

[54] **SHAVING UNIT FOR SAFETY RAZOR**

478,290 2/1953 Italy 30/346.57

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[51] Int. Cl. **B26b 21/54, B26b 21/22**

[58] Field of Search **30/50, 346.57, 346.58, 30/346.59**

[56] **References Cited**

UNITED STATES PATENTS

1,975,757 10/1934 Gray 30/346.57 X

FOREIGN PATENTS OR APPLICATIONS

772,532 4/1957 Great Britain 30/50

Primary Examiner—Al Lawrence Smith

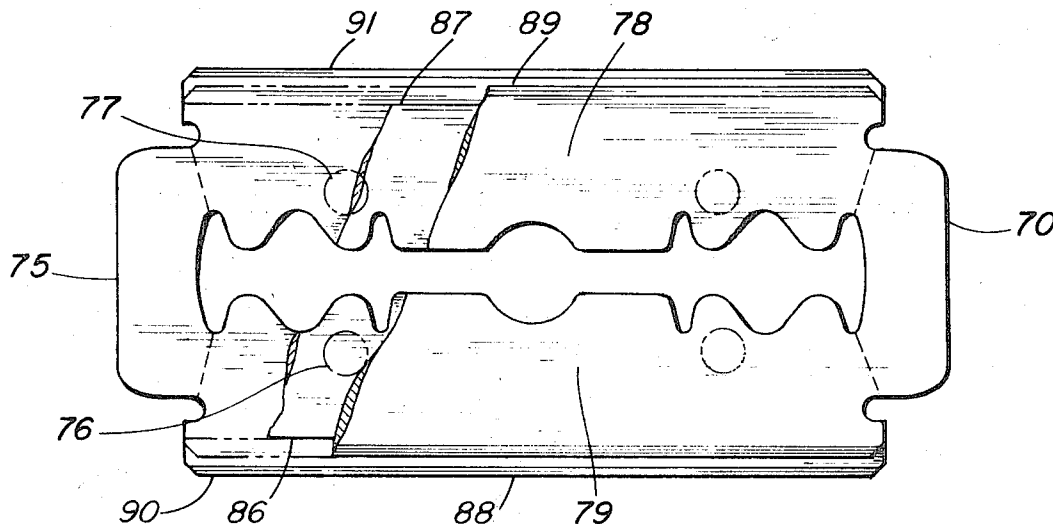
Assistant Examiner—Gary L. Smith

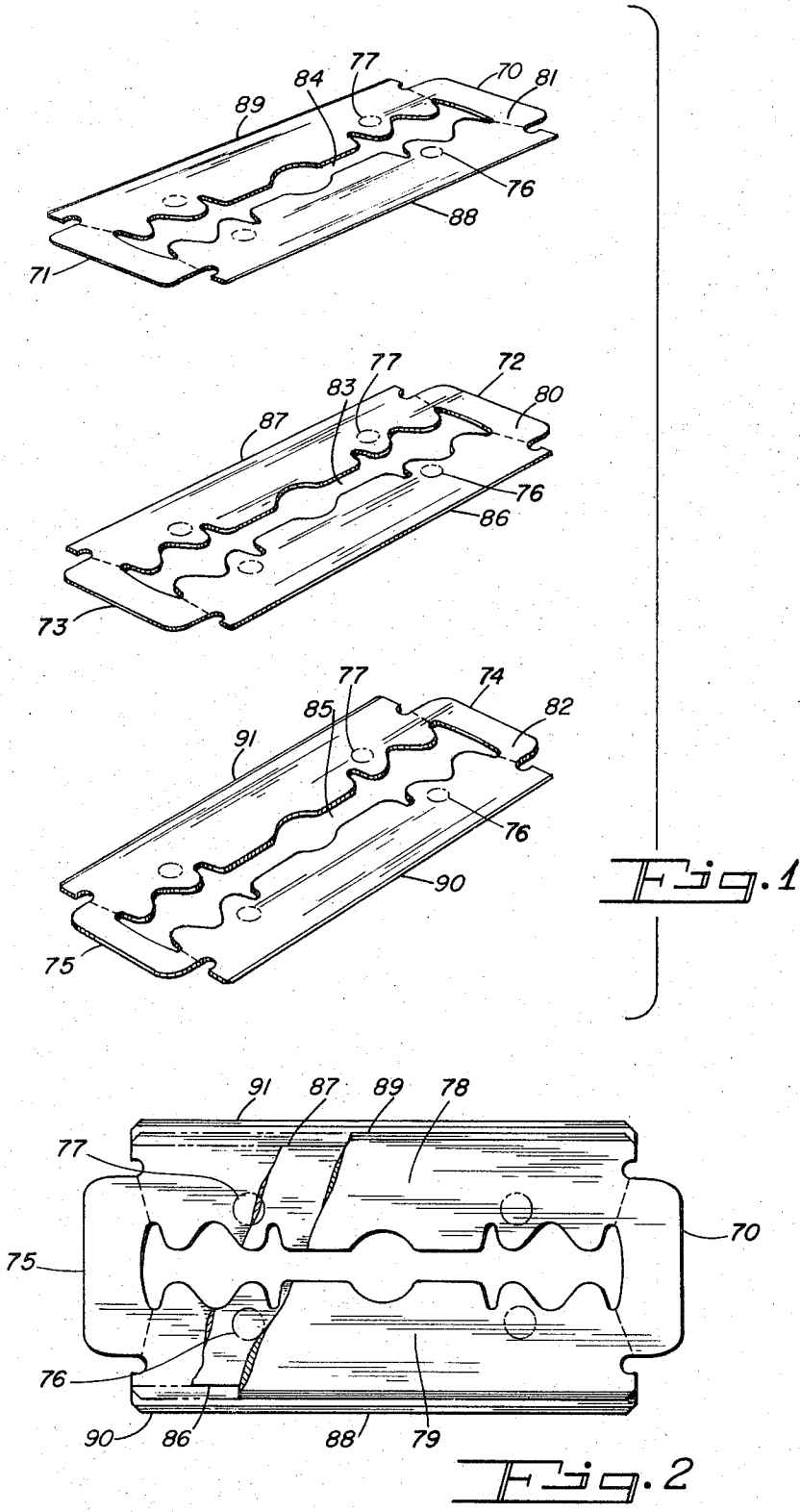
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[57] **ABSTRACT**

The specific disclosure provides a shaving unit having two superimposed double edge razor blades with the cutting edges of the top blade being set back a slight distance from the cutting