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Kuhnl

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[54] **ADJUSTABLE RAZOR BLADE CARTRIDGE**

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[73] Assignee: **Warner-Lambert Company,** Morris Plains, N.J.

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[52] **U.S. Cl.** **30/47,** 30/32, 30/63

[51] **Int. Cl.** **B26b 21/16,** B26b 21/06

[58] **Field of Search** 30/47, 60–63, 30/71–73, 77, 81, 83, 32

[56] **References Cited**

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895,997	8/1908	Flagg	30/61 X
2,799,926	7/1957	Shaylor	30/63
3,111,756	11/1963	Kruger	30/63
3,128,551	4/1964	Crown	30/63
3,388,831	6/1968	Hansom	30/63 X
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FOREIGN PATENTS OR APPLICATIONS

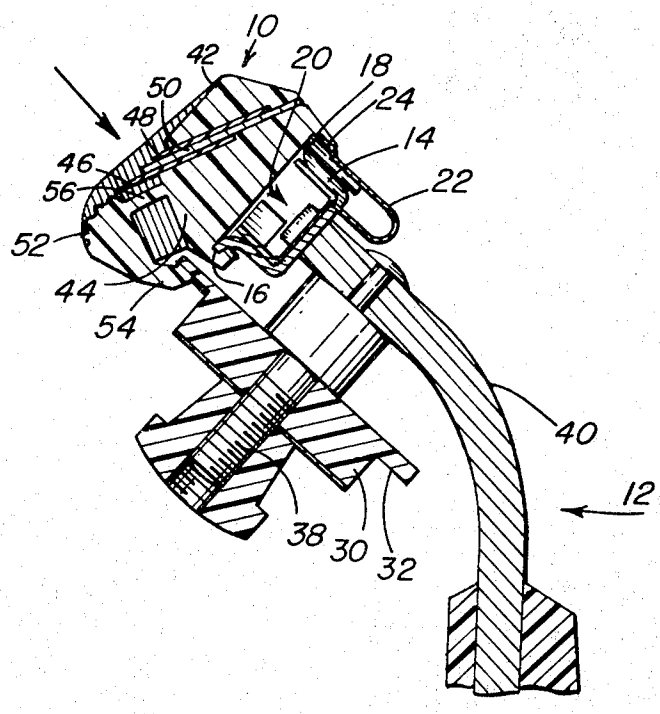
595,799	12/1947	Great Britain	30/63

Primary Examiner—Al Lawrence Smith
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Attorney, Agent, or Firm—James F. Powers, Jr.; Albert H. Graddis

[57] **ABSTRACT**

The specific disclosure provides a safety razor system comprising a cartridge having at least one single cutting edge blade and a guard member having a transverse blade guard surface, and a handle including means for releasably engaging the cartridge. The system also includes means for movably supporting the guard member on the cartridge, and means connected to the handle for engaging the guard member to adjust the guard surface with respect to the cutting edge of the blade.

