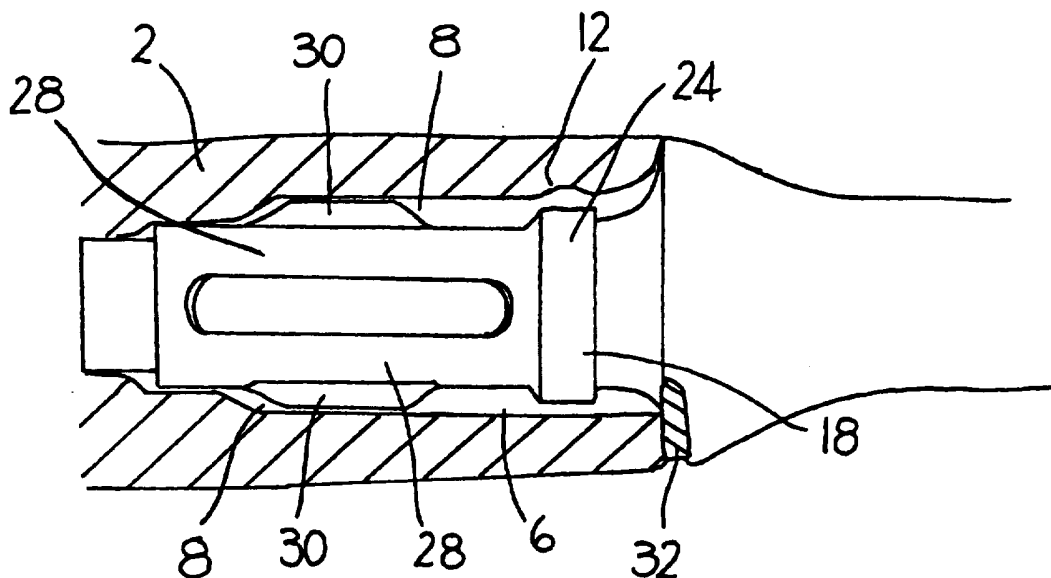


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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/GB96/00100 (22) International Filing Date: 19 January 1996 (19.01.96) (30) Priority Data: 9501009.6 19 January 1995 (19.01.95) GB (71)(72) Applicant and Inventor: BEASLEY, Garry, Martin [GB/GB]; 2 Laith Garth, Cookridge, Leeds LS16 6LD (GB). (74) Agent: BAILEY WALSH & CO.; 5 York Place, Leeds LS1 2SD (GB).		(81) Designated States: AL, AM, AT, AU, BB, BG, BR, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, SD, SE, SG, SI, SK, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AZ, BY, KG, KZ, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: BRUSHING IMPLEMENT**(57) Abstract**

The invention of this application relates to a brushing implement of a type which is formed of a head portion and a handle portion such as a toothbrush. The head portion is angularly adjustable relative to the handle portion thereby improving the efficiency and comfort of use of the toothbrush to brush the teeth. In this invention, the head and handle are angularly adjustable by rotating the handle relative to the head or vice versa and the same can be rotatably moved to a plurality of predetermined positions by the relatively simple rotating action. In one embodiment, the head and handle portions, once engaged, are prevented from being axially movable thereby preventing the danger of the head coming off during use. The adjustment arrangement is not complex and allows adjustment without the need to remove the head and handle from each other to do so.

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Brushing Implement

The present application relates to an improved form of brushing implement such as a toothbrush which comprises a head portion and a handle portion. The said head and handle portions can be angularly adjusted to a number of predetermined positions to aid the use of the brushing implement.

Reference hereonin is made to a toothbrush for example purposes but it should be clearly understood that the subject of this invention can be equally applicable to a number of different types of brushing implement and is not exclusively to a toothbrush.

There are many different types of toothbrush currently available. A first type is the conventional, one piece toothbrush which comprises a moulded and shaped handle which has at one end thereof a bristle block to which the toothpaste is applied and with which the teeth are cleaned. These brushes are sold in large quantities but have the disadvantage that the angle of the handle relative to the bristle block cannot be altered to suit the users particular shape of mouth and/or different brushing positions and secondly that the brushes have to be disposed of when the bristle block is worn. This prevents the handle portions from being as decorative as, for example, shavers, as the whole brush has to be disposed of.

There are in existence several patents which disclose a means whereby the handle portion can be adjusted relative to and removed from the handle portion of a toothbrush. However, typically the movement is achieved by one of a complex mechanical linkage between the handle and head portions or the removal of the head portion from the handle and the reorientation of the head and reinsertion of the head portion onto the handle to create a new angle. Furthermore the pin or

member which is shaped to allow the alteration of angle is conventionally formed from a different material to the handle or head, which are normally made from plastic, such as metal and the manufacture and connection of this to the handle or head is relatively expensive and adds to the complexity of the toothbrush. When relatively complex mechanical linkages are provided, the cost of producing the toothbrush increases substantially and the same becomes heavy and awkward to use. Furthermore the mechanical linkage allows the ingress of foreign matter and bacteria therein and, for these reasons, the toothbrushes of this type have never been a commercial success. Toothbrushes of the type where the head portion is required to be removed from the handle portion are less complex but still require the provision of inserts into the handle or head portions which determine the angle of the head dependent upon the particular location of the head portion relative to the insert.

