

PATENT SPECIFICATION

(11)

1 362 442

1 362 442

- (21) Application No. 11848/73 (22) Filed 14 March 1972
 (62) Divided out of No. 1 362 441
 (31) Convention Application Nos. 124 068 (32) Filed 15 Mar. 1971
 176 547 31 Aug. 1971
 207 422 13 Dec. 1971 in
 (33) United States of America (US)
 (44) Complete Specification published 7 August 1974
 (51) International Classification B26B 21/54 // 21/22 21/54
 (52) Index at acceptance
 B4B 33D1 33E 34F



(54) RAZOR BLADE UNIT

(71) We, THE GILLETTE COMPANY, a corporation organised and existing under the laws of the State of Delaware, United States of America, of Prudential Tower Building, Boston, Massachusetts, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to shaving systems and more particularly to a blade unit for a shaving system, the blade unit being of the type having a blade element permanently secured in predetermined geometrical relationship to a guard element.

It is an object of this invention to provide a new and improved blade unit for a shaving system. A variety of shaving systems have been proposed, the principal arrangements presently being used including systems in which a single or double edged razor blade is inserted into a holder by the user, and systems employing a cartridge which holds a length of band blade with successive shaving lengths being advanced by the user. Other proposed systems employ a body member that defines a guard structure with a razor blade permanently secured to the body member to provide a fixed geometrical relationship between the guard surface and the cutting edge. A more specific object of this invention is to provide an improved blade unit component of that type which, when coupled to a handle component, provides a balanced, sturdy, compact shaving system that is easy to manipulate and provides efficient and effective shaving.

Shavers frequently prefer a shaving system having a handle component of relatively long life which is used with replaceable blade units. When a blade unit is no longer fit for use, the blade unit may be discarded

[Price 25p]

or returned to a portion of a dispensing device designed to receive used blade units and another blade unit is attached to the handle component. Accordingly, another object of this invention is to provide an improved blade unit that has coupling structure which facilitates the attachment of the blade unit to a handle member.

A further object of the invention is to provide an improved blade unit which may be economically manufactured and easily and reliably attached to a handle member.

In accordance with the invention there is provided a razor blade unit comprising two elongated blades permanently mounted in fixed superposed parallel position between cap and base members and with a spacer member between the blades, said spacer member having transversely spaced fingers extending forwardly in the direction of the cutting edges of the blades which are parallel and face in the same direction to permit simultaneous hair cutting engagement, and aligning abutment surfaces adapted to be engaged by the cutting edges of the blades, the spaces between the fingers of the spacer member providing access to passages through the blade unit end extending to the exterior thereof. Preferably, the blade adjacent the cap member has its cutting edge rearwardly offset from the cutting edge of the blade adjacent the base member, the offset position of the blade being maintained by the abutment surfaces. The openings through the blades for the passages of securing means are preferably sufficiently large so that blades of the same form can be used in either of the offset positions. Preferably, the passages to the exterior of the unit are formed in one of the members of the unit and the base member and blade adjacent thereto have aligned unobstructed openings forming said passages. The blade unit preferably includes openings providing access to the blades from the outside of the

7
 LIED
 THE
 SERVICE

unit for moving them to their proper positions against the abutment surfaces.

A blade unit in accordance with the invention is a compact member that is easily secured on a cooperating handle member to provide a relatively light and yet sturdy and balanced shaving implement which is convenient to use and which facilitates shaving of relatively inaccessible areas.

In order that the invention may be clearly understood and readily carried into effect, it will now be described more particularly, in conjunction with the accompanying drawings in which:

Fig. 1 is a side view of a shaving system incorporating a blade unit in accordance with the invention;

Fig. 2 is a perspective view of the shaving system shown in Fig. 1;

Fig. 3 is a bottom view of the blade unit employed in the shaving system shown in Figs. 1 and 2;

Fig. 4 is a sectional view taken along the line 4-4 of Fig. 3;

Fig. 4A is an exploded perspective view of components of the blade unit employed in the razor assembly as shown in Figs. 1, 3 and 4.

The shaving system shown in Figs. 1 and 2 includes a handle component 10 and a blade unit component 12. The handle component includes a grip portion 14 that is 4-1/4 inches long and of generally square cross-section configuration with a slight taper along its axial length. Grooves 16 along a portion of the length of grip 14 facilitates its handling by the user. At the upper end of the grip portion 14 is a neck portion 18 which extends forwardly and upwardly from the upper end of grip portion 14 at an angle of 120° to the axis of grip portion 14 so that the end surface of neck portion 18 is offset a distance A of 0.27 inch from the axis of the grip portion. Secured to the end surface of neck portion 18 is a transversely extending support head 20 that has two outwardly directed flange or rail portions 22, the upper surfaces of which define a reference plane 24 that is perpendicular to the axis of neck portion 18. Reference plane 24 is spaced a distance B of 0.55 inch from the junction of neck portion 18 and grip portion 14 and a distance C of 0.195 inch above the end surface of neck portion 18. Two laterally extending slots 26 are formed in the base of support head 20, one on either side of the point of attachment to neck portion 18. A spring plate 28 functions as a resilient latch member and cooperates with the forward rail 22 of the support head 20 to secure the blade unit 12 on the handle 10.

