Dec. 19, 1967 L. K. KUHNL 3,358,369

ADJUSTABLE DOUBLE EDGE RAZOR

Filed March 21, 1966 2 Sheets-Sheet 1

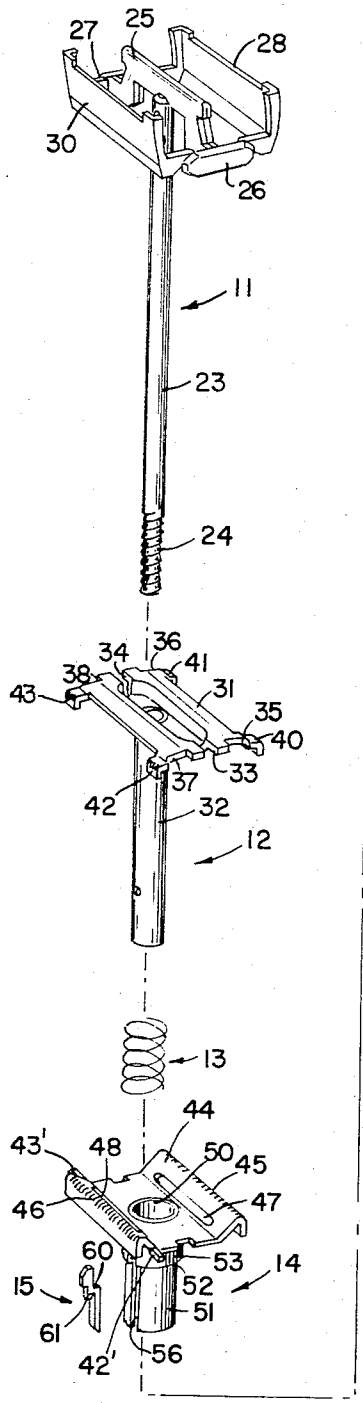
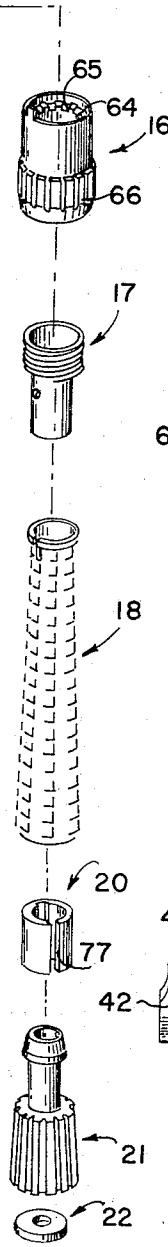


FIG. 1



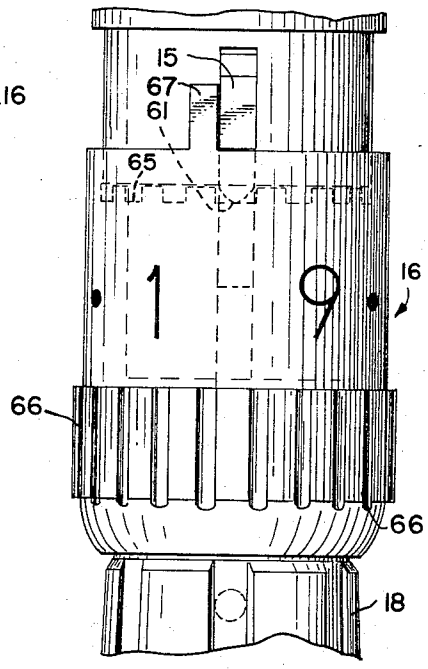


FIG. 3

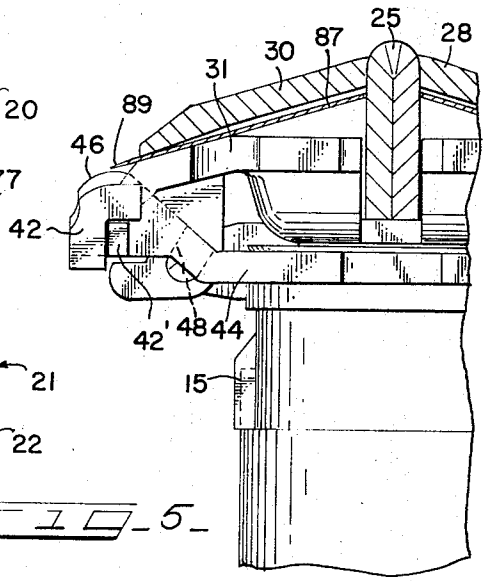


FIG. 5

INVENTOR
LEOPOLD K. KUHNL
BY Greist, Lockwood, Greenawalt & Dewey ATT'YS.

