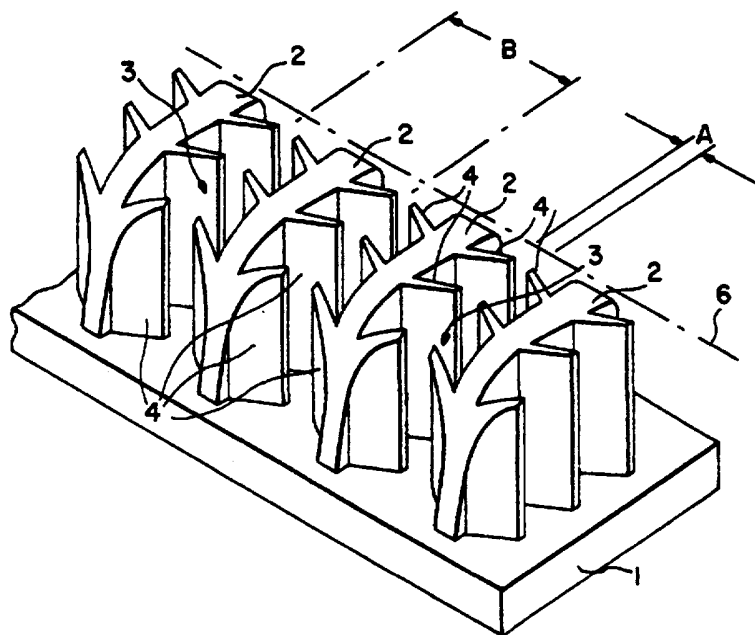




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: B26B 21/40	A1	(11) International Publication Number: WO 96/24469 (43) International Publication Date: 15 August 1996 (15.08.96)
(21) International Application Number: PCT/US96/01300 (22) International Filing Date: 2 February 1996 (02.02.96) (30) Priority Data: 9502268.7 6 February 1995 (06.02.95) GB (71) Applicant (for all designated States except US): THE GILLETTE COMPANY [US/US]; Prudential Tower Building, Boston, MA 02199 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): SIMMS, Graham, John [GB/GB]; "Wachusett", Tokers Green Lane, Tokers Green, Reading, Berkshire RG4 9EB (GB). OGLESBY, Oliver, David [GB/GB]; "Set Aside", Silchester Road, Little London, Basingstoke, Hampshire RG26 5EW (GB). (74) Agents: GALLOWAY, Peter, D.; Ladas & Parry, 26 West 61st Street, New York, NY 10023 (US) et al.		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, 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, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AZ, BY, KG, KZ, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, 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). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: RAZORS



(57) Abstract

A skin contacting member (1) for a razor or like shaving device. In use, the skin contacting member (1) is located ahead of a blade or blades (51, 52) of the razor. The skin contacting member (1) has channels (3) therein for the passage of hairs and having means (4) for engaging and pulling said hairs passing through said channels in advance of the cutting blades.

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.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

- 1 -

RAZORS

This invention relates to razors. It is particularly concerned with a skin contacting member for influencing hair protrusion ahead of a
5 blade of a safety razor moving across the skin surface.

In accordance with the invention there is provided a skin contacting member in or for a shaving device, comprising elements spaced apart
10 to define channels for passage of hairs, the elements having lateral parts extending laterally into the channels for engaging and pulling hairs passing through the channels, said lateral parts being deflectable by resilient deformation to
15 enable a hair to pass through a channel without the elements defining said channel being displaced to restrict an adjacent channel.

One embodiment of a skin contacting member described herein comprises a series of
20 spaced upstanding elements defining channels therebetween for passage of hairs in a direction from front to rear of the member, and resiliently flexible lateral parts projecting laterally from said elements into said channels for engaging
25 hairs to impart thereon pulling forces opposing movement through the channels. In a presently preferred form of this embodiment the upstanding

- 2 -

elements comprise substantially rigid parallel walls. These walls have resilient laterally projecting parts in the form of flaps with slightly tapering cross-sections and inclined rearwardly in the direction away from the walls. A plurality of flaps are provided on each side of a wall, and the spacing between the free upright edges of opposed pairs of flaps in a channel gradually reduces to provide an increasing pulling force on a hair as it moves through a channel.