The cooperating blade unit 12 has a transverse length of 1.56 inch, a width D of 0.426 inch and a depth E of 0.230 inch

includes a base or platform member 30 molded of high impact polystyrene on which are supported two blade elements 32, 34 and an interposed spacer member 36 so that the shaving edges of the blade elements are maintained in spaced, parallel offset relation. Cap member 38, also molded of high impact polystyrene, has depending pins 40 (Fig. 4) which extend through apertures in the blades, spacer and base and are cold headed to secure the blade elements and spacer member to the base member 30.

The base member 30 defines an upper platform surface 42 on which the leading blade member 32 rests and includes a front wall portion 44 and a rear wall portion 46. Five webs 48 extend between the front and rear wall portions 44, 46 and the lower surfaces 50 of these webs define a plane that is disposed at an angle of 35° to the platform surface 42. Apertures 52 are aligned with apertures in blade 32 and permit shaving debris to flow through base 30 away from the shaving zone. Extending downwardly perpendicularly away from surface 50 are two spaced wall extensions 54, each of which has at its lower end an turned flange 56 that projects inwardly 0.018 inch to define a recess in the form of slot 58 that has a height of 0.026 inch. The space between flanges 56 is 0.244 inch. Notch 60 in front flange 56 has a width of 0.04 inch and a depth of 0.04 inch.

Web extensions 62 on the forward side of wall 44 support a transversely extending guard structure 64 that has a surface spaced 0.23 inch above surface 50 (dimension E — Fig. 1) and when the blade unit 12 is attached to the handle unit 10, that surface is offset 0.6 inch from the front surface of the upper end of the grip portion 14 (dimension F in Fig. 1).

Additional details of the blade unit 12 may be seen with reference to the exploded view of Fig. 4A. The base member 30 includes a planar support surface 50a in which are formed a series of four securing apertures 52a and a series of four drain slots 52. There is an upwardly extending vertical surface 56a at the rear of platform 50 in which are disposed two recesses 58a and a downwardly extending vertical surface 60a at the front of platform 50a. A recess 62a is formed at either end of platform 50a and end wall structures 48 extend downwardly and forwardly from either end of platform surface 50a. Guard structure 64 extends between the forward extending portions of the end walls 48 and in spaced relation from front wall 60a of base 30. Spaced webs 48, which extend forwardly from wall 60a to the guard member 64, increase the rigidity of that guard member and define drain recesses between surface 60a and the guard. At either end of the guard member is an up-

wa
68.
end
and
5 chu
the
sur
gro
rail
10 the
pla
flar
tra
F
15 fro
blu
cut
me
slo
20 tur
tur
len
of
por
25 ap
S
ele
wid
incl
30 40:
is C
rec
dir
incl
35 cul
whi
106
tow
ber
40 tha
sm
fac
pro
wit
45 and
Rec
are
bas
C
50 pol
ing
por
war
por
55 hol
and
are
col
tion
60 to t
of c
face
to t
122
65 of 1

wardly projecting, vertical reference surface 68. Extending downwardly from the lower end of the base member 30 at the front and rear thereof are projections which include the inwardly extending flanges 56 at their outer ends that define with the lower surface of the base two parallel opposed grooves which are adapted to receive the rails 22 of the handle component to secure the blade unit 12 to that handle. Spring plate 28 engages a notch in the forward flange 56 to latch the blade unit against transverse movement.

Each blade element 32, 34 has parallel front and rear edges, the front edge of each blade element being sharpened to define a cutting edge 80a. Formed in each blade member are series of four axially extending slots 82a and four irregularly shaped apertures 84. The forward edges 86a of apertures 84a are straight and of the same length as slots 82a while the rear edges 88a of apertures 84a have a curvature corresponding to the curvature of the securing apertures 52a in base member 30.

