

(12) UK Patent Application (19) GB (11) 2471676 (13) A

(43) Date of A Publication

12.01.2011

(21) Application No: 0911721.9

(22) Date of Filing: 07.07.2009

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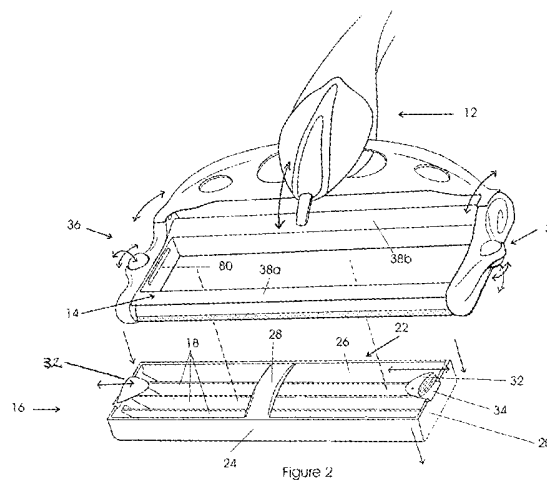
(51) INT CL:
B26B 21/40 (2006.01) **B26B 21/00** (2006.01)

(56) Documents Cited:
GB 0394136 A **WO 2001/008857 A1**

(58) Field of Search:
INT CL **B26B, F16C**
Other: **Online: WPI, EPODOC, TXTE**

(54) Title of the Invention: **Razor assembly**
Abstract Title: **Razor with ball for reducing resistance**

(57) A razor assembly 10 comprises a blade body 16 having at least one elongate blade 18, and one or two balls 58 mounted in the blade body such that the ball rotates when the assembly is moved across the skin of the user, thereby reducing resistance. The first ball may be located near one end of the blade, and a second ball may be located near the other end. Preferably the balls are allowed universal rotation. The balls may be mounted in a cradle 14 that is attached directly or indirectly to the blade body. A biasing member 46 (preferably a spring) may be provided to resiliently mount the blade body within the cradle. The biasing member may be connected between outer side portions of the blade body and inner side portions of the cradle.



