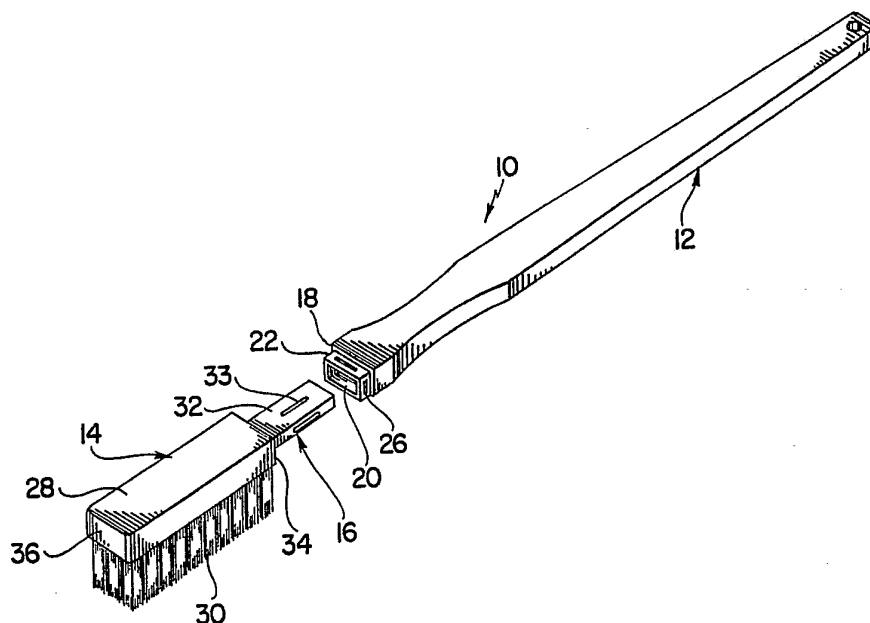




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(54) Title: TOOTHBRUSH WITH REPLACEABLE TIP PORTION



(57) Abstract

A toothbrush (10) includes an elongated handle portion (12) and a tip portion (14) detachably received on the handle portion (12). One of either of the handle portion (12) or the tip portions (14) has a longitudinally extending cavity (20) formed in one end thereof and the other of either the tip portion (14) or the handle portion (12) has a projection (32) formed on one end thereof which is receivable in the cavity (20) for detachably securing the tip portion (14) on the handle portion (12). The tip portion (14) preferably includes a base (28) having bristles (30) thereon for brushing the teeth of a user.

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1 TOOTHBRUSH WITH REPLACEABLE TIP PORTION

2 **Background and Summary of the Invention**

3 The instant invention relates to dental care
4 products and more particularly to a toothbrush with a
5 replaceable brush portion.

6 The need for effective and regular dental care to
7 prevent tooth decay and/or periodontal disease is well
8 recognized. It is also recognized that in order to be
9 effective a program of dental care should include a daily
10 regimen of brushing, gum massaging, and flossing. Still
11 further, it is recognized that in order to be effective
12 a regimen of daily brushing must be carried out with an
13 effective and proper toothbrush having bristles which are
14 not excessively worn or frayed. In this connection, it
15 has been found that the bristles of even a high quality
16 toothbrush can become worn or frayed after several weeks
17 of normal use and that therefore even a high quality
18 toothbrush should be replaced after approximately one
19 month's use. It has also been found that a toothbrush
20 should be replaced whenever the user thereof has had any
21 type of illness in order to avoid infecting the user's
22 gums during subsequent brushing.

23 Despite the proven advantages of frequently
24 replacing toothbrushes, it has been found that for
25 various reasons, such as convenience and cost, users have
26 often failed to replace their toothbrushes with

1 sufficient frequency. It has been further found that, as
2 a result, many persons have failed to gain the benefits
3 from regularly brushing their teeth which might be
4 realized if at least the brush portions of their
5 toothbrushes were replaced more frequently.

