

SPRUSON & FERGUSON

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1990

NOTICE OF ENTITLEMENT


In support of the convention application made for a patent for an invention entitled:

A Toothbrush

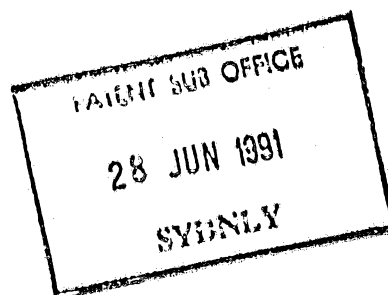
I Erwin Roth, of Drygalskiallee 33, D-8000 Munchen, Federal Republic of Germany do solemnly and sincerely declare as follows:

1. I am the applicant for the patent.
2. The basic application as defined by Section 141 of the Act was made in the Federal Republic of Germany on 25 October 1988 by Erwin Roth.
3. I am the actual inventor of the invention.
4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention(s) the subject of the application.

DECLARED at München this 19th day of June 1991


.....
Signature of Declarant

TO: THE COMMISSIONER OF PATENTS
AUSTRALIA



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(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 614884

(54) Title
A TOOTHBRUSH

(51)^s International Patent Classification(s)
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(56) Prior Art Documents
AU 32251/89 A46B 005/00
AU 44932/89 A46B 005/00
EP 77484

(57) Claim

1. A toothbrush having a handle and a bristle support and a mechanism which indicates the end of the toothbrush's serviceable life, wherein the mechanism is thereby formed that at least part (3, 7) of the toothbrush (1) consists of material that gradually decomposes, disintegrates or changes colour.

6. A toothbrush according to one of the preceding claims, wherein the transition region between the handle (2) and the bristle support (4) of the toothbrush consists of the material that decomposes, disintegrates or changes colour.

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OPI DATE 14/05/90

APPLN. ID

44261 / 89

AOJP DATE 21/06/90

PCT NUMBER PCT/DE89/00683

PCTINTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation 5 : A46B 15/00, 5/00	A1	(11) Internationale Veröffentlichungsnummer: WO 90/04342 (43) Internationales Veröffentlichungsdatum: 3. Mai 1990 (03.05.90)
(21) Internationales Aktenzeichen: PCT/DE89/00683 (22) Internationales Anmeldedatum: 24. Oktober 1989 (24.10.89) (30) Prioritätsdaten: P 38 36 232.5 25. Oktober 1988 (25.10.88) DE (71)(72) Anmelder und Erfinder: ROTH, Erwin [AT/DE]; Drygalskiallee 33, D-8000 München 70 (DE). (74) Anwalt: HAFT, BERNGRUBER, CZYBULKA; Postfach 14 02 46, Hans-Sachs-Straße 5, D-8000 München 5 (DE). (81) Bestimmungsstaaten: AU, DK, FI, JP, KR, NO, SU, US.		Veröffentlicht <i>Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist. Veröffentlichung wird wiederholt falls Änderungen eintreffen.</i>

