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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Toothbrush having a hinged brush retainer cap.**

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Description

This invention relates to interproximal brush devices for oral care. It relates particularly to such a brush device in which a disposable brush insert is retained to a handle by hinged cap retainer means.

Several teeth cleaning aids including various brushes have been developed for performing cleaning for peoples teeth and massaging of gums. The brushes have bristles which rub or wipe perpendicularly across the gum and tooth surfaces. A brush which has been found useful in this manner is a small twisted wire type disposable brush wherein bristles are captured between and extend radially from a pair of twisted metal wires. Accordingly, it is necessary to provide a suitable handle which can hold the small brush insert firmly while in use and hold the twisted wire securely along an extended length thereof. If the brush is to project perpendicularly from the tip of the handle so that it may move sideways to brush into interproximal areas of one's teeth, it becomes difficult to lock the twisted wires securely in place. Unless securely locked, the brush is likely to rotate about the axis of the handle or bend during use. Thus, it is very important to provide a secure grip for the brush in a manner which tends to preclude rotation, bending or bowing of the brush.

Brushes having somewhat similar usage are known. For example, U.S. Patent No. 4,222,143 to Tarrson et al discloses an interproximal brush handle utilizing a slidable sleeve to retain a brush. U.S. 4,030,199 to Russell discloses a handle for holding a stem mounted disposable brush and utilizes a slidable tapered sleeve or retaining the brush in a friction fit. U.S. Patent No. 3,559,226 to Burns discloses a toothbrush having a metal handle for holding an interproximal brush, with a holding chuck utilizing screw threads, knurling, or the like to retain the brush. U.S. 4,296,518 to Furrier et al discloses a toothbrush with fixed bristles and a gum massaging accessory which is pivotally attached to the handle. Also, U.S. 4,319,377 to Tarrson et al discloses an interproximal toothbrush which uses a threaded sleeve retainer for the disposable brush.

Another aid which is used for cleaning the general root and interproximal areas of teeth and gums is a toothpick, and the most satisfactory toothpick is usually a wooden one. However, it is usually difficult to work a toothpick between the teeth, especially at the back of the mouth. Therefore, it is desirable to provide a handle for firmly holding a wooden toothpick projecting therefrom at convenient angle thereto.

Although various interproximal type brushes have been developed and proposed, further improvements in such interproximal brushes are still desired, and have been provided by the present invention.

Accordingly, an object of this invention is to provide an improved interproximal brush device which includes a handle having a holding capability at least comparable to a threaded chuck or sleeve. Another object is to provide a pivotally mounted cap section for the brush handle which is easily opened and closed so that a disposable brush may be changed quickly and with little effort. Another object is to provide a brush handle having a toothpick holder which may receive and retain a wooden toothpick without danger from splinters at the broken end. A further object of the invention is to provide an interproximal brush handle which is commercially attractive.

According to the present invention there is provided an interproximal brush handle characterized by an elongated handle having a grip portion and an end portion, including opposed side surfaces, a bottom surface and a transverse hole, a cap pivotally mounted to the end portion and including a section adapted and arranged for communication with the end portion to cover at least part of the end portion surface, a longitudinal groove carried by the end portion or the cap and adapted and arranged for communication with the transverse hole, and means for releasably attaching the section to the end portion.

The invention will be described further with reference to the following drawings, in which

Figure 1 is a diagrammatic view of the interproximal handle of the present invention;

Figure 2 is a diagrammatic side view of the brush handle of Figure 1 after being rotated 90° about its longitudinal axis;

Figure 3 is a diagrammatic view taken at line 3-3 of Figure 1 and showing a twisted wire brush attached to the handle by a hinged cap;

Figure 4 is a diagrammatic sectional view taken at line 4-4 of Figure 2;

Figure 5 is a diagrammatic sectional view similar to the view shown in Figure 4 but showing an alternative embodiment of the invention;

Figure 6 is a diagrammatic section view of the handle taken at line 5-5 of Figure 1;

Figure 7 is a diagrammatic sectional view of a portion of the handle with a toothpick retained in place in the handle.

Figures 8 and 9 are diagrammatic sectional views similar to the views shown in Figures 4 and 5 but showing representative alternative embodiments of the invention;

Figure 10 is a diagrammatic sectional view similar to the view shown in Figure 3 but showing another alternative embodiment of the invention;

Figure 11 is a diagrammatic sectional view taken at line 11-11 of Figure 10 with the cap attached

to the end section;

FIGURE 12 is a diagrammatic sectional view similar to the views shown in FIGURES 3 and 11 but showing still another alternative embodiment of the invention;

FIGURE 13 is a diagrammatic sectional view taken at line 13-13 of FIGURE 12 with the cap attached to the end section.