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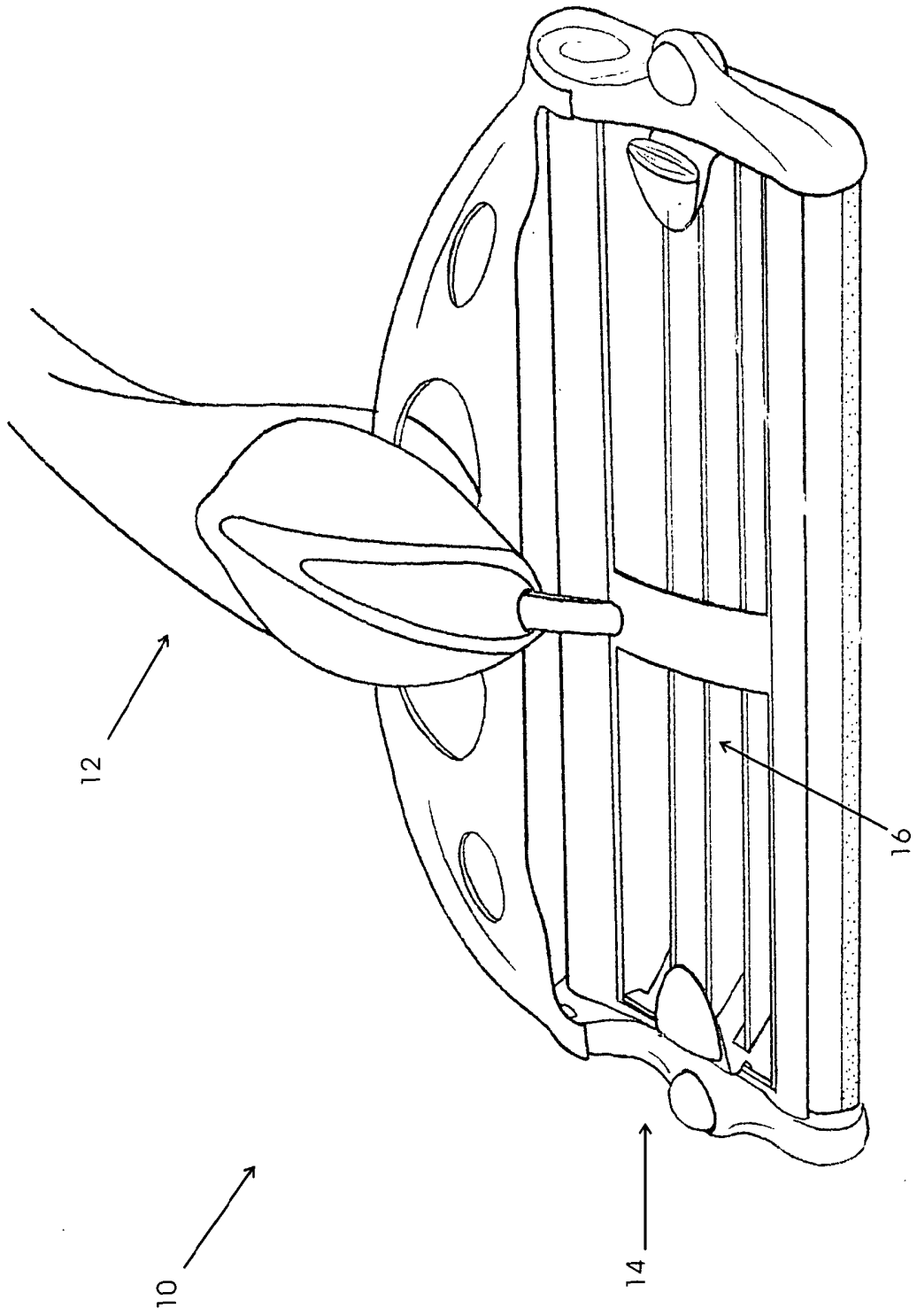
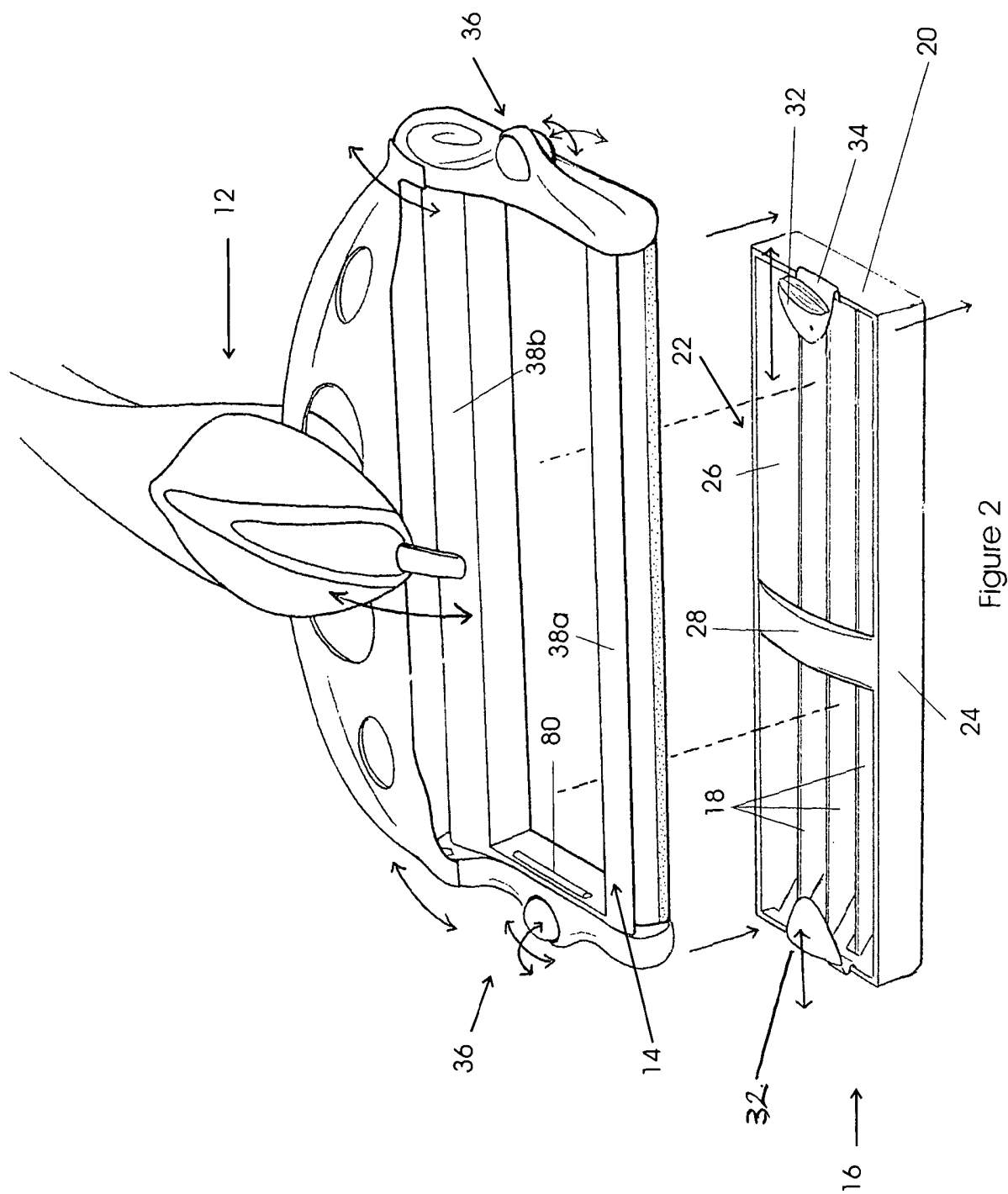