The applicants co-pending application number 9222567.1 discloses a toothbrush where the locating means are formed from the material of the handle and head portions wherein a pin is provided in one of the head and handle portions and a matching aperture in the other. The aperture and pin are shaped such that by placing the pin in different positions in the aperture so the angle of the head relative to the handle can be adjusted. This brush also has the feature that the adjustment of the handle can be performed without completely removing the pin from the aperture.

However it is perceived to be undesirable to have to push off the head portion from the handle portion to any extent and this push off action has led to concerns being raised that the head portion is releasable into the mouth of the user thereby causing danger to the same.

The aim of the present invention is to provide a brushing implement having a head portion and a handle portion and wherein the same are angularly adjustable without requiring the two portions to be even partially removed from each other. While achieving this aim it is a further aim to ensure that the complexity of the adjustment means is minimised.

The present invention provides a brushing implement comprising a handle portion and a head portion, said head portion having a bristle head thereon, and there is provided a female location means formed in an end of either of the head or handle portion and a matching male location means in the other of the handle or head portion to locate the two portions together wherein either of the male or female location means is provided with a resilient element which is deformable when a rotating force is applied to either or both of the head and handle portions to cause relative rotational movement between the two portions to alter the position of the head portion relative to the handle portion.

Typically the resilient element is formed as an integral part of the male location means and preferably from the same material as the head or handle portion.

In one embodiment the resilient element is formed of two elongate walls spaced by a slot, said walls and aperture shaped such that when a rotating force is applied the two walls are forced inwardly to substantially close the slot and release the male and female location means to allow relative rotation of the handle and head portions.

Typically at least one of the head and handle portions are angularly offset relative to the longitudinal axis of the male and/or female location means. This ensures that when the

portions are relatively rotated the relative angle of the two portions is adjusted.

In one preferred embodiment a series of spaced indents are formed around the wall of the either of the female or male locations means and at least one, but preferably a series of, protrusions are provided on the other of the female or male location means such that when the resilient element is in an unbiased position at least one protrusion is located in one of the indents. This prevents further rotational movement of the head and handle portions during use of the brush.

Preferably the head and handle portions are adjustable to a number of predetermined positions. Typically two but preferably four relative positions are determined by the provision of indents in either of the male or female location means which are engaged by at least one protrusion in the other of the male or female location means.

In a further aspect of the invention the head and handle portions, once fitted together to form the brush, cannot be separated thereby preventing the risk of the portion coming off when the brush is in use.

In one embodiment when the head and handle portions are fitted together they engage with a seal which prevents the ingress of foreign matter into the male and female location means.

Thus, when the head and handle portions are fitted together they cannot be released from one another and, in one embodiment, this is achieved by providing a locking mechanism which engages the male and female location means and prevents their subsequent release. In one embodiment a number of lugs are

provided which, when engaged, deform and lock the location means in an engaged position to prevent relative axial movement.

Typically a locking ring is also provided which can act as a further engagement means for the female and male location means.

In an alternative embodiment the head portion is removable from the handle portion by exerting a pulling force on the head or handle while holding the other and this pulling action overrides a safety lock formed between a ring formed as part of the male location means which, in a fixed position locates in a collar formed in the female location means. This allows the head portion, when worn, to be removed and replaced with a new head portion having a fresh set of bristles provided thereon.

In whichever embodiment it is preferred that the male location means including the resilient element is provided on the end of the head portion and the female location means is provided in the end of the handle portion. This arrangement ensures that the head portion is relatively slim and enables the head portion to be inserted into the users mouth more easily. Furthermore the ability to make the head portion slim allows the same to be flexible thereby providing a toothbrush which is not only angularly adjustable but which is also flexible when used in any angle.

In one embodiment when the head and handle portions are fitted together they engage with a seal which prevents the ingress of foreign matter into the male and female location means.

Typically there is provided a washer, typically made of rubber, at the interface between the head and handle portions to prevent the ingress of foreign matter and reduce friction between the movable parts.

Typically the brushing implement is a toothbrush.

In one embodiment the toothbrush is manufactured from nylon to provide improved grip when wet, or could be made of, or plated with a metal and, in one embodiment, a precious metal. In a further aspect of the invention there is provided a method of manufacturing a toothbrush according to the invention wherein the head portion of the brush is manufactured in a first tooling mould which, with the male location means formed on the head, allows the mould to be a relatively simple open and close tool mould.

In a further aspect of the invention the handle portion of the toothbrush is provided with a recess portion or aperture for the reception of an insert therein. Typically the insert can be any of; an insert formed from a different material to allow improved gripping of the handle, an insert which, when inserted has a decorative effect on the appearance of the handle and/or which can include the name of the user of the toothbrush.

It is envisaged that the insert piece will be engageable in the recess or aperture in the handle and also preferably removable prior to discarding the brush and can then be fitted into a similar recess or aperture in a new toothbrush handle thereby allowing immediate identification of the new brush.

