Dec. 19, 1967 L. K. KUHNL 3,358,368

ADJUSTABLE DOUBLE EDGE RAZOR

Filed March 8, 1966 6 Sheets-Sheet 1

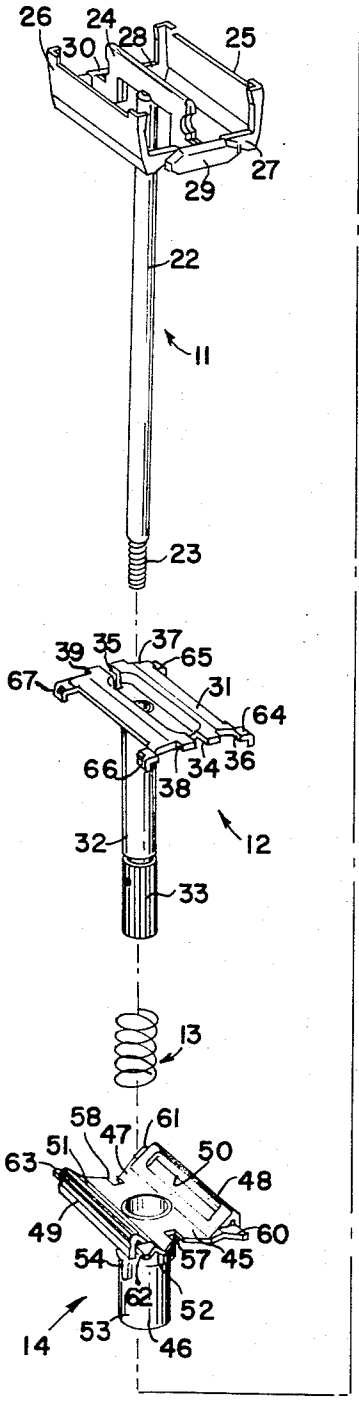
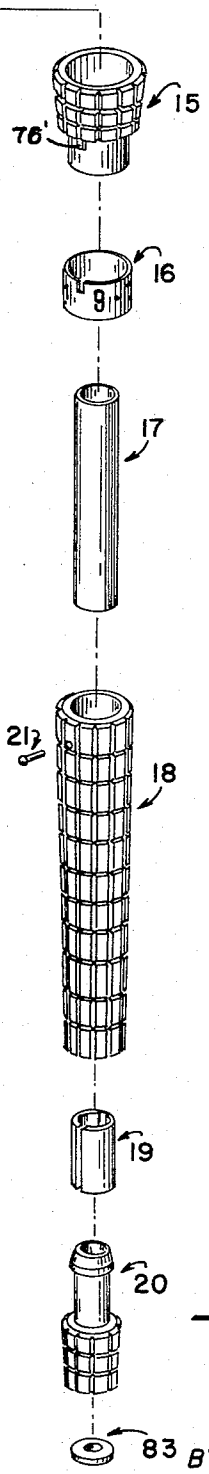


FIG. 1



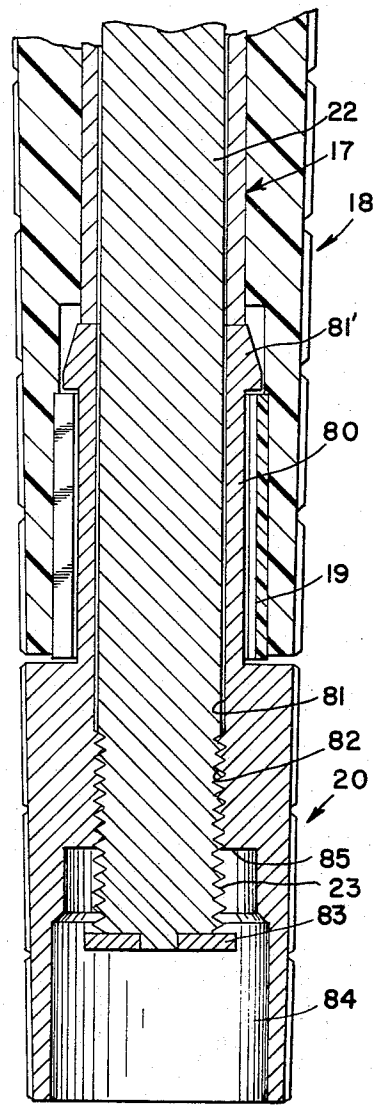


FIG. 3

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ADJUSTABLE DOUBLE EDGE RAZOR