edges of the bottom blade. An elongated slot extends through the blades for locating the shaving unit in a double edge safety razor. Means are provided between the aperture and the cutting edges to each side of the aperture for permanently connecting the blades together. In one embodiment, a spacer is permanently positioned between the blades.

14 Claims, 4 Drawing Figures





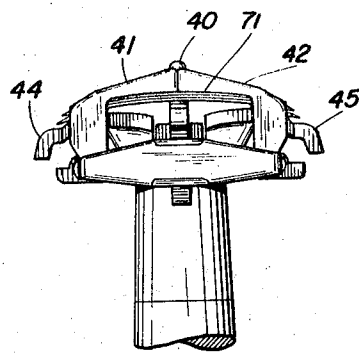


Fig. 3

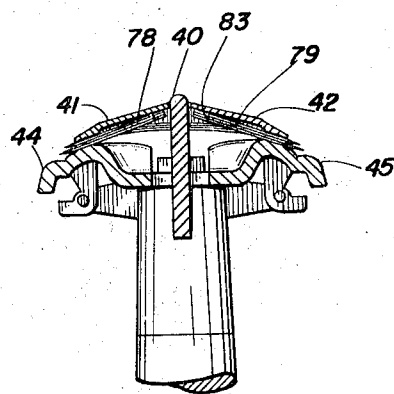


Fig. 4

SHAVING UNIT FOR SAFETY RAZOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to shaving units having a plurality of cutting edges for use in a safety razor. More particularly, the present invention relates to safety razor shaving units having a plurality of double cutting edge members bonded together.

