



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification⁴ : A46B 9/04</p>	<p>A1</p>	<p>(11) International Publication Number: WO 88/ 04530 (43) International Publication Date: 30 June 1988 (30.06.88)</p>
<p>(21) International Application Number: PCT/US86/02731 (22) International Filing Date: 16 December 1986 (16.12.86) (71)(72) Applicant and Inventor: YOUSSEF, Kamal, A. [EG/US]; 106 S. Robbins Drive, P.O. Box 6548, West Palm Beach, FL 33405 (US). (74) Agent: SOKOLOWSKI, Stanley, W.; 2605 East Atlantic Blvd., Pompano Beach, FL 33062 (US). (81) Designated States: AT (European patent), AU, BE (European patent), BG, BR, CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), IT (European patent), JP, KP, KR, LU (European patent), NL (European patent), NO, RO, SE (European patent), SU, US.</p>		<p>Published <i>With international search report.</i></p>
<p>(54) Title: A "FOAM-O-GENIC" TOOTHBRUSH AND A GUM-MASSAGING DEVICE</p>		
<p>(57) Abstract</p>		
<p>A toothbrush with liquid-absorbing sponge structure (70) formed with a thickness diminishing to a pointed head which projects outwardly longitudinally from the bristle (50) whereby the absorbed liquid may be introduced into and along the rows of bristles. The sponge structure (70) carries substantially more liquid than the bristles alone and thereby irrigates the mouth while brushing and particularly upon repeated wetting of the brush.</p>		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT Austria	FR France	ML Mali
AU Australia	GA Gabon	MR Mauritania
BB Barbados	GB United Kingdom	MW Malawi
BE Belgium	HU Hungary	NL Netherlands
BG Bulgaria	IT Italy	NO Norway
BJ Benin	JP Japan	RO Romania
BR Brazil	KP Democratic People's Republic of Korea	SD Sudan
CF Central African Republic	KR Republic of Korea	SE Sweden
CG Congo	LI Liechtenstein	SN Senegal
CH Switzerland	LK Sri Lanka	SU Soviet Union
CM Cameroon	LU Luxembourg	TD Chad
DE Germany, Federal Republic of	MC Monaco	TG Togo
DK Denmark	MG Madagascar	US United States of America
FI Finland		

A "FOAM-O-GENIC" TOOTHBRUSH AND A GUM-MASSAGING
DEVICEBACKGROUND OF THE INVENTION:

This is an International (Patent Convention Treaty) Application for my allowed U.S. Application entitled "A Foam-Generating Toothbrush". Water is of paramount importance in most cleaning processes and cleaning the teeth (Oral Hygiene in general) is no exception. The conventional toothbrush (which was introduced some two hundred eleven years (211 years) ago being poorly or totally non-absorbent is incapable of carrying or conveying into the mouth cavity any significant amounts of water in comparison with the current invention. Insufficient water as carried by the conventional toothbrush results in substantially limiting the cleaning power of the conventional toothbrush. Furthermore, the bristle-design of the classical toothbrush is incapable of instantly generating copious amounts of cleansing foam during the process of brushing the teeth. It lags far behind the FoamBrush subject of the current invention. A toothpaste in order to exert any cleansing action, it must be converted into a mobile solution first. This is particularly true in order to clean the difficult or inaccessible areas of the mouth, such as in-between the teeth, nooks, crannies and crevices. Foam or suds is invaluable in cleaning in general, on account of its effective penetration into inaccessible areas of the mouth mentioned above on account of its huge surface area, high dirt-emulsifying/lifting & anti-sticking power on certain pigments, more importantly food particles, debris and plaque. Foam has much lower surface tension. The extremely valuable measure of water absorbed by the FoamBrushes providing and making available an "irrigation factor" at the opportune moment while brushing the teeth is invaluable for practically everyone. However, it is indispensable for the people suffering from the condition known as dry mouth or as Xerostomia whether temporary or chronic. Water is an excellent lubricant and further protects the gums and teeth against excessive chemical harshness of toothpastes and abrasive action of the bristles. This is accomplished through increased lubricity as mentioned above and the dilution effect on the detergents and soaps usually added to toothpastes and dentifrices. Foam is milder than equally-concentrated Soap or Detergent solution.