6 While the general concept of providing a toothbrush
7 having a replaceable brush portion has been previously
8 known, the previous attempts to construct toothbrushes of
9 this type have generally been commercially unsuccessful
10 for various practical reasons. In other words, while it
11 has generally been recognized that the basic concept of
12 providing a toothbrush having a replaceable brush portion
13 has merit, the previously available toothbrushes having
14 removable brush portions have failed to provide an
15 adequate and practical solution to the problem of
16 providing a toothbrush having an effective, simple, and
17 readily replaceable brush portion. In this regard,
18 toothbrushes representing the closest prior art to the
19 subject invention of which the applicant is aware are
20 disclosed in the U.S. Patents to Wagner, No. 1,758,632;
21 Rickenbacher, No. 2,287,327; Rickenbacher, No. 2,362,159;
22 Schroeder, No. 2,503,134; Glaza et al, No. 2,668,973; and
23 Velazquez, No. 4,020,521. However, since these
24 references fail to suggest a toothbrush having a
25 detachable brush portion which is adapted to be secured
26 to a handle portion in the manner of the toothbrush of

1 the instant invention, they are believed to be of only
2 general interest with respect thereto.

3 The instant invention provides an effective and
4 practical toothbrush construction comprising a handle
5 portion and a tip or brush portion which is detachably
6 secured to the handle portion. More specifically, the
7 instant invention provides a toothbrush comprising a
8 handle portion and a detachable tip portion which is
9 operative for brushing the teeth or massaging the gums of
10 a user in a conventional manner, but which is adapted to
11 permit the tip portion to be simply and easily replaced,
12 as needed. Still more specifically, the toothbrush of
13 the instant invention comprises an elongated handle
14 portion having a brushing end and a tip portion which is
15 detachably received on the brushing end of the handle
16 portion. The handle portion has a cavity of non-circular
17 cross section formed therein which extends longitudinally
18 inwardly from the brushing end. The tip portion includes
19 a base having a dental instrument thereon, the instrument
20 preferably comprising brush means for brushing the teeth
21 of a user, and a projection which extends outwardly from
22 one end of the base. The projection on the tip portion
23 is of non-circular cross section and it is adapted to be
24 snugly received in the cavity, and means is provided for
25 releasably retaining the projection in the cavity in
26 order to retain the tip portion on the brushing end of

1 the handle portion. The cavity and the projection are
2 preferably both of substantially rectangular cross
3 section, and the retaining means preferably comprises
4 detent means which is operative for releasably retaining
5 the projection in engagement in the cavity. The tip
6 portion preferably has a recessed channel formed therein
7 which extends around the perimeter of the projection
8 thereon, and the handle portion preferably has a rim
9 which extends longitudinally outwardly from the brushing
10 end of the handle portion around the perimeter of the
11 cavity. The rim on the handle portion is preferably of
12 substantially the same dimension and configuration as the
13 recessed channel in the tip portion, and the rim is
14 releasably receivable in engagement in the recessed
15 channel to effect a seal between the handle portion and
16 the tip portion around the projection. Further, the rim
17 on the handle portion is preferably recessed inwardly
18 from the outer surface of the handle portion, and the rim
19 and the recessed channel are preferably both of
20 substantially rectangular configuration.

21 It has been found that the toothbrush of the instant
22 invention can be effectively utilized for brushing the
23 teeth of a user. In this connection, because of the
24 manner in which the tip portion is detachably secured to
25 the handle portion, the tip portion is firmly and
26 positively retained on the handle portion during a

1 brushing operation. Further, because the handle portion
2 includes a rim which is receivable in the channel in the
3 brush portion for effecting a seal between the handle
4 portion and the tip portion, the toothbrush of the
5 instant invention is constructed so as to minimize the
6 areas thereon where bacteria could potentially grow when
7 the toothbrush is not in use. Still further, because the
8 tip portion is readily and easily detachable from the
9 handle portion, the tip portion can be quickly and easily
10 replaced with either a new tip portion or with a tip
11 portion of a different type, such as a rubber massaging
12 tip, a small post-surgical brush, or an interproximal
13 brush.

14 Accordingly, it is a primary object of the instant
15 invention to provide an effective toothbrush comprising
16 a handle portion and a tip portion, which is adapted to
17 be firmly and positively detachably retained on the
18 handle portion.

19 Another object of the instant invention is to
20 provide a toothbrush comprising a handle portion having
21 a longitudinally extending cavity in one end thereof, and
22 a tip portion having a projection thereon which is
23 receivable in the cavity in the handle portion for
24 securing the brush portion to the handle portion.

25 Other objects, features and advantages of the
26 invention shall become apparent as the description

1 thereof proceeds when considered in connection with the
2 accompanying illustrative drawings.