(54) Title: A TOOTHBRUSH

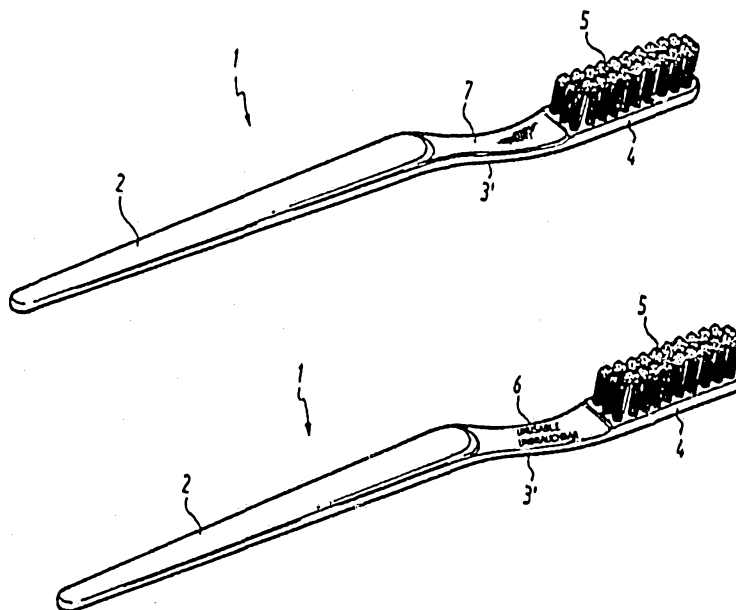
(54) Bezeichnung: ZAHNBÜRSTE

(57) Abstract

The invention relates to a toothbrush (1) with a handle (2) and a head (3). In order to remind the user of the right time to change the toothbrush, at least one part (3, 3') of the toothbrush (1) is to be made of a material which gradually decomposes, dissolves or discolours (3, 7). The preferred substance for use here is a water-soluble plastic.

(57) Zusammenfassung

Die Erfindung bezieht sich auf eine Zahnbürste (1) mit einem Stiel (2) und einem Bürstenträger (3). Um den Benutzer an das rechtzeitige Auswechseln der Zahnbürste zu erinnern, wird vorgeschlagen, zumindest einen Teil (3, 3') der Zahnbürste (1) aus einem sich allmählich zersetzenden, auflösenden oder verfärbenden Material (3, 7) auszubilden. Vorzugsweise wird hierzu ein wasserlöslicher Kunststoff verwendet.



The present invention relates to a toothbrush according to the preamble of patent claim 1.

It is a deplorable fact that oral hygiene, as the most effective precaution against tooth decay, does not occur to the extent required by physicians. The reason for this problem is not only that the teeth are brushed too infrequently or for too short a time, but often also because the toothbrush is used over too long a period of time despite diligent oral hygiene. It has been ascertained that the bristles are affected by brushing and their tips are roughened or even split. However, the gums are injured by such roughened brushes, thus thwarting the effect of looking after one's teeth.

German OS 31 40 903 discloses a toothbrush having an indicating element in its handle with which, for example, the month in which the toothbrush was purchased or is to be replaced can be set. It may be possible to lock this indicating element, but it can also be accidentally reset so that the particulars that were once set are possibly falsified. In addition, dirt can become embedded in the gap between the indicating element and the toothbrush handle which is not only unsightly but also unhygienic.

A toothbrush is known from European patent application EP 0 199 158 A2 which has a battery-operated device in the handle giving off acoustic or visual signals. This device is switched on inductively or capacitively as soon as the toothbrush is picked up so that a melody or spoken text sounds or visual signals are given off while brushing one's teeth for a period of, for example, two minutes. A sensitive, pleasing component is herewith offered to the user while brushing his teeth which should at the same time



encourage regular brushing. If the toothbrush is used twice daily, the battery lasts for approximately three months, thus also letting the user know indirectly that the toothbrush should be replaced.

The manufacture and design of such toothbrushes is more expensive than for conventional types of toothbrushes. In addition, for reasons of environmental protection it must be remembered that toothbrushes containing batteries cannot simply be thrown away when they are no longer being used, rather they must either be collected at special garbage dumps or be recycled.

The present invention is based on the object of providing a toothbrush of the conventional type which is simple to manufacture and which draws the user's attention directly to the fact that the maximum allowable period of use has expired and that the toothbrush must be replaced.

This object is solved in accordance with the invention by the features set forth in the characterizing portion of patent claim 1.

Accordingly, at least part of the toothbrush is manufactured from or is provided with a material that gradually decomposes, disintegrates or changes colour during use. This process can occur by means of air, water or light. A plurality of plastics are known for this purpose, for example polymers with acid or amino groups, for example a polymer with methacrylic acid as the copolymer. Such plastics are soluble in water or in slightly acidic or basic liquids. Dyes and colour plastics that are not lightproof are suitable for the change in colour.