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FIG. 2

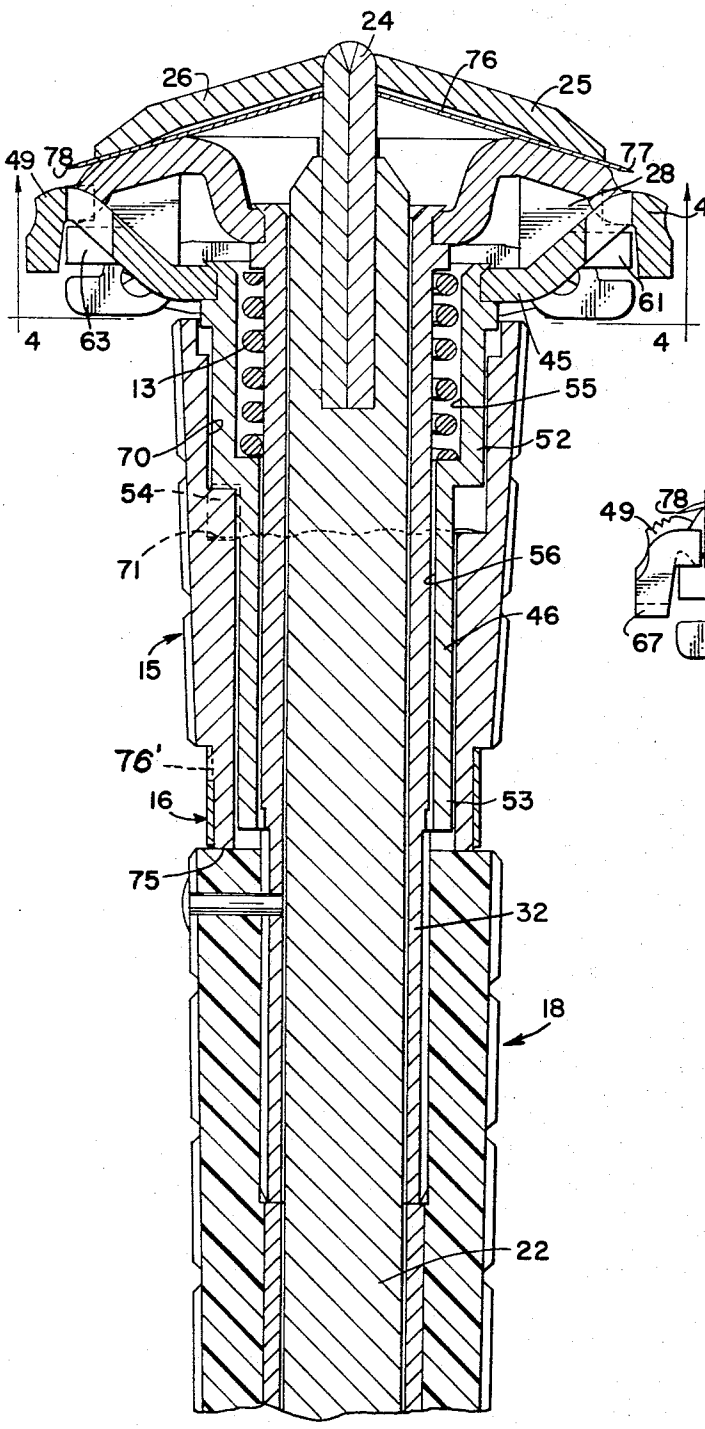
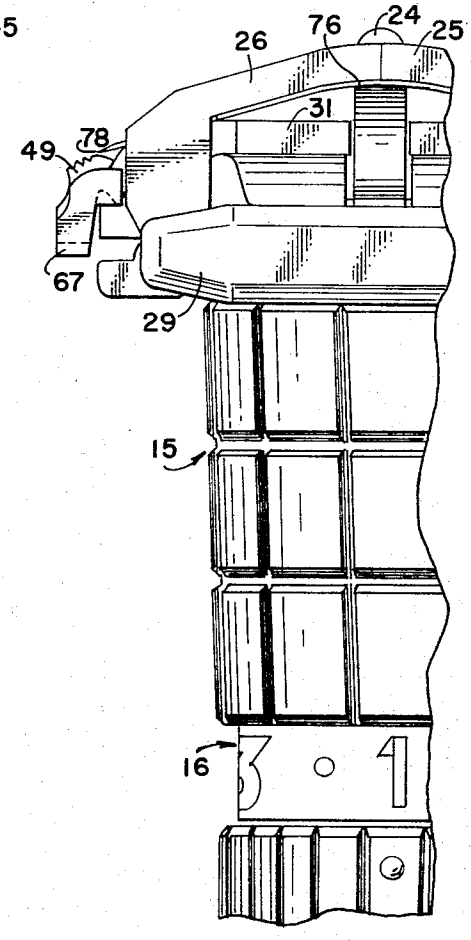