The invention includes a razor blade unit, such as a replaceable shaving cartridge, having a skin contacting member embodying the invention. The skin contacting member may define a guard surface for contacting the skin in front of the blade edge(s) during shaving. Alternatively, the skin contacting member could be positioned between two blades in a blade unit having two or more blades.

A better understanding of the invention will be had from the following detailed description, reference being made to the accompanying drawings, in which:-

Figure 1 shows schematically a longitudinal section of a skin contacting member embodying the invention;

Figures 2 and 3 show respective modified forms of the member showing in Figure 1;

Figures 4 and 5 are similar views to Figure 1 showing alternative embodiments of skin contacting members in accordance with the invention; and

Figure 6 is a perspective view of a shaving cartridge incorporating a skin contacting member according to the invention.

The skin contacting member illustrated in Figure 1 is a unitary plastics structure with

- 3 -

an elongate base 1 shown to have a rectangular configuration, but this is unimportant. Extending upwardly from the base is a series of uniformly spaced elements consisting of parallel walls 2

5 confining between them parallel channels 3 running from front to rear of the member. The tops of the walls 2 define the skin contacting surface of the member, and with a view to improving comfort the upper front edges of these walls are rounded off.

10 Projecting into each channel 3 from the adjacent walls are pairs of laterally opposed resilient parts in the form of wings or flaps 4. Each flap has an upright free edge, tapers in cross-section towards the free edge from the wall to which it is

15 attached, and is inclined rearwardly at an acute angle to this wall. Due to this inclination the opposed pairs of flaps act to guide or funnel hairs towards the openings formed between their free edges. The width of the openings between the

20 pairs of flaps in each channel diminishes progressively in the direction from front to rear along the channel. At least the rearmost pair of flaps define an opening with a width A which is less than the diameter of a hair so that the

25 extremities of these flaps are deflected rearwardly as a hair passes through the channel and as a consequence the hair is subjected to a pulling force due to the friction of the flaps rubbing against it. Pulling the hair in this way

30 can temporarily increase the hair length protruding from the skin surface at a position immediately in front of a razor blade edge 6 so that a close shave may result. The pulling force exerted on a hair will be determined by the

35 resilience of the flaps as well as the initial spacing A between their edges, and these will be chosen so that a force sufficient to achieve hair

- 4 -

extension without causing discomfort are obtained. If the flaps are made sufficiently flexible the normal spacing between the flap edges could be very small, or even zero. The pitch B between the
5 centre lines of the channels is preferably made as small as possible without risking integrity of the structure so that the majority of hairs pass through the channels as the skin from which they protrude slides over the upper surface of the skin
10 contacting member. The height of the walls and the flaps is not critical, but should be at least the diameter of a hair.

It should be understood that the described skin contacting member is an exemplary
15 embodiment of the invention only and modifications are possible without departing from the scope of the claims. For example, in each channel resilient flaps might be provided on only one of the walls confining the channel. If a narrow member
20 is desired, e.g. for location between two blades in a razor blade unit, two pairs or just a single pair of flaps could be provided in each channel.

In the modified skin contacting member illustrated in Figure 2, rather than being carried
25 on a base the parallel walls 12 defining the channels 13 are formed integrally with a bar or plate 10 extending along the front of the member and from which the walls extend rearwardly. Otherwise the member of this embodiment can be as
30 described in connection with the first embodiment. The walls 12 and the flaps 14 suitably extend to a height of about 0.1mm above the height of the top edge of the bar 10.