The transition region between the bristle support and the handle is thereby preferably manufactured at least in part from a plastic that decomposes or dissolves in water. Since this transition region regularly comes into contact with water during brushing, the material dissolves so that after a while the bristle support is no longer stable rather is only soft and thus improperly connected to the handle for cleaning teeth.

Another possibility lies in providing an indicator panel covered with a decomposing or disintegrating material on the bristle support and/or the handle. This material, for example the aforementioned plastic, has dissolved when the possible period of use of the toothbrush ends so that the indicator panel is visible and the end of the period of use is effectively indicated.

Furthermore, the entire body of the toothbrush or only an indicator panel can be manufactured from a material that gradually changes colour.

Two exemplary embodiments of the present invention are explained in greater detail on the basis of the drawings wherein:

Figures 1 and 2 respectively show a toothbrush according to the present invention before the start of use and at the end of the maximum useful life; Figures 3 and 4 show a second exemplary embodiment of a toothbrush according to the present invention likewise before the start of use and at the end of the allowable useful life;

Figures 5 and 6 show a third exemplary embodiment of a toothbrush according to the present invention likewise before the start of use and at the

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end of the allowable useful life.

Figure 1 illustrates a toothbrush 1 having a handle 2, a slightly bent transition region 3 and a bristle support 4 for bristles 5. The transition region 3 between the handle 2 and the bristle support 4 is manufactured from a water-soluble plastic, for example a polymer with acrylic acid as the copolymer. When cleaning teeth, this transition region comes into contact with water whereby it gradually disintegrates and becomes soft. The appropriate composition of the material can influence the length of time required for the plastic to soften or disintegrate. When the thickness of the transition region 3 is no longer sufficient for a stable connection between the handle 2 and the bristle support, then the toothbrush is no longer to be used. This condition is illustrated in Figure 2. It is important hereby that the plastic used does not break on account of brittleness which could result in injuries during brushing, rather that it gradually disintegrates or softens to such an extent that the bristle support bends during brushing and appropriate pressure can no longer be applied to the teeth.

Figure 3 shows a toothbrush 1 having a handle 2, again a slightly bent transition region 3' and a bristle support 4 for bristles 5. The transition region 3' to begin with has a slightly lowered indicator panel 6, as shown in Figure 4, which is subsequently covered with a water-soluble plastic 7. During use of the toothbrush this plastic is gradually dissolved by the water, thus exposing the indicator panel 6. Through this an inscription or other warning symbol becomes visible which reminds the user to replace the toothbrush.

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The toothbrush according to Figure 5 again has a handle 2, a bent transition region 3" and a bristle support 4 for bristles 5. The bent transition region 3" of this toothbrush is manufactured from a material that changes colour in the course of time, for example by means of light or moisture, this material containing, for example, dyes that are not lightproof, their colour changing markedly after a certain period of time, as is indicated by the crosshatching in Figure 6. This also indicates to the user that the toothbrush is no longer to be used, rather a new one is to be used.

In the exemplary embodiments the indication and arrangement of the disintegrating, decomposing or discolouring plastic materials is given by way of example. The invention can in the same way be used not only in conjunction with regular toothbrushes, but also with attachments suitable for electric toothbrushes.



Patent Claims:

1. A toothbrush having a handle and a bristle support and a mechanism which indicates the end of the toothbrush's serviceable life, wherein the mechanism is thereby formed that at least part (3, 7) of the toothbrush (1) consists of material that gradually decomposes, disintegrates or changes colour.

2. A toothbrush according to claim 1, wherein the material (3, 7, 3") is a plastic that gradually decomposes, disintegrates or changes colour by means of air, light and/or water.

3. A toothbrush according to claim 1 or 2, wherein the material is a polymer with acid or amino groups, preferably a polymer with acrylic acid as the copolymer.

4. A toothbrush according to claim 1 or 2, wherein the material is not lightproof.

5. A toothbrush according to claim 4, wherein the material that is not lightproof is a plastic with dyes that are not lightproof.

6. A toothbrush according to one of the preceding claims, wherein the transition region between the handle (2) and the bristle support (4) of the toothbrush consists of the material that decomposes, disintegrates or changes colour.

