



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/US97/02072</p> <p>(22) International Filing Date: 11 February 1997 (11.02.97)</p> <p>(30) Priority Data: 08/601,567 14 February 1996 (14.02.96) US</p> <p>(60) Parent Application or Grant (63) Related by Continuation US 08/601,567 (CON) Filed on 14 February 1996 (14.02.96)</p> <p>(71) Applicant (for all designated States except US): GILLETTE CANADA INC. [CA/CA]; 16700 Trans Canada, Kirkland, Quebec H9H 4Y8 (CA).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): MEESSMANN, Jeffrey, S. [US/US]; 952 Pepper Drive, Iowa City, IA 52240 (US). SZCZECH, Jeffrey, S. [US/US]; 1229 Hunters Run, Iowa City, IA 52246 (US). BREDALL, William, A. [US/US]; 257 Marvilla Circle, Pacifica, CA 94044 (US).</p> <p>(74) Agents: GALLOWAY, Peter, D.; Ladas &amp; Parry, 26 West 61st Street, New York, NY 10023 (US) et al.</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, 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).</p> <p><b>Published</b> <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></p>
<p>(54) Title: BRUSH HANDLE</p>		
<p>(57) Abstract</p>		
<p>A toothbrush has an elongated handle with bristles disposed at one end extending outwardly from one surface of the handle. The handle is formed of a semi-rigid plastic material having a pair of flanges disposed on the surface opposite that of the bristles for controlling the flexure at various points along the handle length and a softer material is formed onto that portion of the handle containing the flanges to provide a soft grip for the user.</p>		

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BRUSH HANDLE

The present invention relates to brush handles and more particularly to a toothbrush handle having a finger-gripping portion which is capable of deformation by the fingers of the user.

Recent toothbrush designs have been marketed which provide various gripping features to the toothbrush handle in an attempt to produce a better "feel" to the user, while maintaining the structural capability of the brush to provide the necessary pressure to the bristle end of the brush. These handle configurations have taken the form of grooves or other formations on the handle of a unitary structure or, in some instances, a two-part handle is provided wherein a thin layer of soft pliable material is provided on the more rigid portion of the handle to achieve the design objective. In many constructions a thin layer of elastic material in the range of 2mm is formed onto a rigid handle which results in an aesthetically pleasing handle having little or no ergonomic value to the user.

In the two-part construction, wherein a separate soft and more pliable material is applied to a more rigid handle member, it is often necessary to compromise the requirement to provide a quantity of soft material necessary to allow deformation by the fingers of the user while retaining the rigidity of the more rigid handle of the brush without producing a handle having an unusually large thickness. A relatively thick toothbrush handle would in many

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instances be unacceptable to the user, in particular where a brush is being provided for use by children or those with smaller hands.

5 It also must be considered in providing the combination of a soft finger-gripping material to the gripping portion of the toothbrush, that a sufficient structure of the rigid material must be maintained to enable the user to apply pressure to the bristle portion of the brush without damage to the handle, over  
10 a period of usage. A necessity therefore has risen to provide a two-element brush in which the flexibility over the length of the handle is controlled while maintaining a desirable thickness to the gripping portion about which the hand of the user envelopes.

15 It is therefore an object of the present invention to provide a handle for a toothbrush or other such appliance which comprises a gripping surface having a finger-deformable portion to present a more desirable "feel" to the user.

20 A further object of the invention is to provide an article of the type set forth above having a greater thickness of finger-deformable material over the handle length than in devices of the prior art.

25 Another object of the invention is to provide a toothbrush of the type described which contains a deformable finger-gripping portion while maintaining that rigidity in the handle necessary to apply a desirable pressure to the toothbrush bristles.

30 Yet another object of the invention is to provide an article such as a toothbrush handle which is simple in design and easily manufactured while maintaining the objectives set forth above.

35 The above objects and other objectives which will become apparent as the description proceeds are accomplished by providing a toothbrush comprising an elongated handle having a pair of opposed surfaces with a plurality of bristles extending outwardly from one of

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the surfaces adjacent one end of the handle. A gripping means is disposed adjacent the opposite end of the handler, the gripping means comprising an elongated cavity formed on the other of the opposed surfaces along a portion of the elongated handle, and at least one and preferably a pair of flanges extend outwardly from adjacent each of the edges of the cavity and into the gripping element to provide a desired rigidity to the elongated handle during the brushing process.