The modified skin contacting member of
35 Figure 3 has separate elements 20 defining respective pairs of lateral parts in the form of resiliently flexible flaps 24 directed generally

- 5 -

oppositely into adjacent channels 23. The flaps, which are otherwise arranged as in the embodiments of Figs. 1 and 2, act to exert a light pulling force on the hairs passing through the channels in the same way as they do in the previous embodiments. The individual elements 20 may undergo a degree of flexing in the rearward direction under the forces exerted by the skin during shaving although this is not essential and will not impair the hair pulling effect of the flaps if it does occur.

The skin contacting member illustrated in Figure 4 is made of elastomer and has generally parallel walls 32 upstanding from and formed integrally with a base 31. These walls have straight central portions and on either side thereof wedge shaped lateral parts formed integrally with the central portion and defining laterally inclined upright flanks whereby the channels 33 defined between the walls 32 taper from front to rear of the member. The hairs passing through the channels are able to deflect the sidewalls of the channel, due to the resiliently compressible nature of the material forming the lateral parts of the walls 32, so that they can pass through the rear end portions of the channels although the channel width is less than the hair diameter while experiencing a light pulling force acting to draw the hairs from the skin which is sliding over the surface defined by the top faces of the walls 32.

Figure 5 shows an embodiment of the invention in which channels 43 are defined by upstanding elements 40 integral with a base 41 and in the form of posts 42 with laterally projecting parts in the form of flaps 44. The flaps are arranged in opposed pairs and can be resiliently

- 6 -

deflected by hairs passing along the channels 43 due to the posts 42 undergoing torsional twisting about their axes. In this manner the flaps are adapted to exert a light pulling force on the hairs. The elements 40 of this embodiment may be capable of flexing rearwardly under the forces encountered during shaving, but as mentioned above in relation to the Figure 3 embodiment, such flexing is not essential to nor will it detract from the hair pulling effect of the element.

In the embodiments of Figs 1-3, it is not essential for the flaps to be arranged in opposed pairs. They can be offset along the channels provided their edges are positioned so that the desired pulling forces are still applied to hairs passing along the channel. Similarly, it is not crucial for the flaps in these embodiments to be rearwardly inclined and they could be substantially perpendicular to the length of the channel, or perhaps be forwardly inclined towards their free edges.

Figure 6 shows a shaving cartridge equipped with a skin contacting member 50 in accordance with the invention. The skin contacting member 50 is illustrated only schematically but it could take the specific form of any one of the embodiments of Figures 1 to 5. Apart from the skin contacting member 50, the cartridge is of a known construction. As shown it includes two parallel blades 51, 52 carried by a frame between guard and cap. The skin contacting member 50 is shown positioned immediately in front of the cutting edge of the first blade 51, but a skin contacting member according to the invention could additionally or alternatively be located between the blades for pulling hairs directly in front of the second blade 52.

- 7 -

C L A I M S

1. A skin contacting member in or for a shaving device, comprising elements spaced apart to define channels for passage of hairs, the
5 elements having lateral parts extending laterally into the channels for engaging and pulling hairs passing through the channels, said lateral parts being deflectable to enable a hair to pass through a channel without the elements defining said chan-
10 nel being displaced to restrict an adjacent channel.
2. A member according to claim 1, wherein the elements are integrally formed with a carrier.
3. A member according to claim 2, wherein the carrier is a base from which said elements
15 extend upwardly.
4. A member according to claim 1, 2 or 3, wherein the elements comprise substantially parallel walls.
5. A member according to claim 4, wherein
20 the walls have wedge-shaped lateral parts defining inclined lateral surfaces on the walls, the material of the lateral parts being resiliently compressible to permit deflection of said side surfaces.
6. A member according to any one of claims
25 1 to 4, wherein the lateral parts comprise resiliently flexible lateral projections on said elements.
7. A member according to claim 6, wherein the projections are laterally rearwardly inclined away from the elements to which they are attached.
- 30 8. A member according to any one of claims 1 to 3, wherein the lateral parts comprise flaps with upwardly directed free edges for contacting hairs.
9. A member according to claim 8, wherein
35 the free edges are substantially upright and generally perpendicular to a skin contacting surface formed by upper faces of the elements.

