in its usage configuration, prevents, in this way, the elastic movement of the two tines 3a, 3b of the distal portion 3 and rigidly fastens the angular position of the support 13 with respect to the handle 2.
- [14] The functioning of the tooth-care device according to the invention is clear from the foregoing description.
- [15] In the traditional use configuration, the device 1 presents the bristles array 4 with the mount 13 oriented in configuration aligned with the distal portion 3. By exerting upon the collar 5 an adequate rotation, the collar 5 screws shifting downward and leaves the two tines 3a, 3b of the distal portion 3 free to elastically warp, allowing the rotation of the hexagonal pin 15 inside the octagonal profile shaped by the two tines 3a, 3b. In this way it is possible to arrange the support 13 in a different angular position, in particular

the angular position most adequate to operate the cleaning of the different parts of the set of teeth according to the correct brushing direction. Once the support 13 is positioned as desired, it is sufficient to exert a rotation of the collar 5 in the opposite direction to lock the system again.

[16] According to a different embodiment of the invention (fig. 3 and 11), the collar 5 is kept locked in the use configuration through the interposition of an adequate spring mean 20 under compression. To modify the angular position of the mount 13 of the bristles 4 is therefore necessary to exert an axial action on the collar 5 downward, contrasting the spring returning action, to rotate the mount 13 in one of the pre-determined positions and to release the collar 5.

[17] Nevertheless it is possible to provide for the collar 5 to freely slide in longitudinal direction on the terminal part of the handle 2 and the locking action, obtained exerting an adequate axial thrust upward on the collar 5, is exerted only by the friction generated on the conical profile 18, thanks to the use of suitable materials.

[18] The tooth-care device reaches the aim to carry out an effective cleaning in every part of the set of teeth. In particular, by adequately orienting the mount 13 of the bristles array 4 it is possible to easily clean even the portion of teeth facing the inside of the mouth. This is easily made simple by the coupling means 14, which allow varying in an easy and fast way the positioning of the mount 13.

[19] A prerogative of the claimed tooth-care device is that the angular positions assumed by the mount 13 allow to effectively operate the teeth brushing with reciprocating motion along the teeth longitudinal axis, even in the area of the set of teeth facing the inside where, with the traditional toothbrushes, it is difficult, if not impossible, to operate those movements.

[20] The claimed device has an ergonomic shape, in particular being suited to be easily used both by right-handed and left-handed people thanks to the specularity of the two inclined positions b) and d) that can be assumed by the mount 13.

[21] An advantage of the claimed device is that the bristles array 4 can easily be made interchangeable thanks to the presence of the removable coupling means 14. In this way it can be provided to re-use the body of the device with a new array of bristles, without compromising the hygiene and the effectiveness of the device.

[22] A further advantage of the claimed device is the predetermined and limited number of operational positions. This allows using the device more easily in the correct position.

[23] Finally, it has to be pointed out that the claimed device results of simple and sturdy structure in order to have moderate costs, adequate to the requirement of a product of large consumption.

[24] Materials adopted for the actual realization of the invention, as well as their shapes

and sizes, can be various, depending on the requirements.

