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Published:
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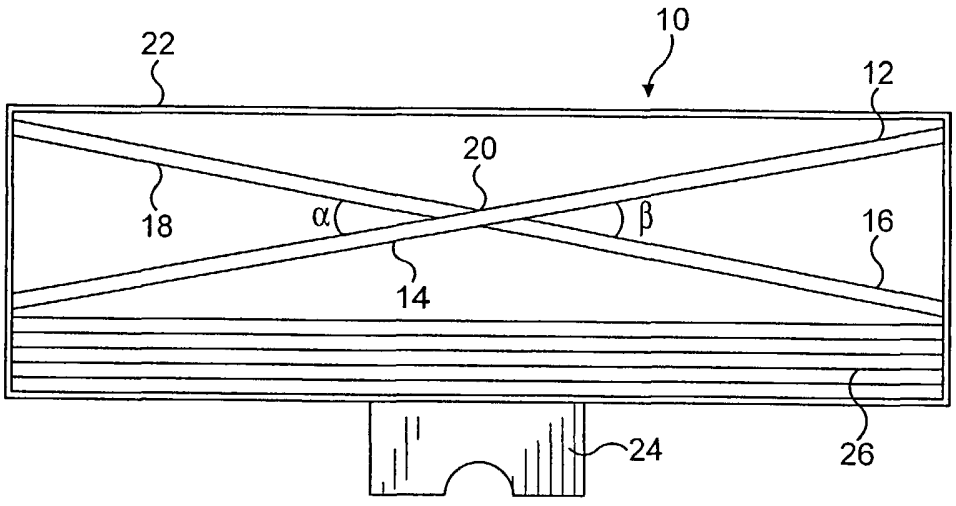
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** RAZOR HEAD



(57) **Abstract:** The present invention relates to razor heads (10, 46, 60) and further to razors which include razor heads as defined. In one aspect of the invention the razor heads comprise at least one blade (12, 16) defining a plurality of cutting edges (14, 18). The cutting edges are arranged to intercept at least one point (20) at which at least one angle of less than 90° is formed between the cutting edges. This arrangement enables the cutting edges to impart cutting, sliding and rotary action onto hair being shaved.

WO 2004/004987 A1

RAZOR HEAD

The present invention relates to razor heads and further to razors which include razor heads according to the invention.

Razor heads for use with razors tend to comprise a housing in which one or more blades are provided. The razor head may comprise one or two, or even three such blades. The provision of more than one blade is intended to provide a closer shave during use. In such a case, the blades are set in a parallel alignment to other blades.

However, blades arranged in a parallel alignment only perform a cutting action on the hair/stubble being shaved. This can lead to the user needing to re-use the razor over areas to ensure that a clean shave is attained.

The present invention seeks to provide a razor head and razor which imparts a cutting and rotary action on to the hair/stubble being shaved.

According to a first aspect of the present invention there is provided a razor head comprising at least one blade defining a plurality of cutting edges, the cutting edges intercepting at at least one point at which at least one angle of less than 90° is formed between the cutting edges.

Preferably, the cutting edges intercept at one point. The cutting edges may intercept at a point substantially midway along their length.

In a preferred embodiment, two cutting edges are provided which may be substantially identical in length and may be defined by a single blade.

Alternatively, the or each cutting edge may be defined by a separate blade. Preferably the cutting edges define a cross within the razor head.

The razor head may comprise a substantially rectangular housing for the one or more blade(s), the or each blade preferably being mounted in the housing.

The razor head may be provided with means for releasably connecting the head to a handle. The connection means preferably provides for relative movement between the razor head and the handle in use. The connection means may provide for pivotal connection of the razor head to the handle, such that the razor head pivots relative to the handle.

By providing a razor head that comprises blades intercepting at that least one point thereby forming a cross, the user is able to obtain a closer shave than by using blades arranged parallel to one another. This is because the cutting edges defined by the razor blades in this orientation leads to the provision of a cutting and rotary action onto the hair/stubble.