In whichever embodiment it is preferred that the bristles

and/or the bristle block of the toothbrush include a bacteria killing agent therein thus preventing the build up of bacteria in the bristles and bristle block and thereby ensuring that potentially harmful bacteria are not harboured in the bristles or the bristle block. This addition of the bacterial killing agent is typically provided in a liquid form with control means to release the liquid in required stages or, alternatively may be incorporated as an integral part of the bristles and/or the block material.

A specific embodiment of the invention is now described with reference to the accompanying drawings wherein;

Figure 1 illustrates an elevation of the handle portion of the toothbrush;

Figures 2A and 2B illustrate a plan and an end view of the handle portion;

Figure 3 illustrates a detailed view of the female location means in the end of the handle in section along line A-A of Figure 2B;

Figure 4 illustrates a detailed side view of the female location means in the end of the handle in section along line B-B;

Figure 5A illustrates an elevation of the head portion of the toothbrush;

Figure 5B illustrates a detailed view of the male location member of the head portion from another angle than Figure 5A;

Figures 6A illustrates a detailed views of the male location

means of the head portion in engagement with the female location means in section of the handle portion in elevation;

Figure 6B illustrates a detailed view of the head and handle portions in engagement in section in plan and in a different position;

Figure 7 illustrates a detailed view of a locking means between the head and handle portions; and

Figure 8 illustrates the head and handle portions in different predetermined angled positions.

Referring firstly to Figures 1, 2A and 2B there is shown the handle portion 2 of the toothbrush according to the invention. The handle is shaped as shown to enable comfortable gripping of the same by the user and, to further aid use of the same, includes grooved portions 4 formed on the outer face or faces of the same. In one embodiment the grooves are formed in rubber pads which are insertable into the handle to further aid gripping of the handle. At one end of the handle there is formed a female location means 6. The female location means has a plurality of elongate indents 8 formed along part of the length thereof and at spaced intervals around the wall of the location means. The spacing of the indents can be used to determine the possible positions of the head relative to the handle portions. The female location means is shown in more detail in Figures 3 and 4 and referring now to those drawings the closed end of the location means aperture 6 includes the elongate indents 8 and at the closed end thereof a narrower section 10. The female location means can also include locking means 13 the function of which is explained in more detail later and a collared section 12 is formed at a point near the opening in the end of the handle

portion.

Figure 5A illustrates a head portion 14 according to the invention which comprises an area 16 for bristles, not shown, at one end of the same and at the other end and protruding therefrom a male location means 18 for insertion into the female location means 6 in the handle portion 2. The member 18 includes a locating end piece 20, a resilient element 22 and a locating collar 24. The locating end piece 20 and collar 24 are for engagement with the narrower section 10 and collared section 12 respectively of the female location means 6 and protrusions 30 are provided for engagement with the indented portions 8 of the female location means.

The resilient element includes a slotted aperture 26 as shown in Figure 5B which shows the male location member 18 turned through 90 degrees. The slot 26 separates two walls 28 at the outer edges of which are mounted protrusions 30 for location in the elongate indents in the female location means 6.

Figures 6A, 6B and 7 illustrate the female location means 6 of the handle portion in engagement with the male location means 18 of the head portion to form the toothbrush of the device. As can be seen the location of the collar 24 and the protrusions 30 in the collared section 12 and elongate indents 8 in the female location means 6 respectively allow the head portion to be securely held in position. Preferably a rubber washer 32 is provided between the interfaces of the head and handle portions.

To move the head portion into engagement with the handle portion to form the toothbrush the male location means 18 is pressed into the female location means 6 and as it does so

the walls 28 of the resilient element on the male location means flex inwardly to substantially close the slot 26 until the protrusions 30 reach the elongate indents 8 whereupon the head is turned until the protrusions 30 engage with one set of indents 8. At this stage the resilient walls 28 return to a relaxed state and when the collar 24 reaches the collared section 12 of the aperture 6 the member is securely located in the aperture. In one preferred embodiment and with reference to Figure 7, locking means 13 in the form of tabs, are contacted by the collar 24 as it reaches the collared section 12 and the tabs flex to abut against the collar 24 and grip the same and thereby prevent the male location means from being removed from the female location means without breaking the locking means 13.

If in an alternative embodiment these locking means are not provided the head portion will still require a stiff pulling action on the head portion to cause the resilient elements to flex inwardly to a sufficient extent to allow the same to be released from the female location means and the head removed. Furthermore the shape and form of the protrusions and indents allow secure location of the head and handle portions while allowing the manufacturing tolerances for the parts to be relatively large thus improving the commercial costs of manufacture of the toothbrush of this invention.

Figure 8 shows four possible predetermined positions of the head portion relative to the handle portion according to the embodiments shown. These positions are predetermined by the location of the indents 8 with which the protrusions 30 are located upon rotation of the head and handle portions. This is achieved by rotating the handle relative to the head or vice versa, in this embodiment, through a minimum of 90 degrees rotation but can be as much as is required. When the

protrusions are located with one set of indents and the angle of the head and handle are as required the toothbrush can be used. If the angle is not correct further rotation can take place. As the head and/or handle portions are angled relative to the location means, the relative rotation of the portions serves to alter the angle between the head and handle portions. This alteration is achieved by exerting a rotating force on the head or handle portion and this rotating force serves to cause the walls 28 of the resilient element to flex inwardly thereby allowing the protrusions 30 to be freed from the elongate indents 8 with which they are positioned. However the collar 24 still remains in location in the collared section 12 of the female location means as no pulling force is required to be exerted. Thus the head portion can be rotated relative to the handle portion until the protrusions 30 again engage in the required elongate indents 8 to form a toothbrush having a different angle. At no stage is there applied any force which may cause the head to be removed from the handle portion as the same are only required to be rotated.