2. Description of the Prior Art

Double edge safety razors are well known in the art, and are in many forms. For example, U.S. Pat. Nos. 3,293,745, 3,466,746 and 3,708,879 disclose a razor having sectional caps, an adjustable razor and a razor having a hinged cap, respectively. Such razors act to clamp a thin, flexible double edge razor blade in the razor head with each cutting edge oriented with respect to a guard bar surface.

U.K. Pat. No. 772,532 discloses a shaving unit having two double edge razor blades which are vertically separated by a flexible spacer. The cutting edges of the top blade are set back a slight distance from the cutting edges of the bottom blade to provide tandemly arranged cutting edges on each side of the shaving unit.

U.K. Pat. No. 772,532 contemplates welding the blades and spacer together, and, at Page 3, lines 98-100, specifically teaches welding the spacer near its elongated ends.

Commercially available flexible steel double edge razor blades having an elongated central slot parallel to the cutting edges are arcuately flexed at tab portions at each end of the slot when firmly seated in double edge razors having manually operated mechanisms for opening and closing the cap portion. However, as shown in FIG. 4 of U.S. Pat. No. 3,708,879, the portions of the razor blade between the slot and the cutting edges are substantially flat.

Welding metal increases grain size of the metal about the weld, and the corrosion rate about the weld is high. When double edge razor blades are welded together at the tab portions, and the tab portions are thereafter arcuately bent in a razor as specifically taught in U.K. Pat. No. 772,532, a danger of stress-corrosion cracking is raised. Stress-corrosion cracking is failure by cracking under combined corrosion and applied and/or residual stress.

SUMMARY OF THE INVENTION

In accordance with a broad aspect of the present invention, there is provided a shaving unit for a double edge safety razor comprising a first member having a pair of opposite cutting edge sides. A second member also having a pair of opposite cutting edge sides is positioned above the first member with the cutting edges of the second member being set back a slight distance from the cutting edges of the first member. A transversely elongated aperture vertically extends through the shaving unit for locating the shaving unit in the safety razor. Means are provided between the aperture and the cutting edges on each side of the aperture for permanently connecting the first and second members together.

In accordance with a specific aspect of the present invention, the second member is connected directly to the first member.

In accordance with another specific aspect of the present invention, means are provided between the first member and the second member for vertically spacing the first and second members.

A shaving unit constructed in accordance with the present invention minimizes the stress-corrosion cracking problem by bonding the components of the shaving unit at surfaces which are at least substantially flat when the unit is seated in the razor. Further, bonding in accordance with the present invention prevents relative movement between the tandemly arranged cutting edges when the unit is seated in a razor.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of an embodiment of a shaving unit constructed in accordance with the present invention;

FIG. 2 is a top plan view of the shaving unit of FIG. 1 with portions of the component parts of the shaving unit cut away;

FIG. 3 is a side elevational view of the shaving unit of FIG. 1 seated in a sectional capped razor; and

FIG. 4 is a side cross-sectional view of the razor of FIG. 3.

DESCRIPTION OF SPECIFIC EMBODIMENTS

With reference to FIGS. 1 and 2, one representative embodiment of the present invention has first and second members **82, 81** in the form of double cutting edge razor blades, and means in the form of a spacer element **80** for vertically spacing the second member **81** from the first member **82**. The blades **81, 82** and the spacer element **80** are permanently connected together by a pair of welds **76, 77** diagrammatically represented by dashed circles on each side of transversely elongated apertures **83-85** formed in the spacer element **80** and the blades **81, 82**.

As clearly shown in FIG. 2, the cutting edges **88, 89** of the top blade **81** are set back a slight distance from the cutting edges **90, 91** of the bottom blade **82**. The cutting edges **88, 89** on opposite sides of the top blade are parallel to the cutting edges **90, 91** on opposite sides of the bottom blade **82**.

The spacer element **80** has a pair of blunt surfaces **86, 87** set back a slight distance from the cutting edges **88, 89** of the top blade **81**.

The apertures **83-85** extend between end tab portions **72, 73; 70, 71; 74, 75** of the spacer element **80** and the blades **81, 82**.