FIG. 6



ADJUSTABLE DOUBLE EDGE RAZOR

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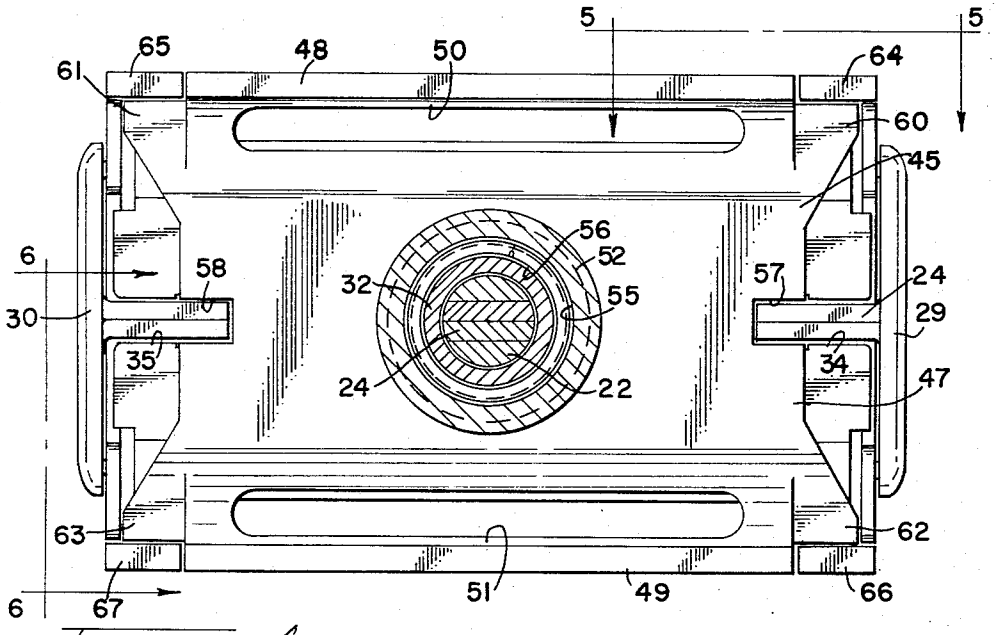


FIG. 4.

FIG. 5.

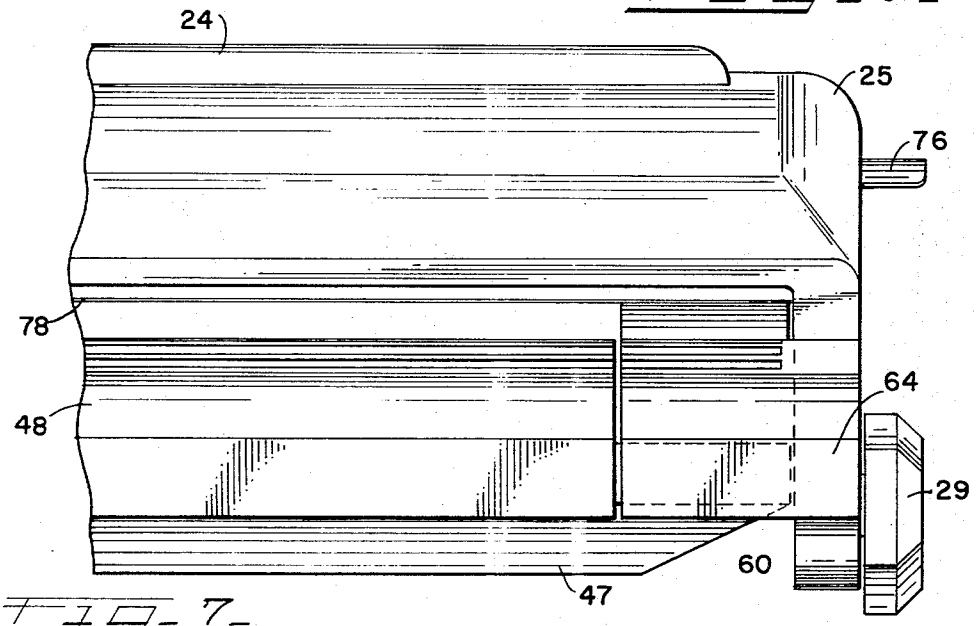
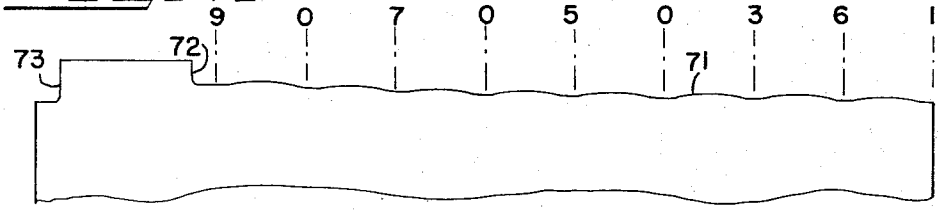


FIG. 7.