The ability to move the head to four positions relative to the handle portion allows the angle and position of the head to be moved to the most convenient position for brushing and, furthermore allows the recommended brushing method of up and down movements relative to the teeth to be performed more easily than is the case with conventionally angled toothbrushes. This is due to the fact that the bristles can be located at 90 degrees to the plane in which the handle is comfortably gripped.

In an alternative embodiment two elongate indents can be provided in the aperture, spaced apart by 180 degrees thereby allowing two different angled positions of toothbrush to be

achieved every 180 degrees of rotation. Equally any number of possible positions can be achieved by providing the sufficient number of indented portions at the required locations.

The current invention therefore allows a toothbrush to be provided with a head portion which is angularly adjustable without the need to remove the same and also without the need for complex mechanical arrangements.

The ability to provide an insert in an embodiment, not shown, allows the insert to be provided in a manner which allows improved gripping materials to be incorporated into the brush or alternatively allows decorative and/or identifying materials to be incorporated in to the brush thereby providing added value to the toothbrush which otherwise would not be possible. It is envisaged that the inserts will be engageable using conventional location means which allow release of the inserts to remove same prior to the remainder of the toothbrush being discarded and to allow the insert to be moved to another toothbrush.

Thus, in whichever embodiment the brush of the invention has the distinct advantage over conventional brushes with angularly adjustable portions in that firstly, no axial movement of the portions is required to bring about the angular adjustment of the portions and, furthermore no complex mechanical arrangement is required to be formed while still ensuring that the brush in use is safe and the portions are securely held in position.

CLAIMS

1. A brushing implement comprising a handle portion and a head portion, said head portion having a bristle head thereon, and there is provided a female location means formed in an end of either of the head or handle portion and a matching male location means in the other of the handle or head portion to locate the two portions together wherein either of the male or female location means is provided with a resilient element which is deformable when a rotating force is applied to either or both of the head and handle portions to allow relative rotational movement between the two portions to another position.
2. A brushing implement according to claim 1 wherein the head and handle portions are movable between a plurality of predetermined positions.
3. A brushing implement according to claim 1 wherein the resilient element is formed as an integral part of the male location means.
4. A brushing implement according to claim 1 wherein the male location means is formed from the same material as the head or handle portion.
5. A brushing implement according to claim 1 wherein the resilient element comprises at least two elongate walls spaced by a slot.
6. A brushing implement according to claim 5 wherein when a rotating force is applied the walls are forced inwardly to substantially close the slot and release the male and female location means to allow relative rotation of the handle and

head portions.

7. A brushing implement according to any of the preceding claims wherein at least one of the head and handle portions are angularly offset relative to the longitudinal axis of the male and/or female location means.

8. A brushing implement according to claim 1 wherein a series of spaced indents are formed around the wall of either of the female or male locations means and at least one protrusion is provided on the other of the female or male location means to allow engagement between the male and female location means in any of a number of predetermined positions.

9. A brushing implement according to claim 8 wherein two predetermined positions are provided by the location of indents.

10 A brushing implement according to claim 8 wherein four predetermined positions are provided by the location of indents.

11. A brushing implement according to any of the preceding claims wherein the head and handle portions, once fitted together to form the brush are retained in a locked position to prevent axial movement of the same.

12. A brushing implement according to claim 11 wherein a locking means is provided which grips the male location member once inserted in the female location means to prevent removal of the same without breaking the locking means and rendering the brushing implement inoperable.

13. A brushing implement according to any of claims 1- 10

wherein the head portion is removable from the handle portion by exerting a pulling force on the head or handle while holding the other.

14. A brushing implement according to any preceding claim wherein a collar is formed as part of either of the male or female location means which, in a fixed position locates in a collared section formed in the other of the male or female location means.

15. A brushing implement according to any of the preceding claims wherein male location means including the resilient element is provided on the end of the head portion and the female location means is provided in the end of the handle portion.

16. A brushing implement according to any of the preceding claims wherein a sealing element is provided between the head and handle portions when engaged.

17. A brushing implement according to any of the preceding claims wherein the implement is a toothbrush.

18. A brushing implement according to claim 17 wherein the toothbrush is manufactured from any of or any combination of nylon, metal plate or a precious metal.

19. A brushing implement according to any of the preceding claims wherein the bristles and/or the bristle block of the brush includes a bacteria killing agent.

20. A brushing implement according to claim 19 wherein the bacteria killing agent is located in the head portion and is released in a controlled manner onto the bristles.

21. A toothbrush wherein the handle and/or head of the same is provided with a recess portion or aperture for the reception of an insert therein.