5  
10 The flanges are generally disposed entirely within the gripping element and the inner surfaces of the flanges may be an extension of the inner surface of the cavity. The flanges also may be inwardly offset from the outer edge of the elongated handle.

15 A plurality of slotted opening may be provided in the base of the cavity in which construction the gripping element will be formed having portions extending into the slotted openings.

20 While the invention is disclosed embodied in a toothbrush handle it may be incorporated in an appliance handle of any type comprising an elongated body member having a pressure-applying surface disposed at one end and a gripping portion adjacent the other end thereof. In an appliance structure of this type  
25 the body member has an elongated cavity formed therein extending axially along the gripping portion at the opposite-facing surface of that of the pressure-applying surface. The cavity generally is provided with a pair of flanges extending outwardly therefrom  
30 and adjacent each of the elongated edges thereof. A gripping element is formed in the cavity having the pair of flanges extending therein to provide a rigidity to the gripping portion of the brush handle during use of the appliance.

35 In its broadest aspect the invention may be adapted to any dental appliance or the like having a pressure-applying surface disposed at one end and a

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gripping portion adjacent the opposite end thereof.  
The gripping portion generally comprises a layer of  
soft thermoplastic elastomer having a thickness in the  
pressure-applying direction of 2mm to 15mm and a Shore  
5 A hardness value in the range of 5 to 30.

Reference is made to the accompanying drawing  
in which there is shown an illustrative embodiment of  
the invention from which its novel features and  
advantages will be apparent, wherein:

10 Figure 1 is a side elevational view intended  
to depict a typical toothbrush of the prior art having  
a soft gripping portion provided thereon;

Figure 2 is a sectional view taken along the  
line II-II of Figure 1 showing details of the prior art  
15 toothbrush of Figure 1;

Figure 3 is a side elevational view of a  
toothbrush constructed in accordance with the teachings  
of the present invention, the opposite side view being  
a mirror image thereof;

20 Figure 4 is a top plan view of the toothbrush  
of Figure 3 showing details of the structure;

Figure 5 is a side elevational view, similar  
to Figure 3, showing a portion of the structure of  
Figures 3 and 4 in detail;

25 Figure 6 is a top plan view similar to Figure  
4 showing further details of the portion of the  
toothbrush shown in Figure 5;

Figure 7 is a right sectional view taken  
along the line VII-VII of Figure 5 showing details of  
30 the cavity formed in that portion of the toothbrush  
structure;

Figure 8 is a right sectional view taken  
along the line VIII-VIII of Figure 5 showing additional  
details of the structure; and

35 Figure 9 is a right sectional view taken  
along the line IX-IX of Figure 5 showing details of  
that area of the toothbrush portion depicted in Figures

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5 through 8.

Referring now to the drawing and in particular to Figures 1 and 2 in which a typical prior art toothbrush 90 is shown to comprise a semi-rigid handle member 91 with the bristles 92 disposed on one surface and a gripping layer 93 disposed on the opposite surface from that of the bristles. The gripping layer 93 may be formed of a number of available materials, the objective being to provide a finger-gripping area which is more pleasing to the user and which prevents slippage of the handle in the user's grip during the brushing operation.

As best shown in Figure 2, the handle member 91 is provided with a pair of shoulders 94 and 95 to receive and retain the gripping layer 93. As is evident from Figure 2 the amount of deformable or pliable material in the gripping layer 93 must be sufficient to allow a soft feel by the fingers of the user, while the material which is chosen must also have the wearability necessary for reliability during daily use. In contrast, the handle member 91 must be of sufficient rigidity and strength to provide pressure at the bristles 92, while the deformation of the handle over its length should be controlled during the brushing operation. A handle structure having excessive deformable material would present a large gripping area difficult for manipulation by those with small hands such as children, while a handle which is insufficient in rigid material would lack the rigidity at the proper locations necessary to provide proper brushing pressure. The result generally is a compromise over the optimum desirable for each of these features.