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ADJUSTABLE DOUBLE EDGE RAZOR

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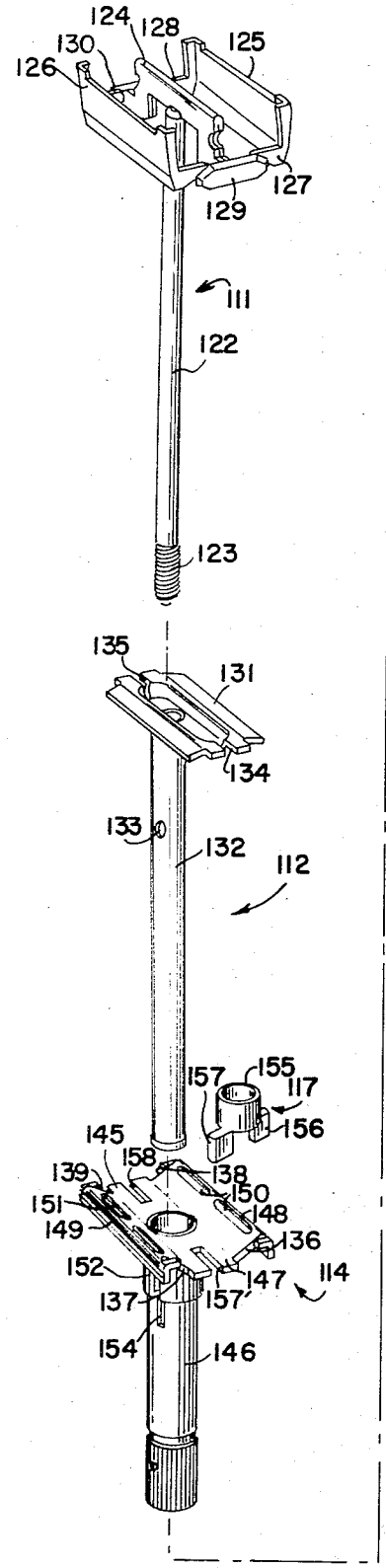