22. A toothbrush according to claim 21 wherein the insert is any of; an insert formed from a different material to allow improved gripping of the handle, an insert which has a decorative effect on the appearance of the handle and/or an insert including the name of the user of the toothbrush thereon.

23. A toothbrush according to claim 21 wherein the insert piece is releasably engageable.

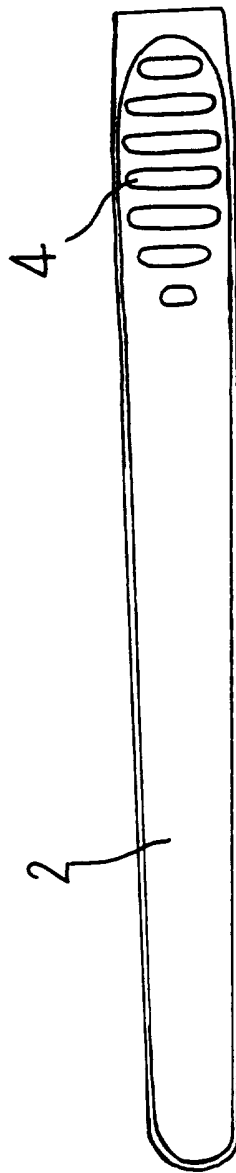
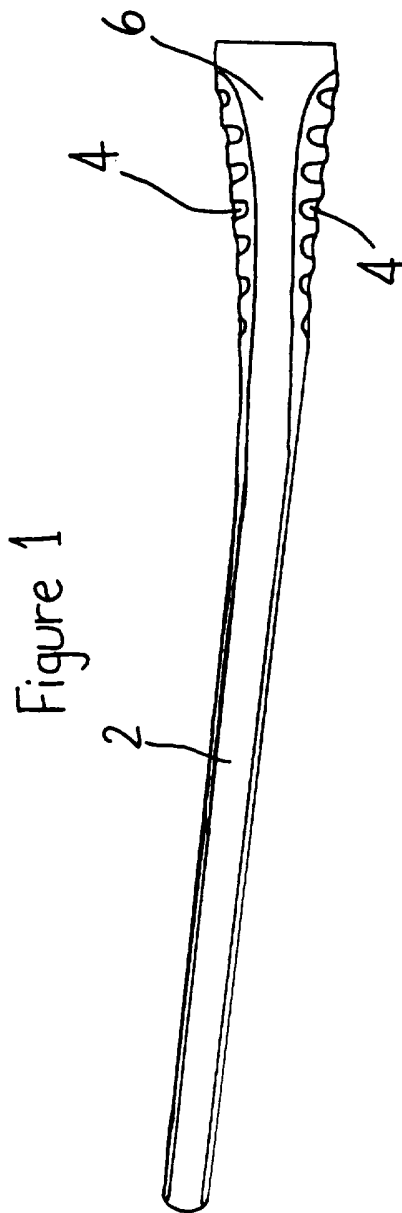
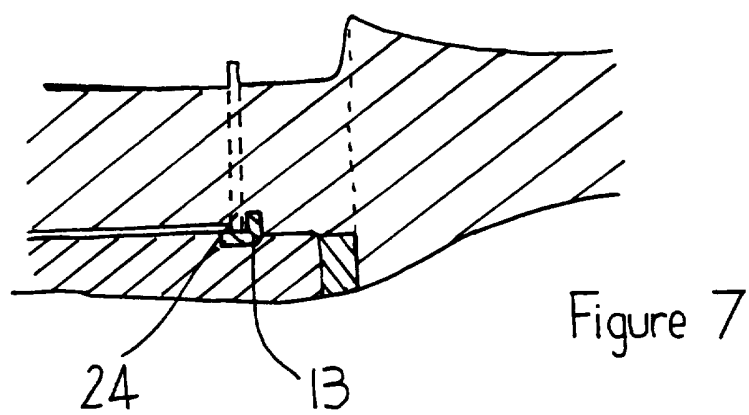
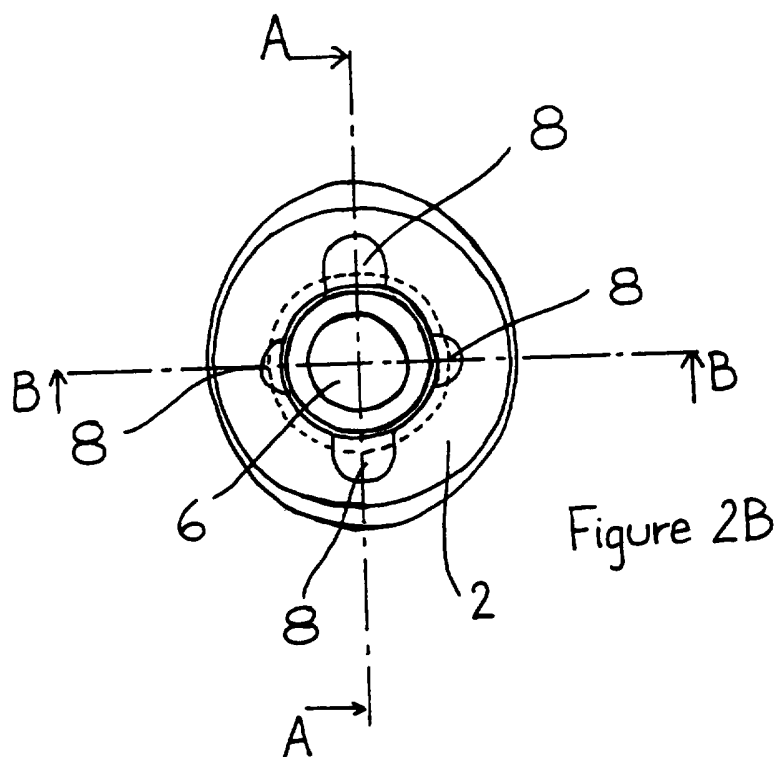