FIGS. 3 and 4 show the shaving unit seated and clamped in a double edge safety razor having a center-bar and stem assembly **40**. The center-bar and stem assembly **40** is fitted through the apertures **83-85** to locate the shaving unit in the razor. A pair of sectional caps **41, 42** act to bias the shaving unit on a blade seat with the cutting edges of the blades **81, 82** tandemly arranged with respect to guard bar surfaces **44, 45** formed on the outer ends of the blade seat.

FIG. 3 illustrates the arcuately bent mode of the tab portions **70-75** when the shaving unit is firmly seated in the razor. FIG. 4 shows the shaving unit portions **78, 79** between the tabs **70-75** in a flat state.

The blades **81, 82** and the spacer element **80** can be composed of thin martensitic stainless steel commonly used for razor blades, or of any other flexible material suitable for double edge razor blades. The thickness of the blades **81, 82** and of the spacer **80** can be 0.0039

inches. The distance between the cutting edges of the top blade **81** can suitably be 0.832 inches when the distance between the cutting edges of the bottom blade is 0.870 inches. The distance between the blunt surfaces **86, 87** of the spacer element **80** can be 0.780 inches. The shaving unit can be welded anywhere on the flat shaving unit portions **78, 79** between the tabs **71, 73, 75; 70, 72, 74**, but sufficiently inwardly of the top blade cutting edges **88, 89** to avoid adversely affecting the cutting edges **88, 89**. A suitable position for the welds is 0.156 inches from the transverse center line of the unit.

The components of shaving units can be bonded together by spot, projection, arc, laser or other welding techniques. The flat shaving unit portions **78, 79** can alternatively be bonded together by adhesives.

The embodiment shown in the figures has symmetrically beveled surfaces forming the cutting edges of the blades **81, 82**. However, it is contemplated that the acute angle of the beveled cutting edge surfaces of the blades **81, 82** immediately adjacent to the spacer element **80** can be increased with respect to the horizontal plane of the spacer element **80** to increase the vertical distance between the cutting edges of the blades **81, 82**. This alternative embodiment is particularly suitable for another contemplated alternative embodiment wherein the spacer element is eliminated and the two blades are bonded directly to each other at the flat portions between the tabs.

The present invention further contemplates more than two double edge razor blades with the cutting edges on each side of the unit tandemly arranged.

What is claimed is:

1. A shaving unit for a double edge safety razor, said shaving unit comprising:
 - a. a first flexible member including a pair of transversely extending opposite sides, each one of the first member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said first member;
 - b. a second flexible member including a pair of transversely extending opposite sides, each one of the second member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said second member, said second member being positioned above said first member with the cutting edges of said second member being positioned upwardly and outwardly of the cutting edges of said first member;

- c. a transversely elongated aperture between said tabs of said first member and said second member and vertically extending through said shaving unit for locating said shaving unit in said safety razor; and
 - d. means solely between said aperture and the cutting edges to each side of said aperture for permanently connecting said first member and said second member together;
 - e. whereby said first member and said second member are connected together at substantially flat surfaces, and said tabs are curved when said unit is seated in said safety razor.
2. The shaving unit of claim 1 further comprising means between said first member and said second member for vertically spacing said second member from said first member.
 3. The shaving unit of claim 2 wherein said flexible connecting means comprises means for bonding said spacing means to said first member and to said second member.
 4. The shaving unit of claim 3 wherein the cutting edges of said first member and said second member are parallel.
 5. The shaving unit of claim 4 wherein said first and second members are flexible, metallic members.
 6. The shaving unit of claim 5 wherein said spacing means is a flexible, metallic element.
 7. The shaving unit of claim 6 wherein said connecting means comprises a plurality of spot welds.
 8. The shaving unit of claim 6 wherein said first and second members are double cutting edge safety razor blades.
 9. The shaving unit of claim 1 wherein said connecting means comprises means for bonding said second member directly to said first member.
 10. The shaving unit of claim 9 wherein the cutting edges of said first member and said second member are parallel.
 11. The shaving unit of claim 10 wherein said first and second members are flexible, metallic members.
 12. The shaving unit of claim 11 wherein said connecting means comprises a plurality of spot welds.
 13. The shaving unit of claim 12 wherein said first and second members are double cutting edge safety razor blades.
 14. The shaving unit of claim 1 wherein said first and second members are double cutting edge safety razor blades.

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