The present invention presents to the art novel, improved interproximal brush handles designed to securely retain an interproximal brush of the type described before. In its broadest form, the novel improved interproximal brush handles include an elongated handle including a grip portion terminating at an end portion which includes a transverse hole arranged for communication with a longitudinal groove. The hold is designed so that the stem of an interproximal brush can be inserted through the hole while the groove is assigned the function of capturing and retaining the length of the stem which is inserted through and extended beyond the hold. A cap is pivotally mounted on the end portion and includes a section adapted and arranged to communicate with and cover at least part of the end portion surface to retain a length of the stem in the groove. The handle further includes means to releasably attach the cap section to the end portion so that worn interproximal brushes can be replaced with new brushes.

In the preferred embodiment of the invention, the groove is carried by the end portion. In such embodiments, the cap section engages the length of the brush stem extending beyond the hole and bends the stem length downwardly as the cap is moved into communication with the end portion. In this way, the cap moves the stem length into the groove and upon attachment of the section to the end portion, the stem length is captured within the groove and securely retained within the groove. In the especially preferred handles of the invention, the cap section includes an opening providing an inner surface having opposed side surfaces terminating at opposed flexible edges. The opposed flexible edges provide an especially effective means for releasably attaching the cap section to the end portion so that the cap section is closed over the end portion with a snap action to securely retain the brush in the handle.

Referring to FIGURES 1-4, the interproximal brush handle 20 comprises an elongated member terminating at end portions 22 and 24. Handle 20 includes grip portion 26 which extends between end portion 22 and 24. Preferably, end portion 22 has a reduced thickness (or diameter) and a leading edge 28 (FIGURE 2) which preferably is bent upwardly at an angle (A) from about 5° to about 25° with respect to the longitudinal axis 30 of handle 20. In the illustrated handles of FIGURES 1-4, leading edge 28 is bent upwardly at an angle of about 15°. A transverse hole 32 (FIGURES 3 and 4) extends through the leading edge region of end portion 22 with the axis of hole 32 being included in angle A. Connected to hole 32 is a longitudinal groove 34 which extends rearwardly from hole 32.

The diameter of hole 32 is selected to permit stem 36 of interproximal brush 38 (FIGURE 3) to be easily inserted through hole 32 but also to restrain movement or twisting of stem 36 to any significant extent when stem 36 is positioned within hole 32. Interproximal brushes are well known articles of commerce and essentially comprise a brush having bristles extending radially from the stem which usually involves a pair of twisted wires. Interproximal brushes can take many shapes to serve interproximal and root brushing needs. For example, the brush may be conical (FIGURE 3) or cylindrical (FIGURE 4) in shape. Additionally, the stiffness of the bristles can vary from degrees of softness to degrees of hardness and the bristles may be natural or synthetic fibers with nylon fibers being preferred. Any of the several different types of interproximal brushes can be used in the handles of the present invention. Further details relating to interproximal brushes can be found in U.S. Patent 4,395,943.

Longitudinal groove 34 is designed to provide a locking groove for capturing and retaining a length of stem 36 in a fixed position on end portion 22. Accordingly, groove 34 is a wide and deep enough to receive stem 36 and long enough to receive a fairly precise length of stem 36, which will ensure that brush 38 projects a predetermined distance beyond the other side of end portion 22 when stem 36 is bent downwardly and pressed into groove 34.

In the preferred interproximal brushes of the invention, end portion 22 has a curved (cylindrical or partially cylindrical) cross-sectional shape (FIGURES 3 and 4) and opposed side surfaces 40, and bottom surface 42. As best seen in FIGURE 3, dual projections 44 are provided near leading edge 30 and located in alignment with each other on opposed side surfaces 40. A molded polymeric cap 46 having opposed ears 48 (FIGURE 3) which include holes 50 arranged and sized to accommodate projections 44 is pivotally mounted on end portion 22. Cap 46 includes section 52 which is separated from ears 48 by slots 54 and extends rearwardly from slots 54 for a distance designated as D (FIGURE 1). As best shown in FIGURE 4, section 52 provides an opening 56 which has an inner surface 58 closely conforming to the cross-sectional shape and size of end portion 22. Inner surface 58 includes opposed side surfaces 60 terminating at opposed side edges 62. Preferably edges 62 extend downwardly at least to the center of end portion 22.