Figure 2A

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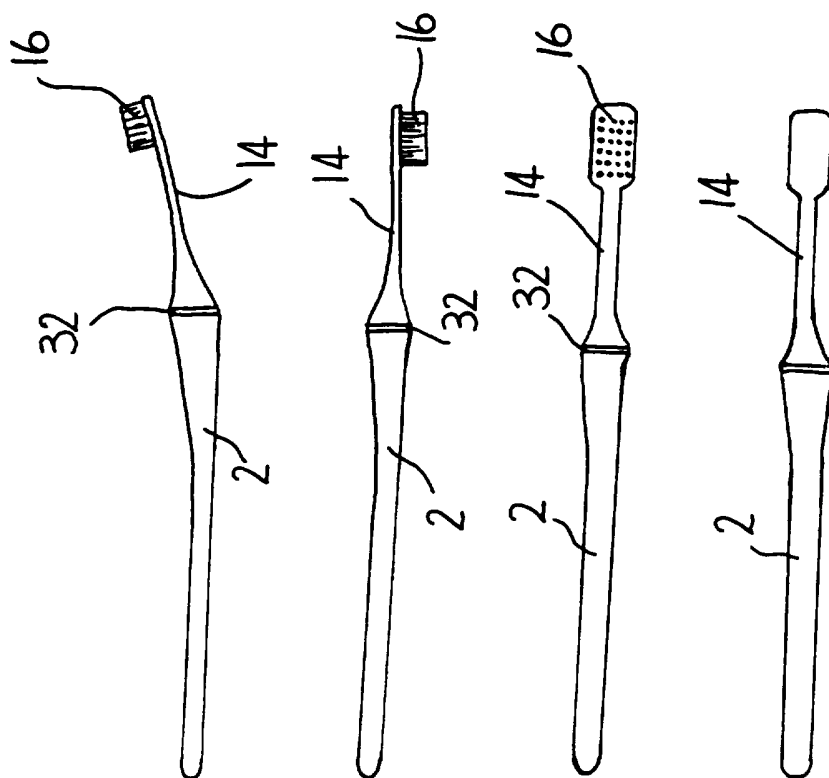
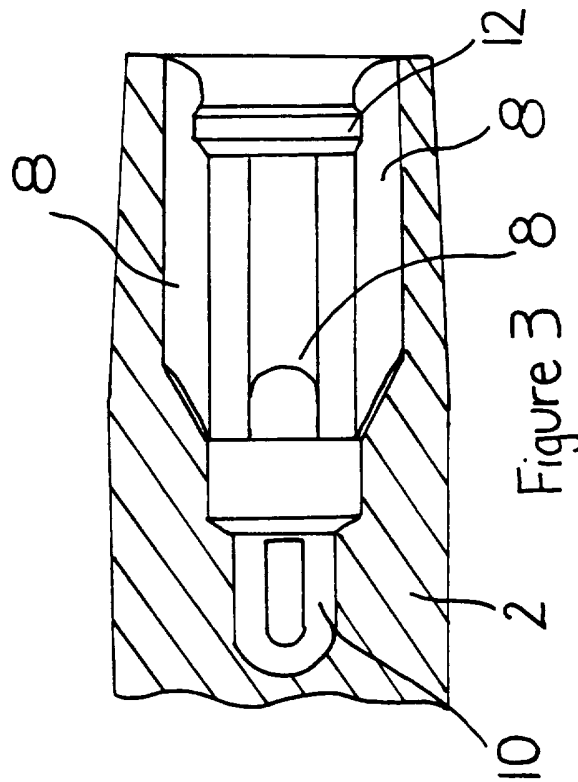
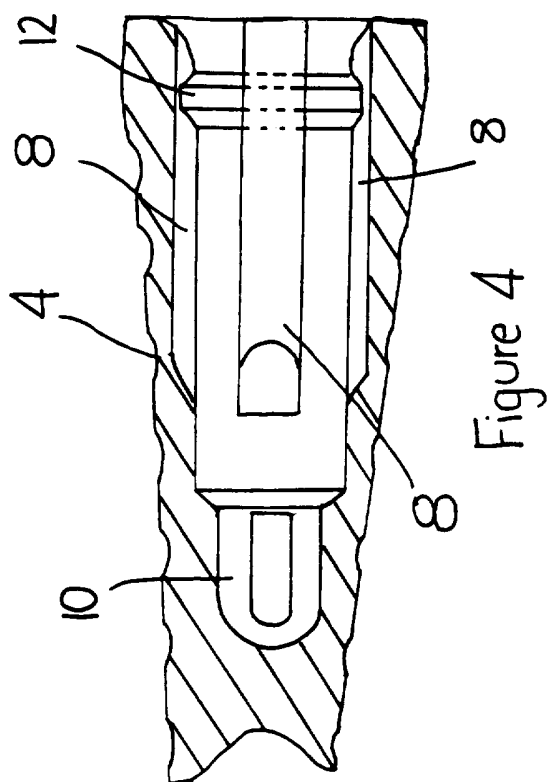