Figure 1



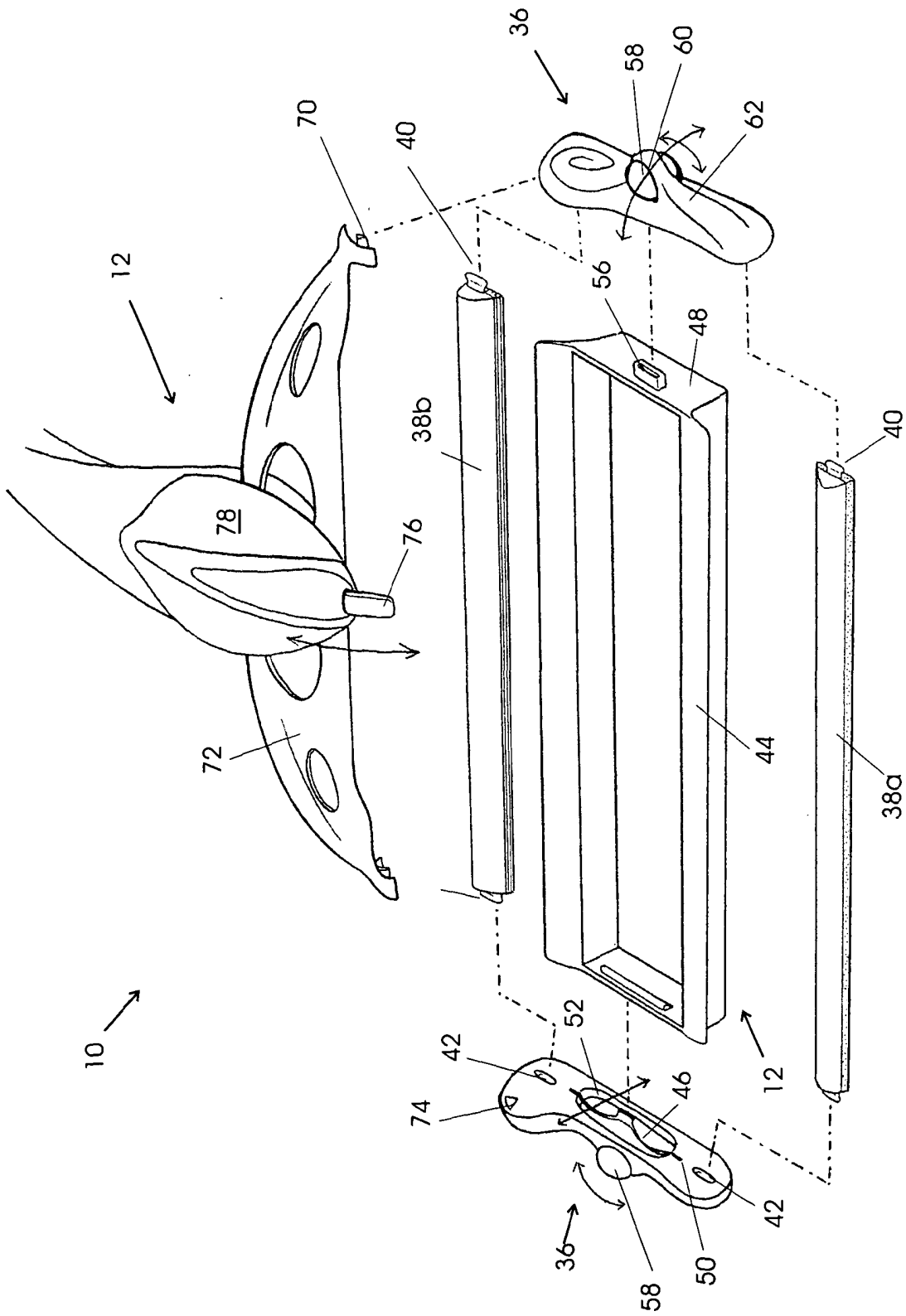


Figure 3

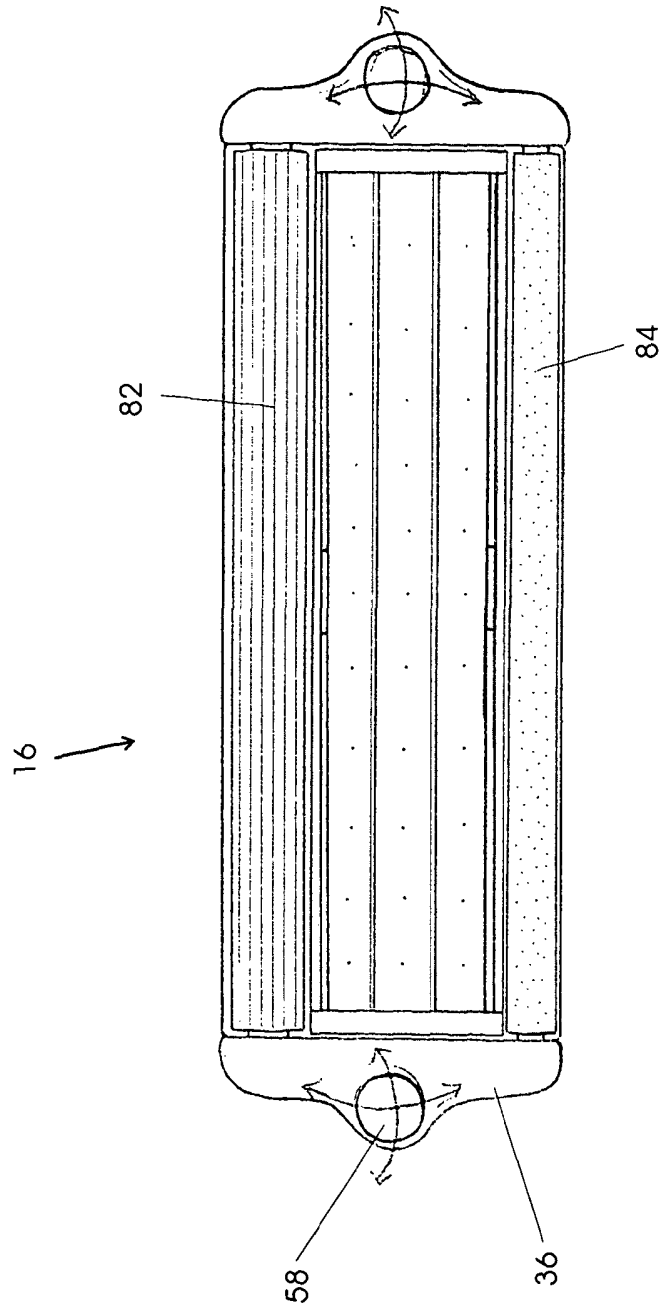


Figure 4

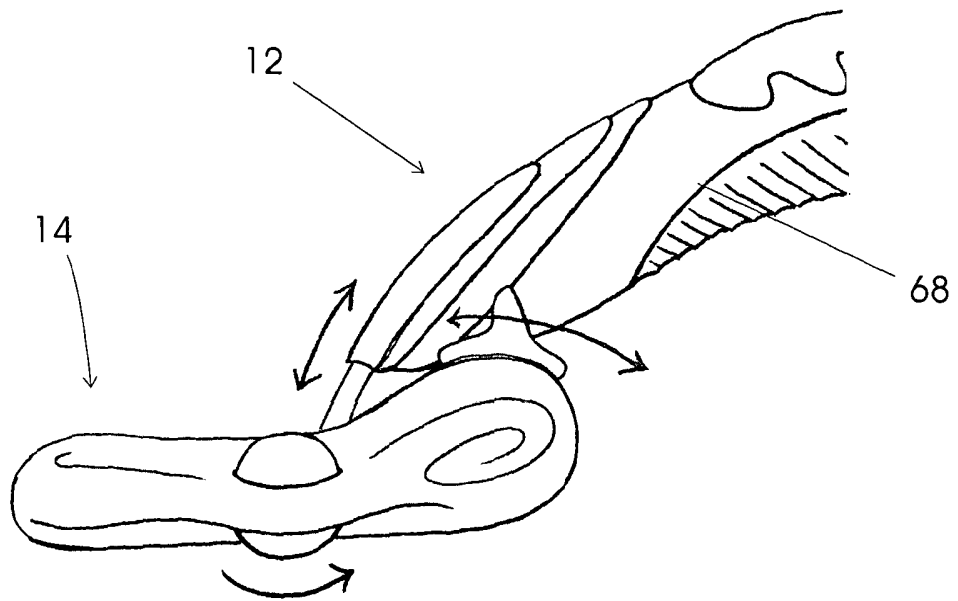


Figure 5

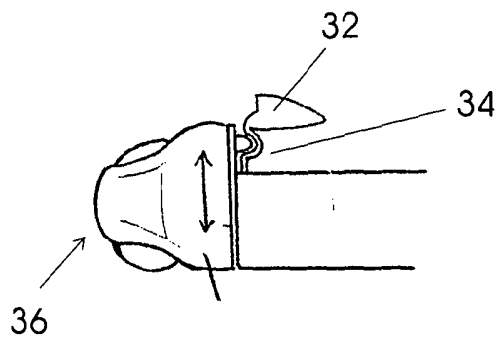


Figure 6

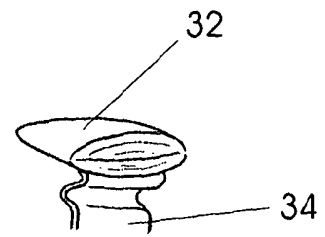


Figure 7

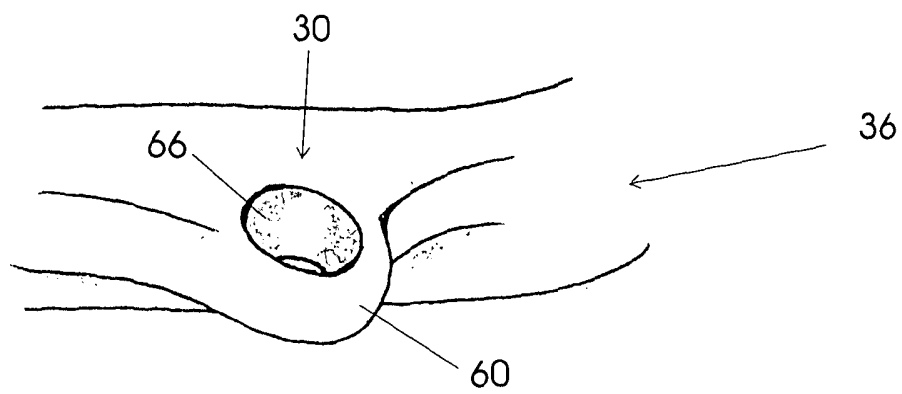


Figure 8

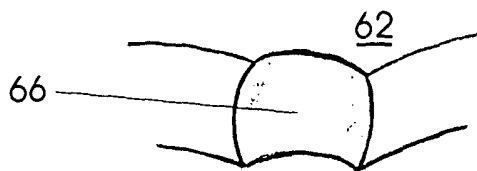


Figure 9

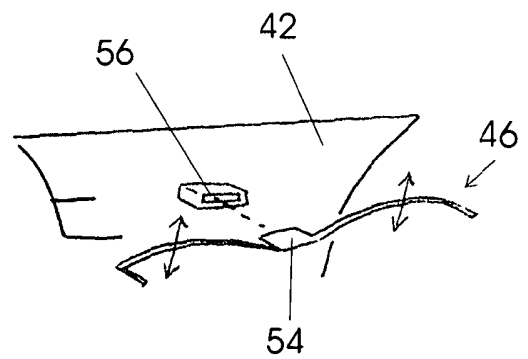


Figure 10

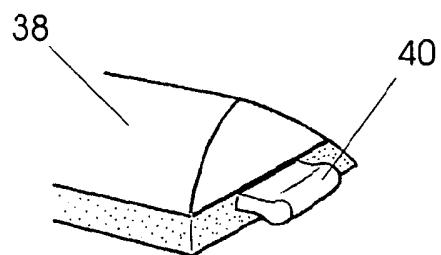


Figure 11