- 8 -

10. A member according to claim 8 or 9, wherein the elements comprise posts and the flaps are deflectable due to torsional twisting of the posts.

5 11. A member according to claims 8 or 9, wherein the elements comprise respective pairs of resiliently flexible flaps directed to project into adjacent channels.

12. A member according to claim 8 or 9,
10 wherein the elements comprise parallel walls, and said flaps are resiliently flexible and project laterally from said walls.

13. A member according to claim 11 or 12,
15 wherein the flaps are laterally rearwardly inclined towards their free edges.

14. A member according to claim 11, 12 or 13, wherein the flaps taper in cross-section towards their free edges.

15. A member according to any one of claims
20 8 to 14, wherein the flaps are arranged in opposed pairs in each channel.

16. A member according to claim 15, wherein there is a plurality of opposed pairs of flaps in each channel.

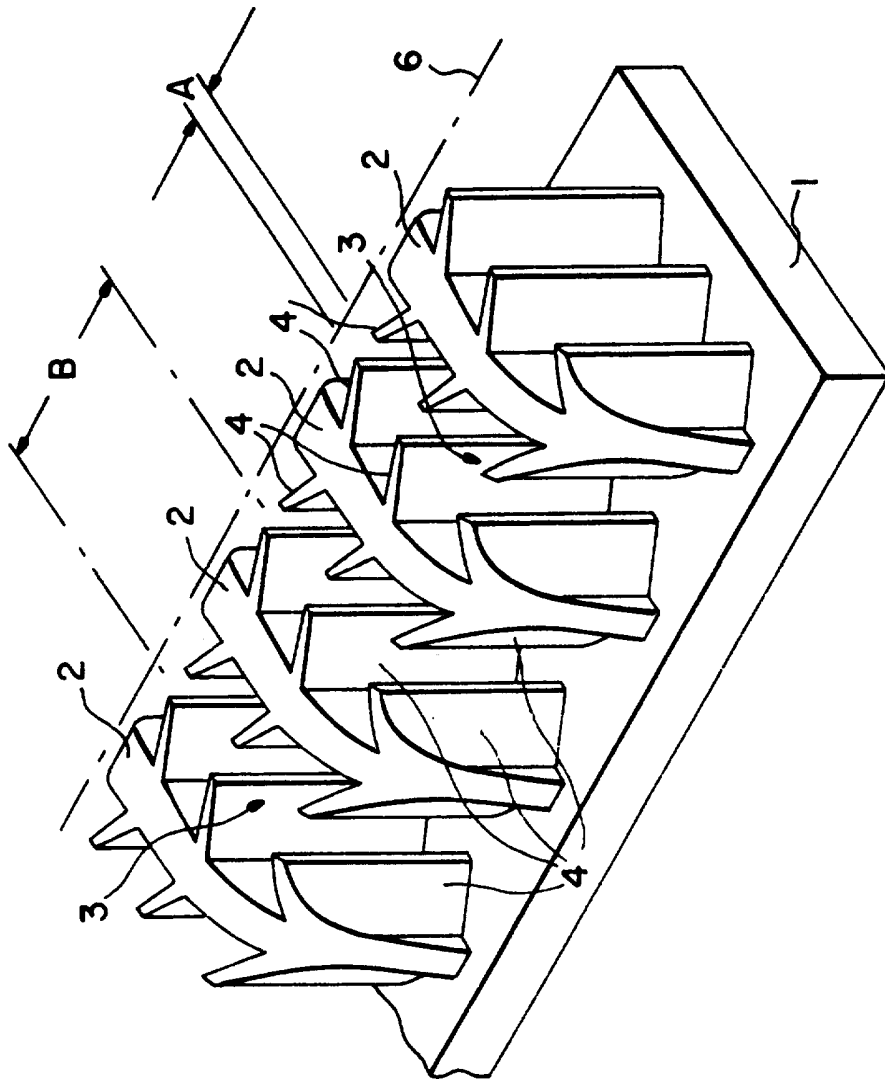
25 17. A member according to claim 16, wherein the normal spacing between the free edges of the pairs of flaps reduces along the channel.