To enable shaved hairs and residual soap to be readily washed from the razor head, there is preferably provided cleaning means, the cleaning means may comprise a flexible member mounted in the housing and arranged on application of pressure to a surface thereof to move between the blade(s) defining the cutting edges. Preferably the flexible member is made from flexible plastics material. Preferably a button member is provided on the flexible member, such that an application of pressure to the button member, the flexible member is flexed such that it passes between the blades.

According to a second aspect of the present invention there is provided a razor comprising a handle and a razor head of the first aspect of the present invention connected thereto.

Preferably the razor head is releasably connected to the handle. The connection of the razor head to the handle preferably enables relative movement between the razor head and handle in use. Preferably relative pivotal movement is provided such that the razor head pivots relative to the handle.

According to a third aspect of the present invention there is provided a razor head comprising at least one blade mounted in a housing defining at least one cutting edge, wherein at least one angle of less than 90° is formed between the or each cutting edge and the housing.

Preferably one blade is provided which may define one cutting edge.

The housing is preferably substantially rectangular. The razor head may be provided with means for releasably connecting the head to a handle. The connection means preferably provides for relative movement between the razor head and the handle in use. The connection means may provide for pivotal connection of the razor head to the handle, such that the razor head pivots relative to the handle.

According to a fourth aspect of the present invention there is provided a razor comprising a handle and a razor head of the third aspect connected thereto.

Preferred aspects of the first to third aspects apply equally to the fourth aspect.

Preferred features of each aspect of the invention are as for each of the other aspects *mutatis mutandis*.

The present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

Figure 1 is a front view of a razor head according to a first aspect of the invention;

Figure 2 is a perspective view of the razor head of figure 1;

Figure 3 is a front view of a razor according to the second aspect of the present invention;

Figure 4 is a schematic illustration of the action of the razor head of the first aspect of the present invention;

Figure 5 is a schematic illustration of the action of a prior art razor head;

Figure 6 is a schematic view of a hair after being cut using a prior art razor head;

Figure 7 is a schematic view of a hair after being cut by a razor head of the present invention.

Figure 8 is a front view of a razor head according to the third aspect of the present invention;

Figure 9 is a front view of a razor according to the fourth aspect of the present invention; and

Figure 10 is a front view of a further razor head of the present invention.

Figure 1 of the accompanying drawings illustrates an embodiment of a razor head according to the present invention. The razor head 10 includes a housing 22 in which razor blades 12, 16 are mounted. Each blade 12, 16 defines a respective cutting edge 14, 18. The cutting edges 14, 18 intercept at a point 20 in the housing 22. At this point 20, angles α,β are defined between the cutting edges. These angles are less than 90° and in the example shown are substantially identical. Therefore, the blades, 12, 16 and cutting edges 14, 18 define a cross within the housing. The angles may of course be less or greater than those illustrated, though still being less than 90°. Indeed the greater the angle the more pronounced the rotary and cutting action.

Also provided as part of the razor head is a region denoted by reference numeral 26 on which a number of flexible strips are provided. These strips function to pull the hair or stubble upwards before passing the blades there across and would thereby provide for a closer shave. Such strips are well known in the art.

Reference numeral 24 denotes a connecting arrangement for connecting the razor blade 10 to a handle 28 such that the razor head 10 can be used during shaving. The connection 24 should enable the razor head 10 to move relative to the handle 28 during use such that the blades 12, 16 and cutting edges 14, 18 can move across the contours of the surface being shaved, for example a persons face. The connection 24, for example, provides for pivotal movement of the razor head 10 relative to the handle 28.

Figure 2 illustrates a perspective view of the razor head 10. This perspective view illustrates an example of the shape of the razor blades 12, 16 which define the cutting edges 14, 18.