In the especially preferred embodiments of the present invention, opposed side edges 62 are flexible and are spaced apart from each other by a dimension (W, FIGURE 4). Dimension W is selected so that flexible edges 62 will flex outwardly when at least a portion of edges 62 engage oposec end portion side surfaces 40 at the maximum thickness (T, FIGURE 4) of end portion 22. As shown in FIGURE 4, the thickness of end portion 22 decreases toward bottom surface 42. Accordingly as edges 62 are pushed beyond maximum thickness T and toward bottom surface 42, flexed edges 62 relax inwardly to approach or restore dimension W between edges 62. Flexible edges 62 therefore provide an extremely effective but simple means for releasable attachment of section 52 to end portion 22. Flexible edges 62 permit section 52 to be snapped over end portion 22 and also permit section 52 to be disengaged from end portion 22 by lifting cap 46 upwardly to again flex edges 62 outwardly as edges 62 approach and reach T. The disengagement of section 52 from end portion 24 can be facilitated by projections 64 (FIGURES 1 and 4) which can be easily lifted or pressed upwardly by a finger nail.

FIGURE 5 illustrates another especially preferred but alternative handle of the present invention. As shown in FIGURE 5, cap 46a includes section 52a which provides an opening having an inner surface 58a closely conforming to the cross-sectional shape and size of end portion 22a. Like the handle shown in FIGURES 1-4, inner surface 58a includes opposed side surfaces 60a terminating at flexible opposed side edges 62a. Additionally, edges 62a are spaced apart by dimension W′ which permits edges 62a to flex outwardly on communication with opposed end portion side surfaces 40a having a maximum thickness T′ which exceeds dimension W′. As shown, end portion 22a has a partially cylindrical cross-section shape and a substantially flat bottom surface 42a and the thickness of opposed end portion side surfaces 40a at or approaching bottom surface 42a is less than W. Accordingly, as section 52a is rotated downwardly toward end portion 22a for engagement, edges 62a are flexed outwardly when in communication with opposed end portion side surfaces 40a having a thickness greater than W′ but relax and flex inwardly as edges 62a approach and reach bottom surface 42a. In the especially preferred embodiment of the invention (FIGURES 1-5), the cooperation between the opposed flexible side edges and the cross-sectional dimensions of opposed end portion side surfaces provides means for releasably attaching sections 52 and 52a to the end portions 22 and 22a which achieves an extremely desirable and effective snap-action effect.

In using brush handles of the present invention, the user has two options for locking stem 36 of brush 38 into groove 34. First, the user may bend stem 36 as seen in FIGURE 3 with section 52 in the disengaged position to form a substantially right angle bend between stem 36 and brush 38. Stem 36 is then inserted through hole 32 and into groove 34 and cap 46 is rotated downwardly to snap section 52 about end portion 22 as shown in FIGURE 3. In the preferred option, stem 36 is inserted through hole 32 and brush 38 is held against end portion bottom surface 42 with a finger while cap 46 is rotated downwardly for engagement of section 52 with end portion 22. During the downward movement, section 52 simultaneously bends and guides stem 36 into groove 34. The snap action effect discussed before and provided by flexible edges 62 of section 52 assures effective bending and guidance of stem 36 into groove 34. Additionally, the use of transparent or translucent polymeric cap materials permits the user to observe the guidance of stem 36 into groove 34 and make appropriate adjustments in the alignment between stem 36 and groove 34.

In the embodiments of the invention shown in Figures 1-5, handle 20 and cap 46 are formed by high volume injection molding techniques and may be fabricated of any suitable moldable polymeric material such a polypropylene. Assembly of the two molded parts may be done manually or by machine by flexing ears 48 so that holes 50 can engage projections 44 to pivotally attach cap 46 to end portion 22. In a representative preferred embodiment of the invention, hole 32 had a diameter of 0.140 cm (0.055 inches) while groove 34 had width and depth of 0.127 cm (0.05 inches) and a length of 0.27 cm (0.5 inches). The dimension (W', Figure 5) between opposed flexible side edges 62a was 0.437 cm (0.172 inches) while the maximum thickness (T', Figure 5) was 0.503 cm (0.198 inches). A brush used with the handle had a stem 36 having a substantially uniform diameter of about 0.127 cm (0.05 inches) and a stem length of about 1.27 cm (0.5 inches).

Grip portion 26 of handle 20 may be flat, angular or circular in shape. Grip portion 26 may be provided with grip facilitating means such as flattened portions 70 spaced apart from each other as shown in Figures 1, 2 and 6. Flattened portions 70 are adapted to receive the finger tips of the user to prevent undesired rotation and to provide better control of the handle unit.

As shown in Figure 7, end portion 24 is provided with a transverse hole 72 adapted for receiving rigid or flexible inserts for cleaning between the teeth and gums. Figure 7 shows how a toothpick 74 is fitted into and held by hole 72 with hole 72 being generally tapered so that the tapered end of a conventional toothpick can be forced into hole 72

and held in hole 72 with a firm friction fit. Alternatively, a conical-shaped flexible insert may be provided in hole 72 for use in cleaning between teeth and gums.

The embodiments shown in FIGURES 1-5 illustrate the best mode presently contemplated for practicing the invention. FIGURES 8-13 illustrate some of the representative alternative embodiments included within the scope of the appended claims.