Dec. 19, 1967 L. K. KUHNL 3,358,369

ADJUSTABLE DOUBLE EDGE RAZOR

Filed March 21, 1966 2 Sheets-Sheet 2

FIG. 2

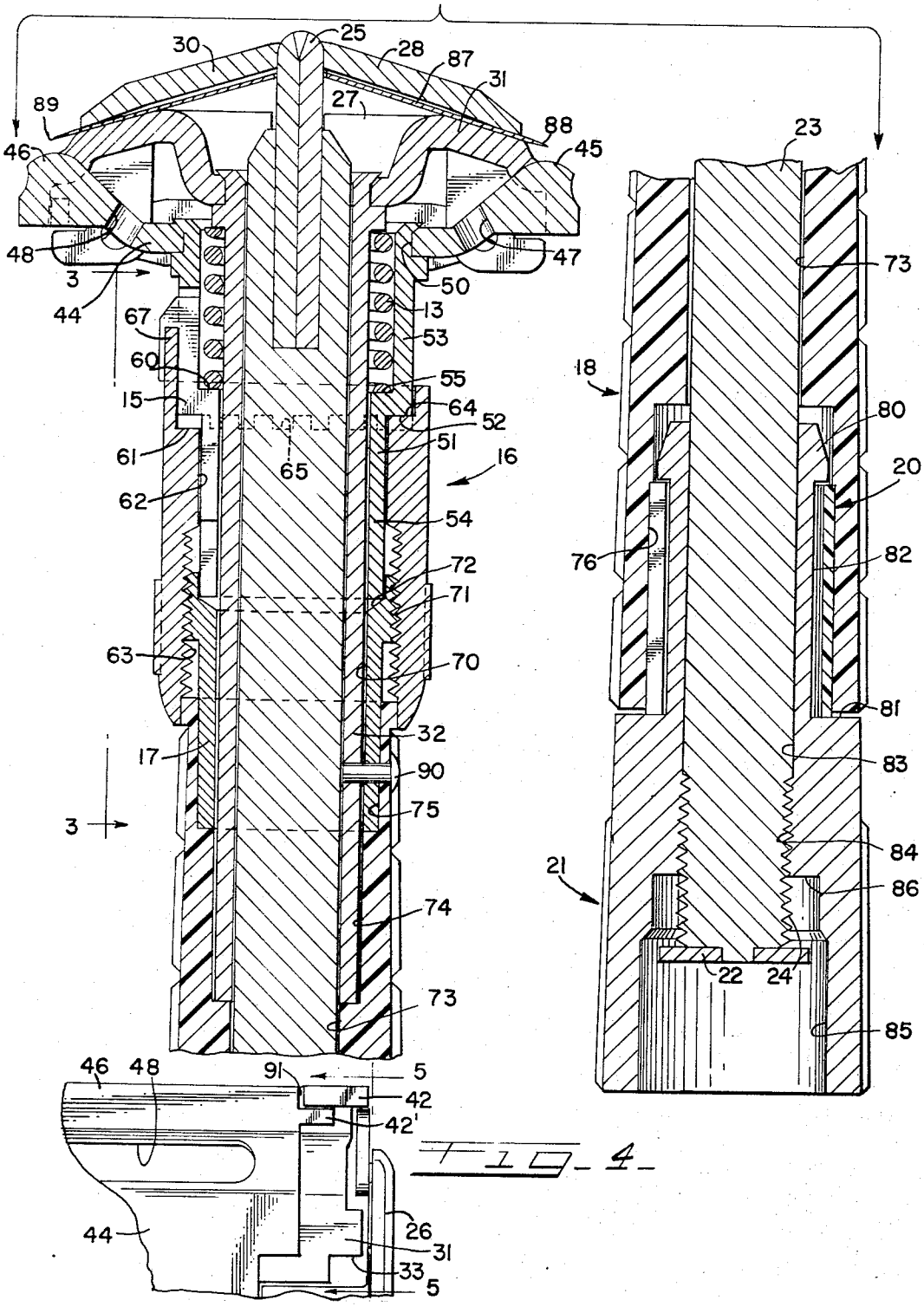


FIG. 4

United States Patent Office 3,358,369 Patented Dec. 19, 1967

3,358,369

ADJUSTABLE DOUBLE EDGE RAZOR

Leopold K. Kuhnl, Stratford, Conn., assignor to Eversharp, Inc., Milford, Conn., a corporation of Delaware