Spacer 36, interposed between the blade elements, has a length of 1-1/2 inches, a width of 0.24 inch and a thickness of 0.020 inch. Formed in the forward edge of spacer 40 are a series of recesses 98a, each of which is 0.080 inch deep and 1/8 inch long. These recesses define a series of spaced forwardly directed fingers 100a each of which is 0.056 inch in width. Each of the fingers 100a culminates in an 0.020 inch wide tip 102a which is defined by inclined surfaces 104a, 106a which extend rearwardly and outwardly towards the main body of the spacer member 36 and also are inclined vertically so that the top surface 108a of each finger is smaller than the corresponding bottom surface of that finger. The spacer is further provided with holes 110a that are alignable with the holes 52a at the base member 45 and the holes 84a in the blade elements. Recesses 112a in the rear edge of spacer 36 are alignable with the recesses 58a in the base member.

Cap member 38 molded of high impact polystyrene includes a transversely extending portion 118a disposed between end wall portions 120a, 122a. Pins 40 extend downwardly from the transversely extending portion 118a and are alignable with the holes 52a, 84a and 110a in the base, blades and spacer members, respectively. The pins are hollow at their free ends to facilitate cold heading. The top surface 126a of portion 118a is inclined at an angle of 73° to the axis of pins 40 and the top surfaces of end walls 120a, 122a project above surface 126a and are inclined at an angle of 70° to the axes of pins 40. The end walls 120a, 122a also extend beyond the forward edge 65 of the cap surface 126a and each includes

an exterior vertical reference surface 130a that is adapted to engage the reference surface 68 on base member 30 and interior vertical reference surfaces 134a and 136a which are used for locating the blade members 32, 34 relative to one another and to the guard structure 64 in the assembled blade unit. An elongated recess 138a defined by transverse portion 118a and the end wall portions 120a, 122a receives the wall surface 56a of the base member 30.

In assembly, the base 30, blade elements 32, 34, spacer 36 and cap member 38 are disposed in aligned relation with pins 40 extending through the corresponding holes 52a, 84a and 110a. The components are loosely held in stacked relation under light pressure and suitable means such as a jet of air or a mechanical tool applies force through the openings defined by recesses 58a and cooperating portions of cap 38 to urge the two blade members 32, 34 forwardly against stop surfaces 134a, 136a, respectively. The assembly is then clamped firmly together and the free ends of the pins 40 are expanded in a cold heading operation to secure the components of the blade unit firmly together.

In the assembled blade unit, as indicated in Fig. 4B, the cutting edge 80a of the leading blade 32 extends over the recesses between forward wall 60a and the guard member 64, while the cutting edge 80a of the following blade 34 is located above the recesses 98a between fingers 100a of spacer 36 so that paths are provided for communication through the slots 82a and the forward ends of apertures 84a in the leading blade 32 and the slots 54a in the base member 30. These passages facilitate the flow away from the shaving zone of lather and debris resulting from the shaving operation.

In our application no. 11842/72 (Serial No. 1 362 441), we have described and claimed a razor blade unit comprising one or more elongated blades permanently mounted in fixed relation to a guard portion of the unit, and elongated coupling elements along the length of the unit spaced from each other to such an extent that one element is generally coextensive with one longitudinal margin of the area of the unit occupied by the blade or blades and the other element is generally co-extensive with the other longitudinal margin of said area, said elements being adapted to cooperate with complementary coupling elements on a razor handle for securing the blade unit on the handle.

In our application no. 11849/73 (Serial No. 1 362 443), we have described and claimed a razor blade unit having elongated leading and following blades with means along the length of the blades for supporting the cutting edges thereof in spaced parallel

relation to one another and a guard surface disposed forwardly of the cutting edge of the leading blade to provide a leading edge tangent angle in the range of 20-32° and a span (S_L) in the range of 0.030-0.080 inch, the cutting edge of the following blade being rearwardly offset from the leading cutting edge to define a span (S_F) of similar extent, and each cutting edge having an exposure 10 from -0.002 inch to +0.004 inch.

WHAT WE CLAIM IS:—

1. A razor blade unit comprising two elongated blades permanently mounted in 15 fixed superposed parallel position between cap and base members and with a spacer member between the blades, said spacer member having transversely spaced fingers extending forwardly in the direction of the 20 cutting edges of the blades which edges are parallel and face in the same direction to permit simultaneous hair cutting engagement, and aligning abutment surfaces adapted to be engaged by the cutting edges 25 of the blades, the spaces between the fingers of the spacer member providing access to passages through the blade unit and extending to the exterior thereof.

2. A blade unit according to claim 1, in 30 which the blade adjacent the cap member has its cutting edge rearwardly offset from the cutting edge of the blade adjacent the base member, the offset position of the blade being maintained by the abutment 35 surfaces.

3. A blade unit according to claim 2, in which openings through the blades for the passage of securing means are sufficiently large so that blades of the same form can 40 be used in either of the offset positions.

4. A blade unit according to any one of the preceding claims, in which the abutment surfaces are on forwardly extending projections at each side of the cap member.