3

4 **Description of the Drawings:**

5 In the drawings which illustrate the best mode
6 presently contemplated for carrying out the present
7 invention:

8 Figure 1 is a perspective view of the toothbrush of
9 the instant invention;

10 Figure 2 is an exploded perspective view thereof;

11 Figure 3 is an enlarged, sectional view taken along
12 line 3-3 in Figure 1;

13 Figure 4 is an enlarged, sectional view taken along
14 the line 4-4 in Figure 1;

15 Figure 5 is an exploded, perspective view of a
16 second embodiment of the toothbrush of the instant
17 invention; and

18 Figure 6 is an exploded, perspective view of a third
19 embodiment thereof.

20

21 **Description of the Invention**

22 Referring now to the drawings, a first embodiment of
23 the toothbrush of the instant invention is illustrated in
24 Figures 1 through 4 and generally indicated at 10 in
25 Figures 1 and 2. The toothbrush 10 comprises a handle
26 portion generally indicated at 12, a tip portion

1 generally indicated at 14, and a detent assembly
2 generally indicated at 16 which is operative for
3 releasably securing the tip portion 14 on the handle
4 portion 12.

5 The handle portion 12 is of elongated configuration,
6 and it is preferably of substantially the same overall
7 shape as the handle portion of a conventional toothbrush.
8 The handle portion 12 includes a brushing end 18 having
9 a cavity 20 formed therein which extends longitudinally
10 inwardly from the brushing end 18. The cavity 20 is
11 preferably of substantially rectangular configuration,
12 and a substantially rectangular rim 22 extends longi-
13 tudinally outwardly from the brushing end 18 around the
14 perimeter of the cavity 20. An elongated, longitudinally
15 extending, slightly recessed slot 24 is formed on each of
16 the four sides of the interior of the cavity 20 as
17 illustrated in Figures 3 and 4 and a transversely
18 extending rib 26 is formed on each of the four sides of
19 the rim 22 as illustrated in Figure 2. Further, the
20 rim 22 is formed so that it is slightly recessed inwardly
21 from the adjacent portions of the outer surface of the
22 handle portion 12, as illustrated in Figures 2 through 4.

23 The tip portion 14 comprises a base or body
24 portion 28 which is integrally molded from a suitable
25 plastic material, a plurality of bristles 30 which are
26 embedded in the base 28, and a projection 32 which is

1 preferably integrally molded with the base 28. The base
2 28 is preferably of elongated configuration, and it has
3 opposite first and second ends 34 and 36, respectively,
4 and the bristles 30 are preferably of conventional
5 construction and made of a suitable synthetic material,
6 such as nylon. The projection 32 extends integrally
7 outwardly from the first end 34 and in a longitudinal
8 direction with respect to the base 28. As illustrated in
9 Figures 2 through 4, the projection 32 is recessed
10 inwardly from the adjacent portions of the outer surface
11 of the base 28, and the base 28 is of substantially
12 rectangular cross-sectional configuration. Further, the
13 base 28 is adapted and dimensioned to be snugly received
14 in the cavity 20 for securing the tip portion 14 on the
15 brushing end 18 of the handle portion 12. As illustrated
16 in Figures 3 and 4, a recessed channel 38 projects
17 inwardly into the base 28 around the perimeter of the
18 projection 32. The channel 38 is of substantially
19 rectangular configuration, and it is positioned and
20 dimensioned for snugly receiving the rim 22 therein when
21 the projection 32 is received in the cavity 20. Formed
22 in the interior of the channel 38 are transversely
23 extending recesses 40 which are adapted and positioned
24 for receiving the ribs 26 therein when the rim 22 is
25 received in the recessed channel 38.

1 The detent assembly 16 comprises the ribs 26 and 33
2 and the recessed slots 24 and 40 which cooperate to
3 releasably retain the brush or tip portion 14 on the
4 brushing end 18 of the handle portion 12. Specifically,
5 when the projection 32 is inserted into the cavity 20,
6 the ribs 33 are releasably receivable in engagement in
7 the elongated recessed slots 24 as illustrated in Figures
8 3 and 4, and the ribs 26 are releasably receivable in the
9 elongated transversely extending recessed slots 40 in the
10 channel 38. When the ribs 26 and 33 are releasably
11 received in the recessed slots 24 and 40, respectively,
12 in this manner they cooperate for releasably securing the
13 tip portion 14 on the handle portion 12 in a manner which
14 permits the toothbrush 10 to be effectively manipulated
15 for brushing the teeth of a user, but which nevertheless
16 permits the tip portion 14 to be readily and easily
17 disengaged from the handle portion 12. In this con-
18 nection, because of the elongated rectangular con-
19 figuration of the projection 32, the projection 32 is
20 effectively receivable in the cavity 20 for firmly and
21 positively securing the tip portion 14 to the handle
22 portion 12. In addition, because of the manner in which
23 the rim 22 is releasably receivable in the recessed
24 channel 38, the rim 22 and the channel 38 are capable of
25 effecting a seal around the projection 32 for restricting
26 the entrance of saliva and/or food particles into the