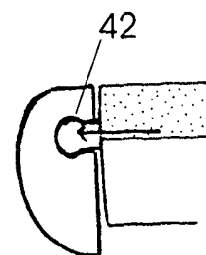


Figure 12

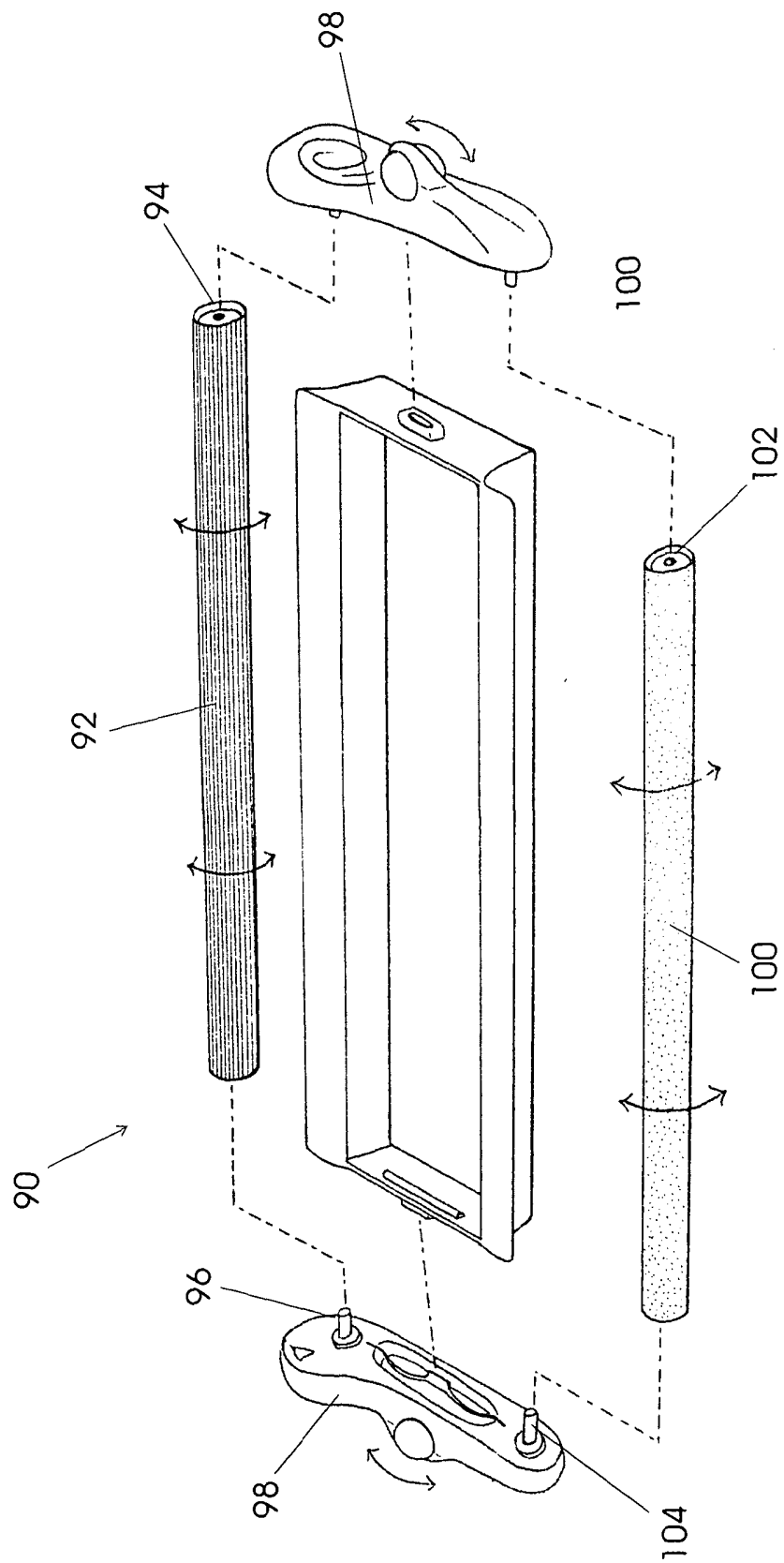


Figure 13

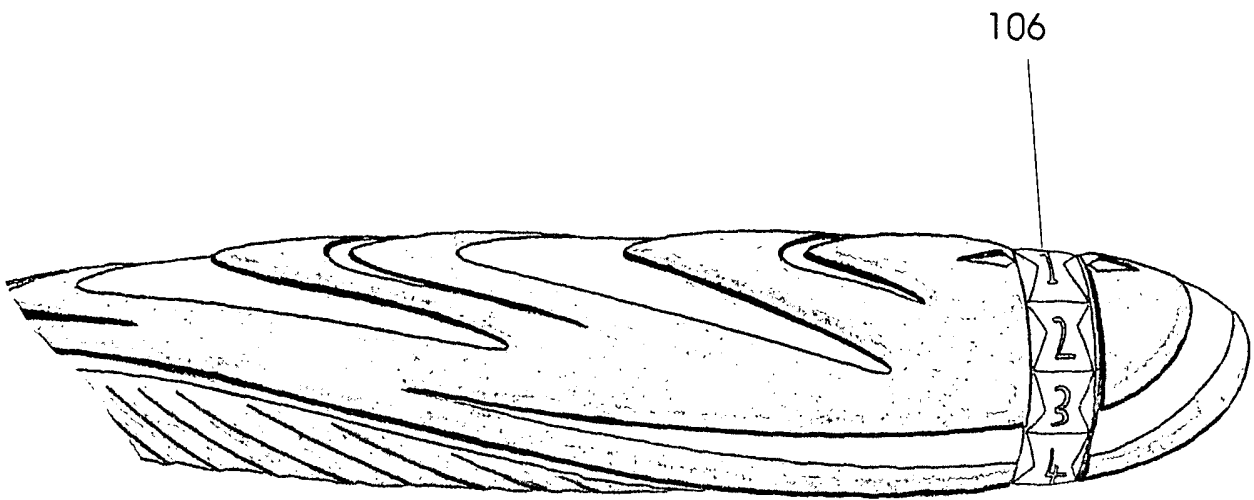


Figure 14

Razor Assembly

Technical Field & Background Art

The present invention relates to an improved razor assembly for the wet shaving of a person's skin. The assembly may be used as part of a disposable razor or as a replaceable blade member for a non-disposable razor.

In use, it is desirable that a razor be easily drawn across the skin. This is generally achieved by providing elongate strips of a material having a low coefficient of friction either in front or at the rear of the blade; normally as part of the blade holder or cartridge.

Brief Description of the Invention

An aim of the present invention is to provide razor that is more comfortable to use. Another aim is to provide a razor that allows a user to more easily control the closeness of a shave by adjusting the force applied between the shaver handle and the skin. A further aim is to provide a razor that limits the force that can be so applied thereby helping to avoid accidental cuts to the skin of a user.

In one aspect the invention comprises a razor assembly having a blade body with at least one elongate blade mounted therein and a ball rotationally mounted directly or indirectly to said blade body such that in use when said assembly is moved in a shaving direction across the skin of a user said ball rotates thereby reducing resistance to such movement.