Referring to FIGURE 8, section 52b of cap 46b has an inner surface 58b which is substantially rectangular in cross-sectional shape and includes opposed side surfaces 60b. End portion 22b has a cross-sectional shape closely corresponding to the cross-sectional shape of inner surface 58b and includes opposed side surfaces 40b. As shown in FIGURE 8, opposed side surfaces 60b carry opposed ribs 76b extending inwardly for engagement with opposed recesses 78b carried by opposed end portion side surfaces 40b. Side surfaces 60b carrying ribs 76b are flexible enough so that ribs 76b are flexed outwardly during the initial communication between ribs 76b and opposed end portion side surfaces 40b but will relax inwardly to engage recesses 78b. In this way, opposed ribs 76b and recesses 78b cooperate to provide means to releasably attach section 52b to end portion 22b to securely retain stem 36a in groove 34b. A modification of the embodiment shown in FIGURE 8 involves a handle in which the opposed end portion side surfaces 40b carry the ribs 76b which extend downwardly while the recesses 78b are carried by opposed side surfaces 60b of the inner surface 58b of section 52b.

The embodiment shown in FIGURE 9 is similar to the embodiment shown in FIGURE 8. However, ribs or projections 80c are carried at flexible opposed side edges 62c of inner surfaces 58c of section 52c. In this embodiment side edges 62c are flexed outwardly slightly while in communication with opposed end portion side surfaces 40c but relax inwardly for engagement with end portion bottom surface 42c to releasably attach section 52c to end portion 22c and secure stem 36c in groove 34c.

In the embodiment shown in FIGURES 10 and 11, the elements of a latch (a bar and cavity or recess) are used to releasably attach section 52d (D′, FIGURE 10) to end portion 22d. The illustrated latch elements include a bar 82d carried by inner surface 58d of section 52d. End portion 24d carries a notch or cavity 84d which is positioned beyond groove 34d and is shaped and sized to engage bar 82d to releasably attach section 52d to end portion 22d and securely retain stem 36d in groove 34d. Preferably, bar 82d is compressible so that it is compressed inwardly as it is inserted into cavity 84d but relaxes outwardly after insertion.

In the embodiment shown in FIGURES 12 and 13, groove 34 is carried by or formed in inner surface 58e of section 52e. Accordingly, as cap 46e is rotated downwardly toward end surface 22e, groove 34e can engage, capture and bend stem 36e downwardly to end portion top surface 86e. Opposed flexible side edges 62e are flexed outwardly as they are moved downwardly to approach and reach T′ but relax inwardly as they approach and reach end portion bottom surface 42e to provide a snap action effect for releasably attaching section 52e to end portion 22e in the manner described in FIGURES 1-5.

Claims

1. An interproximal brush handle (20) with an elongated handle having a grip portion (26) and an end portion (22), including opposed side surfaces (40), a bottom surface and a transverse hole (32), characterized by a cap (46) pivotally mounted to the end portion and including a section (52) adapted and arranged for communication with the end portion to cover at least part of the end portion (22) surface, a longitudinal groove (34) carried by the end portion or the cap and adapted and arranged for communication with the transverse hole, and means (62) for releasably attaching the section to the end portion.

2. A handle according to claim 1, characterized in that the end portion (22) is bent upwardly at an angle of from 5° to 25° with respect to the longitudinal axis (30) of the handle (20).

3. A handle according to claim 1, characterized in that the groove (34) is carried by the end portion (22).

4. A handle according to claim 1, characterized in that the section (52) comprises an opening having an inner surface (58) which corresponds to the cross-sectional shape of the end portion (22) and includes opposed surfaces (60) terminating at opposed side edges (62) and the side surfaces (60) are dimensioned to extend downwardly at least to the center of the end portion when the section is attached to the end portion (22).

5. A handle according to claim 4, characterized in that the inner surface (58) has a cross-sectional shape corresponding to the cross-sectional shape of the opposed end portion (22).

6. A handle according to claim 4, characterized in

that the means (62) for releasably attaching the section (52) to the end portion (22) includes a section having an inner surface (58) having opposed side surfaces terminating at opposed flexible side edges (62) spaced apart from each other by a dimension which causes at least a portion of the edges (62) to flex outwardly on engagement with opposed end portion side surface (40) and the end portion (22) has a cross-sectional shape whereby the flexible side edges (22) can relax inwardly after flexing outwardly, and in that the end portion (22) has a cross-sectional shape in which the thickness decreases toward the end portion bottom surface.

7. A handle according to claim 1, characterized in that the section (52b) includes an opening having an inner surface (58b) including opposed side surfaces (60b) terminating at opposed side edges and the means for releasably attaching the section (52b) to the end portion (22b) includes ribs (76b) and recesses (78b) arranged and adapted for engagement with each other when the section (52b) is attached to the end portion (22b).

