May 14, 1968 R. L. KARR 3,382,576

SAFETY RAZOR WITH ADJUSTABLE GUARDS

Filed April 11, 1966 2 Sheets-Sheet 1

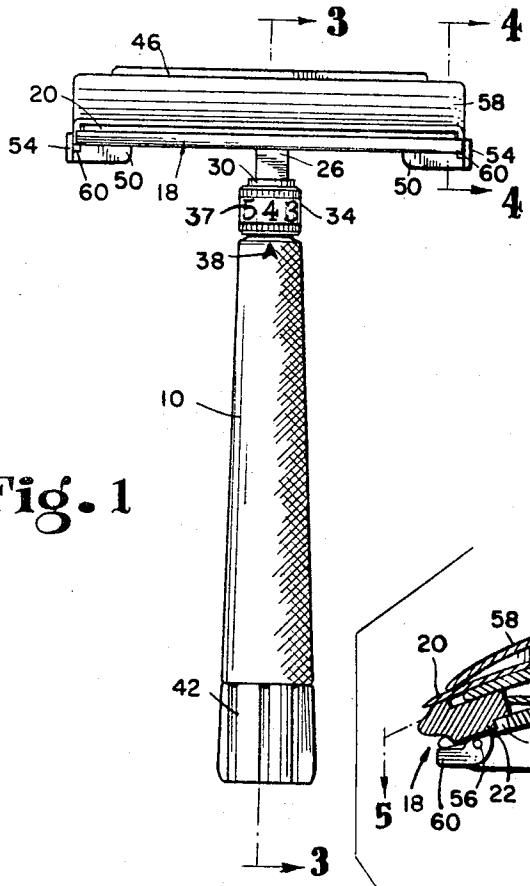


Fig. 1

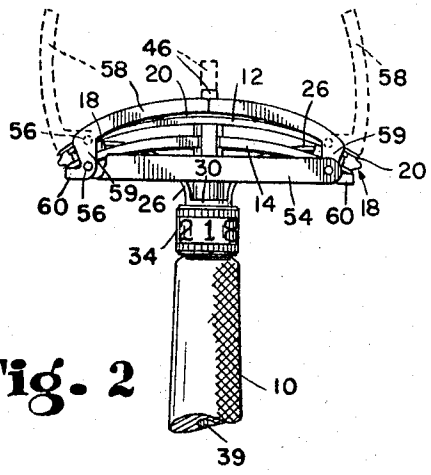


Fig. 2

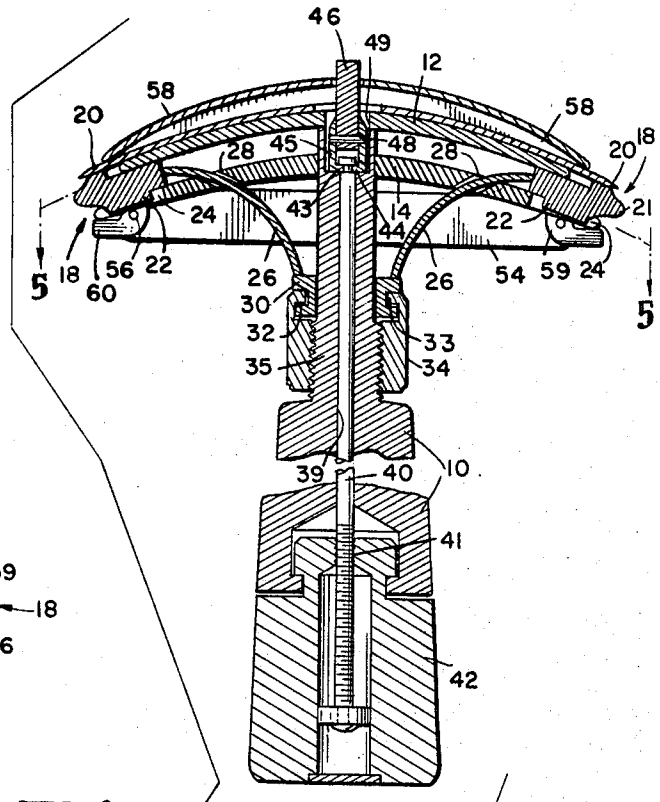


Fig. 3

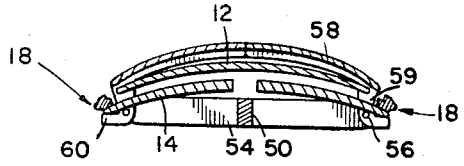


Fig. 4

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SAFETY RAZOR WITH ADJUSTABLE GUARDS