Preferably, the ball is located proximal one end of said blade and more preferably the razor assembly comprising two balls one located proximal each end of said blade. The ball or balls may be mounted to allow universal rotation. Preferably, the ball is mounted to the blade body or to a cradle that holds the blade body. The razor assembly

may have a ball rotationally mounted by means of a mount attached to or integral with a side portion of the blade body or the cradle. Preferably the ball or balls are mounted within an aperture having a circular cross section that presents a mount surface that has an inverse barrel shape. The cradle may comprises two side portions with at least one roller rotationally mounted between said side portions.

The blade body may be attached to a cradle wherein the ball or balls are mounted. Preferably, the blade body is resiliently mounted within a cradle. The resilient mount may comprise a resilient member such as a spring; for example a leaf spring. The resilient member may be connected between outer side portions of the blade body and inner side portions of the cradle said side portions extending in a direction generally parallel to said shaving direction.

The razor assembly may have a handle that is pivotally attached to the cradle or blade body. Bias means may be provided in the handle to return the cradle or blade body to a pre-set position relative to the handle, after pivoting in use.

Brief Description of the Drawings

The following diagrammatic figures illustrate the main features of the present invention:

Figure 1 shows a perspective view of an assembled razor assembly according to a preferred embodiment of the invention;

Figure 2 shows a perspective view of the razor shown in Figure 1 partly disassembled;

Figure 3 shows an exploded perspective view of a part of the assembly shown in Figures 1 and 2;

Figure 4 shows an underside view of the blade body of the razor shown in Figure 1;

Figure 5 shows a side elevation of the razor shown in Figure 1;

Figures 6-12 show selected parts of the razor shown in Figure 1 but in more detail;

Figure 13 shows an alternative embodiment of the invention with rollers; and

Figure 14 shows the handle of the razor according to a further embodiment of the invention.

Detailed Description of a Preferred Embodiment

A preferred embodiment of the invention will now be described by reference to Figures 1-12

Figure 1 shows a razor, for use in wet shaving a person's skin, according to a preferred embodiment of the invention. The razor (10) has three main components; a handle portion (12); a cradle portion (14) and a disposable blade cartridge portion (16).

Figure 2 shows the blade cartridge (16) separated from the remainder of the razor. The blade cartridge (16) has at least one elongate metal blade (18) attached at each end to the inner face of side walls (20) of a blade body (22). The blade body (22) also has a front wall (24) and a rear wall (26). The blade body (22) provides an enclosure that is generally rectangular in outline and which houses the blade/blades (18) there within. Preferably, a brace (28) is provided between the front and rear walls (24, 26) and located above the blade/blades (18). This brace provides rigidity to the blade cartridge (16) and also reduces any tendency for the blade/blades (18) to flex away from the skin in use. A latch (32) is resiliently mounted (34) to the upper portion of each side wall 20; in use these latches engage apertures; for example elongate slots (80) in the cradle; for example within the inner side walls of a housing (44) that forms an inner part of the cradle (14) (see Figures 3, 6 and 7).

Figure 2 also shows the handle portion (12) pivotally attached to the cradle portion (14). This cradle portion comprises side portions (36) and elongate strips (38a and 38b) that have engagement means (40) (for example a tongue) that locate within corresponding apertures (42) on the inner faces of side portions 36 (see Figures 3, 11 and 12). Typically items 40 and 42 comprise a male and female member; but other conventional joining means may be used instead. Thus, when assembled the two side portions 36 and the two elongate strips 38a and 38b form a cradle. Preferably, the cradle (14) includes a resiliently supported inner housing (44) that both strengthens the cradle and also is configured to accept the blade cartridge (16). The resilient support is provided by resilient members (46) located between the side portions (36) and the

inner housing (44); preferably between the inner face of the side portions (36) and the outer face of the corresponding walls (48) of the inner housing. Thus, for example, ends of a leaf spring (46) may be located in adjacent slots (50) provided at each end of a recess (52); recesses (52) being located in the inner face of each side portion (36). A tongue (54) at the centre of each leaf spring (46) may engage a female socket (56) provided on the corresponding face (see Figure 10) of the inner housing (44). While the above arrangement is preferred, the blade cartridge (16) may directly engage the cradle (14) in which case there will be no resiliently mounted inner housing (44). In this event, the cradle may comprise a single member or a plurality of members shaped to accept the blade cartridge (16) and also to provide side portions equivalent to the side portions (36).

The side portions (36) each house a ball (58) mounted directly or indirectly thereto so that it may universally rotate (about any axis). Preferably, this mount (60) comprises a housing (62) integrally formed in the outer face of each side portion (36) and having a barrel shaped aperture (30) of circular cross section the diameter of which varies so that it presents an arcuate external surface (66) that in use closely surrounds the equatorial portion of the ball (58). This equatorial portion will vary in location as the ball moves axially. (see Figures 8 and 9). The mount (60) is preferably made of a resilient plastics material so that during manufacture the ball (58) may be forced within the ring aperture and is thereafter free to rotate about any axis owing to a slight clearance between the equatorial portion of the ball and the adjacent arcuate (inverse barrel shaped) surface (66) of the aperture (30).