- [25] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

- [1] Tooth-care device, of the type comprising a gripping handle (2) presenting a distal portion (3) equipped with an array of bristles (4), **characterized in that** the said bristles array (4) is set on a mount (13) connected in a revolving way to the said distal portion (3) through coupling means (14) suitable to allow the said mount (13) to rotate with respect to the said distal portion (3) in a plurality of predetermined angular usage positions (a, b, c, d), with respect to an axis (A) parallel to the said direction of the bristles (4), and in that it comprises locking means (19) suitable to selectively lock the said mount (13) of the bristles (4) in one of the said predetermined angular positions (a, b, c, d).
- [2] Device according to claim 1, **characterized in that** the said coupling means (14) consist of turning mating means comprising a trunnion (15) with octagonal profile superiorly fastened to the said mount (13) and arranged parallel to the said direction of the bristles (4).
- [3] Device according to claim 1, **characterized in that** the said distal portion (3) peripherally shapes a pair of parallel tines (3a, 3b), internally shaping a seat (25) with octagonal profile suitable to be engaged by the said trunnion (15).
- [4] Device according to claim 3, **characterized in that** the said locking means (19) comprise a movable collar (5) set coaxial externally to the said distal portion (3) and suitable to slide between a lifted tightening position of the said parallel tines (3a, 3b), for the locking of the coupling means (14) of the mount (13), and a lowered disengagement position that allows the rotation of the same mount (13).
- [5] Device according to claim 4, **characterized in that** the said parallel tines (3a, 3b) shape an area (18) of contact with the said collar (5) having conical profile conjugated with a conical bevel (17) of the same collar (5).
- [6] Device according to claim 4, **characterized in that** the said movable collar (5) is strained by elastic means (20) in the said lifted tightening position of the said parallel tines (3a, 3b).
- [7] Device according to claim 1, **characterized in that** the said predetermined angular positions (a, b, c, d) of the said mount (13) of the bristles (4) are angularly distributed on a plane orthogonal to the said direction of the bristles (4).
- [8] Device according to claim 7, **characterized in that** the said predetermined angular positions (a, b, c, d) of the said mount (13) of the bristles (4) consist of a first position (a) aligned with the axis of the said handle (2); a second position (b) oriented at 45° with respect to the axis of the said handle (2); a third position (c) oriented at 90° with respect to the axis of the said handle (2); a fourth position

(d) oriented at 135° with respect to the axis of the said handle (2).

FIG.4

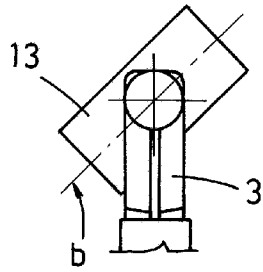


FIG.5

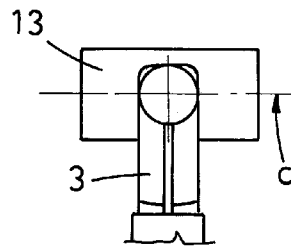


FIG.6

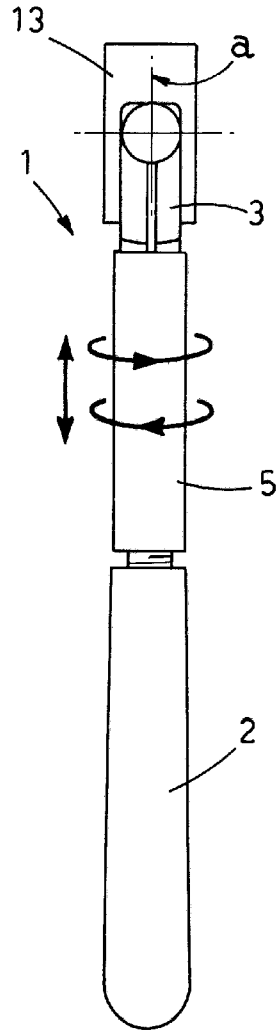
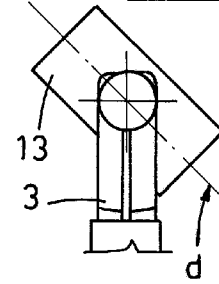