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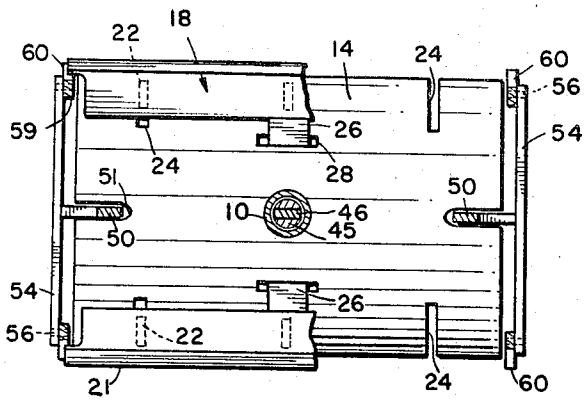


Fig. 5

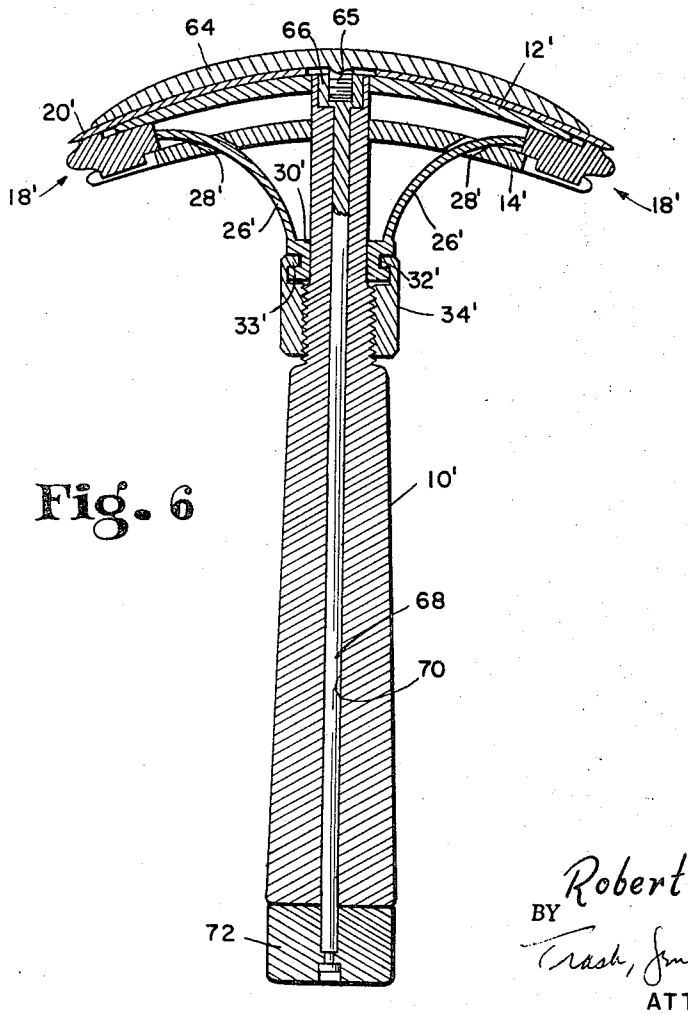


Fig. 6

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SAFETY RAZOR WITH ADJUSTABLE GUARDS

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6 Claims. (Cl. 30—60.5)

ABSTRACT OF THE DISCLOSURE

A safety razor having a pair of vertically spaced plates mounted on a handle with a pair of laterally movable guards carried therebetween. Means are provided for mounting a blade on one of said plates and means are also provided for moving said guards laterally outwardly and inwardly with respect to said plates and blade for controlling the exposure of the blade edges.