Figure 4 shows an underside view of the blade body of the razor. The underside portions of members 38a and 38b may comprise low friction strips 82 and 84 to further reduce friction between the razor and a user's skin in use.

The razor assembly may further comprise a handle portion (12) having a grip portion (68) and locating portion or portions (70) that allow the cradle (14) to be attached thereto. Preferably, two locating portions are provided spaced apart by attachment to side arms (72) located at the end of the handle (12) portion proximate the blade. The

locating portion or portions preferably allow the handle (12) to pivot (see Figure 5) relative to the cradle (14) and/or the blade body/cartridge (16). Figure 3 shows that engaging portions (70) may comprise axles integrally formed at the ends of the side arms (72). These axles engage apertures (74) provided in the inner face of side portions (36). Thus, handle portion (12) may pivot relative to the remainder of the assembly. Preferably, there is also a resilient member (76) provided on or within a head portion (78) of the handle (12), this head portion being located at the end of the handle nearest the blade. The purpose of this resilient member is to bias the handle so that in use and when not in use the cradle and/or blade cartridge tend to return to a pre-set orientation (see Figure 5).

Figure 13 shows a further embodiment of the invention where the cradle portion (90) is similar to that described above except the two elongate strips 38a and 38b have been replaced by rollers 92 and 100 each end of which have cylindrical recesses 94 and 102 respectively that engage axles 96 and 104 respectively provided on the inner face of side portions 98. In use rollers 92 and 100 rotate as the shaver is drawn across a person's skin; thus further reducing frictional resistance.

Figure 14 shows the handle portion of a razor according to a further embodiment of the invention. The handle includes a hand operated counter (106) that can be axially rotated (advanced) relative to the rest of the handle, one digit at a time after each shave; thus keeping a record of the number of shaves that the blade cartridge portion has been used for.

The skilled person will recognise that in other embodiments of the invention the balls may be mounted in a variety of ways at opposite ends of the elongate blade or blades; either in a mount that forms part of the blade body or is attached directly or indirectly thereto.

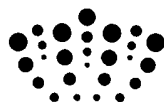
In a further aspect of the invention the resiliently mounted blade member feature can be used without any rotationally mounted ball.

The provision of a ball or balls mounted within the blade body or cradle of the razor assembly of the invention advantageously allows the blade to easily drawn across the skin. The embodiment of the invention that employs a resiliently mounted holder within the cradle also advantageously allows the user to control the closeness of the shave by varying the force applied to the handle when in use while avoiding the application of excessive pressure that can lead to skin injury.

CLAIMS

1. A razor assembly comprising a blade body with at least one elongate blade mounted therein and a ball rotationally mounted directly or indirectly to said blade body such that in use when said assembly is moved in a shaving direction across the skin of a user said ball rotates thereby reducing resistance to such movement.
2. A razor assembly according to Claim 1 wherein the ball is located proximal one end of said blade.
3. A razor assembly according to Claim 1 comprising two balls one located proximal each end of said blade.
4. A razor assembly according to any preceding claim wherein the ball or balls are mounted to allow universal rotation..
5. A razor assembly according to any preceding claim wherein the blade body is attachable directly or indirectly to a cradle wherein the ball or balls are mounted.
6. A razor according to Claim 5 having a ball rotationally mounted by means of a mount attached to or integral with a side portion of the cradle.
7. A razor assembly according to Claim 5 or 6 wherein said blade body is resiliently mounted within said cradle.
8. A razor assembly according to Claim 7 wherein said resilience is provided by a bias member.
9. A razor assembly according to Claim 8 wherein the bias member is a spring.

10. A razor assembly according to Claim 8 or 9 wherein the bias member is connected between outer side portions of said blade body and inner side portions of said cradle said side portions extending in a direction generally parallel to said shaving direction.
11. A razor assembly according to any of Claims 1 to 4 having a ball rotationally mounted by means of a mount attached to or integral with a side portion of the blade body.
12. A razor assembly according to Claim 6 or 11 wherein the ball mount comprises an aperture with a inverse barrel shaped surface
13. A razor assembly according to any preceding claim wherein a handle is pivotally attached to said cradle or blade body.
14. A razor according to Claim 13 wherein a bias member is provided in said handle to return the cradle or blade body to a pre-set position relative to the handle, after pivoting in use.
15. A razor according to Claim 5 wherein the cradle comprises two side portions with at least one roller rotationally mounted between said side portions.



Application No: GB0911721.9

Examiner: Miss Alison Berry

Claims searched: 1-15

Date of search: 11 February 2010

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-3, 5, 6 and 13-15	GB 394136 A (SALOMONSEN), see figure 1 and page 1, lines 9-35
A	-	WO 01/08857 A1 (TANIO), see figures 2 and 6c especially

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

Worldwide search of patent documents classified in the following areas of the IPC

B26B; F16C

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, TXTE

International Classification:

Subclass	Subgroup	Valid From
B26B	0021/40	01/01/2006
B26B	0021/00	01/01/2006