Referring now to Figures 3 and 4, the present invention provides a toothbrush 10 having an elongated handle member 12 comprising bristles 14 extending from the lower surface thereof. A gripping means in the

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form of a gripping element 16 is formed on the opposite surface from that of the bristles, the gripping element having a plurality of grooves 17 formed on its surface to enhance the gripping quality of the element. The

5 handle member 12 is generally manufactured of a thermoplastic material, such as polypropylene, which in the present structure has a Shore R hardness value in the area of 97 to 100. The gripping element 16 is formed by an injection molding process onto the handle

10 member 12, and in the present embodiment is a thermoplastic elastomer material which may have a hardness value in the area of 5 to 30, and preferably in the area of 20, measured on the Shore A scale, the hardness value being chosen to give a soft flexible

15 feeling under finger pressure. While a chemical bond exists between the gripping element 16 and the handle member 12, a plurality of slotted openings 18 are provided in that surface of the handle member 12 from which the bristles 14 extend, and in the injection

20 molding process the material of the gripping element 16 flows through the openings to better retain the gripping element onto the handle member as well as to provide additional gripping surfaces for the user's fingers. An elongated opening 20 is provided at the

25 opposite end of the handle member 12 from that of the bristles 14 and, as with the slotted openings 18, the material from the gripping element 16 is injected into the slotted opening 18 and aids in retaining that portion of the gripping element 16 onto the handle

30 member 12.

Referring now to Figures 5 through 9, the handle member 12 is shown to be provided with a cavity 22 extending from adjacent the end of the handle member, opposite the bristle location to a point past

35 the mid-length of the handle member. The cavity 22 has a pair of upwardly extending flanges 24 and 26 formed on either side thereof, the inner surface of each



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flange being an extension of the inner surface of the cavity 22. The flanges 24 and 26 are offset inwardly from the outer surfaces of the handle member 12 and by forming the outer surface of the gripping element 16 as  
5 an extension of the outer side surfaces of the handle member 12 the flanges 24 and 26 are completely contained within the gripping element 16.

As will be evident from viewing Figures 7 through 9, both the size of the toothbrush handle in  
10 its entirety, the handle member, and gripping element, may be formed in keeping with the objectives of the invention. The need for a handle size which is easy to manipulate, the desirability of a quantity of soft flexible material to provide a soft gripping element 16  
15 and the varying rigidity over the length of the handle member 12, are easily controlled by increasing or decreasing the height of the flanges 24 and 26, generally maintaining a height of 2mm to 15mm of soft material in the gripping element. Furthermore, this  
20 combination may be accomplished at any point along the length of the toothbrush or appliance to create a particular rigidity and softness at any point along the length of the brush handle while maintaining a brush having a desirable feel and appearance.

25 Thus, in either Figures 7, 8 or 9, should a more rigid section be required, the flanges 24, 26 may be increased in height. Should more flexibility be required the flanges may be decreased in height. The amount of material in the gripping element 16 may be  
30 increased or decreased to produce the proper feel as the more rigid handle member is proportionately increased or decreased to maintain a required overall thickness, the overall desired rigidity at any point being attained by increase or decrease of the flanges  
35 24, 26.

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C L A I M S

1. A toothbrush comprising:  
an elongated handle having a pair of opposed  
surfaces with a plurality of bristles extending  
5 outwardly from one of said surfaces adjacent one end of  
said handle;  
a gripping means disposed adjacent the  
opposite end of said handle;  
said gripping means comprising an elongated  
10 cavity formed in the other of said opposed surfaces  
along a portion of said elongated handle;  
a gripping element formed in said cavity,  
extending outwardly therefrom; and  
at least one flange extending outwardly from  
15 said cavity and into said gripping element to provide  
rigidity to said elongated handle during the brushing  
process.
2. A toothbrush as set forth in claim 1, wherein  
said flanges are two in number.
- 20 3. A toothbrush as set forth in claim 2, wherein  
said flanges are disposed entirely within said gripping  
element.
4. A toothbrush as set forth in claim 2, wherein  
the inner surfaces of said flanges are an extension of  
25 the inner surface of said cavity.
5. A toothbrush as set forth in claim 2, wherein  
said pair of flanges are inwardly offset from the outer  
edge of said elongated handle.
6. A toothbrush as set forth in claim 1, wherein  
30 a plurality of slotted openings are provided in the  
base of said cavity and said gripping element is formed  
having portions extending into said slotted openings.
7. A toothbrush as set forth in claim 1, wherein  
said gripping element is manufactured of a  
35 thermoplastic elastomer material.
8. A toothbrush as set forth in claim 6, wherein  
said thermoplastic elastomer material is of a hardness