8. A handle according to claim 1, characterized in that the section (52c) includes an opening having an inner surface (58c) including opposed side surfaces terminating at opposed side edges (62c) and the means for releasably attaching the section (53a) to the end portion (22a) includes projections (80c) arranged at the opposed side edges 62c) extending toward each other and adapted for engagement with the end portion bottom surface (42a).

9. A handle according to claim 1, including an interproximal brush (38) having a stem (36) which is inserted through the hole (32) and retained in the groove (34).

Revendications

1. Manche (20) de brosse interproximale sous forme d'un manche allongé ayant une partie de saisie (26) et une partie d'extrémité (22), comportant des surfaces latérales opposées (40), une surface inférieure et un trou transversal (32), caractérisé par un capuchon (46) monté de façon pivotante sur la partie d'extrémité et comprenant un tronçon (52) dont la réalisation et la disposition assurent la communication avec la partie d'extrémité de manière qu'une partie au moins de la surface de la partie d'extrémité (22) soit recouverte, une gorge longitudinale (34) formée par la partie d'extrémité ou le capuchon et ayant une disposition et une réalisation permettant la communication avec le trou transversal, et un dispositif (62) de fixation temporaire du tronçon sur la partie d'extrémité.

2. Manche selon la revendication 1, caractérisé en ce que la partie d'extrémité (22) est recourbée vers le haut, suivant un angle compris entre 5 et 25° par rapport à l'axe longitudinal (30) du manche (20).

3. Manche selon la revendication 1, caractérisé en ce que la gorge (34) est formée dans la partie d'extrémité (22).

4. Manche selon la revendication 1, caractérisé en ce que le tronçon (52) a une ouverture ayant une surface interne (58) qui correspond à la configuration en coupe de la partie d'extrémité (22) et comprend des surfaces opposées (60) aboutissant à des bords latéraux opposés (62), et les surfaces latérales (60) ont des dimensions telles qu'elles sont dirigées vers le bas au moins vers le centre de la partie d'extrémité lorsque le tronçon est fixé à la partie d'extrémité (22).

5. Manche selon la revendication 4, caractérisé en ce que la surface interne (58) a une configuration en coupe qui correspond à la configuration en coupe de la partie opposée d'extrémité (22).

6. Manche selon la revendication 4, caractérisé en ce que le dispositif (62) de fixation amovible du tronçon (52) sur la partie d'extrémité (22) comprend un tronçon ayant une surface interne (58) qui a des surfaces latérales opposées aboutissant à des bords latéraux flexibles opposés (62) séparés mutuellement par une dimension telle qu'une partie au moins des bords (62) fléchit vers l'extérieur lors de la coopération avec la surface latérale opposée (40) de la partie d'extrémité, et la partie d'extrémité (22) a une configuration en coupe telle que les bords latéraux flexibles (22) peuvent présenter une relaxation vers l'intérieur après avoir fléchi vers l'extérieur, et en ce que la partie d'extrémité (22) a une configuration en coupe telle que l'épaisseur diminue vers la surface inférieure de la partie d'extrémité.

7. Manche selon la revendication 1, caractérisé en ce que le tronçon (52b) comporte une ouverture ayant une surface interne (58b) qui a des surfaces latérales opposées (60b) aboutissant à des bords latéraux opposés, et le dispo-

sitif de fixation amovible du tronçon (52b) sur la partie d'extrémité (22b) comporte des nervures (76b) et des cavités (78b) dont la disposition et la réalisation sont telles qu'elles peuvent coopérer mutuellement lorsque le tronçon (52b) est fixé à la partie d'extrémité (22b).

8. Manche selon la revendication 1, caractérisé en ce que le tronçon (52c) comporte une ouverture ayant une surface interne (58c) comportant des surfaces latérales opposées aboutissant à des bords latéraux opposés (62c), et le dispositif de fixation temporaire du tronçon (53a) sur la partie d'extrémité (22a) comporte des saillies (80c) placées aux bords latéraux opposés (62c), tournées l'une vers l'autre et destinées à coopérer avec la surface inférieure (42a) de la partie d'extrémité.

9. Manche selon la revendication 1, comprenant une brosse interproximale (38) ayant une tige (36) qui est introduite dans le trou (32) et qui est retenue dans la gorge (34).