BRIEF DESCRIPTION OF THE DRAWINGS:

- Fig.1-A : Shows a front view of a preferred embodiment of a Foam-Toothbrush.
Fig.1-B : Shows a back view of the Foam-Toothbrush in Fig. 1-A.
Fig.2-A : Shows a front view of a second embodiment of a Foam-Toothbrush.
Fig.2-B : Shows a back view of the Foam-Toothbrush of Fig.2-A.
Fig.3-A : Shows a front view of a third embodiment of a Foam-Toothbrush.
Fig.3-B : Shows a back view of the Foam-Toothbrush of Fig. 3-A.
Fig.4-A : Shows a front view of a fourth embodiment of a Foam-Toothbrush.
Fig.4-B : Shows a back view of the Foam-Toothbrush in Fig.4-A.
Fig.5-A : Shows a front view of a fifth embodiment of a Foam-Toothbrush.
Fig.5-B : Shows a back view of the Foam-Toothbrush of Fig.5-A.

Fig.6-A : Shows a front view of a sixth embodiment of a Foam-Toothbrush.
 Fig.6-B : Shows a back view of the FoamBrush in Fig. 6-A.
 Fig.7-A : Shows a front view of a seventh Foam-Toothbrush.
 Fig.7-B : Shows a back view of the FoamBrush of Fig.7-A.
 Fig.7-C : Shows a side view of the "Tail-end" of the FoamBrush of Fig. 7-A & 7-B.
 Figs.1-C,2-C,3-C,4-C,5-C & 6-C Show side views of the Head of the respective Foam-Toothbrushes.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION:

Referring to Fig.1-A, FoamBrush has 3-rows of bristles 50 which may be soft or extra-soft....etc. with handle 60 and fibrous/fibrocellular conical or pyramidal spongy structure 70 glued-on or mechanically-fitted to the tip, sides & back of the head of the toothbrush. Fig.1-B shows a back-view of same toothbrush where the sponge structure 70 is glued-on or mechanic-^{ally-fitted} onto the tip, sides & back of the head 80. In the embodiment of Fig.2-A, the FoamBrush has 3 rows of bristles 50 and glued-on or mechanic-^{ally-fitted} foam 70 encircling entire head 80. In Fig.3-A, a third embodiment has glued-on or mechanic-^{ally fitted} foam 70 completely encircling the 3-rows of bristles and handle-end 90. In the embodiment of Fig.4-A multiple laminated & conically-shaped foam is glued-on or mechanically-fitted thereon. Fig.4-B : Shows a view of the back of the Foam-Toothbrush of Fig.4-A with multiple-layered rainbow-colored & glued-on or mechanic-^{ally-fitted} foam covering the upper two thirds of the back of the head of the brush 80. In the embodiment of Fig.5-A two rows of bristles 50 have contiguous glued-on or mechanic-^{ally-fitted} foam 70 with handle 60 and handle-end 90. In Fig.6-A : The Foam-Toothbrush has a circumference-row of bristles 50 completely surrounding glued-on or mechanic-^{ally-fitted} foam 70. In Fig.7-A, the Foam-Toothbrush has three rows of bristles 50 with a glued-on or mechanic-^{ally-fitted} conical sponge 70 at one end & a non-bristle, conical foam at the other end. The side-views show the positions of the glued-on or mechanic-^{ally-fitted} foam-appendages 70 respectively and in relation to the Bristles-head 80 (or bristle-free tail-end 90 in case of Fig.7-C) of the Foam-Toothbrush and more importantly in relation to the brushing bristles 50 which enjoy total freedom from the foam. In operation, the Foam-Toothbrush is wetted well with warm (or tepid) water, then the tooth-paste is applied to the bristles 50 and the sponge head 70, the latter providing an extra & highly absorbent area for securing an extra amount of toothpaste/gel. The toothbrush is then introduced into the mouth and brushing is commenced preferably with the mouth closed. It will be felt that the FoamBrush fits more comfortably against the teeth in general and the back-teeth in particular. In addition