Filed Mar. 21, 1966, Ser. No. 536,114
1 Claim. (Cl. 30—60.5)

ABSTRACT OF THE DISCLOSURE

A safety razor of the double edge type having the guard mounted for adjusting movement relative to the blade seat. The spring which biases the blade seat and guard in opposite directions also biases a detent into engagement with castellations formed in an adjusting knob. The detent projects outwardly and co-operates with a stop on the knob to limit full adjustment to slightly less than one full turn.

The present invention relates to a new and improved adjustable double edge safety razor of an uncomplicated design which lends itself to economical manufacture. A unique detent and adjusting arrangement also forms a part of the invention and provides additional advantages which will become apparent on consideration of the objects and description.

It is an object of this invention to provide a new and improved adjustable safety razor of uncomplicated construction.

It is a further object of this invention to provide a new and improved adjustable safety razor which is inexpensive to manufacture and economical to assemble while being accurate in adjustment.

It is a still further object of this invention to provide a new and improved safety razor having a novel detent means serving to maintain adjustment and provide an audible sound during adjustment.

Other objects and advantages of this invention will become apparent on consideration of the accompanying drawings and detailed description which follows:

In the drawings:

FIG. 1 is an exploded perspective view of the parts forming the adjustable safety razor of the present invention;

FIG. 2 is an enlarged broken cross sectional view of the safety razor of FIG. 1 with the parts assembled and a double edge blade clamped in shaving relation;

FIG. 3 is an enlarged fragmentary view taken generally along the lines 3—3 of FIG. 2 and illustrating the adjusting knob and detent arrangement;

FIG. 4 is an enlarged fragmentary bottom plan view of the guide arrangement; and

FIG. 5 is an enlarged fragmentary cross sectional view of the safety razor head taken along the lines 5—5 of FIG. 4 adjacent the end of the caps to illustrate the guiding relation between the guard member and the seat.

The basic elements forming the adjustable safety razor of the present invention are illustrated in the exploded perspective view of FIG. 1 and include a spider assembly **11**, blade seat assembly **12**, spring **13**, guard member **14** and detent **15**. Also included are an adjusting knob **16**, threaded sleeve **17**, tubular handle **18**, bearing **20**, operating knob **21**, and rivet washer **22**.

The spider and cap assembly **11** is of conventional or known form and includes a spider stem **23** having the lower end portion threaded as at **24** with the upper end attached to a conventional spider **25**. On opposite ends of the spider **25** are provided transverse arms **26** and **27** which pivotally mount identical cap sections **28** and **30** on opposite sides of the spider **25**. Additional details of this

construction may be found in my copending application Ser. No. 450,927, filed Apr. 26, 1965, and entitled Adjustable Razor which has matured into U.S. Patent No. 3,293,744, granted Dec. 27, 1966.

The blade seat assembly **12** consists of a blade seat member **31** joined to a tubular seat mounting member **32** of tubular construction. As seen in the cross sectional view of FIG. 2, the blade seat member **31** may be joined to the mounting member **32** by swaging, spinning, riveting or the equivalent. The blade seat member **31** is provided with spider guide grooves **33** and **34** centrally positioned at opposite ends to slidably receive the downwardly projecting ends of the spider **25** to guide it as it reciprocates during opening and closing movement of the cap sections.

Vertical guides **35** and **36** are also disposed at opposite ends, however, to one side of the blade seat and co-operate with the pivot arms on the cap section **28** during vertical movement of the spider assembly **11**. Similar guides **37** and **38** are symmetrically formed on the opposite side of the blade seat member **31** to receive the downwardly projecting arms on the cap section **30**.