Figure 3 is an illustration of a razor referred to according to the invention which comprises a handle 28 and a razor head 10, as described above. As can be seen, the handle 28 is connected to the razor head 10 through the connecting arrangement 24. This arrangement provides for pivotal movement of the razor head 10 relative to the handle 28. The razor 30 illustrated in figure 3 is ready for use by a user when shaving. During shaving, the user would grip the handle 28 of the razor 30 and draw the razor head 10 across the hairs to be shaved. This direction of travel of the razor head 10 relative to the hairs to be shaved, brings the cutting edges 14, 18 of the blades 12, 16 into contact with the hairs to enable the hairs to be cut. As illustrated in figure 4, the arrangement of the blades 12, 16 and cutting edges 14, 18 on the razor head 10 causes a cutting, sliding and rotary action to be imparted upon the hairs 34, 36 on movement of the razor head 10 relative thereto in the direction shown by arrow A. The rotary, sliding and cutting movements (denoted by arrows B and C) enables the hair to be cut more cleanly than by a prior art razor.

In this regard, a prior art standard razor would move relative to the hairs in a manner similar to that illustrated in figure 5. In this case, only a cutting action is provided by the razor blades and not a rotary action as with a razor head of the present invention.

To illustrate this further, figure 6 provides a schematic illustration of a hair 38 after being cut by a prior art razor, which comprises one or more blades arranged in a parallel relationship. In contrast, figure 7 provides a schematic

illustration of a hair 42 which had been cut using a razor head according to the invention. Clearly, a razor head of the present invention would provide a cleaner cut than prior art arrangements.

Figures 8 and 9 illustrate further embodiments of the present invention. In Figure 8 there is shown a razor head 46 which includes a blade 48 defining a cutting edge 50. The blade and cutting edge are mounted in a housing 52 such that the angles $\alpha 1$, $\beta 1$ between the cutting edge 46 and the housing 52 are less than 90°. The angles may of course be less or greater than those illustrated, though still being less than 90°. Indeed the greater the angle the more pronounced the rotary and cutting action.

Figure 9 illustrates a razor 56 that includes the razor head 46 and a handle 58. The razor and razor head will also provide a similar rotary, sliding and cutting action onto hair during shaving due to the angle of the cutting edge and as such provide a cleaner shave than prior art arrangements.

Various modifications may be made to the razor head and razor of the present invention without departing from the scope thereof. For example, the cutting edges may be defined by a single blade that is shaped accordingly. In addition, more than two cutting edges may be provided and/or more than two blades may be provided. Also, the housing of the razor head may be of any suitable shape which enables the blades to be securely mounted therein.

As noted above with reference to Figure 1 and Figure 8, the angles between the blades may be different to those illustrated. By increasing the angles α, β, $\alpha 1$ and $\beta 1$, the rotary and cutting action imparted on hairs may be more pronounced.

The razor head may be provided with an arrangement which enables shaved hairs to be readily washed therefrom, during and after shaving. Such an arrangement may comprise a plurality of openings within the housing thereby providing for a flow of water to be achieved therethrough.

In addition, or alternatively, there may be provided an arrangement 68, 70 for cleaning between the blades 62, 64 of the razor head 60. This arrangement is illustrated in Figure 10a and10b. The arrangement 68, 70 can be in the form of a flexible member 68 having a butt6on member 70. Application of pressure to the button member 70 in the direction of arrow D causes the flexible member 68 to be flexed and moved towards and between the blades 62, 64 thereby cleaning away any shaved hair, excess soap etc as illustrated in Figure 10b. The housing 66 and the flexible member 68 are made from flexible plastic material such that on application of pressure to the button member 70 flexing occurs thereby enabling the position illustrated in Figure 10b to be attained. On release of pressure on the button member 70 the flexible member 68 and housing 66 can return to the original positions such that the razor head 60 returns to the orientation illustrated in Figure 10a.

The razor of the present invention may be of a disposable type, which is intended to only be used once or twice by a user. Alternatively the razor head and handle of a razor may be adapted to enable replacement of used razor heads with new razor heads as desired.

The razor head may further comprise soothing lotion on the region with one or more of the flexible strips, or on another area provided on the razor head which contacts the user's skin. Such soothing lotion providing a soothing effect on the skin which has been shaved.