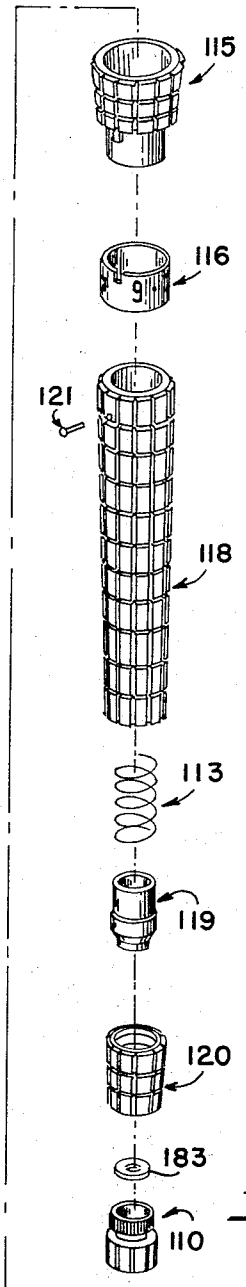

FIG. 8

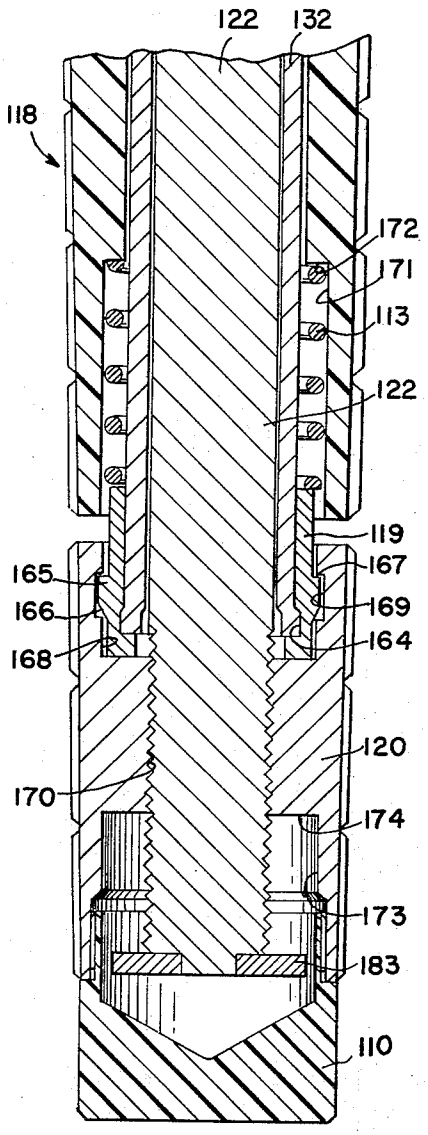

FIG. 10

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FIG. 9

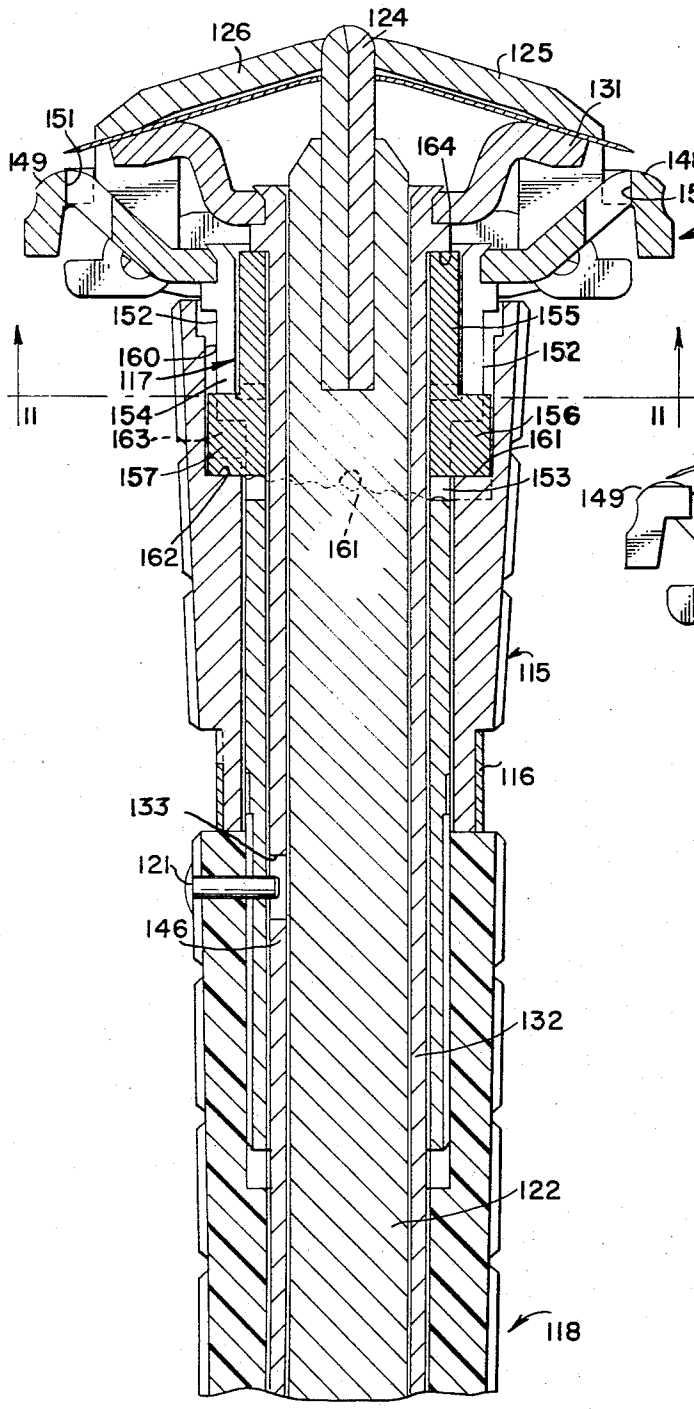
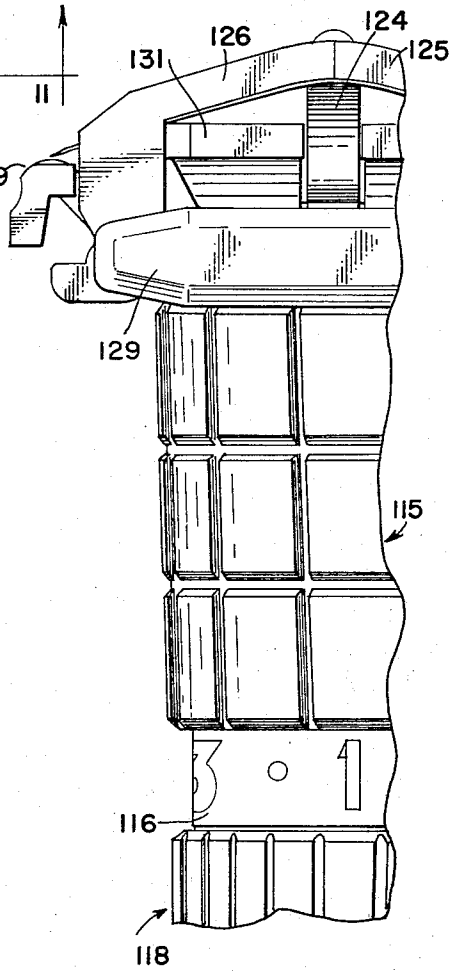


FIG. 13



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ADJUSTABLE DOUBLE EDGE RAZOR