1 cavity 20. Hence, the rim 22 and the recessed channel 38
2 are operative for effectively minimizing the potential
3 locations for bacteria growth in the interfitting
4 structure between the handle portion 12 and the tip
5 portion 14 when the toothbrush 10 is not in use.

6 Referring to Figure 5, a second embodiment of the
7 toothbrush of the instant invention is illustrated and
8 generally indicated at 42. The toothbrush 42 includes a
9 handle portion 12 which is substantially identical to the
10 handle portion 12 of the toothbrush 10 and a tip
11 portion 44. The tip portion 44 includes a base portion
12 46 which is integrally molded with a projection 32 and a
13 rubber tip element 48 on the base portion 46. The base
14 portion 46 is of reduced dimension as compared to the
15 base portion 28, although it includes a recessed channel
16 38 (not shown) having a plurality of recessed slots 40
17 therein. The rubber tip element 48 is of conventional
18 construction, and it is preferably made from a suitable
19 elastomeric material in a substantially conical con-
20 figuration so that it can be effectively utilized for
21 massaging the gums of a user. The toothbrush 42 is also
22 adapted for use in a conventional manner; and because the
23 tip portion 44 is detachably secured to the handle
24 portion 12, the tip portion 44 can be readily disengaged
25 from the handle portion 12 and replaced with a new tip

1 portion 44 or with a tip portion of a different
2 configuration.

3 Referring finally to Figure 6, a third embodiment of
4 the toothbrush of the instant invention is illustrated
5 and generally indicated at 50. The toothbrush 50
6 comprises a handle portion 12, a tip portion generally
7 indicated at 52, and a detent assembly generally
8 indicated at 54. The handle portion 12 is substantially
9 identical to the handle portions 12 of the brushes 10 and
10 42, and the tip portion 52 includes a base 56 having a
11 plurality of bristles 58 thereon, and a projection 32.
12 The base 56 is preferably integrally molded from a
13 suitable plastic material in a reduced dimension as
14 compared to the base 28, and the bristles 58, which are
15 preferably made from a suitable material such as nylon,
16 are preferably embedded in the base 56. The base 56 is
17 preferably integrally molded with the projection 32, and
18 a recessed channel 38 (no shown) having slots 40 therein
19 is formed in the base 56 around the perimeter of the
20 projection 32. The tip portion 52 is adapted to be
21 assembled with the handle portion 12 thereof in a manner
22 similar to the way in which the tip portion 14 and the
23 tip portion 44 are adapted to be assembled with their
24 respective handle portions 12. However, the tip portion
25 52 is adapted for selectively brushing localized areas of

1 a user's mouth so that it can be used after periodontal
2 surgery.

3 It is seen, therefore, that the instant invention
4 provides an effective toothbrush construction comprising
5 a handle portion and a detachable tip portion. The
6 toothbrushes 10, 42, and 50 can be effectively utilized
7 for brushing the teeth or massaging the gums of a user.
8 However, because the tip portions 14, 44 and 52 are
9 readily and easily detachable from their respective
10 handle portion 12s, the tip portions 14, 44 and 52 can be
11 readily interchanged for various specific applications,
12 or they can be readily replaced when they become worn.
13 Further, because the projections 32 are receivable in
14 their respective cavities 20 and because the detent
15 assemblies 16 are operative for securing the projections
16 32 in their respective cavities 20, the toothbrushes 10,
17 42 and 50 can normally be effectively utilized as
18 conventional toothbrushes or dental instruments. In
19 addition, because of the manner in which the rims 22 are
20 receivable in their respective channels 38 for sealing
21 around their respective projections 32, the potential for
22 bacterial growth in the structures utilized for
23 connecting the handle portions 12 to their respective tip
24 portions 14, 44 or 52 are minimized. Accordingly, for
25 these reasons, it is seen that the toothbrushes 10, 42
26 and 50 represent significant advances in the art relating

1 to dental hygiene products and that they therefore have
2 significant commercial merit.