The present invention is susceptible of modifications and variations as will be apparent to those skilled in the art, and the present disclosure extends to combinations and subcombinations of the features mentioned or described herein.

Claims

1. A razor head comprising at least one blade defining a plurality of cutting edges, the cutting edges intercepting at at least one point at which at least one angle of less than 90 degrees is formed between the cutting edges.

2. A razor head as claimed in claim 1, wherein the cutting edges intercept at one point.

3. A razor head as claimed in claim 1 or 2, wherein the cutting edges intercept at a point substantially midway along their lengths.

4. A razor head as claimed in any one of the preceding claims, wherein two cutting edges are provided.

5. A razor head as claimed in claim 4, wherein the cutting edges are substantially identical in length.

6. A razor head as claimed in claim 4 or 5, wherein the cutting edges are defined by a single blade.

7. A razor head as claimed in claim 4 or 5, wherein each cutting edge is defined by a separate blade.

8. A razor head as claimed in claim 6 or 7, wherein the cutting edges define a cross.

9. A razor head as claimed in any one of the preceding claims, wherein the razor head comprises a substantially rectangular housing in which the or each blade is mounted.

10. A razor head as claimed in claim 9, wherein the or each blade is affixed to the housing.

11. A razor head as claimed in any one of the preceding claims, wherein the head is provided with means for removably connecting the head to a handle.

12. A razor head as claimed in claim 11, wherein said connecting means provides for relative movement between the razor head and handle in use.

13. A razor comprising a handle and a razor head connected thereto, the razor head being as defined in any one of the preceding claims.

14. A razor head comprising at least one blade mounted in a housing defining at least one cutting edge, wherein at least one angle of less than 90° is formed between the or each cutting edge and the housing.

15. A razor head as defined in claim 14 wherein one blade is provided which may define one cutting edge.

16. A razor comprising a handle and a razor head connected thereto, the razor head being as defined in claims 14 or 15.

17. A razor head substantially as hereinbefore described and with reference to figures 1 to 7 and 10 of the accompanying drawings.

18. A razor substantially as hereinbefore described and with reference to figures 1 to 7 and 10 of the accompanying drawings.

19. A razor head substantially as hereinbefore described and with reference to figures 8, 9 and 10 of the accompanying drawings.

20. A razor substantially as hereinbefore described and with reference to figures 8, 9 and 10 of the accompanying drawings.