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FIG. 11

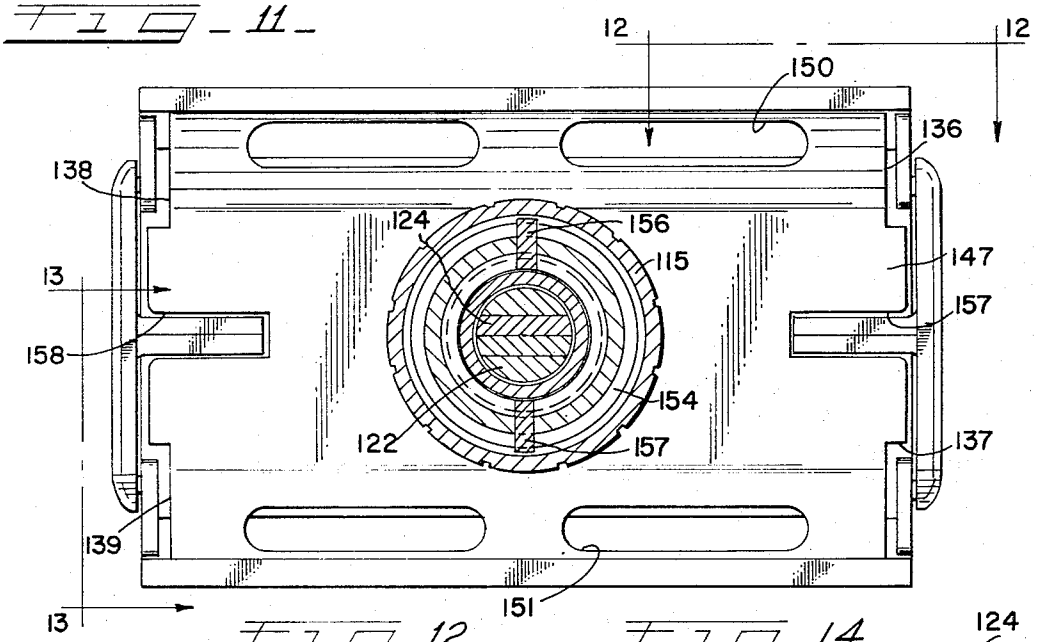


FIG. 12

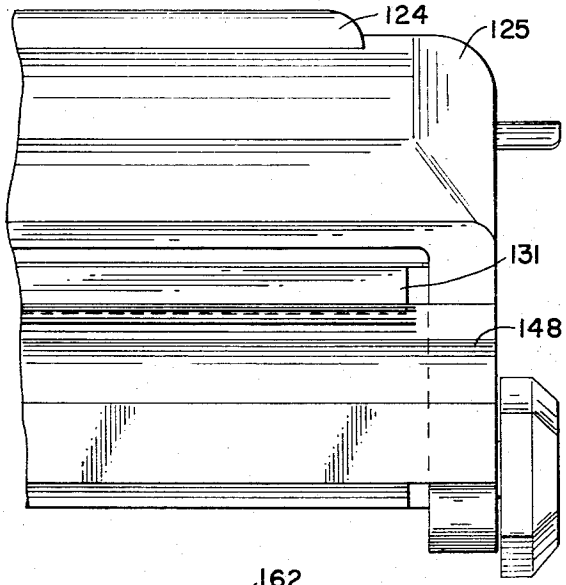
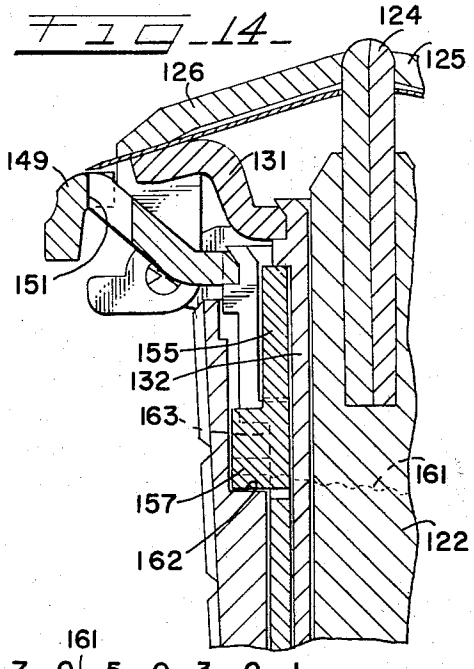


FIG. 14



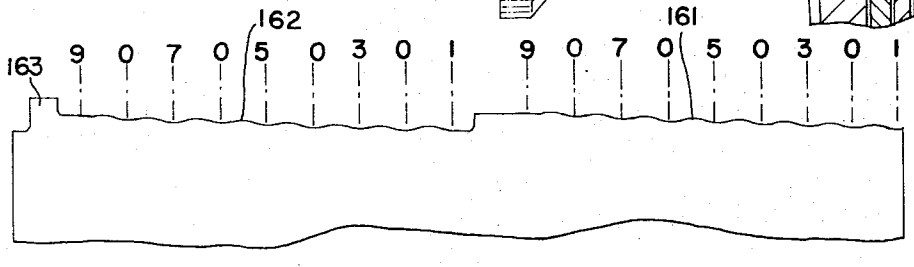


FIG. 15

United States Patent Office

3,358,368

Patented Dec. 19, 1967

3,358,368

ADJUSTABLE DOUBLE EDGE RAZOR

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

Filed Mar. 8 1966, Ser. No. 532,599
3 Claims. (Cl. 30—60.5)

ABSTRACT OF THE DISCLOSURE

An adjustable double edge safety razor of the sectional cap type in which the blade seat is fixed relative to the handle. The guard is provided with guide means and an adjustment to permit incremental variance of the clearance between the blade edge and the guard. The guide means maintains the guard properly located during adjustment and also permits cleaning of the razor by flushing. The clamping pressure on the razor does not vary with changes in adjustment and the razor may be opened and closed without affecting the adjustment.