3 While there is shown and described herein
4 certain specific structure embodying the invention, it
5 will be manifest to those skilled in the art that various
6 modifications and rearrangements of the parts may be made
7 without departing from the spirit and scope of the
8 underlying inventive concept and that the same is not
9 limited to the particular forms herein shown and
10 described except insofar as indicated by the scope of the
11 appended claims.

What is claimed:

1 1. A toothbrush comprising an elongated handle
2 portion having a brushing end and a tip portion
3 detachably received on said brushing end, said handle
4 portion having a cavity therein which extends
5 longitudinally inwardly from said brushing end, said
6 cavity having a non-circular cross section, said tip
7 portion including a base having an end, dental instrument
8 means on said base for treating the teeth of a user and
9 a projection extending outwardly from the end of said
10 base, said projection being of non-circular cross section
11 and being adapted to be snugly received in said cavity,
12 the end of said base also having a recessed channel
13 formed therein, said channel extending completely around
14 the perimeter of said projection on said end of said
15 base, said handle portion having a rim on the brushing
16 end thereof, said rim extending longitudinally outwardly
17 around the perimeter of said cavity, said rim being of
18 substantially the same dimension and configuration as
19 said recessed channel and being releasably received
20 therein to effect a seal between said handle portion and
21 said tip portion around said projection in order to
22 minimize the penetration of moisture into said cavity and
23 means for releasably retaining said projection in said
24 cavity to secure said tip portion on the brushing end of
25 said handle portion.

1 2. In the toothbrush of claim 1, said cavity and
2 said projection being of substantially the same dimension
3 and configuration.

1 3. In the toothbrush of claim 2, said cavity and
2 said projection being of substantially rectangular cross
3 section.

1 4. In the toothbrush of claim 3, said retaining
2 means further characterized as detent means releasably
3 retaining said projection in said cavity.

1 5. In the toothbrush of claim 1, said handle
2 portion having an outer surface, said rim being recessed
3 inwardly from said outer surface.

1 6. In the toothbrush of claim 1, said cavity and
2 said projection being of substantially rectangular cross
3 section, said rim and said recessed channel being
4 substantially rectangular.

1 7. In the toothbrush of claim 1, said dental
2 instrument means further characterized as brush means for
3 brushing the teeth of a user.

1 8. A toothbrush comprising an elongated handle
2 portion having a brushing end and a tip portion
3 detachably received on said brushing end, one of either
4 the brushing end of said handle portion or said tip
5 portion having a longitudinally inwardly extending cavity
6 formed therein, the other of either the brushing end of
7 said handle portion or said tip portion having a longi-
8 tudinally extending projection formed thereon, said
9 projection and said cavity being of non-circular cross
10 section, said projection being snugly received in said
11 cavity and means for releasably retaining said projection
12 in said cavity in order to releasably secure said tip
13 portion on said handle in end-to-end relation therewith,
14 the one of either the brushing end of said handle portion
15 or said tip portion having said projection thereon also
16 having a recessed channel formed therein, said channel
17 extending completely around the perimeter of said
18 projection, the one of either the brushing end of said
19 handle or said tip portion having said cavity formed
20 therein having a rim thereon, said rim extending
21 longitudinally outwardly around the perimeter of said
22 cavity, said rim being of substantially the same
23 dimension and configuration as said recessed channel and
24 being releasably received therein to effect a seal
25 between said handle portion and said tip portion around

26 said projection in order to minimize the penetration of
27 moisture into said cavity.

1 9. In the toothbrush of claim 8, the one of either
2 the brushing end of said handle portion or said tip
3 portion having said cavity formed therein having an outer
4 surface, said rim being recessed inwardly from said outer
5 surface.

1 10. In the toothbrush of claim 8, said cavity and
2 said projection being of substantially rectangular cross
3 section, said rim and said recessed channel being
4 substantially rectangular.

1 11. In the toothbrush of claim 8, said dental
2 instrument means further characterized as brush means for
3 brushing the teeth of a user.