7. A toothbrush according to claims 1 to 5, wherein the toothbrush (1) has an indicator panel (6) which is covered with the material (7) that decomposes, disintegrates or changes colour.

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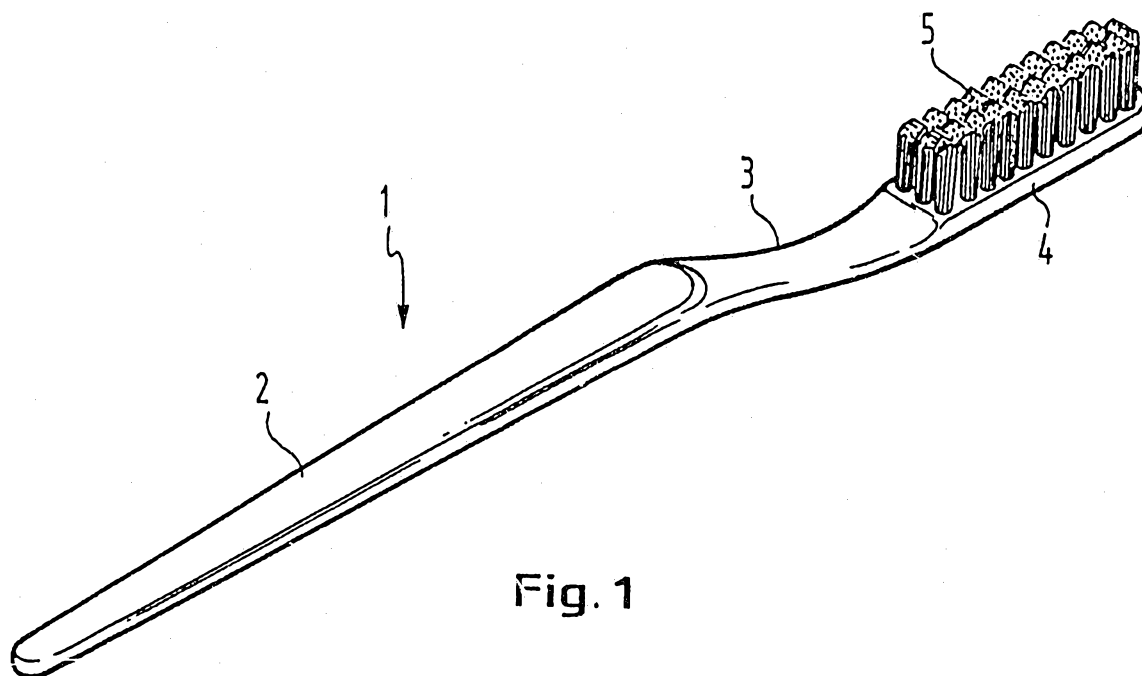