18. A razor blade unit having at least one blade and a guard for contacting the skin surface
30 in front of the blade(s), the guard comprising a skin contacting member as defined in any one of the preceding claims.

19. A razor blade unit having a plurality of parallel blades and a skin contacting member as
35 defined in any one of claims 1 to 17 positioned to contact the skin directly in front of at least one of said blades.

1 / 4

FIG. 1



2 / 4

FIG. 2

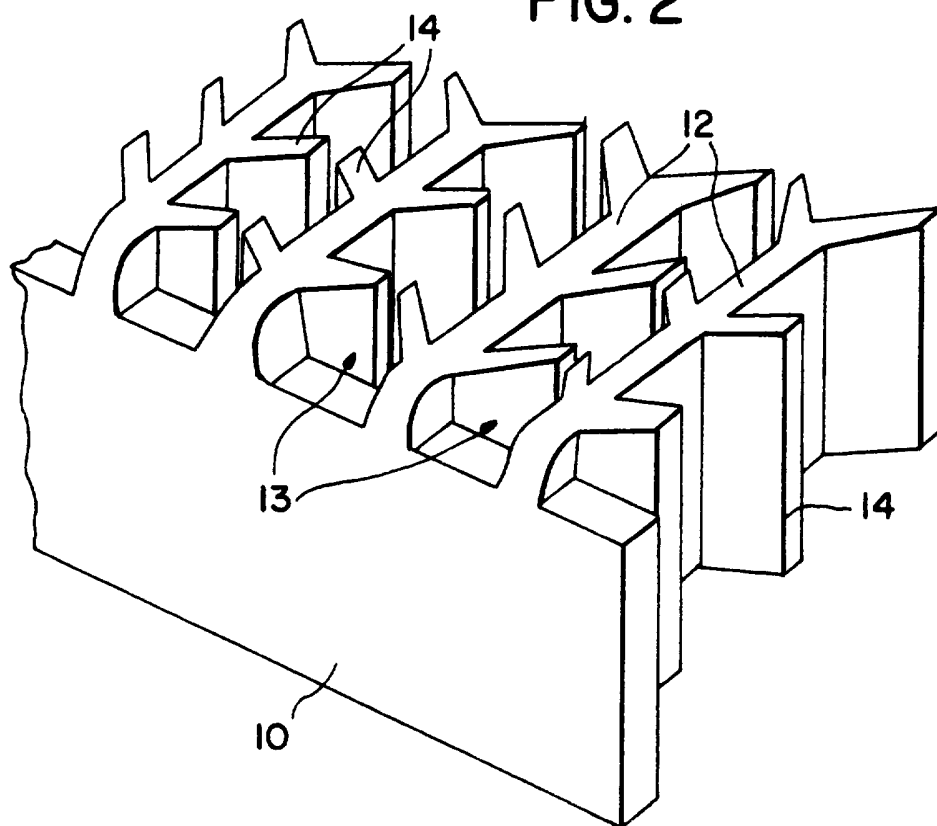
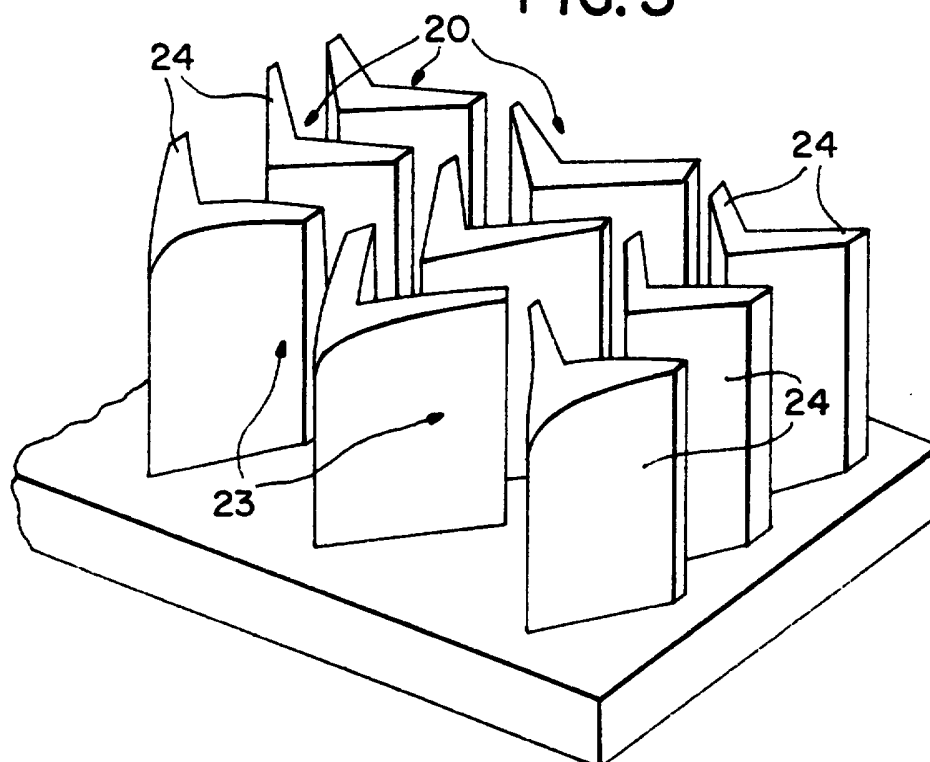