This invention relates to a safety razor, and more particularly to an adjustable safety razor for use with double edged blades.

It is an object of the invention to provide a safety razor which can be easily adjusted for adjusting the blade edge exposure, which can effect such adjustment without changing the blade angle, and which can be easily manipulated for cleaning and blade changing.

In accordance with the preferred form of the invention, there is provided a handle having a pair of vertically spaced plates mounted on its upper end; the upper one of said plates being adapted to support a conventional double edged blade thereon. A pair of guards are slidably received between said pair of plates and project laterally outwardly from between a pair of opposed edges on said plates to support the edges of the blade. Each of said guards is connected by a flexible strip projecting through the lower one of said pair of plates to a sleeve vertically movable on the handle. Thus, movement of said sleeve along the handle will cause the strips to move the guards outwardly or inwardly with respect to said pair of plates for adjusting the exposure of the blade edges.

A blade guide extends longitudinally of the upper plate for locating the blade thereon. Said guide is connected at its ends to a pair of pivot bars disposed at the ends of the razor and pivotally supporting a pair of opposed cover plates movable between an operative position overlying the upper plate for holding the blade thereon and a retracted position projecting upwardly from said upper plate. Means are provided on the handle for effecting movement of the blade guide and pivot bars with respect to the pair of plates for moving the pivotal connections of the cover plates to said pivot bars. Each of the cover plates is provided with crank means engageable with the guards to cause the cover plates to move between their operative and retracted positions upon such movement of the pivot bars with respect to said pair of plates.

Other objects and features of the invention will become apparent from the more detailed description which follows and from the accompanying drawings, in which:

FIG. 1 is an end elevation of a razor embodying the invention;

FIG. 2 is a fragmentary end elevation of the razor shown in FIG. 1;

FIG. 3 is an enlarged fragmentary vertical section taken on the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary vertical section taken on the line 4—4 of FIG. 1;

FIG. 5 is a horizontal section taken on the line 5—5 of FIG. 3; and

FIG. 6 is a fragmentary vertical section similar to FIG. 3 but showing a modified form of the invention.

As shown, my razor comprises an elongated handle **10** fixedly connected at its upper end to a pair of rectangular vertically spaced plates **12** and **14** having slightly arcuate cross-sections. A pair of elongated guards **18** are slidably carried between the plates **12** and **14** and project laterally outwardly from between said plates to support the cutting edges of a conventional razor blade **20** carried on the plate **12** with its cutting edges projecting beyond the longitudinal edges of said plate. The guards project longitudinally beyond the plates **12** and **14**, and, as shown in FIG. 3, have their outer longitudinal edges rounded and their outer faces shouldered, as at **21**. The upper and lower faces of the guards **18** are disposed in sliding engagement with the lower and upper faces of the plates **12** and **14**, respectively. Conveniently, a plurality of keys **22** are formed on the lower faces of the guards and are received in slightly longer keyways **24** formed in the plate **14** for guiding and limiting the sliding movements of guards with respect to the plates **12** and **14**.

In order to move the guards laterally inwardly and outwardly, each guard is connected, along its inner edge, to an arcuate strip **26** of spring steel projecting downwardly through a slot **28** formed in the plate **14**. The lower ends of the strips **26** are connected to a sleeve **30** vertically slidable along the outer circumference of the handle **10**. A circumferential groove **32** is formed in the sleeve **30** to receive the inwardly projecting finger **33** on a collar **34** threadably connected to a threaded section **35** of the outer handle face. Thus, rotation of the collar **34** to move the sleeve **30** upwardly on the handle will cause the strips **26** to move the guards **18** outwardly with respect to the plates **12** and **14** to thus reduce the amount of the blade cutting edges that are exposed. Conversely, rotation of the collar **34** to move the sleeve downwardly will cause the strips **26** to move the guards **18** inwardly to increase the exposure of the cutting edges of the blade. During any such adjusting movements, the guards will be guided by the keys and keyways **22** and **24** and by the strips **26** moving the slots **28**.