Fig. 1

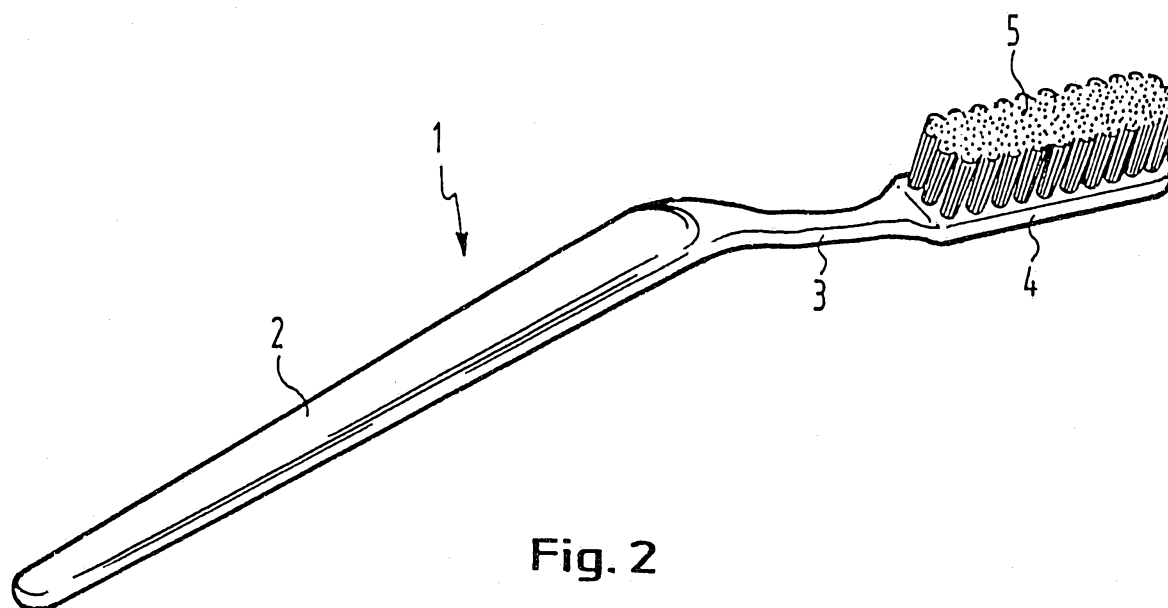