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in the area of 5 to 30 measured on the Shore A scale.

9. A toothbrush as set forth in claim 1, wherein said handle is manufactured of a thermoplastic material.

5 10. A toothbrush handle as set forth in claim 9, wherein said thermoplastic material has a Shore R hardness in the area of 97 to 100.

10 11. A toothbrush as set forth in claim 3, wherein said pair of flanges are inwardly offset from the outer edge of said elongated handle.

12. A toothbrush as set forth in claim 11, wherein said gripping element is manufactured of a thermoplastic elastomer material of a hardness in the area of 5 to 30 measured on the Shore A scale.

15 13. A toothbrush as set forth in claim 12, wherein said handle is manufactured of a thermoplastic material.

20 14. A toothbrush handle as set forth in claim 13, wherein said thermoplastic material has a Shore R hardness in the area of 97 to 100.

15. An appliance handle comprising an elongated body member having a pressure-applying surface disposed at one end thereof and a gripping portion adjacent the other end thereof;

25 said body member having an elongated cavity formed therein extending axially along said gripping portion at the opposite facing surface from that of said pressure-applying surface for receiving and retaining a gripping element therein;

30 said cavity having a pair of flange extending outwardly therefrom one adjacent each of the elongated edges thereof; and

a gripping element formed in said cavity having said pair of flanges extending therein to provide rigidity to said gripping portion of said brush handle during use thereof.

16. An appliance handle as set forth in claim 15,

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which further includes a plurality of slotted openings provided in the base of said cavity and said gripping element is formed having portions thereof extending into said slotted openings.

5 17. An appliance as set forth in claim 16, wherein said flanges are disposed entirely within said gripping element.

10 18. A dental appliance handle having a pressure-applying surface disposed at one end and a gripping portion adjacent the opposite end thereof wherein said gripping portion in cross-section comprises a layer of soft thermoplastic elastomer having a thickness in the pressure-applying direction of 2mm to 15mm and a Shore A hardness value of 5 to 30, said layer being disposed  
15 on the opposite surface of said handle from the pressure-applying surface.

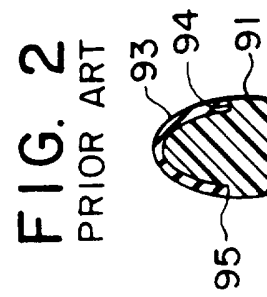
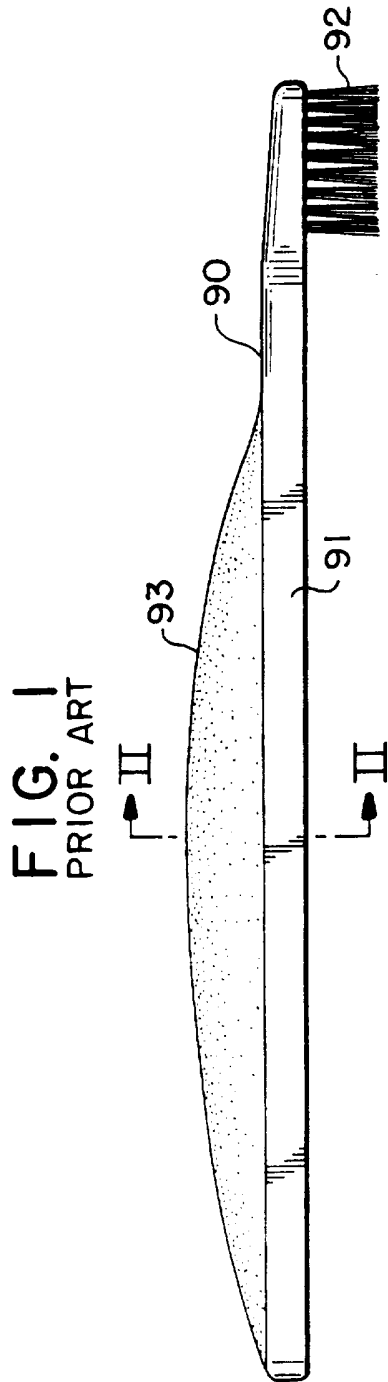