This invention relates to safety razors of the adjustable type and more specifically is directed to adjustable safety razors of the double edge type.

A considerable amount of attention has been given during recent years towards the development of an adjustable safety razor having a means to vary the blade clearance to provide beneficial functional results and yet be sufficiently practical from the standpoint of production to be commercially feasible. As expected, a large number of razor designs have been proposed which represent considerable progress, however, there remains ample opportunity for improvement in specific areas.

Certain prerequisites must be embodied in an adjustable safety razor if the desired ends or results with regard to function and cost are to be achieved. Safety razors of the type above described must be mass produced and yet, when assembled, provide extremely fine control with respect to blade adjustment. The multiple parts forming the finished safety razor design must be economically, accurately, and expediently produced as well as being easily assembled.

In the research program to obtain these characteristics, the additional characteristics of structural simplicity must not be overlooked as it is well known that over-sophistication not only increases cost as a rule, but also breeds unreliability and reliability in the frequent and accurate adjustment of the razor is an indispensable attribute. Simplicity of the razor design along with achieving reliability results in an adjustable razor which is economically produced and reliable in use.

In summary, the present invention relates to an adjustable double edge razor in which the guard is moved relative to the clamped blade. A cam track formed with undulations permits ready selection of any desired degree of blade clearance while permitting the blade to remain fixed relative to the razor handle. In an alternate embodiment, the guard is held rigid relative to the blade and a double cam track co-operates with a cam follower having double track engaging portions to shift the double edge blade after it is clamped on the blade seat up and down relative to the guard to permit selection of any desired degree of clearance. The double cam arrangement provides a simple form of adjustment which may be molded or otherwise easily formed and in which the applied force is uniformly distributed in an annular pattern beneath the blade seat to prevent cocking or tilting of the same relative to the fixed guard.

The present invention proposes a practical solution to the problem outlined above within the framework of the considerations stated.

It is an object of this invention to provide a new and improved adjustable safety razor which is simple in structure and operation and which may be mass produced accurately and economically.

It is a further object of this invention to provide a new and improved safety razor of the adjustable type in which accuracy of adjustment may be achieved.

It is a still further object of this invention to provide an adjustable safety razor having a novel means to guide and maintain the clamped blade and guard in proper relation throughout the entire range of adjustment.

Other objects of this invention will become apparent from the detailed description to follow:

Within the contemplation of this invention is an adjustable safety razor of the double edge type employing a spider stem mounting a spider having transverse spider arms at opposite ends. Mounted on the transverse spider arms are a pair of cap sections of conventional design having pivot arms which have the lower ends thereof engageable with either the guard member or the blade seat whereby substantial shifting of the spider causes an opening and closing of the cap sections in a well known manner. Disposed beneath the cap sections is a blade supporting seat which serves to co-operate with the closed cap sections to clamp a double edge razor blade in shaving relation above the guard member. Suitable means is provided to incrementally vary the distance between the guard member and the razor blade to establish the desired razor blade clearance for comfortable shaving. This means consists of a simplified adjustment construction utilizing a cam track and co-operating cam follower which when rotated relative to each other varies the blade clearance, permitting the full range of adjustment to be accomplished with one full turn of the knob. A novel guide arrangement insures that the parts will be properly oriented relative to each other at all times during adjustment. Additional means is provided which permits the cap sections to be opened and closed irrespective of the position of the cam means and without affecting the adjustment. Other important detailed features will become apparent on description of the embodiments below.

In the drawings:

FIG. 1 is an exploded perspective view on one preferred form of safety razor incorporating the features of the invention;

FIG. 2 is an enlarged cross sectional view through the embodiment of FIG. 1 after assembly with a double edge razor blade clamped for shaving;

FIG. 3 is a fragmentary cross sectional view through the lower portion of the handle of the embodiment of FIGS. 1 and 2;

FIG. 4 is a bottom plan view taken generally along the lines 4—4 of FIG. 2;

FIG. 5 is an enlarged fragmentary front elevational view of the razor of FIG. 4 taken along the lines 5—5 of FIG. 4, and illustrating the co-operation of the guard bar and blade seat;

FIG. 6 is a fragmentary side elevational view of the razor of FIGS. 1–5 taken along the lines 6—6 of FIG. 4 and illustrating the guard bar adjusted to minimum clearance;

FIG. 7 is a fragmentary developed view of the cam track used in the embodiment of FIGS. 1–6;

FIG. 8 is an exploded perspective view of a modified form of the invention;

FIG. 9 is an enlarged cross sectional view of the embodiment of FIG. 8 after assembly with a portion of the handle broken away;

FIG. 10 is an enlarged fragmentary cross sectional view of the handle of the embodiment of FIGS. 8 and 9;

FIG. 11 is an enlarged bottom plan view of the razor of FIGS. 8–10 taken along the lines 11—11 of FIG. 9;

FIG. 12 is an enlarged fragmentary front elevational view of one end portion of the razor taken generally along the lines 12—12 of FIG. 11;

FIG. 13 is a fragmentary side elevational view taken generally along the lines 13—13 of FIG. 11 with the adjustment in the position of minimum blade clearance;

FIG. 14 is a fragmentary cross sectional view of the razor head with the blade clearance at minimum; and

FIG. 15 is a developed view of the cam track embodiment of FIGS. 8–14.