Guide flanges **40**, **41**, **42** and **43** are formed at the corners of the blade seat and are folded downwardly to present a vertical guide surface for co-operation with guide surfaces on the guard member **14**. The guide flanges **40–43** also form a stop to engage a flange on each of the pivot arms on the caps **28** and **30** to cause opening of the cap sections when the spider shifts relative to the blade seat. The spring **13** is of conventional design being a helical spring adapted for compressive loading between a blade seat assembly **12** and guard member **14**.

The guard assembly **14** includes a guard member **44** having guard bar portions **45** and **46** at opposite margins. Suitable openings **47** and **48** may be positioned adjacent respective guard bars **45** and **46** to permit the shaving product to pass through during the shaving operation. The guard member **44** is provided with a central opening **50** through which is received a tubular mounting neck **51**. As seen in FIGS. 1 and 2, the tubular mounting neck is of increased diameter **53** at the upper end while the lower end is of smaller diameter as at **54**, the juncture of the two ends forming a radially extending shoulder **55** which serves as an abutment for one end of the coil spring **13**.

An axially extending slot **56** is formed along one side of the tubular mounting neck **51** and extends through a shoulder **52** into the enlarged cylindrical portion **53**. The slot **56** is of sufficient transverse width to receive the detent **15** with a sliding fit. The detent **15** is provided with a shoulder or notch **60** generally conforming to the shape and dimensions of the shoulder **55**. Outwardly of and below the shoulder is an arcuate nose **61** which is adapted to co-operate with notch means formed in the adjusting knob **16** in a manner to be described.

The adjusting knob **16** shown in cross section in FIG. 2 is provided with a cylindrical bore **62** which is threaded at its lower end as at **63**. At the upper end of the cylindrical bore **62**, a shoulder **64** is provided with a series of notch means or castellations **65**. As is evident in FIG. 3, the top of the castellations (shown in dotted lines) are formed on a plane which is substantially at right angles to the axis of the knob **16**. An outer circumferential portion of the adjusting knob **16** may be provided with a series of splines, serrations or the like **66** to enhance the ease of gripping the knob during rotation. At the upper end of the knob is formed an axially projecting tongue **67** which co-operates with the detent **15** to form a stop in a manner to be described in greater detail.

The threaded sleeve **17** shown in FIGS. 1 and 2 is provided with a central cylindrical bore **70** of sufficient diameter to receive the tubular seat mounting member **32** of the blade seat assembly. The threaded sleeve **17** is pro-

vided with a portion of increased outside diameter adjacent the upper end which is externally threaded as at **71** to co-operate with the internal threads **63** in the adjusting knob **16**. The central bore **70** of the threaded sleeve **17** may be counterbored as at **72** to admit the lower end of the mounting neck **51** of the guard assembly **14**, thus permitting the shoulder **52** to engage the shoulder **64** on the adjusting knob **16**.

The tubular handle **18** may be formed from plastic or any suitable material and is shaped to a generally frustoconical outer contour or the like with rib-like means to enhance the appearance of the razor assembly. A cylindrical bore **73** may be formed in the tubular handle **18** with counterbores **74** and **75** adjacent the upper end to receive the lower end of the tubular seat mounting member and threaded sleeve **17** respectively. The lower end of the handle **18** is provided with a counterbore **76** having a spline or key-like projection positioned within the split **77** of the bearing **20** as it is inserted into the bore to prevent the bearing from rotating relative to the handle.

The operating knob **21** is provided with an enlarged upper end **80** and a radial shoulder **81** which define a bearing mounting area **82**. The knob is also provided with a central bore **83** which is threaded at its lower end as at **84** to co-operate with the threads **24** on the lower end of the spider stem **23**. The lower end of the operating knob **21** is provided with a counterbore **85** which terminates in a radial shoulder **86**. The counterbore **85** is of sufficient diameter to accommodate the rivet washer **22** which is joined to the lower end of the spider stem **23**. The stem is dimensioned so that the shoulder **86** is engaged by the rivet washer **22** when the caps reach the fully opened position to maintain the spider properly located within the spider guide grooves **32** and **34** as well as keeping remaining parts in assembled relation.