copious amounts of foam will be instantly generated-. excess, for two main reasons: First, the significant amount of water carried on the sponge head 70. This water-instantly mixing with the toothpaste-contributes substantially to the build-up and mobility of the foam generated as explained earlier. Second: the fibrocellular design plus the trapped air-bubbles -the latter constituting 97% of the sponge mass- strongly promotes the instant & modal - generation of myriads of foam bubbles. This extra foam which can be 4-5 times greater in quantity and higher in cleaning power than otherwise, bathes the teeth, gums & mouth cavity for a highly effective and cleansing Foam-Bath. Toothpastes/Gels apparently taste better when in the "Foam State" than in solution comparable to a solution of candy before and after being transformed into cotton candy. The latter in the foam state tastes uniquely better than in solution, although both solution and foam are chemically identical. The unpleasant taste of toothpaste seems to be much milder, less unpleasant & mediciney in the foam state than in solution. In addition, the higher water content of the foam generated by the foam toothbrush contributes to this mildness by diluting the bitter taste of the toothpastes. Furthermore the higher water content enhances the flow and mobility, hence the penetration of the toothpaste/gel or dentifrice ingredients into otherwise inaccessible areas in the mouth cavity, such as in-between the teeth, cracks & crevices...etc. This contributes to much better and overall "all" tooth-surfaces cleaning and minimizes the buildup of "plaque material" and lessens significantly the chances of developing cavities, tooth decay & gingivitis with the dreaded tooth-loss that may ensue. The milder taste of the toothpastes/gels in the "foam-state" definitely encourages more brushing and lessens the common hate or phobia associated with brushing and toothpastes in general, especially by children and young adults. Furthermore, foam-having more body to it- seems to have a protective or cushioning effect on the gums against the often sharp, abrasive and pointed ends of the bristles of the toothbrush. It will be noticed in brushing with the FoamBrush of Fig. 1-A & 1-B that the brush fits more comfortably in general against the teeth, particularly the back-teeth for the first time by virtue of the cushioning of the tip of the brush. This results in a more thorough and adequate brushing of the teeth in general and the back-teeth in particular. It should be mentioned here that the back-teeth are notoriously more vulnerable and susceptible to tooth decay than the front teeth. Also bigger ^{cavities, which are} / more difficult to treat. The sponge-composition(s) in the different Foam-Toothbrushes described above may be advantageously & permanently pretreated with un-leaching (non-bleeding) antibacterial & anti-microbial agents during the process of manufacture. This pre-treatment, so as to chemically-bind these antibacterial & anti-microbial agents will render these sponge composition(s) highly resistant to "souring" and the development of any potentially harmful microbes, although these compositions are self-cleaning for all practical purposes during brushing of the teeth, rinsing immediately afterwards to be followed by squeezing-out ^{of} excess water & rapid drying of these sponge compositions. Rapid drying of the highly-ventilatable sponge-compositions automatically discourages any such microbial development. The anti-microbial pre-treatment is for added protection and as a precautionary measure against any such development or accident.

The foam-tail 70 of Fig.7-A,B&C Foambrush can be used for massaging (with or without dentifrices) and even cleaning, brushing & stimulating the gums & teeth of people with delicate &/or inflamed, painful & tender or bleeding & diseased gums, referred to as Periodontal disease by Dentists. If the Periodontal or gum condition persists, it may be advisable to switch to the bristles-free or Foam-Only TooStix subject of U.S. patent 4,576,190 mentioned above & a third co-pending patent application, a continuation-in-part for the TooStix patent.

It is understood that variations could be made on the embodiments described herein, without departing from the essential features of the invention and the preferred embodiments are not intended to limit the spirit or scope of the invention as set forth in the appended claims, thus :

I claim:

1- A Hybrid "Foam-Toothbrush" comprising:

a handle,

a head;

quality brush bristles located on said head; and
sponge-type composition located on said head adjacent
to said bristles and operating in conjunction with
said bristles to enhance normal operation thereof.

2- The Hybrid of Claim 1 wherein said sponge composition is conical
and pyramidal in shape and is glued-on or mechanic-^{ally fitted} to the tip,
sides and back of the head of said Hybrid toothbrush.

3- The Hybrid of Claim 1 wherein said sponge composition is glued-on
or mechanic-^{ally fitted} to the tip, sides and completely surrounds the back
of the head of said Hybrid.

4- The Hybrid of Claim 1 wherein said sponge composition forms a
"Corona" around the head of said Hybrid.

5- The Hybrid of claim 1 wherein said sponge composition forms a
"Rainbow" of colors on the head of said Hybrid.

6- The Hybrid of Claim 1 wherein said sponge composition completely
surrounds said bristles and is maintained flush with their ends.

7- The Hybrid of claim 1 wherein said bristles completely surround
said sponge composition and is maintained flush with their ends.

8- The Hybrid of claim 1 wherein said sponge composition is conical &
pyramidal in shape and may additionally be located on the "tail"
or handle-end of said FoamBrush opposite to said head.

9- The Hybrid of claim 1 wherein said sponge composition comes in
various textures on said head.