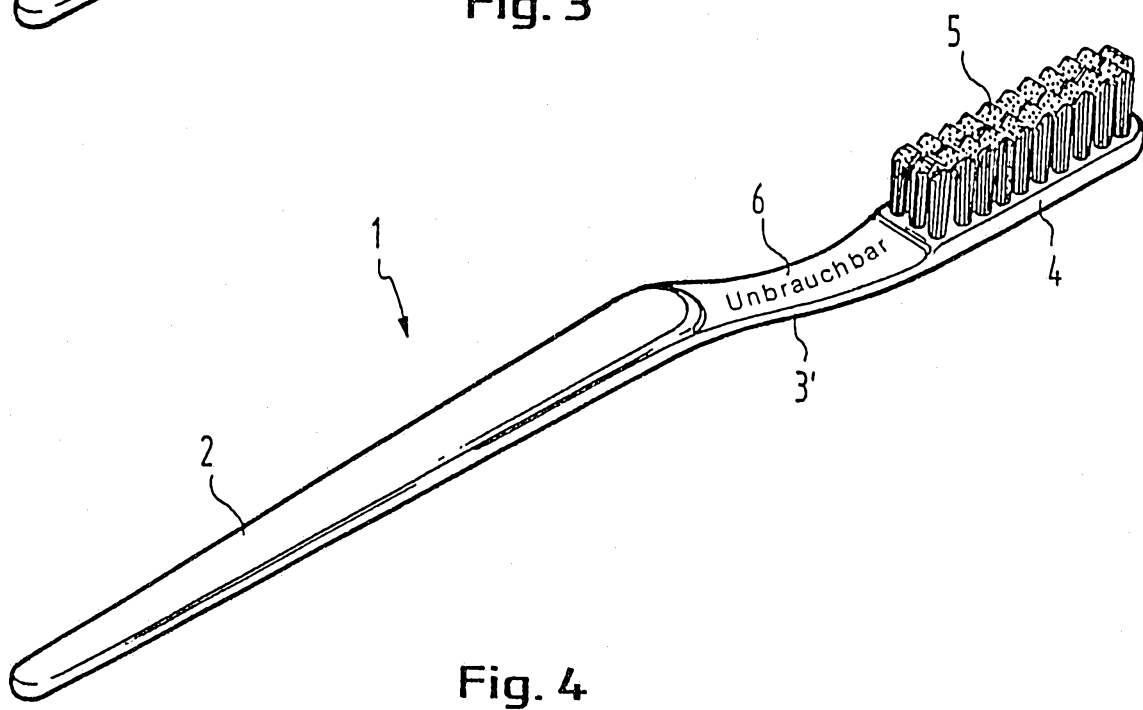
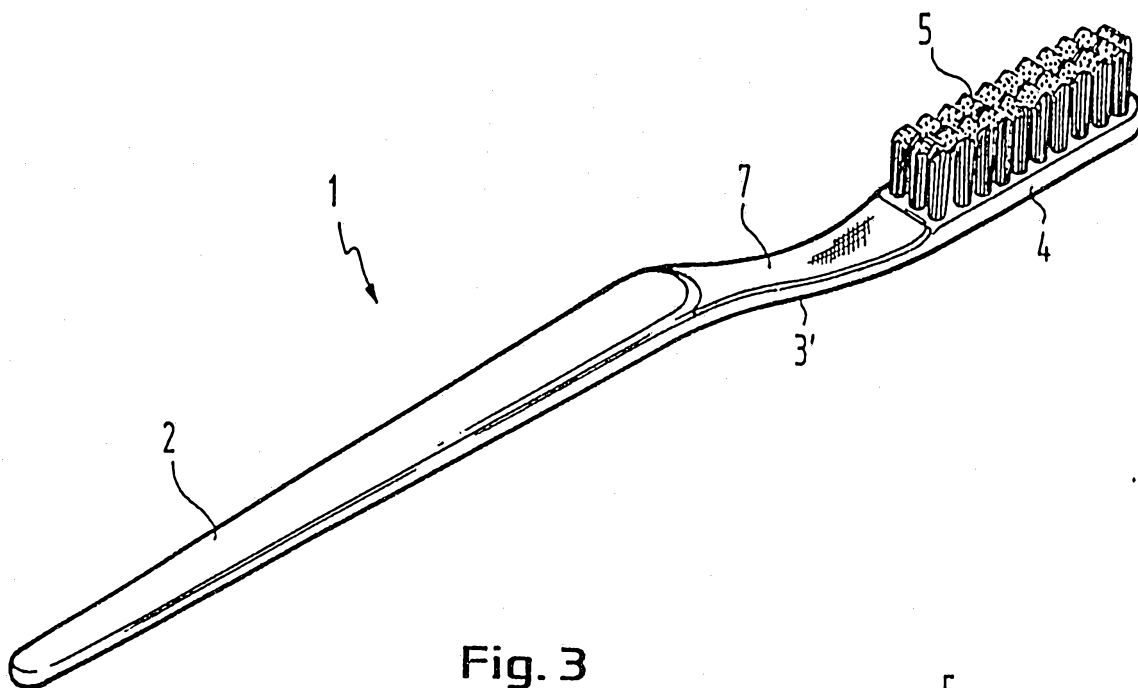