Figure 5A

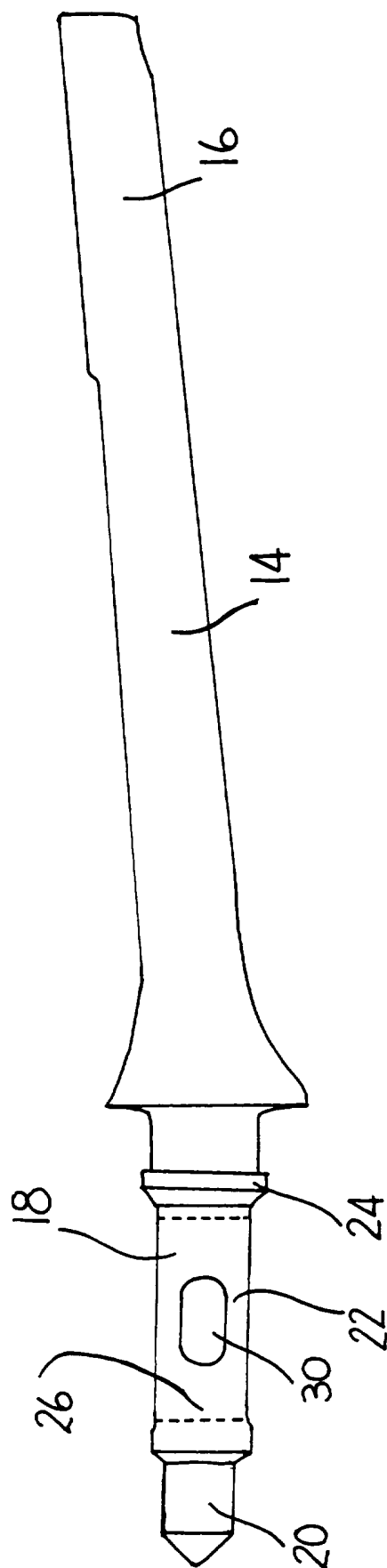
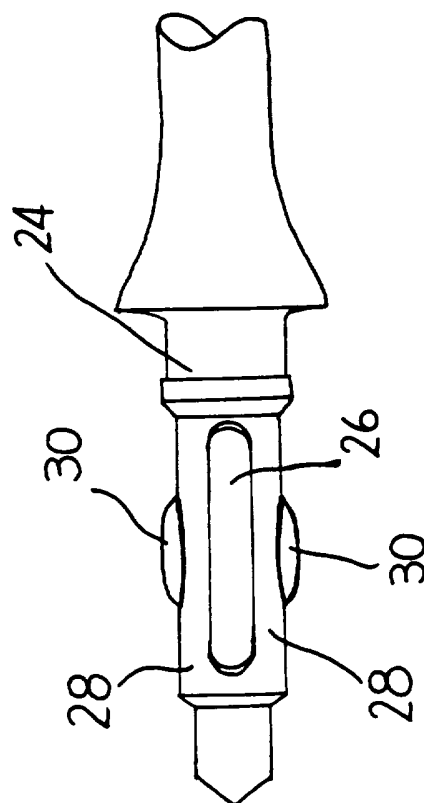
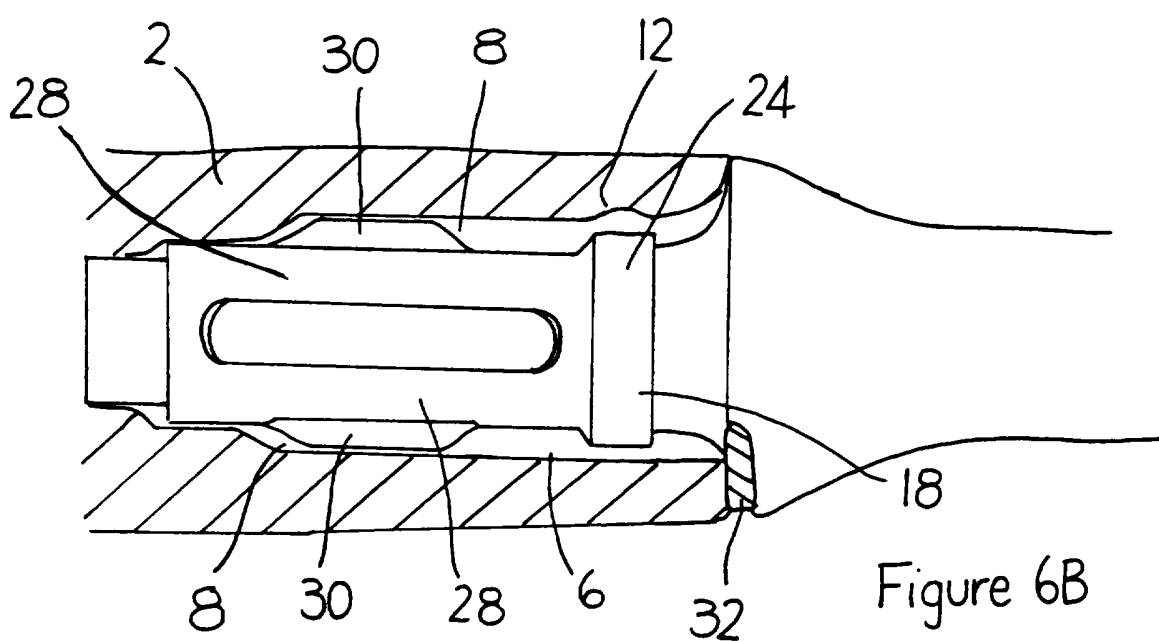
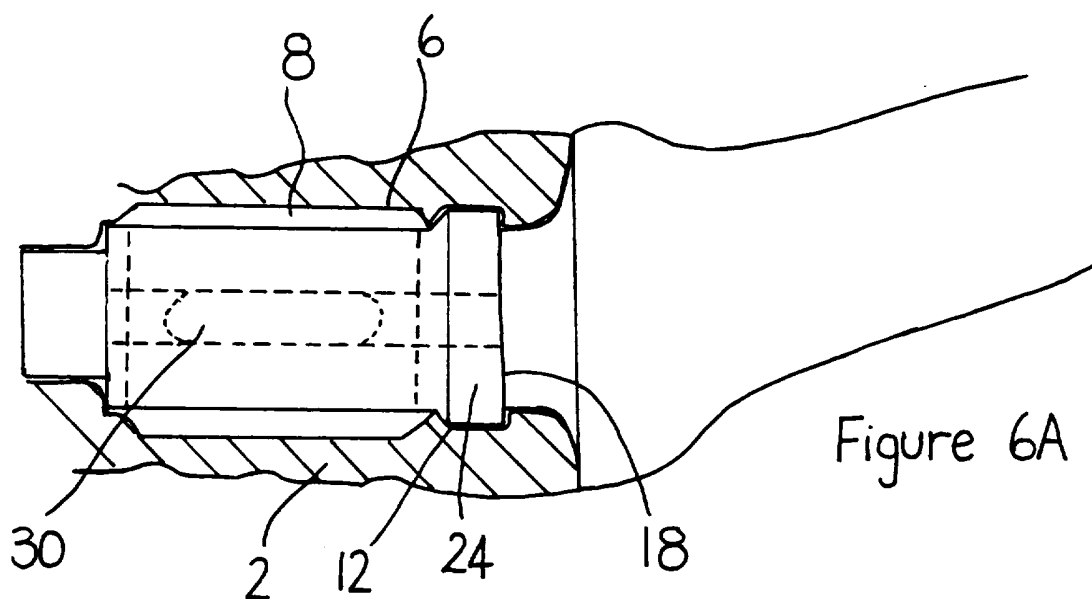