FIG. 3



3 / 4
FIG. 4

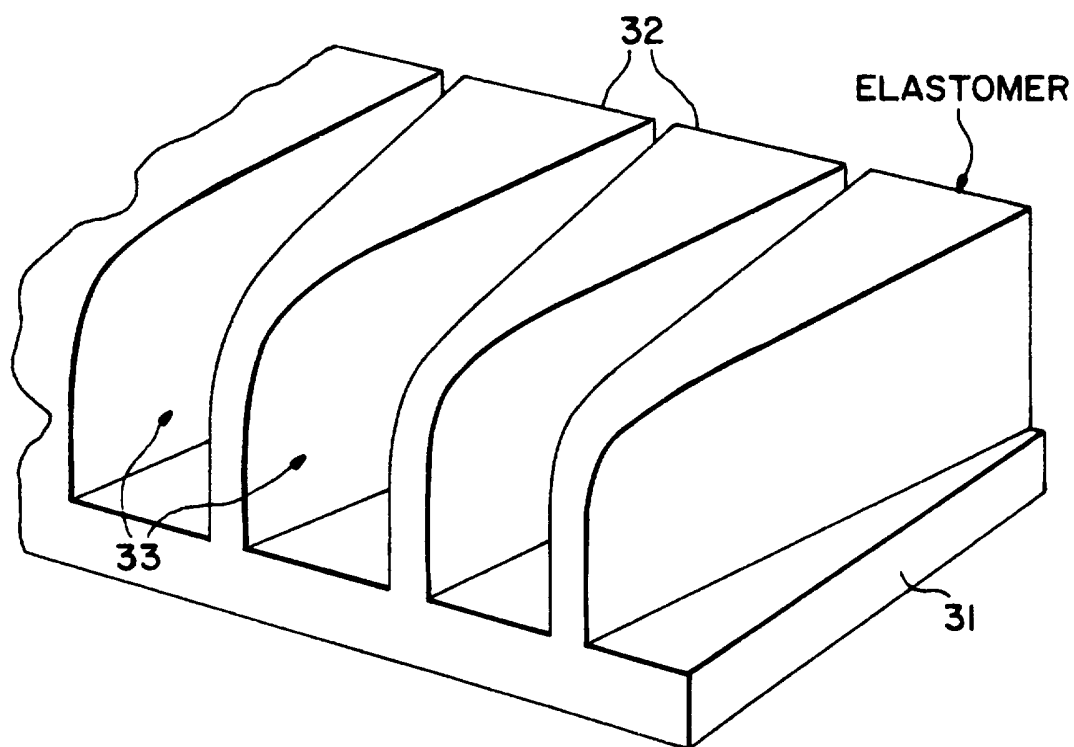