Patentansprüche

1. Halter (20) für eine Interproximalbürste mit einem länglichen Handgriff, der ein Griffstück (26) und ein Endstück (22) aufweist, umfassend gegenüberliegende Seitenflächen (40), eine Bodenfläche und eine schräg verlaufende Öffnung (32), gekennzeichnet durch eine Kappe (46), die drehbar an dem Endstück befestigt ist und einen Abschnitt (53) aufweist, der geeignet und dazu vorgesehen ist, mit dem Endstück zusammenzuwirken, um wenigstens einen Teil der Oberfläche des Endstücks (22) abzudecken, eine Längsrille (34), die auf dem Endstück oder der Kappe angeordnet ist und geeignet und dazu vorgesehen ist, mit der schräg verlaufenden Öffnung Zusammenzuwirken, und eine Einrichtung (62), die den Abschnitt lösbar an dem Endstück befestigt.

2. Halter nach Anspruch 1, dadurch gekennzeichnet, daß das Endstück (22) in einem Winkel von 5° bis 25° in bezug auf die Längsachse (30) des Halters (20) nach oben gebogen ist.

3. Halter nach Anspruch 1, dadurch gekennzeichnet, daß die Rille (34) auf dem Endstück (22) angeordnet ist.

4. Halter nach Anspruch 1, dadurch gekennzeichnet, daß der Abschnitt (52) eine Öffnung besitzt mit einer Innenfläche (58), die der Querschnittsform des Endstücks (22) entspricht und gegenüberliegende Flächen (60) aufweist, die an gegenüberliegenden Seitenkanten (62) enden, und die Seitenflächen (60) so dimensioniert sind, daß sie sich nach unten mindestens bis zur Mitte des Endstücks erstrecken, wenn der Abschnitt an dem Endstück (22) befestigt ist.

5. Halter nach Anspruch 4, dadurch gekennzeichnet, daß die Innenfläche (58) eine Querschnittsform besitzt, die der Querschnittsform des gegenüberliegenden Endstücks (22) entspricht.

6. Halter nach Anspruch 4, dadurch gekennzeichnet, daß die Einrichtung (62), welche den Abschnitt (52) lösbar an dem Endstück (22) befestigt, einen Abschnitt aufweist, dessen Innenfläche (58) gegenüberliegende Seitenflächen besitzt, die an gegenüberliegenden flexiblen Seitenkanten (62) enden, die so weit voneinander beabstandet sind, daß sich mindestens ein Teil der Kanten (62) beim Eingriff in den gegenüberliegenden Endteil der Seitenfläche (40) nach außen biegt, und das Endstück (22) eine Querschnittsform besitzt, durch die die flexiblen Seitenkanten (32) wieder nach innen zurückfedern können, wenn sie sich nach außen gebogen haben, und daß das Endstück (22) eine Querschnittsform besitzt, bei der die Dikke in Richtung zur Bodenfläche des Endstücks abnimmt.

7. Halter nach Anspruch 1, dadurch gekennzeichnet, daß der Abschnitt (52b) eine Öffnung aufweist, welche eine Innenfläche (58b) mit gegenüberliegenden Seitenflächen (60b) besitzt, die an gegenüberliegenden Seitenkanten enden, und die Einrichtung, welche den Abschnitt (52b) lösbar an dem Endstück (22b) befestigt, Rippen (76b) und Ausnehmungen (78b) aufweist, die so angeordnet sind, daß sie miteinander in Eingriff kommen, wenn der Abschnitt (52b) an dem Endstück (22b) befestigt wird.

8. Halter nach Anspruch 1, dadurch gekennzeichnet, daß der Abschnitt (52c) eine Öffnung aufweist mit einer Innenfläche (58c), die gegenüberliegende Seitenflächen besitzt, welche an gegenüberliegenden Seitenkanten (62c) enden, und daß die Einrichtung, welche den Abschnitt (53a) lösbar an dem Endstück (22a) befestigt, Vorsprünge (80c) aufweist, die an den gegenüberliegenden, sich zueinander erstreckenden Seitenkanten (62c) angeordnet sind und geeignet sind, mit der Bodenfläche (42a) des Endstücks in Eingriff zu kommen.

9. Halter nach Anspruch 1, umfassend eine Inter-

proximalbürste (38) mit einem Stiel (36), der durch die Öffnung (32) eingesetzt wird und in der Rille (34) gehalten wird.