6 Claims, 9 Drawing Figures



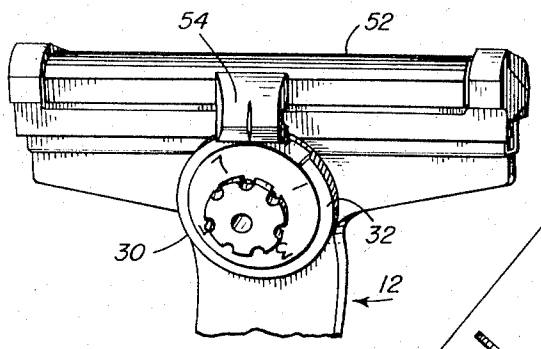


Fig. 1

Fig. 2

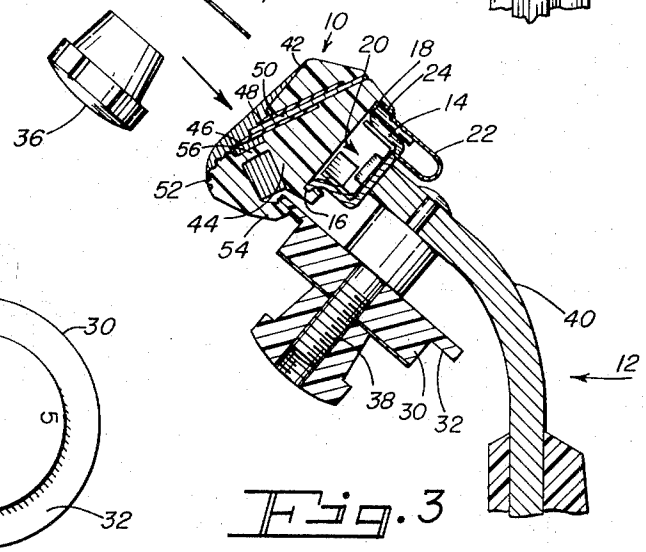


Fig. 3

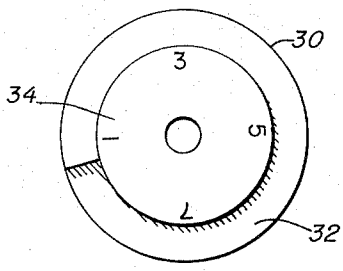


Fig. 4

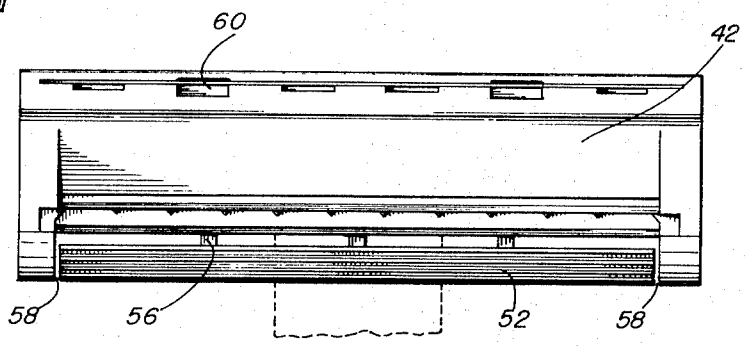


Fig. 5

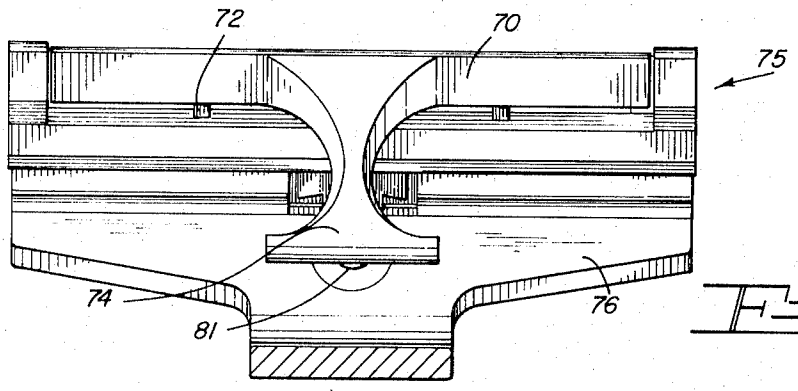


Fig. 6

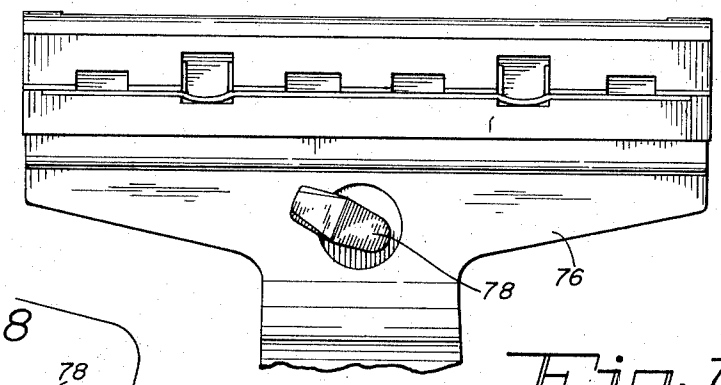
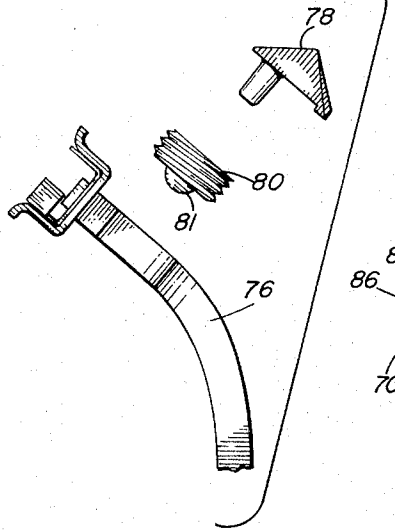