Figure 5B



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 96/00100

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A46B7/02 A46B5/00 A46B15/00 F16B21/06

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)
IPC 6 A46B F16B

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

Electronic data base consulted during the international search (name of data base and, where practical, 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.
Y	EP,A,0 274 618 (TRISA BUERSTENFABRIK AG) 20 July 1988 see column 2, line 22 - column 4, line 5; figures ---	1-11,13, 16,17
Y	EP,A,0 428 798 (CLICK CONNECTIONS CORP) 29 May 1991 see column 5, line 36 - column 8, line 34; figures ---	1-11,13, 16,17
A	US,A,4 780 924 (HANSEN PAUL D ET AL) 1 November 1988 see column 4, line 3 - line 54; figures 3-5 ---	12,15
A	EP,A,0 326 363 (LAGIESKI DANIEL P ;THOMPSON TODD B (US)) 2 August 1989 see figures ---	14
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Date of the actual completion of the international search

22 May 1996

Date of mailing of the international search report

03.06.96

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB,A,2 088 710 (BRAGA R) 16 June 1982 see claims ---	18
A	DATABASE WPI Week 9313 Derwent Publications Ltd., London, GB; AN 93-103624 XP002003628 & JP,A,05 042 017 (KANEBO KASEI) , 12 August 1991 see abstract ---	19,20
A	EP,A,0 580 406 (JOHNSON & JOHNSON CONSUMER) 26 January 1994 see claims; figures ---	21-23
A	US,A,5 033 154 (MARCHAND PAUL ET AL) 23 July 1991 see figures -----	1

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EP-A-0428798	29-05-91	DE-D- 68916800 DE-T- 68916800	18-08-94 16-02-95
US-A-4780924	01-11-88	US-A- 4850735	25-07-89
EP-A-0326363	02-08-89	US-A- 4811445 AU-B- 2878289 CA-A- 1316646 JP-A- 2092304 JP-B- 6057173	14-03-89 27-07-89 27-04-93 03-04-90 03-08-94
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US-A-5033154	23-07-91	NONE	