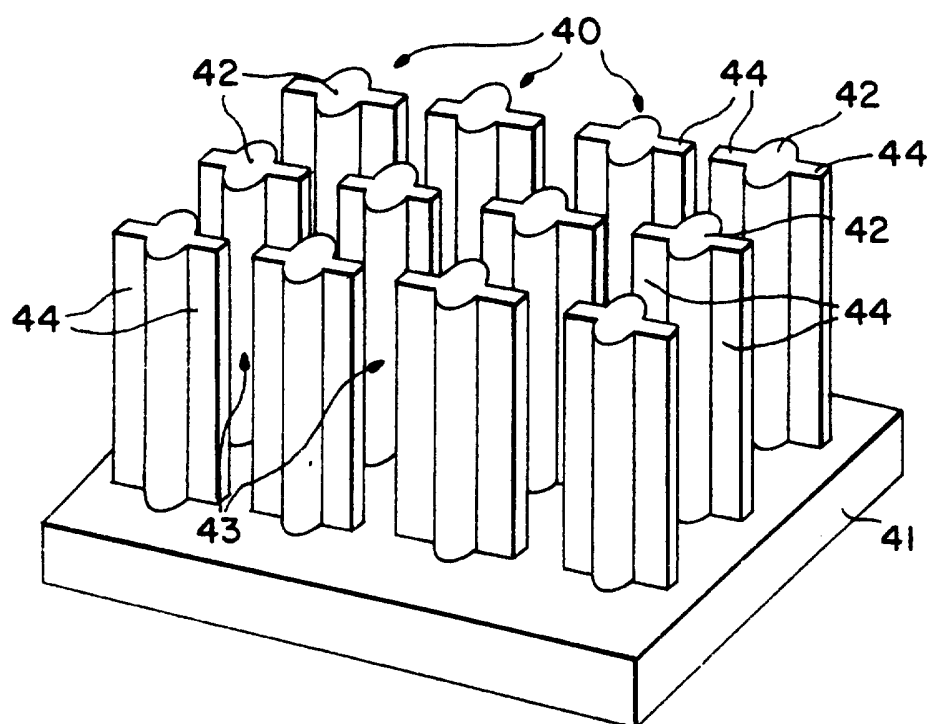
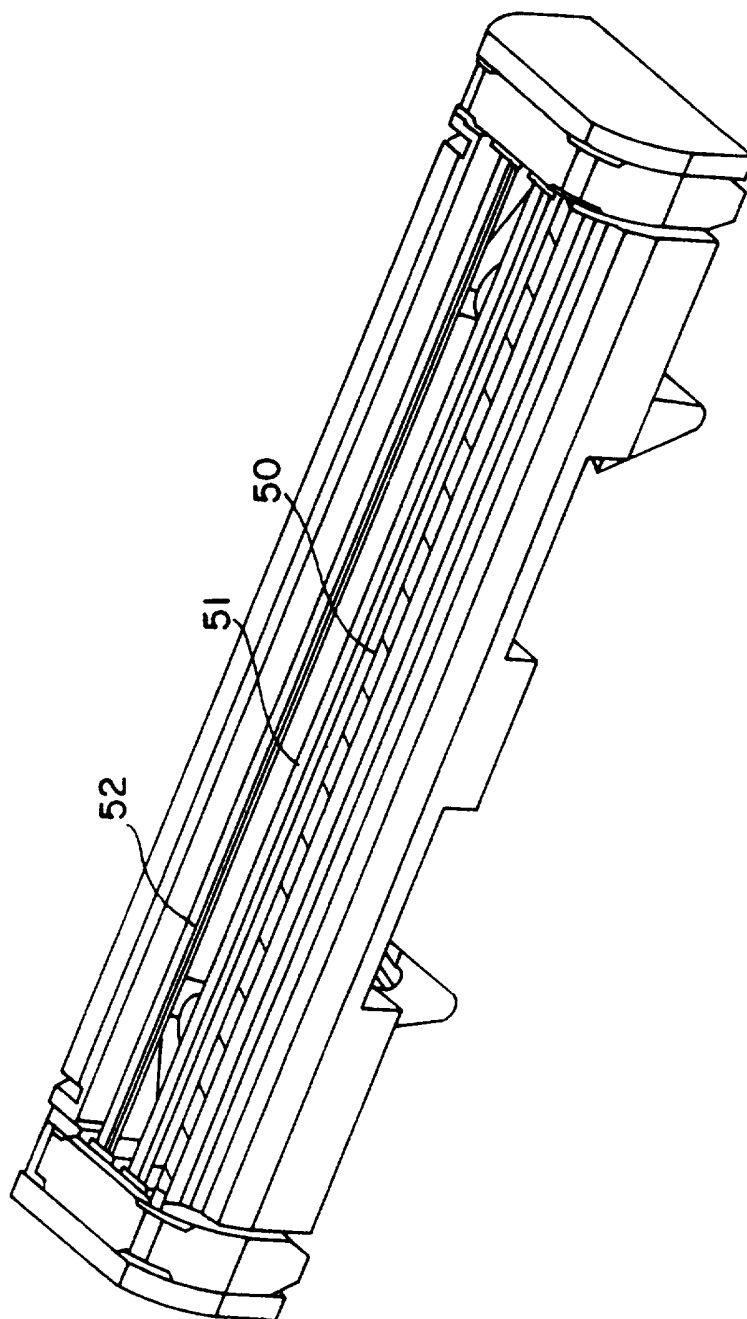