45 5. A blade unit according to any one of the preceding claims, in which the passages to the exterior of the unit are formed in one of the members of the unit.

50 6. A blade unit according to claim 5, in which the base member and the blade adjacent thereto have aligned unobstructed openings forming the passages to the exterior of the unit.

7. A blade unit according to any one of the preceding claims, in which each spacer 55 finger comprises a forward edge from which wall surfaces extend rearwardly and outwardly to the main body of the spacer member, and top and bottom surfaces constituting extensions of the corresponding surfaces 60 of the spacer member.

8. A blade unit according to claim 6, in which the top surface of the finger is of less area than the bottom surface.

9. A blade unit according to any one 65 of the preceding claims, including openings providing access to the blades from the outside of the unit for moving them to their proper positions against the abutment surfaces. 70

10. A blade unit according to any one of the preceding claims, in which a guard portion of the base member is separated from the remainder of said member by a slot, and the blade adjacent to the base 75 member extends over part of said slot.

11. A blade unit according to any one of the preceding claims, in which the means for the permanent mounting of the blades comprises pins on one of the cap and base 80 members extending through holes in the blades and corresponding holes in the other of said members.

12. A blade unit according to claim 11, in which the ends of the pins are expanded 85 to effect the permanent mounting.

13. A blade unit according to any one of the preceding claims, in which the spacer member is of metal.

14. A blade unit according to any one 90 of the preceding claims, in which the base and cap members are of molded plastic material.

15. A razor blade unit according to claim 1 substantially as hereinbefore de- 95 scribed with reference to and as illustrated in the accompanying drawings.

A. A. THORNTON & CO.

Chartered Patent Agents,

Northumberland House,
303-306 High Holborn,
London, W.C.1.



relation to one another and a guard surface disposed forwardly of the cutting edge of the leading blade to provide a leading edge tangent angle in the range of 20-32° and a span (S_L) in the range of 0.030-0.080 inch, the cutting edge of the following blade being rearwardly offset from the leading cutting edge to define a span (S_F) of similar extent, and each cutting edge having an exposure from -0.002 inch to +0.004 inch.

WHAT WE CLAIM IS:—

1. A razor blade unit comprising two elongated blades permanently mounted in fixed superposed parallel position between cap and base members and with a spacer member between the blades, said spacer member having transversely spaced fingers extending forwardly in the direction of the cutting edges of the blades which edges are parallel and face in the same direction to permit simultaneous hair cutting engagement, and aligning abutment surfaces adapted to be engaged by the cutting edges of the blades, the spaces between the fingers of the spacer member providing access to passages through the blade unit and extending to the exterior thereof.

2. A blade unit according to claim 1, in which the blade adjacent the cap member has its cutting edge rearwardly offset from the cutting edge of the blade adjacent the base member, the offset position of the blade being maintained by the abutment surfaces.

3. A blade unit according to claim 2, in which openings through the blades for the passage of securing means are sufficiently large so that blades of the same form can be used in either of the offset positions.

4. A blade unit according to any one of the preceding claims, in which the abutment surfaces are on forwardly extending projections at each side of the cap member.

5. A blade unit according to any one of the preceding claims, in which the passages to the exterior of the unit are formed in one of the members of the unit.

6. A blade unit according to claim 5, in which the base member and the blade adjacent thereto have aligned unobstructed openings forming the passages to the exterior of the unit.

7. A blade unit according to any one of the preceding claims, in which each spacer finger comprises a forward edge from which wall surfaces extend rearwardly and outwardly to the main body of the spacer member, and top and bottom surfaces constituting extensions of the corresponding surfaces of the spacer member.

8. A blade unit according to claim 6, in which the top surface of the finger is of less area than the bottom surface.

9. A blade unit according to any one of the preceding claims, including openings providing access to the blades from the outside of the unit for moving them to their proper positions against the abutment surfaces.

10. A blade unit according to any one of the preceding claims, in which a guard portion of the base member is separated from the remainder of said member by a slot, and the blade adjacent to the base member extends over part of said slot.

11. A blade unit according to any one of the preceding claims, in which the means for the permanent mounting of the blades comprises pins on one of the cap and base members extending through holes in the blades and corresponding holes in the other of said members.

12. A blade unit according to claim 11, in which the ends of the pins are expanded to effect the permanent mounting.

13. A blade unit according to any one of the preceding claims, in which the spacer member is of metal.

14. A blade unit according to any one of the preceding claims, in which the base and cap members are of molded plastic material.

15. A razor blade unit according to claim 1 substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

A. A. THORNTON & CO.

Chartered Patent Agents,

Northumberland House,
303-306 High Holborn,
London, W.C.1.