FIG. 3

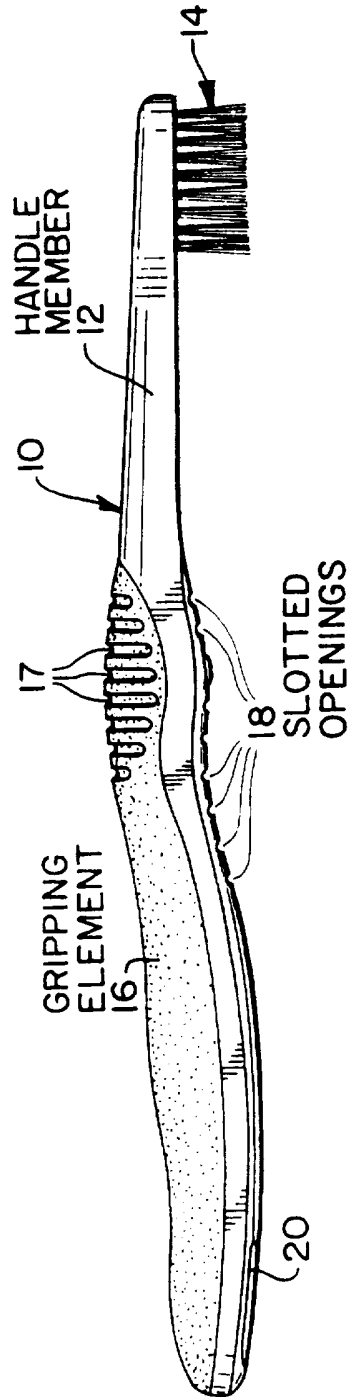


FIG. 4

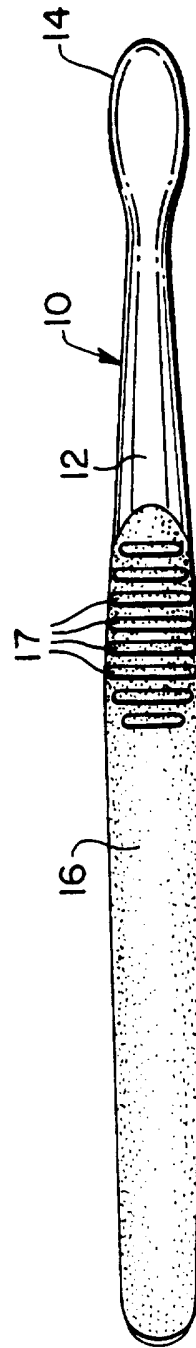


FIG. 5

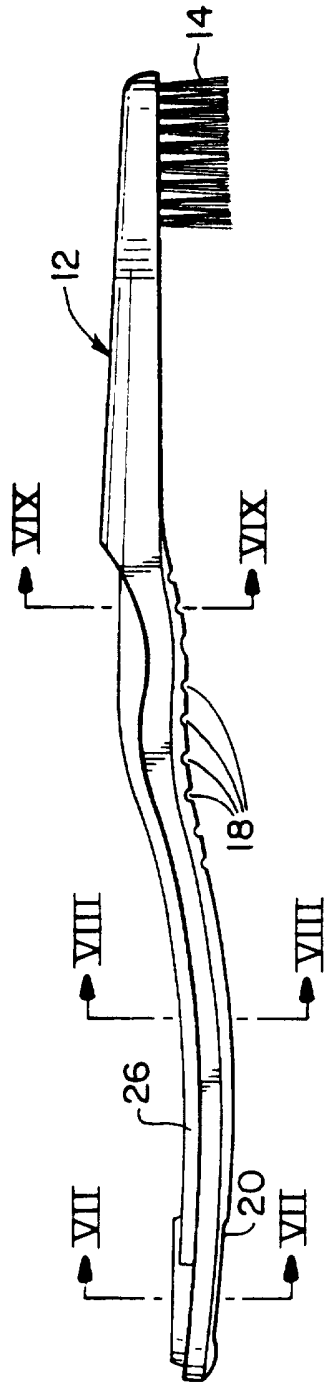


FIG. 6

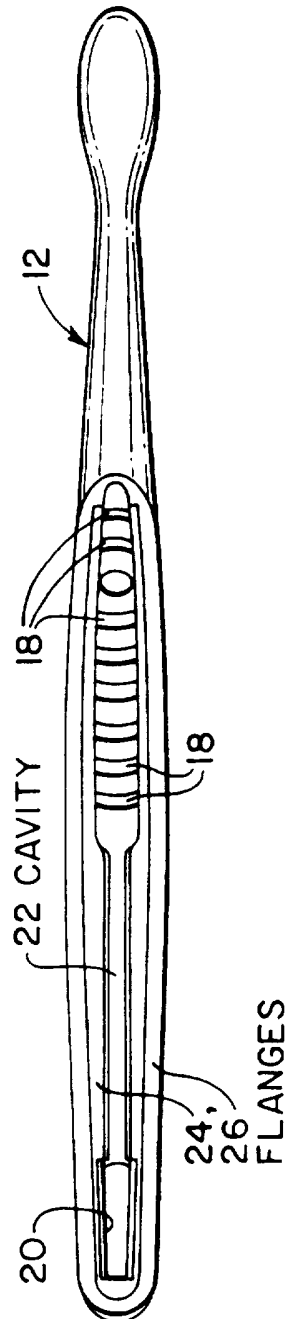


FIG. 7

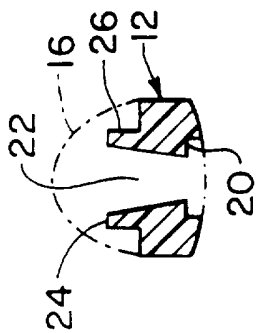


FIG. 8

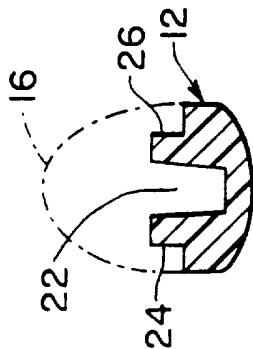
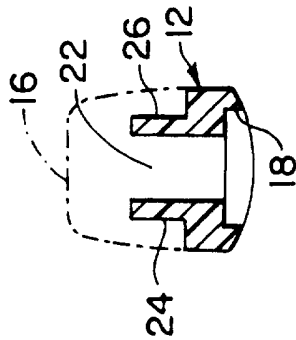


FIG. 9





# INTERNATIONAL SEARCH REPORT

Int. onal Application No  
PCT/US 97/02072

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A46B5/02

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

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.
X	US 5 398 369 A (HEINZELMAN ET AL.) 21 March 1995	18
A	see column 2, line 23 - line 37; figures 1-3 see column 3, line 35 - line 66; claims 1-3	1-17
X	DE 295 08 990 U (M + C SCHIFFER) 17 August 1995	18
A	see the whole document	1-17
A	EP 0 580 406 A (DESIMONE) 26 January 1994 see claims 1-10; figures 1-5	1-18
A	DE 42 29 152 A (JORDAN) 3 March 1994 see the whole document	1-18

Further documents are listed in the continuation of box C.       Patent family members are listed in annex.

\* Special categories of cited documents :

<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 when the document is taken alone</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>"&amp;" document member of the same patent family</p>
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Date of the actual completion of the international search  <b>29 May 1997</b>	Date of mailing of the international search report  <b>13.06.97</b>
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	Authorized officer  <b>Christensen, C</b>
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1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/02072

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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