Desirably, in order to prevent any rotation of the collar **34** from being transmitted through the sleeve **30** to the strips **26**, said sleeve and the handle are provided with mating flattened faces to thus prevent the sleeve from rotating about said handle. The lateral displacement of the guards with respect to the plates **12** and **14** is measurable by circumferentially spaced indicia **37** on the outer face of the collar **34** which register with a reference point **38** on the handle immediately below said collar.

The handle is provided with an axially extending opening **39** in which an elongated rod **40** is rotatably carried. Said rod is threadably connected, as at **41**, to an adjustment knob **42**, rotatably mounted on the lower end of the handle **10**, whereby rotation of said knob will cause the rod **40** to move vertically with respect to the handle. As shown in FIG. 3, the upper end of the rod **40** is provided with an annular groove **43** in which inwardly directed flanges **44** on a pair of opposed mating clamps **45** are received. Said clamps project upwardly from the rod **40** on opposite sides of a blade guide **46** and are fixedly con-

nected to said guide by a pin **48**. As shown in FIG. 3, the plate **12** is provided with an opening **49** for reception of the clamps **45**, and the guide **46** projects upwardly above said plate and extends longitudinally thereof for reception in the central slot of the blade **20** for locating said blade on the plate.

A pair of downwardly projecting arms **50** at the ends of the guide are slidably carried in slots **51** in plates **12** and **14** and are connected to a pair of pivot bars **54** disposed outwardly from the ends of said plates. Each of the bars **54** is connected by pins **56** to the adjacent ends of a pair of opposed cover plates **58**. As shown in FIG. 4, the cover plates are provided at their opposed ends with downwardly projecting cranks; each comprising a vertical arm **59** through which one of the pins **56** extends and an outwardly projecting horizontal arm **60** receivable under an adjacent guard **18**. Thus, rotation of the knob **42** to move the rod **40** downwardly as viewed in FIG. 3 causes the guide **46** and pivot bars **54** to move downwardly pulling the cover plates **58** downwardly into an operative position against blade **20** for retaining said blade in a fixed position against plate **12**. In this operative position, the adjacent ends of cover plates **58** will be disposed around the guide **46** projecting upwardly through the central blade opening. Rotation of the knob **42** to move the guide **46** and pivot bars **54** upwardly as viewed in FIG. 3 raises the pivot pins **56** in a like direction to cause the crank arms **60** to engage the guards **18**. With the crank arms **60** engaging the guards **18**, further upward movement of the pivot bars will cause the cover plates **58** to swing upwardly and outwardly into their retracted positions as shown in dotted lines in FIG. 2 to permit removal of the blade **20** and/or cleaning of the razor.

To insert a new blade into the razor, it is merely necessary to move the cover plates **58** into their retracted position and lay a new blade on the plate **12** with the guide **46** projecting through the central blade opening. The knob **42** is then rotated to pull the guide **46** and pivot bars **54** downwardly whereupon the crank arms **60** engage the guards **18** to swing the cover plates inwardly over the blade. Further downward movement of the pivot bars **54** pulls said cover plates downwardly into binding engagement with the upper blade face for releasably locking it in position on the plate **12**. Any desired adjustment of the blade edge exposure can then be effected by merely rotating the collar **34**.

The embodiment of my invention shown in FIG. 6 differs from the emobdiment shown in FIGS. 1–5 only in the method of releasably locking the blade in the razor. Thus, as shown in FIG. 6, the handle **10'** is connected at its upper end to the vertically spaced plates **12'** and **14'**. The pair of guards **18'** are slidably carried between said plates and project laterally outwardly between their opposed lateral edges for supporting the cutting edges of the blade **20** supported on the plate **12'**. The guards **18'** are connected by flexible strips **26'** projecting through openings **28'** in the plate **14'** for connection to a sleeve **30'** vertically slidable on the handle **10'**. Vertical movement of the sleeve is effected by the collar **34'** threadably connected to the handle and provided with a lip **33'** received in a groove **32'** extending around said sleeve.