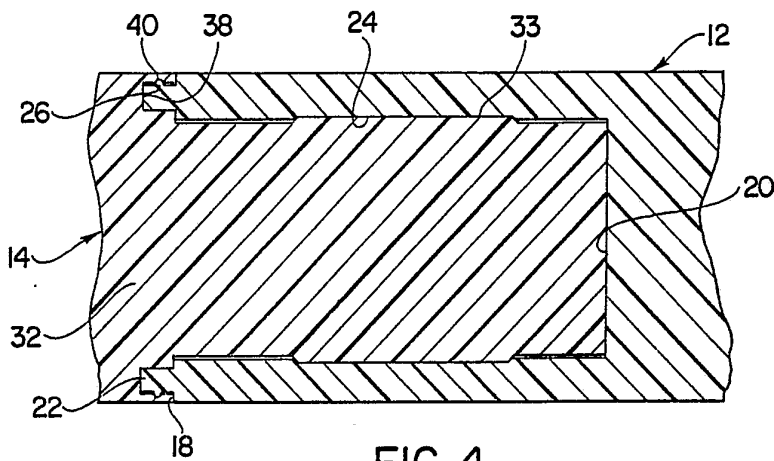
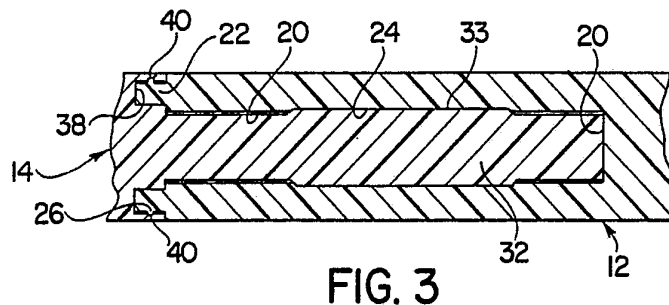
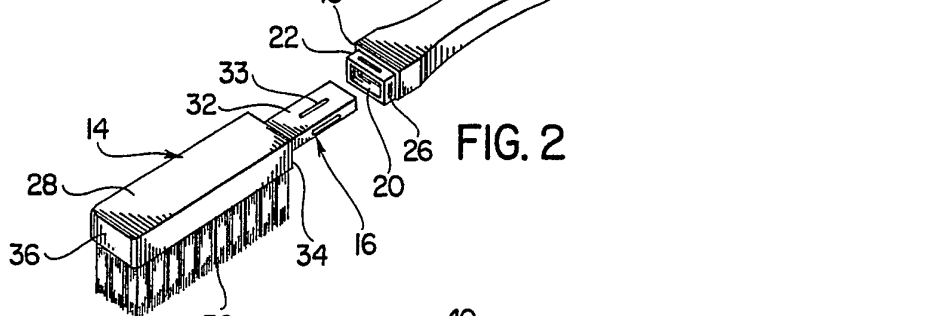
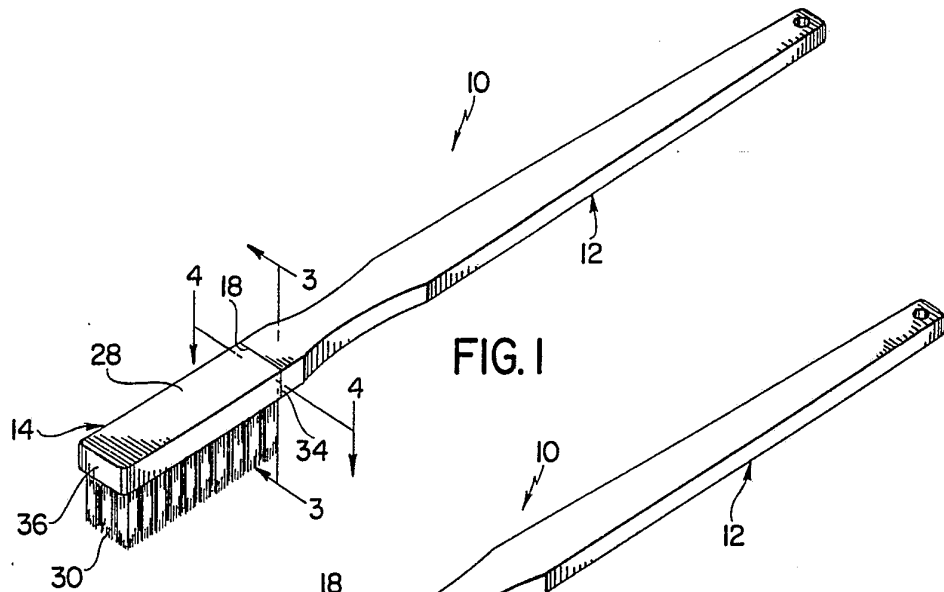
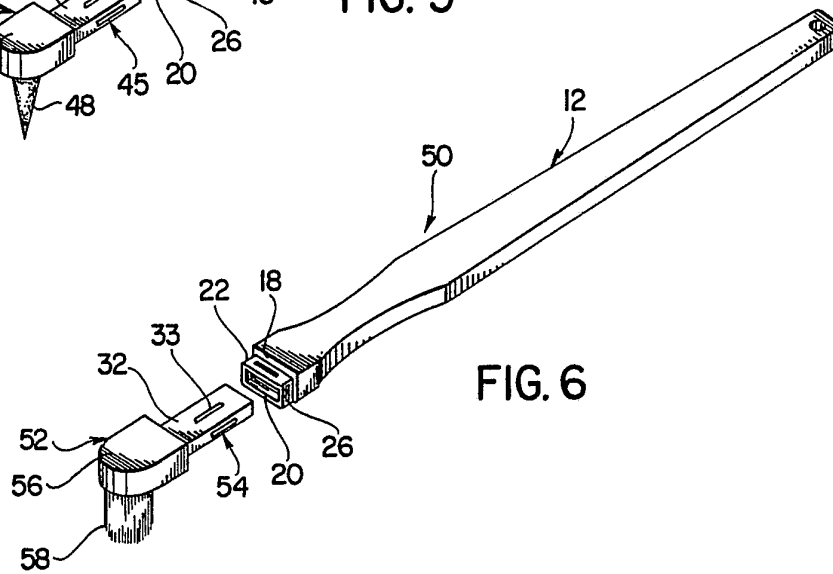
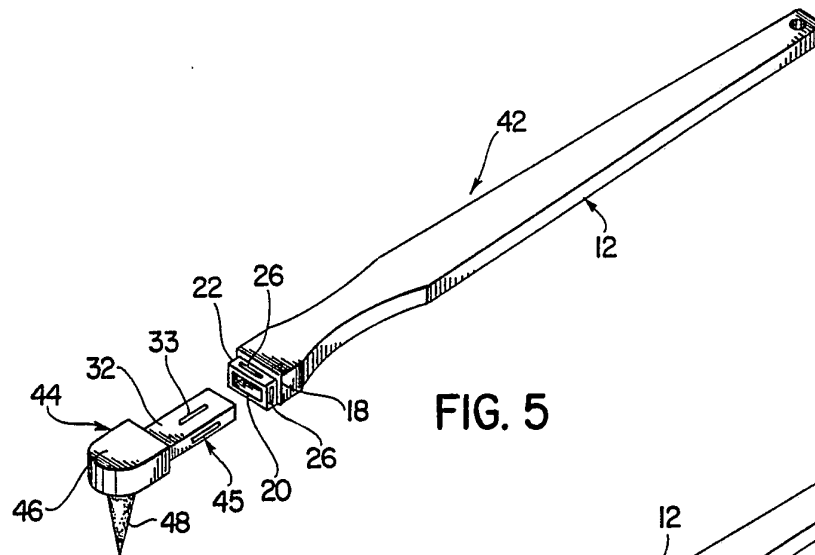


FIG. 4



INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US91/07762**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC IPC(5): A46B 7/04 U.S. CL. 15/167.1 15/176.1 15/22.1		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
U.S.	15/167.1, 167.2, 176.1, 110, 22.1	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	US, A, 1,758,632 (WAGNER) 13 May 1930	ALL
A	US, A, 1,887,913 (BELL) 15 November 1932	
A	US, A, 2,175,278 (OREBAUGH) 10 October 1939	
A	US, A, 2,287,327 (RICKENBACHER) 23 June 1942	
A	US, A, 2,362,159 (RICHENBACHER) 07 November 1744	
A	US, A, 2,503,134 (SCHROEDER) 04 April 1950	
A	US, A, 2,668,973 (GLAZA et al) 16 February 1954	
A	US, A, 2,875,458 (TSUDA) 03 March 1957	
A	US, A, 3,369,265 (HALBERSTADT et al) 20 February 1968	
A	US, A, 4,020,521 (VELASQUEZ) 03 May 1977	
<p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search 23 March 1992		Date of Mailing of this International Search Report 29 APR 1992
International Searching Authority ISA/US		Signature of Authorized Officer <i>Patrick F. Brinson</i>