FIG.1

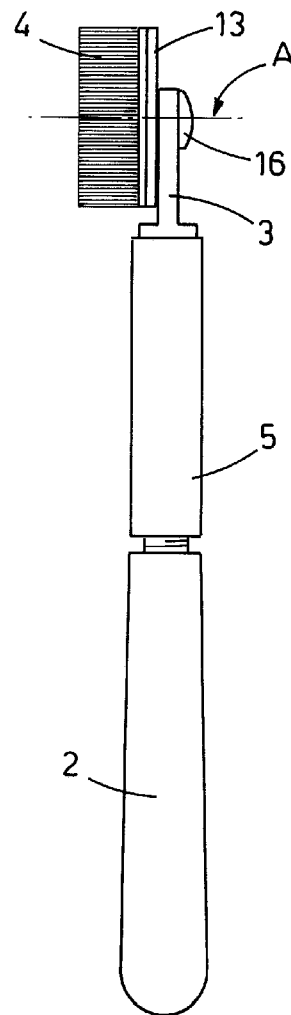


FIG.2

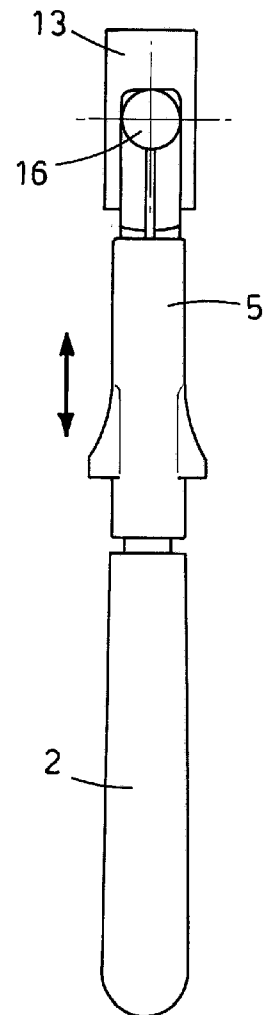


FIG.3

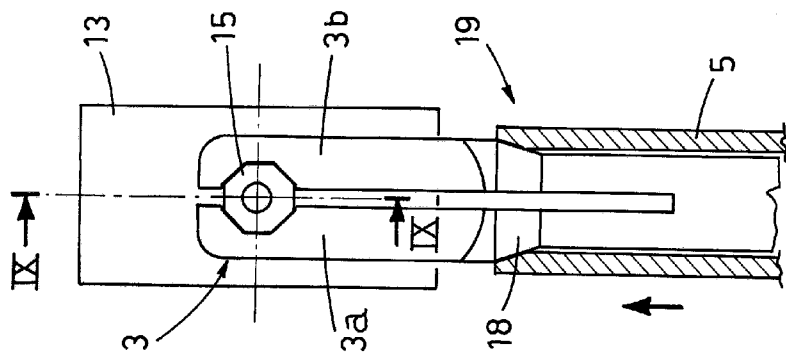


FIG. 7

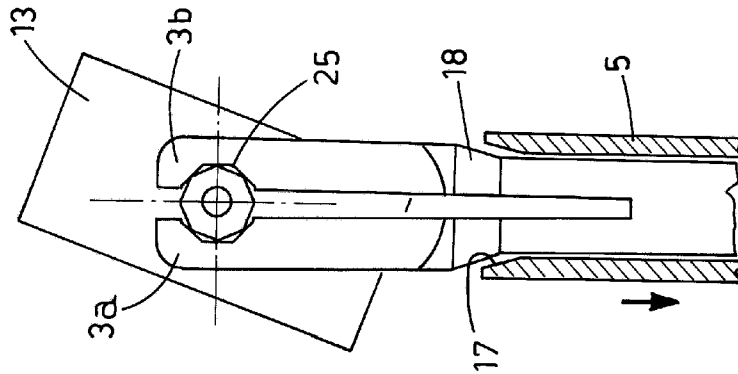


FIG. 8

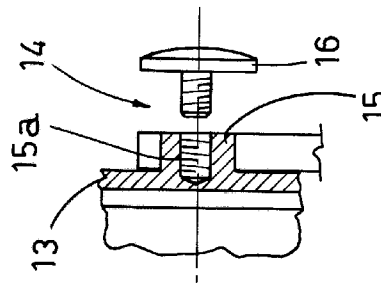


FIG. 9

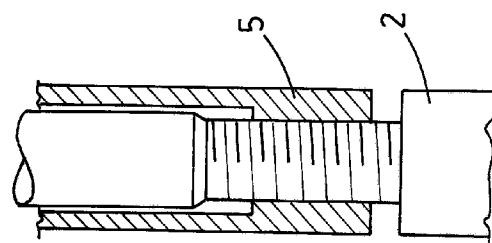


FIG. 10

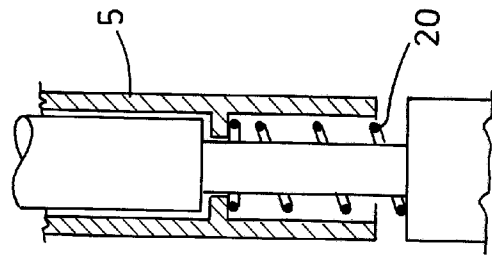


FIG. 11