Fig. 2

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3/3

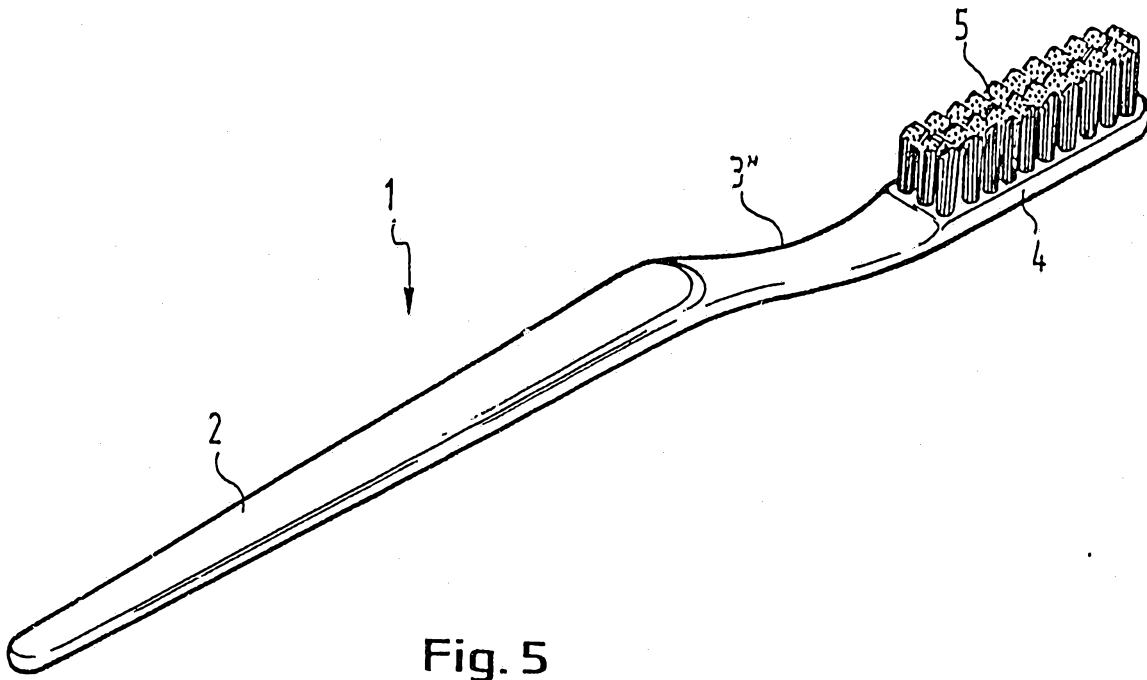


Fig. 5

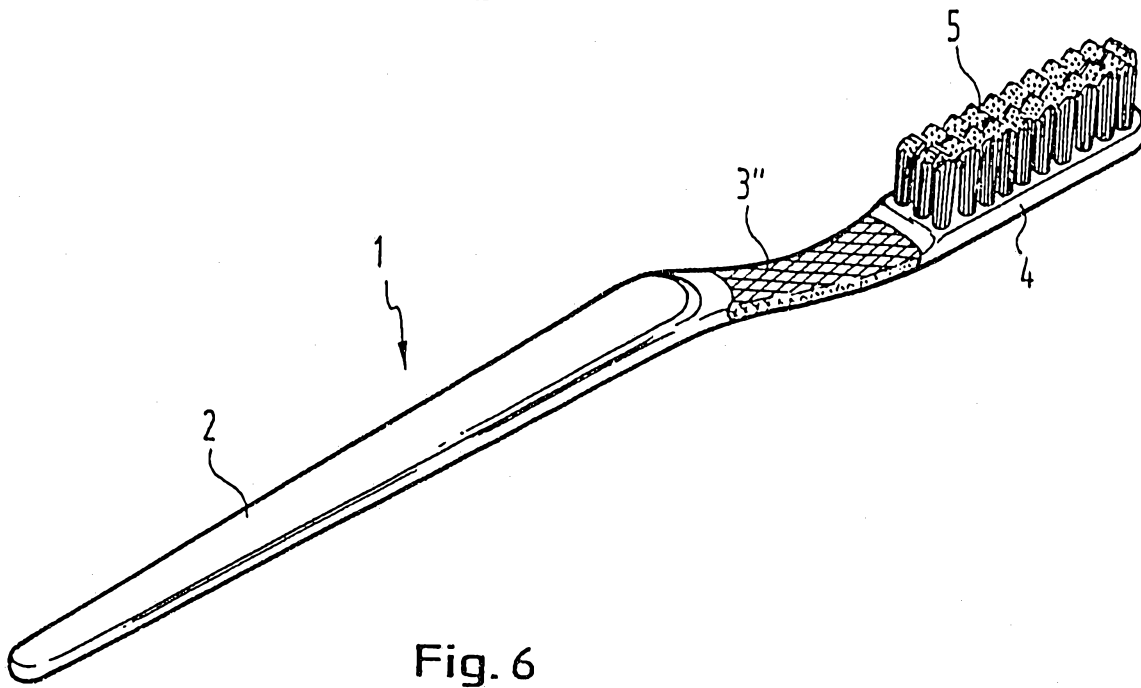


Fig. 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/DE 89/00683

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		
Int. Cl. ⁵ A 46 B 15/00; A 46 B 5/00		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int. Cl. ⁵	A 46 B; A 46 D	
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 ¹⁰	Citation of Document, ¹¹ with Indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	DE, A, 3400941 (CORONET-WERKE HEINRICH SCHLERF) 11 October 1984, see claims 1-3; figures 1-4	1
P, A	EP, A, 0303202 (GILLETTE CANADA) 15 February 1989 see page 3, line 53 - page 7, line 24; figures 1-5	1
A	DE, U, 8802744 (GEBR. SCHABERT) 5 May 1988 see claims 1,2; figures 1-6	1