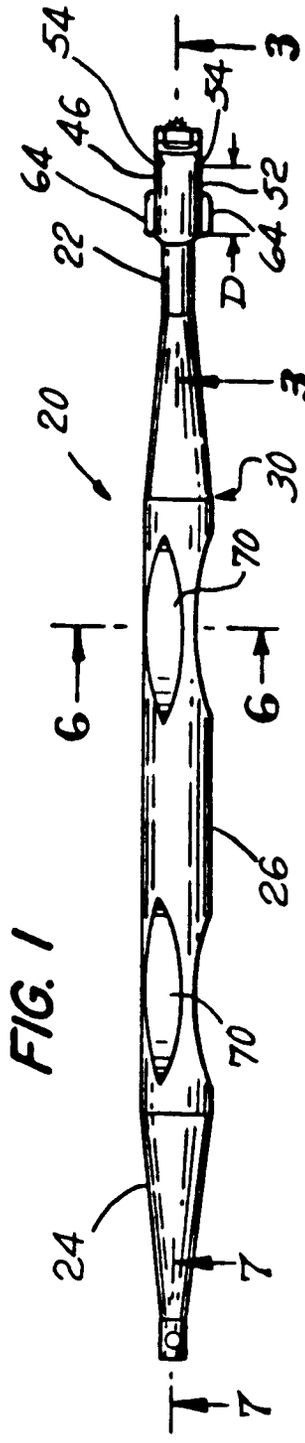


FIG. 1

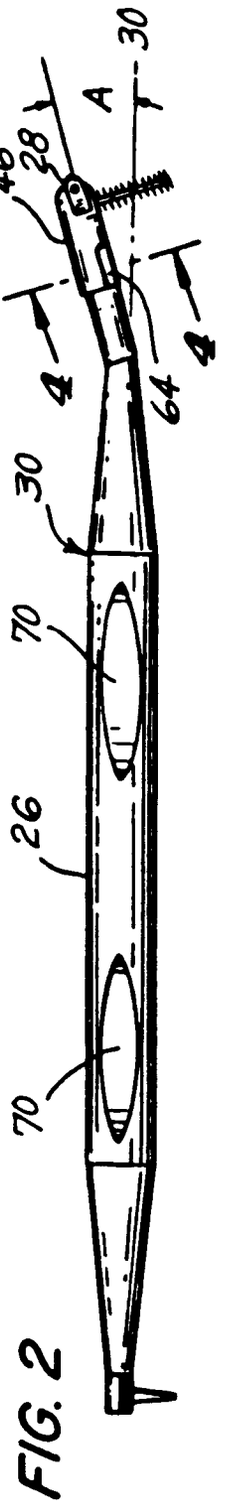


FIG. 2

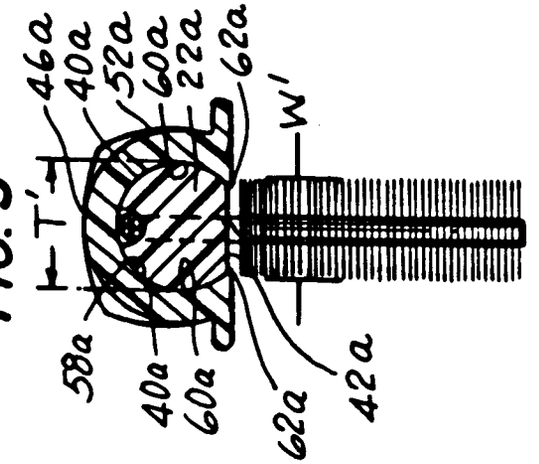


FIG. 5

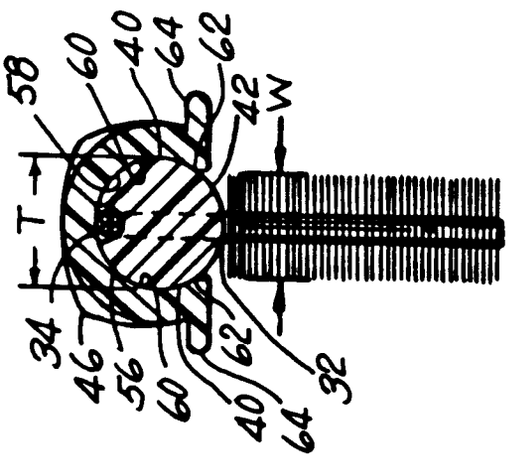


FIG. 4

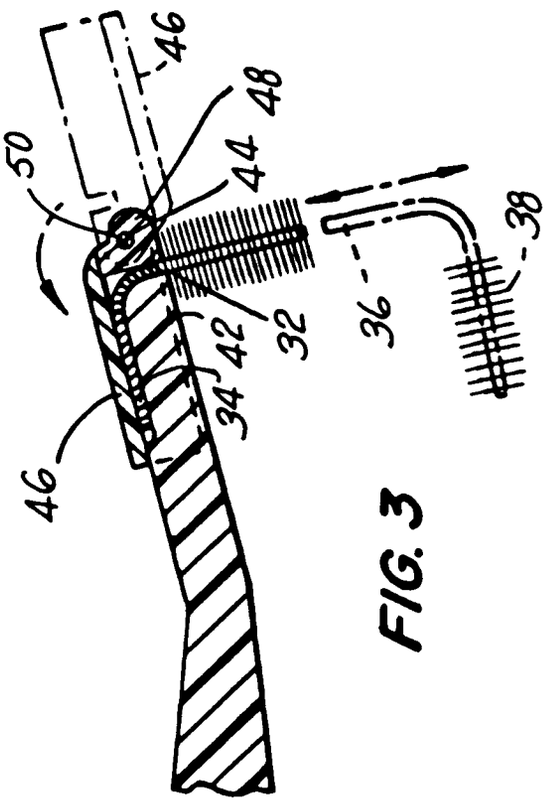
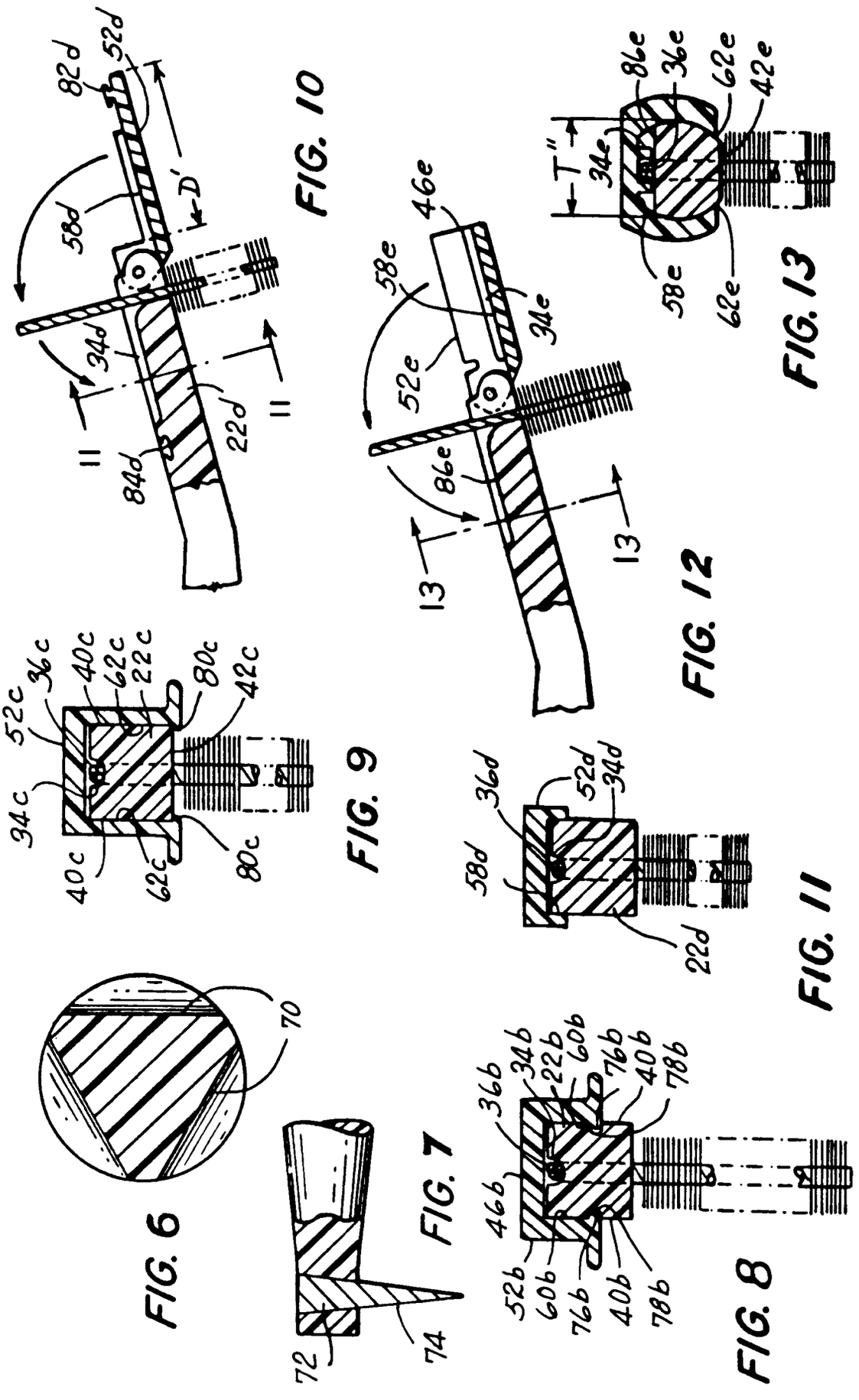


FIG. 3


82d
52d
58d
D'
34d
22d
84d
II
II
FIG. 10
36c
40c
62c
22c
80c
42c
52c
34c
40c
62c
80c
FIG. 9
46e
58e
34e
52e
86e
13
13
FIG. 12
86e
36e
62e
42e
T"
34e
58e
62e
FIG. 13
36d
52d
34d
58d
22d
FIG. 11
70
FIG. 6
72
74
FIG. 7
36b
34b
22b
60b
76b
40b
78b
46b
52b
60b
76b
40b
78b
FIG. 8