In order to retain the blade **20'** on the plate **12'** a cap **64** having the same curvature as said plate is received thereover. A threaded stud **65** for locating the blade in the razor and connecting the cap **64** to the razor is provided on said cap. Said stud projects downwardly through the central opening in the blade and is received in a threaded socket **66** rotatably carried in the upper end of the handle **10'**. The socket **66** is connected to a rod **68** carried in an axially extending opening **70** in the handle **10'**. The lower end of the rod is connected to a knob **72** rotatably carried at the lower end of the handle.

Thus, to put a blade in the razor, said blade is placed

on the plate **12'** and the cap **64** is placed over said blade with its stud projecting through the central blade opening for reception in the socket **66**. The knob **72** is then rotated to rotate the rod **68**. As said rod is rotated, it will remain in a fixed axial position in the shaft, but its rotation will cause the socket **66** to draw the stud **65** and thus the cap **64** downwardly so that said cap will bind against the blade and releasably lock it in position on the plate **12'**. The cap can be removed for removing the blade by merely reversing this sequence. With the blade in position on the plate **12'** any desired adjustment of the blade edge exposure can be effected by merely rotating the collar **34'** in the manner described in the embodiment shown in FIGS. 1–5.

I claim:

1. A safety razor, comprising a handle, a pair of vertically spaced plates fixedly connected to said handle, a pair of guards slidably interposed between said pair of plates, adjustment means movable axially along said handle, flexible connector means interconnecting said guards and adjustment means for simultaneously moving said guards laterally outwardly or inwardly along a pair of opposed sides of said pair of plates upon axial movement of said adjustment means along the handle, means on said guards and at least one of said plates for guiding the lateral movements of said guards, and means releasably retaining a blade on the upper one of said pair of plates with its cutting edges overlying said pair of guards.

2. A safety razor as set forth in claim **1** in which said adjustment means comprises a sleeve connected to said connector means and axially slidable along said handle, and a collar rotatably connected to said sleeve and threadably carried on said handle whereby rotation of said collar will move said sleeve axially along said handle.

3. A safety razor as set forth in claim **1** in which said connector means comprises a pair of arcuate strips connected to said guards and projecting through openings in the lower one of said pair of plates and connected to said adjustment means.

4. A safety razor, comprising a handle, a pair of vertically spaced plates fixedly connected to said handle, a pair of guards slidably interposed between said pair of plates, adjustment means axially movable along said handle, flexible connector means interconnecting said guards and adjustment means for simultaneously moving said guards laterally outwardly or inwardly along a pair of opposed sides of said pair of plates upon axial movement of said adjustment means along the handle, means on said guards and at least one of said plates for guiding the lateral movements of said guards, and means releasably retaining a blade on the upper one of said pair of plates with its cutting edges overlying said guards comprising a blade guide operatively connected to said handle and movable with respect to said pair of plates, a pair of pivot bars connected to said blade guide for movement therewith, a pair of cover plates pivotally connected to said pivot bars and engageable with said pair of guards upon movement of said blade guide between an operative position overlying said upper plate and a retracted position angled outwardly from said upper plate, and means for moving said blade guide with respect to said upper plate.

5. A safety razor as set forth in claim **4** in which said means for moving the blade guide comprises a rod connected to the blade guide and movable in said handle.

6. A safety razor, comprising a handle, upper and lower plates fixedly mounted on said handle at the upper end thereof, a pair of guards slidably carried between said plates along a pair of opposed longitudinal edges thereof, a pair of opposed arcuate flexible strips connected to said guards and projecting through openings in said lower plate, adjustment means movable axially of said handle and connected to said pair of strips whereby upon axial movement of said adjustment means said strips will cause said guards to move simultaneously laterally inwardly

or outwardly with respect to said longitudinal blade edges, means for guiding the lateral movements of said guards, and means for releasably retaining a blade on said upper plate with its cutting edges overlying said pair of guards.

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