FIG. 5



4 / 4

FIG. 6



INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 96/01300

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B26B21/40

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 B26B

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.
A	EP,A,0 366 139 (THE GILLETTE CO) 2 May 1990 see the whole document ---	1-4,9, 18,19
A	US,A,5 249 361 (D V APPRILLE JR) 5 October 1993 see the whole document ---	1-4,9
A	GB,A,2 069 398 (N V PHILIPS) 26 August 1981 ---	
A	US,A,5 067 238 (G R MILLER) 26 November 1991 ---	
A	WO,A,92 05926 (THE GILLETTE CO) 16 April 1992 -----	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *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)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *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
- *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
- *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
- *&* document member of the same patent family

Date of the actual completion of the international search

2 July 1996

Date of mailing of the international search report

19. 07. 96

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

Wohlrapp, R

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 96/01300

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-366139	02-05-90	CA-A- 2000772 JP-T- 4502413 WO-A- 9005047 US-A- 5191712	28-04-90 07-05-92 17-05-90 09-03-93
US-A-5249361	05-10-93	AU-B- 668955 AU-B- 4238193 CN-A- 1078420 CZ-A- 9402763 EP-A- 0640026 JP-T- 7508906 NZ-A- 252553 WO-A- 9323214 ZA-A- 9303224	23-05-96 13-12-93 17-11-93 15-03-95 01-03-95 05-10-95 27-02-96 25-11-93 15-11-93
GB-A-2069398	26-08-81	NL-A- 8000884 CA-A- 1167630 DE-A- 3104053 FR-A,B 2475452 JP-A- 56125089 US-A- 4310968	16-09-81 22-05-84 24-12-81 14-08-81 01-10-81 19-01-82
US-A-5067238	26-11-91	AU-B- 8768391 CN-A- 1060242 EP-A- 0550676 TR-A- 26207 WO-A- 9205923	28-04-92 15-04-92 14-07-93 15-02-95 16-04-92
WO-A-9205926	16-04-92	US-A- 5092042 AU-B- 8734191 CN-A- 1060055 EP-A- 0550639	03-03-92 28-04-92 08-04-92 14-07-93