Fig. 7

Fig. 8



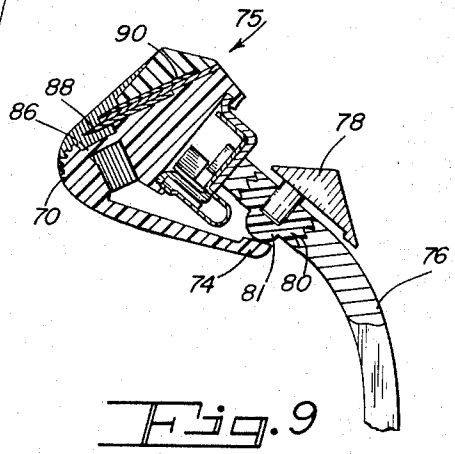


Fig. 9

ADJUSTABLE RAZOR BLADE CARTRIDGE

BACKGROUND OF THE INVENTION

The present invention relates to safety razors of the type having at least one blade permanently bonded in a disposable and replaceable cartridge.

It is known to permanently bond a blade in a disposable and replaceable cartridge. For example, U.S. Pat. Nos. 1,864,995 and 3,388,831 each disclose a razor system having a blade permanently bonded in a disposable and replaceable cartridge. Typically, a safety razor has a guard surface situated downwardly and outwardly from the cutting edge of a blade and parallel to the cutting edge. The guard surface may be of the comb variety such as shown in U.S. Pat. No. 1,864,995, or may be formed by an outer surface of an elongated guard bar such as shown in U.S. Pat. No. 3,388,831. The cartridges disclosed in the foregoing patents have factory-set shave angles which are defined by the relationship between a blade cutting edge and a guard surface.

SUMMARY OF THE INVENTION

The present invention is directed to a safety razor system wherein the shave angle is adjustable to meet a need or preference of a user.

In accordance with the present invention, there is provided a safety razor system comprising a cartridge including at least one single cutting edge blade bonded thereto and a guard member having a transverse blade guard surface. The system also comprises a handle having means for releasably engaging the cartridge. Means are provided for movably supporting the guard member on the cartridge, and means are connected to the handle for engaging the guard member to adjust the guard surface with respect to the cutting edge of the at least one blade.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an upper end of a razor system showing one embodiment of the present invention;

FIG. **2** is an exploded view in side elevation of the razor system of FIG. **1**;

FIG. **3** is a cross-sectional view of the system shown in FIG. **1**;

FIG. **4** is a front elevation view of a cam member used in the embodiment of FIG. **1**;

FIG. **5** is an elevation view of the system taken along the arrow of FIG. **3**;

FIG. **6** is a view of an underside of an upper portion of another razor system embodiment in accordance with the present invention;

FIG. **7** is a rear elevation view of the upper portion of the system of FIG. **6**;

FIG. **8** is an exploded view in side elevation of the upper portion of a handle used in the embodiment of FIG. **6**; and

FIG. **9** is a sectional view of the embodiment of FIG. **6**.

DESCRIPTION OF SPECIFIC EMBODIMENTS

With reference to FIGS. **1** through **5**, a disposable and replaceable cartridge **10** is releasably secured to a handle or holder **12**. The holder **12** has a transverse generally U-shaped channel member **14** at the upper end thereof, and the member **14** has flange portions **16, 18** for sliding engagement in a T-shaped channel **20** formed in the underside of the cartridge **10**. The holder **12** also has a spring member **22** for biasing a detent portion **24** at the upper end of the spring into a notch (not shown) formed in the T-shaped channel **20**.