As seen in FIG. 2, when the component parts of the adjustable double edge razor of the present invention are assembled, a double edge razor blade **87** inserted and caps **28** and **30** brought to the closed position, the blade **87** is clamped to the blade seat **31** with cutting edges **88** and **89** at opposite margins of the blade disposed immediately above the guard bars **45** and **46**. Rotation of the adjusting knob **16** permits the clearance between the cutting edges **88** and **89** and the guard bars **45** and **46** to be varied. Indicia for selection of a setting is provided on the outside of the adjusting knob **16** for handy reference. Rotation of the adjusting knob **16** causes the knob to move axially relative to the threaded sleeve **17**. Inasmuch as the shoulder **52** of the mounting neck is biased against the shoulder **64** in the adjusting knob **16** through the force of the spring **13**, the guard member will move in response to rotation of the adjusting knob **16**.

The threaded sleeve **17** is held against rotation by means of a rivet **90** which joins the handle **18**, threaded sleeve **17**, and tubular blade seat mounting member **32**. Equivalent forms of fastening are equally well suited.

As seen in FIGS. 1, 4 and 5, throughout the razor shifting proper alignment between the guard member **44** and blade seat member **31** is maintained through the guiding engagement of guide lugs **42'** and **43'** with the downwardly folded guide flanges **42** and **43** respectively. The bottom plan view of FIG. 4 is enlarged to more clearly illustrate this relation. An opening **91** is formed between the guard bar **46** and the guide flange **42**. Through guiding on the rear surface of the guide flange **42** the opening **91** may be of sufficient dimension to preclude pulling of the hair and also permit cleansing by flushing. While two guide flanges **42'** and **43'** have been shown, it is obvious that any desired number up to four may be provided.

After a consideration of the foregoing description, it is

apparent that the safety razor of the present invention is of simplified design which promotes economy in manufacture and assembly. The novel detent and adjusting knob arrangement is such that it utilizes the spring force **13** to provide bias to the detent producing an audible sound on rotation of the knob **16**.

As seen in FIG. 3, as the knob is rotated, the round nose **61** on the detent **15** will be forced from one notch to the other. The audible sound made by the detent being pushed into the next notches through the force of the compression spring **13** is of sufficient intensity to be clearly heard and also permits selection of a setting or adjustment intermediate the numbered indicia on the exterior of the adjusting knob **17**. In addition, the detent serves to hold the knob in the adjusted position against accidental movement. The detent **15** is engaged by the axial tongue **67** on the knob **16** at opposite limits of adjustment to limit rotation of the adjusting knob to one full turn only. Since the detent **15** may be made of rather heavy gauge material and receives its bias from the spring **13**, it will enhance ease of assembly as well as being less prone to failure over prolonged periods of use.

Upon a consideration of the foregoing, it will become obvious to those skilled in the art that various modifications may be made without departing from the invention embodied herein. Therefore, only such limitations should be imposed as are indicated by the spirit and scope of the appended claim.

I claim:

An adjustable safety razor of the double edge type comprising a tubular handle, razor blade clamping means carried by said tubular handle, said razor blade clamping means including a blade supporting seat member and a pair of cap sections, said blade supporting seat member having a tubular mounting portion joined to said tubular handle, said pair of cap sections being mounted on a spider stem disposed within said tubular mounting portion and shiftable to cause said cap sections to close over said blade supporting seat member to clamp a razor blade between said blade supporting seat member and said cap sections, a guard member positioned below said blade supporting seat member, spring means urging said guard member away from said blade supporting seat member, adjustment means for incrementally varying the clearance between said guard member and said clamped razor blade without affecting the clamping force on said razor blade, said adjustment means including a threaded sleeve held against rotational and axial movement relative to said blade supporting seat member and a complementary threaded adjusting knob threadably engaging said threaded sleeve, said adjusting knob having one end portion thereof engaging said guard member, said adjusting knob being rotatable relative to said handle and said threaded sleeve whereby said guard member may be adjusted relative to said blade supporting seat, an opposite end of said adjusting knob being provided with notch means, an axially movable detent received in an axially extending slot, said spring means urging said detent against said notch means to cause an audible sound and provide locating means for fine adjustment on rotational movement of said adjusting knob, and means on said adjusting knob to engage said detent to limit rotation thereof.

References Cited

UNITED STATES PATENTS

2,848,806	8/1958	Schnitzler et al.	30—60.5
2,848,807	8/1958	Schnitzler et al.	30—60.5
2,934,821	5/1960	Bailey et al.	30—60.5
2,952,911	9/1960	Schnitzler et al.	30—60.5

MYRON C. KRUSE, *Primary Examiner.*