<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	Date of Mailing of this International Search Report	
26 January 1990 (26.01.90)	21 February 1990 (21.02.90)	
International Searching Authority	Signature of Authorized Officer	
European Patent Office		

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

DE 8900683
SA 31839

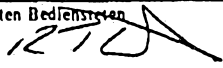
This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 26/01/90

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A-3400941	11-10-84	FR-A- 2539283 GB-A- 2137080	20-07-84 03-10-84
EP-A-0303202	15-02-89	US-A- 4802255	07-02-89
DE-U-8802744	05-05-88	None	

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/DE 89/00683

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben) ⁶		
Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC		
Int.Kl. 5 A46B15/00 ; A46B5/00		
II. RECHERCHIERTE SACHGEBIETE		
Recherchierter Mindestprüfstoff ⁷		
Klassifikationssystem	Klassifikationssymbole	
Int.Kl. 5	A46B ; A46D	
Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen ⁸		
III. EINSCHLAGIGE VERÖFFENTLICHUNGEN ⁹		
Art. ⁹	Kennzeichnung der Veröffentlichung ¹¹ , soweit erforderlich unter Angab. der maßgeblichen Teile ¹²	Betr. Anspruch Nr. ¹³
A	DE,A,3400941 (CORONET-WERKE HEINRICH SCHLERF) 11 Oktober 1984 siehe Ansprüche 1-3; Figuren 1-4 ---	1
P,A	EP,A,0303202 (GILLETTE CANADA) 15 Februar 1989 siehe Seite 3, Zeile 53 - Seite 7, Zeile 24; Figuren 1-5 ---	1
A	DE,U,8802744 (GEBR. SCHABERT) 05 Mai 1988 siehe Ansprüche 1, 2; Figuren 1-6 ---	1
⁹ Besondere Kategorien von angegebenen Veröffentlichungen ¹⁰ : "A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist "E" älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist "L" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt) "O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht "P" Veröffentlichung, die vor dem internationalen Anmeldedatum, aber nach dem beanspruchten Prioritätsdatum veröffentlicht worden ist "T" Spätere Veröffentlichung, die nach dem internationalen Anmeldedatum oder dem Prioritätsdatum veröffentlicht worden ist und mit der Anmeldung nicht kollidiert, sondern nur zum Verständnis des der Erfindung zugrundeliegenden Prinzips oder der ihr zugrundeliegenden Theorie angegeben ist "X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden "Y" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als auf erfinderischer Tätigkeit beruhend betrachtet werden, wenn die Veröffentlichung mit einer oder mehreren anderen Veröffentlichungen dieser Kategorie in Verbindung gebracht wird und diese Verbindung für einen Fachmann naheliegend ist "Z" Veröffentlichung, die Mitglied derselben Patentfamilie ist		
IV. BESCHEINIGUNG		
Datum des Abschlusses der Internationalen Recherche	Absenddatum des Internationalen Recherchenberichts	
26. JANUAR 1990	21 FEB. 1990	
Internationale Recherchenbehörde	Unterschrift des bevollmächtigten Bediensteten	
EUROPAISCHES PATENTAMT	ERNST R.T. 	

ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR.

DE 8900683

SA 31839

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentedokumente angegeben.

Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am 26/01/90.
Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

26/01/90

Im Recherchenbericht angeführtes Patentedokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
DE-A-3400941	11-10-84	FR-A- 2539283 GB-A- 2137080	20-07-84 03-10-84
EP-A-0303202	15-02-89	US-A- 4802255	07-02-89
DE-U-8802744	05-05-88	Keine	

EPO FORM P0473

Für nähere Einzelheiten zu diesem Anhang : siehe Amtslatt des Europäischen Patentamts, Nr.12/82