The cartridge **10** comprises a pair of single edge blades **46, 48** separated by a spacer **50** which are sandwiched between a cap member **42** and a blade seat member **44**. The spacer **50** can have a plurality of channels (not shown) extending from between the cutting edges of the blades **46, 48** to ports **60** for passage of shaving residue from between the blades.

An elongated serrated guard bar **52** is spaced forwardly and downwardly from the cutting edges of the blades **46, 48** by a plurality of ribs **56**. Each end of the guard bar **52** is spaced a slight distance at **58** from the blade seat member **44**. The guard bar **52** has a cam follower member **54** extending downwardly therefrom.

A cam member **30** is mounted on a frame **40** of the holder **12** by means of a threaded bolt **38** which is rigidly secured to the cam member **30** and to a knob **36**. The cam member **30** has a cam surface **32** for abutting engagement with the cam follower member **54**.

The cap and blade seat members **42, 44** are formed of moldable plastic. The guard bar **52** and the ribs **56** are molded integrally with the blade seat member **44** such that the cam follower member **54** is arcuately biased into abutting engagement with the cam surface **32**. Thus, rotary movement of the cam member **30** by means of the knob **36** causes the guard bar **52** to move with respect to the cutting edges of the blades **46, 48** to thereby adjust the shave angle of the cartridge **10**. A plate **34** having numerals radially displayed thereon is provided to give a user an indication of the shave angle setting of the cartridge **10**.

FIGS. **6** through **9** show an alternative embodiment wherein a cartridge **75** constructed in the manner described hereinabove with respect to FIGS. **1** through **5** has a follower member **74** integrally formed with a guard bar **70** which, in turn, is pivotally mounted to the cartridge **75** by a plurality of ribs **72**. A finger grip **78** is rigidly secured to a threaded insert **80** having a boss **81** in abutting engagement with the follower member **74**. The follower member **74** is molded such that it is biased into abutting engagement with the boss **81**. Rotary movement of the finger grip **78** causes the threaded insert **80** to move perpendicularly with respect to the frame **76** to thus move the guard bar **70** with respect to the cutting edges of blades **88, 90** and thereby adjust the shave angle of the cartridge **75**.

As used herein, the front or forward end of the cartridge **10**; **75** and/or the holder **12** is that end having the guard bar **52**; **70**. Thus, transverse is used herein to identify a side-to-side direction that is at least substantially parallel to the guard bar **52**; **70**.

What is claimed is:

1. In a safety razor system comprising a cartridge including at least one single cutting edge blade bonded thereto and a guard member having a transverse blade guard surface, and a holder adapted to releasably engage said cartridge, the improvement comprising:

means for movably supporting said guard member on said cartridge,

said guard member including a cam follower, and

a cam mounted on said holder and including a cam surface for abutting engagement with said cam follower when said cartridge is engaged by said holder, said cam surface being disengaged from

said cam follower when said cartridge is disengaged from said holder,

said cam being manually operable for adjusting said guard surface with respect to the cutting edge of said at least one blade.

2. The system of claim **1** wherein said supporting means comprises plastic structure molded for biasing said cam follower into abutting engagement with said cam surface.

3. The system of claim **1** wherein said cam follower is biased into abutting engagement with said cam surface.

4. The system of claim **1** wherein said cam surface is a helical cam surface.

5. In a safety razor system comprising a cartridge including at least one single cutting edge blade bonded thereto and a guard member having a transverse blade guard surface, and a holder adapted to releasably engage said cartridge, the improvement comprising:

means for movably supporting said guard member on said cartridge, and

a manually operable member threadedly mounted on said holder for abutting engagement with a portion of said guard member to adjust said guard surface with respect to the cutting edge of said at least one blade when said cartridge is engaged by said holder, said manually operable member being disengaged from said guard member portion when said cartridge is disengaged from said holder.

6. The system of claim **5** wherein said supporting means comprises plastic structure molded for biasing said portion of said guard member into abutting engagement with said member.

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