10- A method of making a fibrocellular/fibrous "Hybrid" FoamBrush,
comprising:

permanently placing brushing bristles in a preferred pattern
on the head of a holder;

placing fibrocellular/fibrous composition
in a preferred pattern in operable proximity to said
bristles on said head, such that said sponge composition
operated to materially enhance the foaming and cleaning
properties of said FoamBrush.

11- The method of claim 10 wherein said fibrocellular/fibrous composition is placed in such position that said brushing bristles will fit comfortably against the back teeth, its cushioned-tip protecting the mucous membranes and the gums in the mouth, thereby encourages more thorough and better brushing of the teeth in general and the more decay-prone back teeth in particular.

12- The method of claim 10 wherein said fibrocellular composition is maintained flush with the pointed ends of said brushing bristles so as to protect further a user's gums against the abrasiveness of said brushing bristles.

13- The Foam-toothbrush according to claim 1, wherein said sponge-type composition is permanently pre-treated with antibacterial and antimicrobial agents, so as to render it bacteria-resistant and discourage any potentially harmful bacterial and microbial development within.

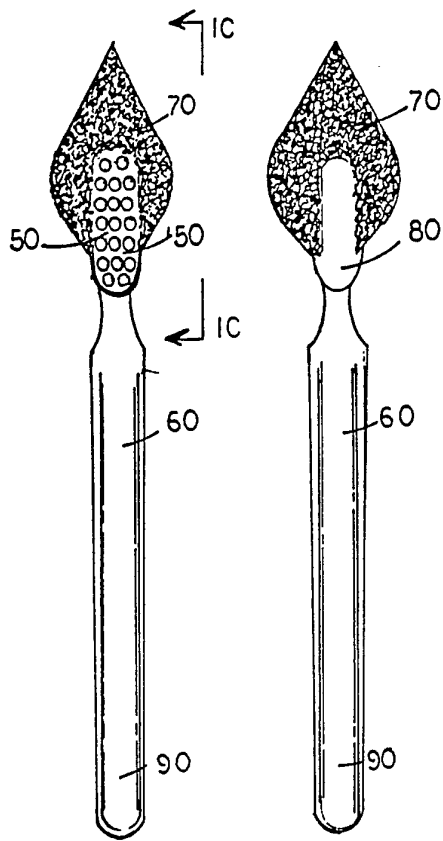


FIG 1A

FIG 1B

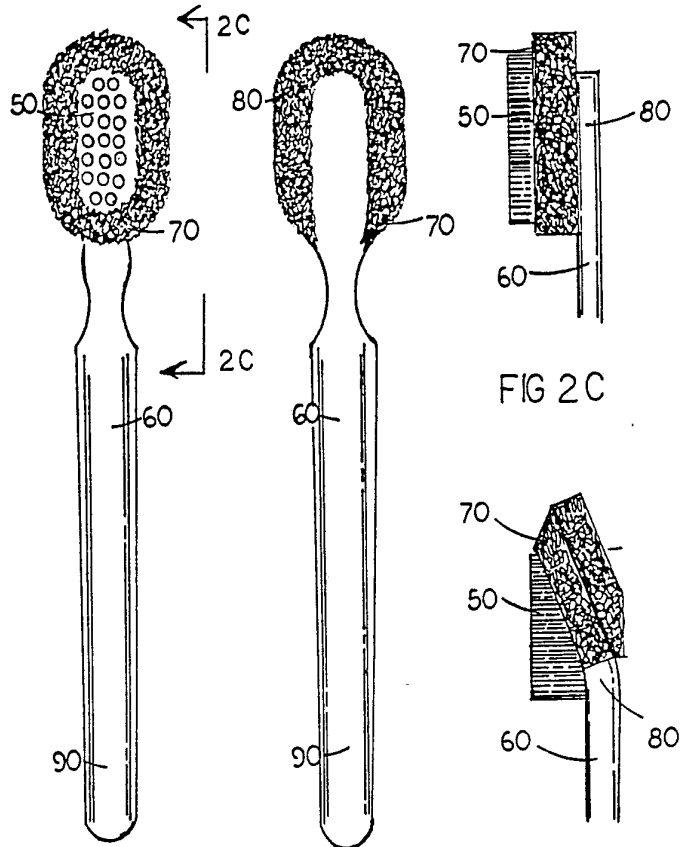


FIG 2A

FIG 2B

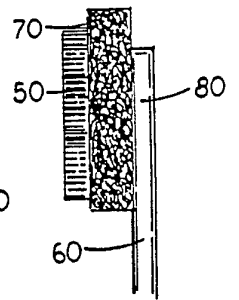


FIG 2C

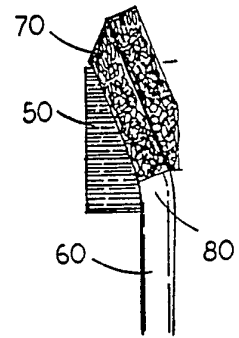


FIG 1C

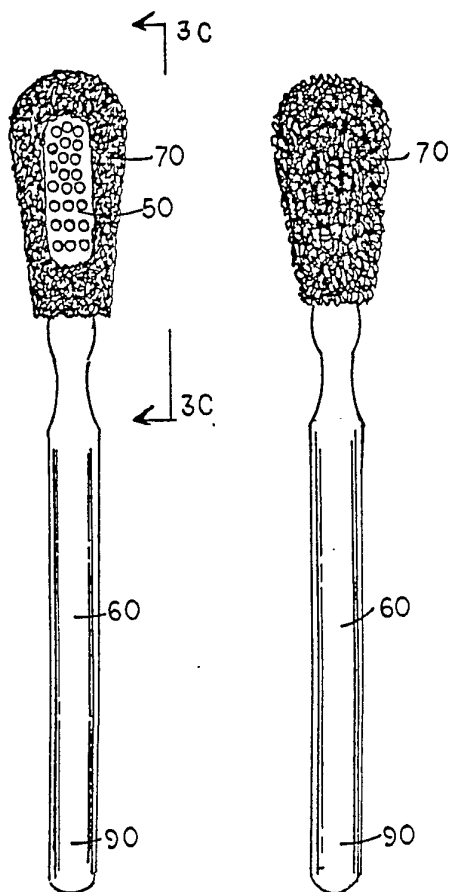


FIG 3A

FIG 3B

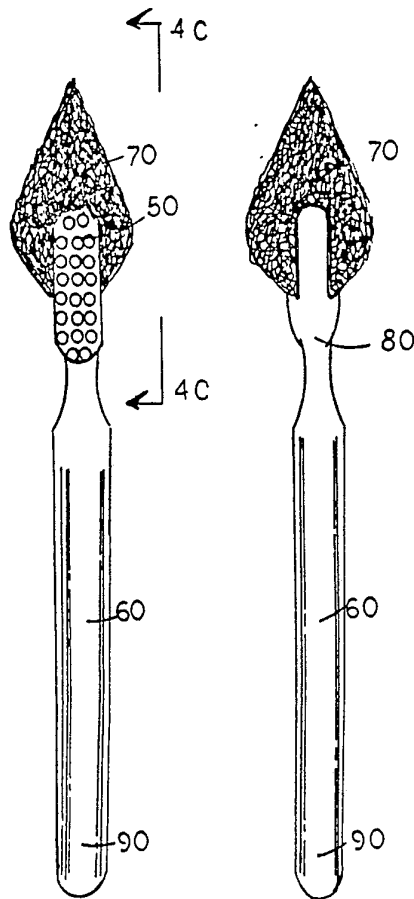


FIG 4A

FIG 4B

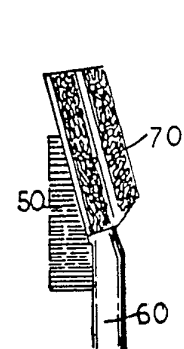


FIG 4C

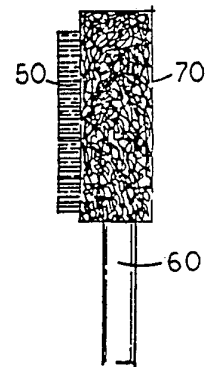


FIG 3C

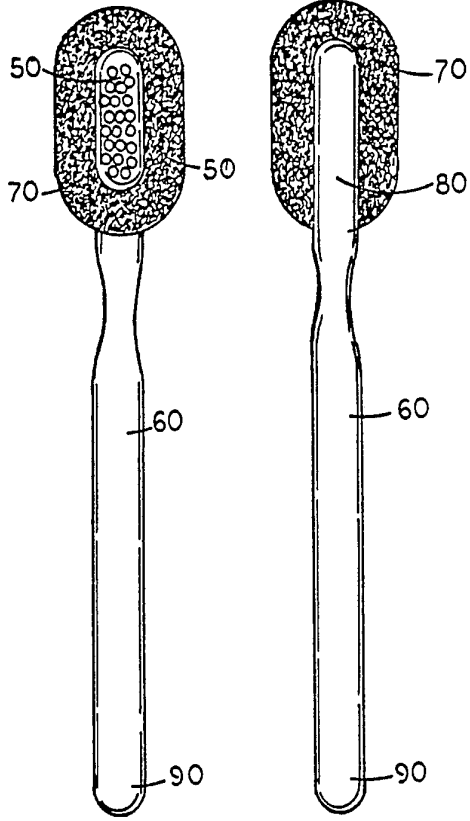


FIG 5 A

FIG 5 B

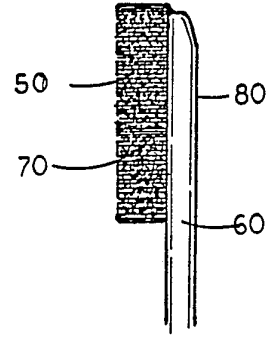


FIG 5 C

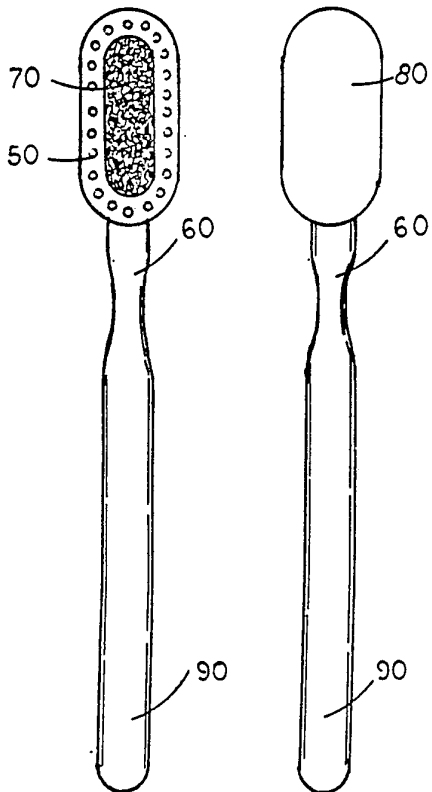


FIG 6 A

FIG 6 B

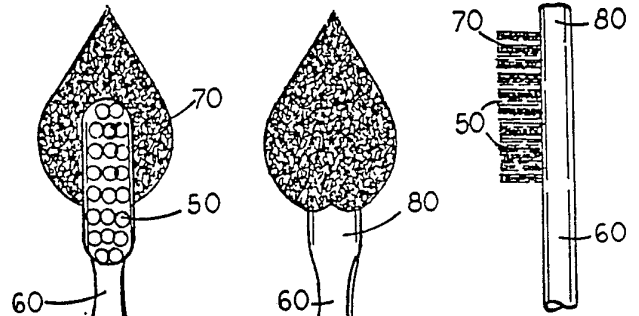


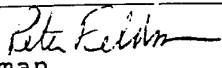
FIG 7 A

FIG 7 B

FIG 7 C

INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US86/02731**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int. Cl. (4) A 46B 9/04 U.S. Cl. 15/167.R		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
U.S.	15/110,167.R,167.A,114,244.R,244.C, 128/62R,62A,104.93,104.94,132/89,300/21	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category *	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X Y	US,A 3,146,478 (Rosenthal) 1 September 1964 See entire document	<u>1,2,9</u> 3,4,5,6
X	US,A 3,337,893 (Fine et al) 29 August 1965 See entire document	1,10,11
X Y	US,A 2,819,482 (Applegate) 14 January 1958 See entire document	<u>7,10</u> 8,12,13
A	US,A 2,555,858 (Oleksy) 5 June 1951	1
A	GB,A 443,523 (Swales) March 1936	1
A	US,A 2,570,596 (Ross) 9 October 1951	1
X Y	US,A 4,194,290 (Vallhonrat) 25 March 1980 See entire document	<u>1</u> 13
A	US,A 2,906,643 (Dennis) 29 Sept. 1959	1
A	US,A 2,133,805 (Brown) 18 October 1938	1
<p>* Special categories of cited documents: ¹⁵</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 ²	Date of Mailing of this International Search Report ²	
1 April 1987	13 APR 1987	
International Searching Authority ¹	Signature of Authorized Officer ²⁰	
ISA/US	 Peter Feldman	