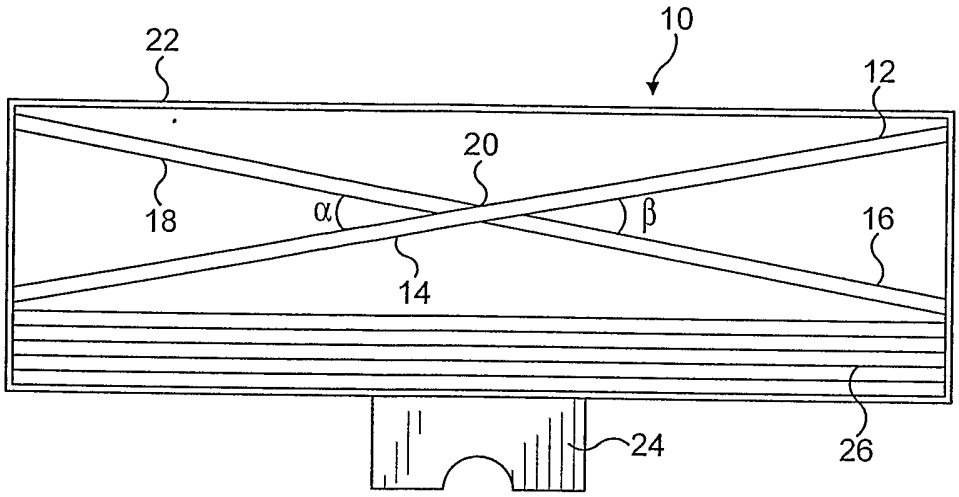


FIG. 1

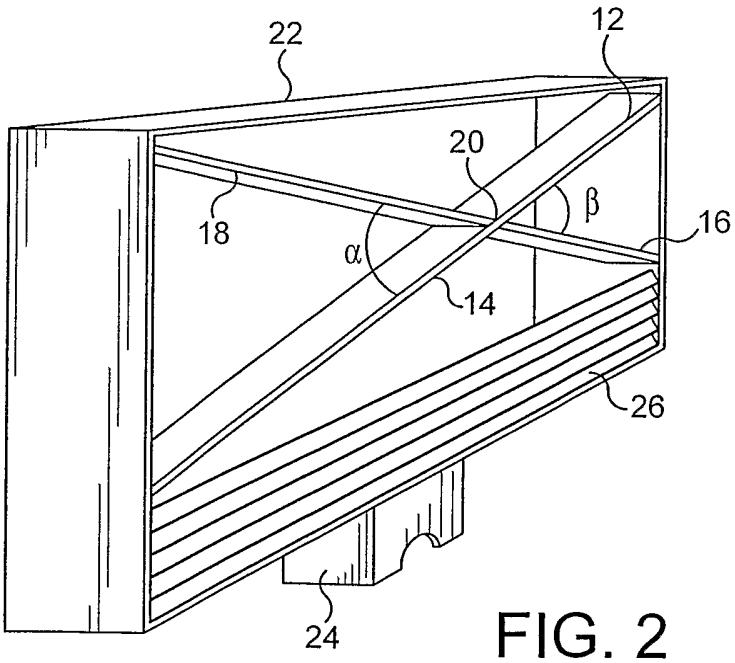


FIG. 2

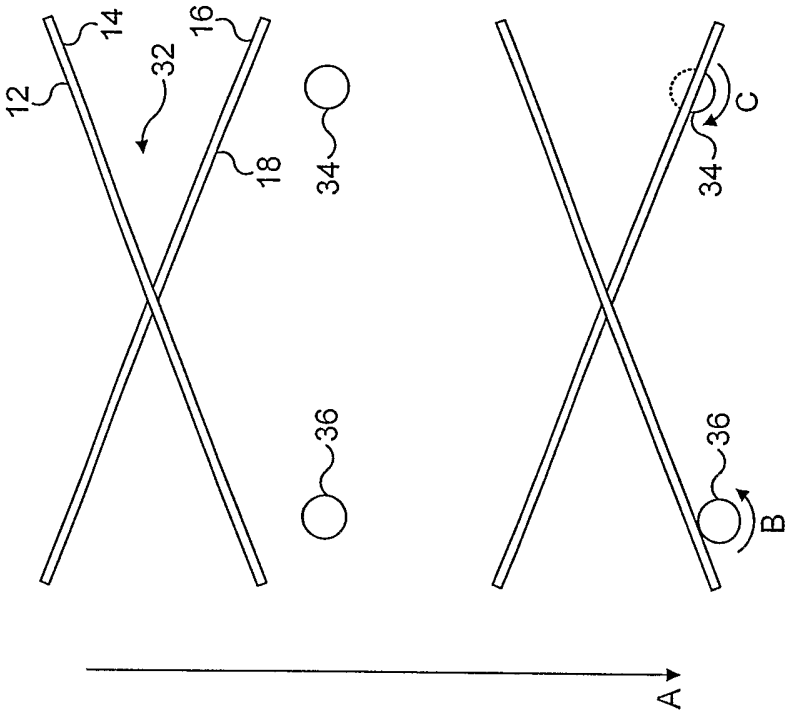


FIG. 4

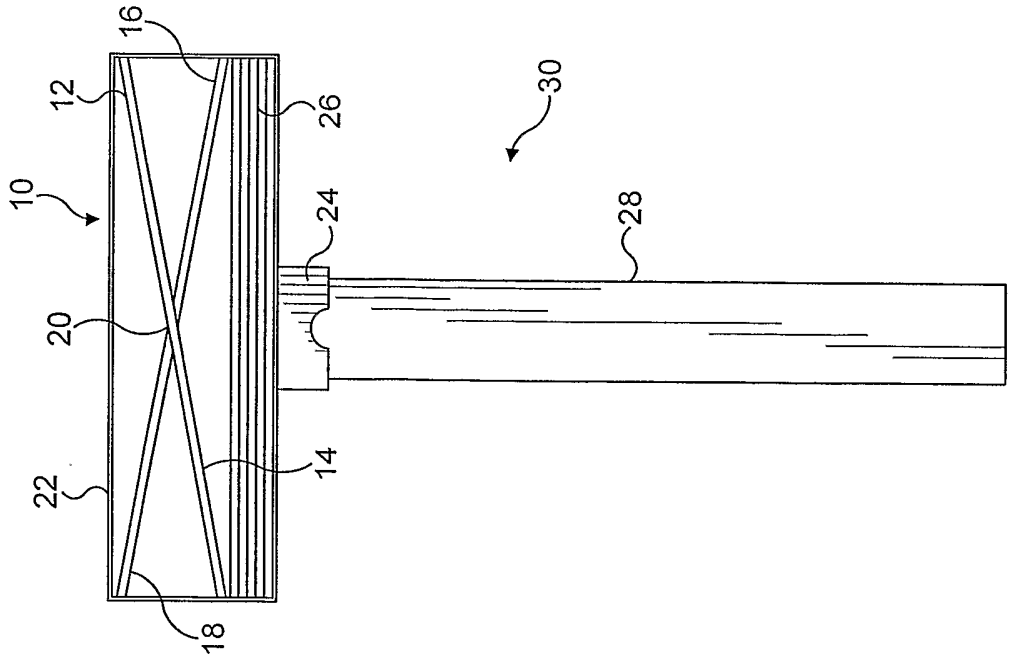


FIG. 3

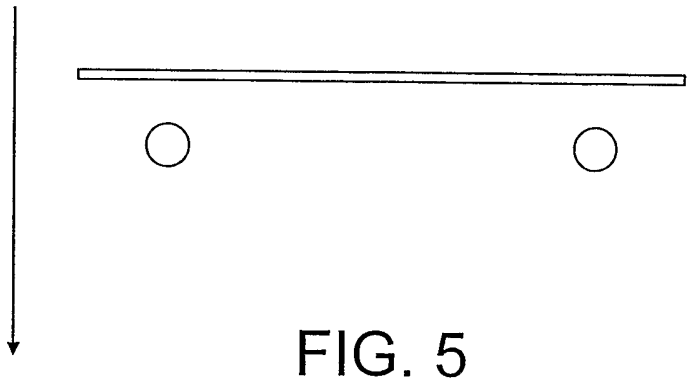


FIG. 5

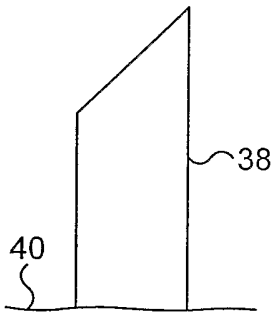


FIG. 6

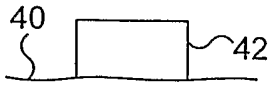


FIG. 7

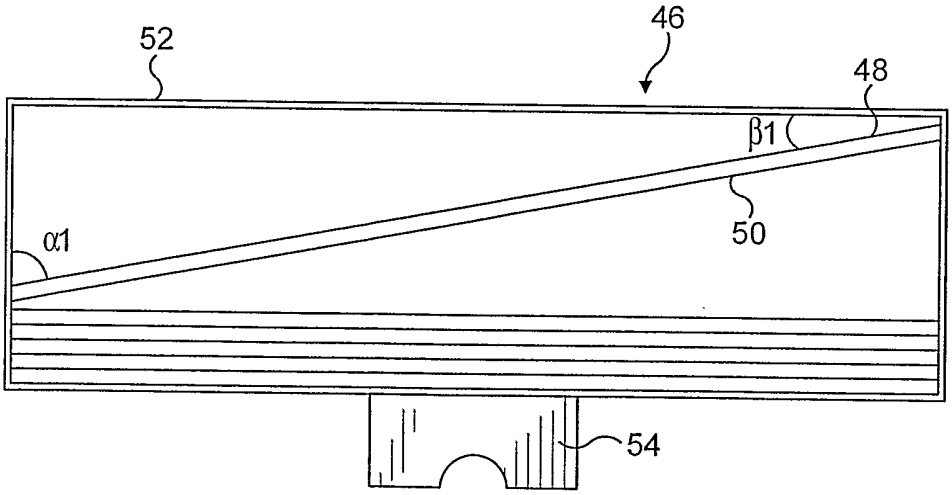


FIG. 8

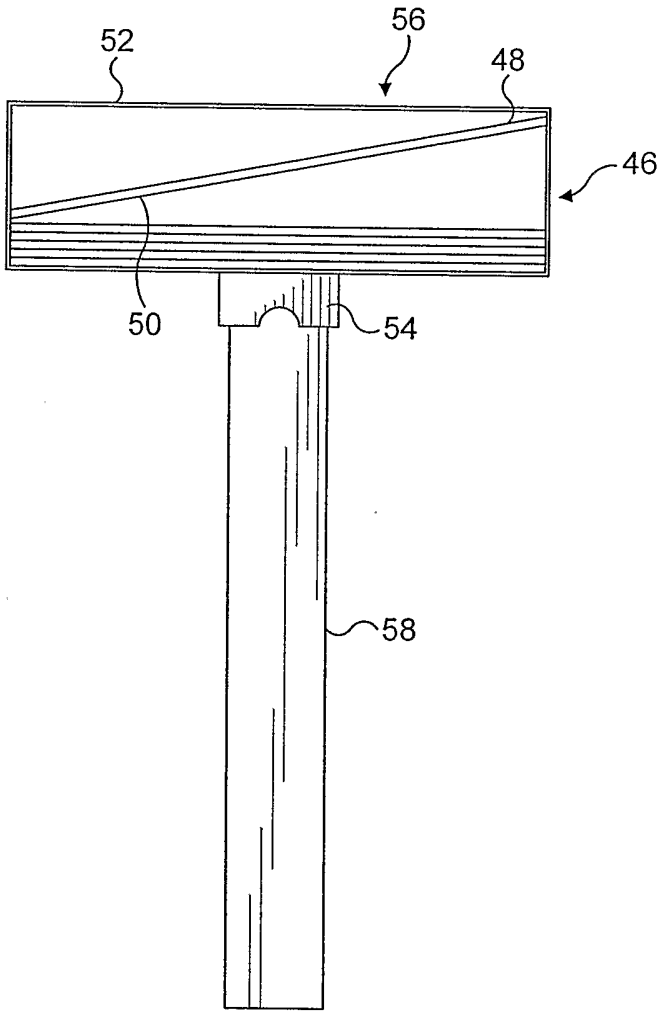


FIG. 9

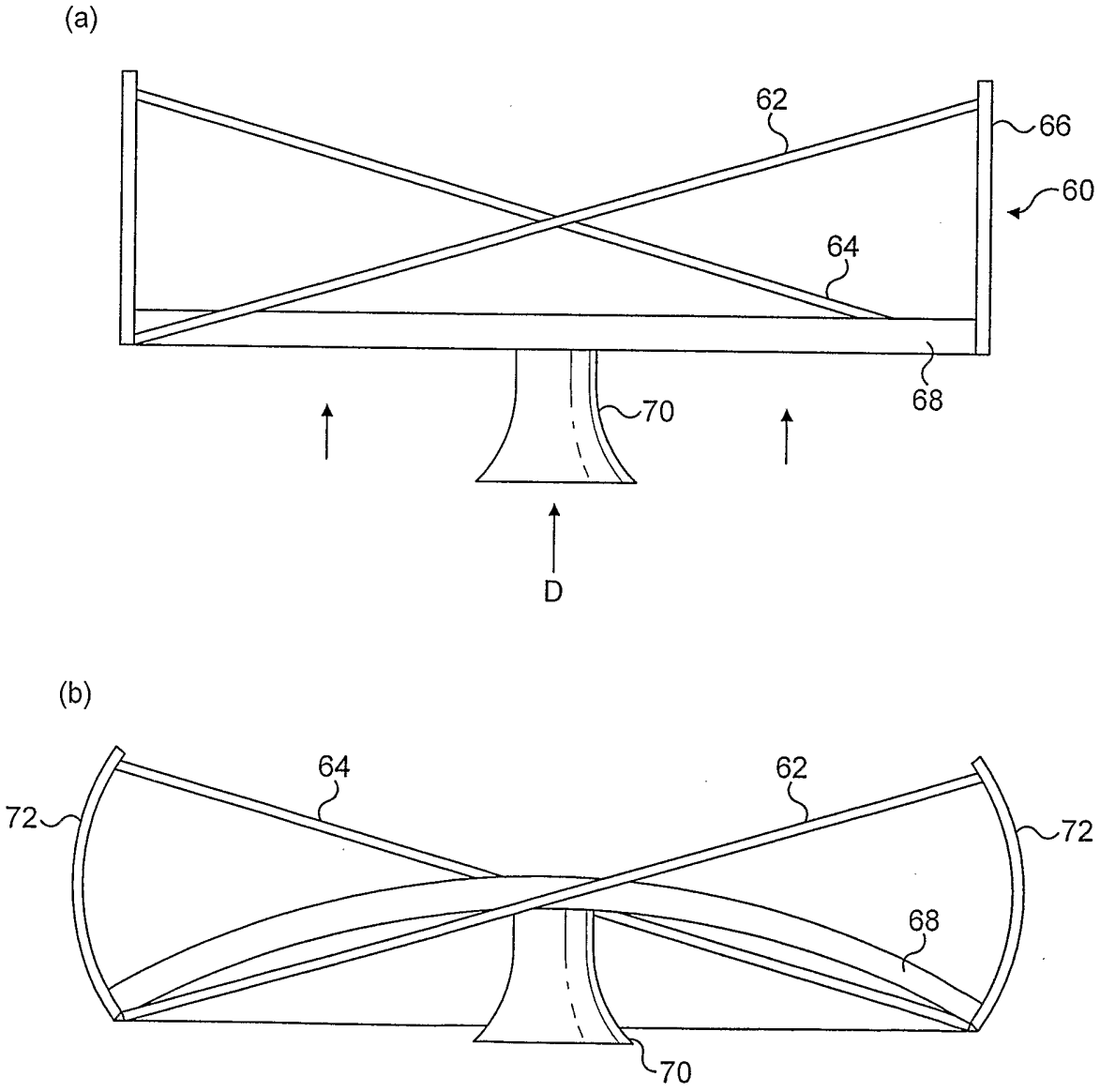


FIG. 10

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/02649

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B26B21/28 B26B21/56

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 7 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)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 13, 5 February 2001 (2001-02-05) & JP 2000 300865 A (YAMANO:KK), 31 October 2000 (2000-10-31) abstract; figures 1-5 paragraphs '0014!,'0021!	1-5,7,8, 11,13
X	GB 2 357 057 A (WALKER GRAHAM ANDREW) 13 June 2001 (2001-06-13) page 3, line 24 -page 4, line 5; figure 3	14-16
X	DE 196 21 491 A (BROICHER HERIBERT DR ING) 4 December 1997 (1997-12-04) column 2, line 41 - line 47; figures 4,5 column 1, line 1 - line 11	1,2,4,5, 7,9,10, 13

☐ 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	Date of mailing of the international search report
2 September 2003	25/09/2003

Name and mailing address of the ISA	Authorized officer
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	Maier, M

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/02649

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 17-20
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 17-20

Reason: subject-matter undefined.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 03/02649

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2000300865 A	31-10-2000	NONE	
GB 2357057 A	13-06-2001	NONE	
DE 19621491 A	04-12-1997	DE 19621491 A1	04-12-1997