Referring now to FIG. 1, the basic elements forming the adjustable safety razor of the present invention are illustrated in exploded relation and include a spider and cap assembly indicated generally at **11**, a blade seat assembly **12** and coil spring **13** adapted for reception in a guard assembly **14**. Also included is an adjusting knob **15**, provided with an indexing ring **16**, and a spacer sleeve **17** positioned in a tubular handle **18** receiving at its lower end a bearing collar **19** serving to mount an operating knob **20**. A rivet **21**, shown to the left of the upper end of the tubular handle **18**, may be provided to join the blade seat assembly and tubular handle in a manner to be described in detail in conjunction with FIG. 2.

The spider and cap assembly **11** includes a spider stem **22** having a lower threaded end **23** with the upper end attached to a conventional spider **24**. A pair of cap sections **25** and **26** are of identical construction and include downwardly projecting pivot arms **27** and **28** which are mounted on transverse spider arms **29** and **30** carried at opposite ends of the spider **24**. The spider and cap assembly **11** is of conventional design being specifically described in my copending application, Ser. No. 450,927, filed Apr. 26, 1965, entitled Adjustable Razor, which has matured into U.S. Patent No. 3,293,744, granted Dec. 27, 1966 and therefore reference may be had to that application for additional detailed features.

The blade seat assembly **12** consists of a blade seat member **31** joined to a tubular seat mounting member **32** having the lower end provided with a knurled or serrated surface **33**. The blade seat member **31** is provided with spider guide grooves **34** and **35** which receive opposite downwardly projecting ends of the spider **24** and serve to guide it as it reciprocates during adjustment of the blade clearance, and opening and closing of the cap sections **25** and **26**. Vertical guides for the pivot arms of the cap sections **25** are provided at **36** and **37** with similar guides **38** and **39** provided with the pivot arms of the cap section **26**. The guides are symmetrically spaced on opposite sides of the spider guide grooves **34** and **35**. As is well known in the safety razor art, substantial shifting of the spider **24** causes a flange on the lower end of each pivot arm to engage the underside of the blade seat member **31** to cause opening and closing of the cap sections **25** and **26**.

As seen in FIGS. 1 and 2, the guard assembly **14** includes a guard member **45** joined to a tubular mounting neck **46** by staking, riveting or the like. The guard member **45** includes a main body **47** having guard bar portions **48** and **49** formed at opposite edges. Elongated slots **50** and **51** are provided intermediate the body and the guard bar portions **48** and **49** and function to permit the shaving product to flow therethrough during the shaving operation. Spider guide grooves **57** and **58** are formed at opposite ends of the main body **47** and guide the spider **24** in its movement relative to the guard member **45**.

The tubular mounting neck **46** on the guard member **45** has an enlarged cylindrical portion **52** at the upper end which merges into a portion of reduced diameter **53** at the lower end. A key or stop **54** may be provided on the tubular mounting neck **46** to serve as a stop for the opposite limits of the blade clearance adjustment. The cylindrical portion **52** is provided with an enlarged bore **55** which accommodates the coil spring **13**. A coaxial bore **56** of reduced diameter receives the tubular mounting member **32** on the seat assembly **12** with a sliding fit.

As is best seen in FIGS. 1 and 4, the guard member **45** is provided with guide flanges **60** and **61** formed at opposite ends of the guard bar **48** with similar flanges **62** and **63** formed at opposite ends of the guard bar **49**. The flanges **60–63** engage vertical guide flanges **64–67** formed at the four corners of the blade seat **31** to maintain the guard bars **48** and **49** accurately aligned between the guide flanges **64–67**, respectively, during vertical adjustment of the guard member **31**. In this unique guide arrangement, adequate clearance is provided between the end of the guard bar and the guide flange to preclude pulling of the whiskers and permit easy flushing, yet the guides may be made to close tolerances for continuous engagement.

The adjusting knob **15** shown in cross section in FIG. 2 is provided with a counterbore **70** which receives the enlarged portion **52** of the neck **46**. At the base of the counterbore is formed a cam track **71**, the shape of which is shown in the fragmentary developed view of FIG. 7. The cam track has a shallow rise and consists of a series of interconnected undulations, the low points of which are numerically indicated on the indicia ring **16** and reproduced in FIG. 7 for purposes of illustration. Stop shoulders **72** and **73** are engageable with the longitudinal key **54** on the neck **46** to limit the rotation of the adjusting knob **15** in the lower end of the longitudinal key **54** which serves as a cam follower riding across the cam track **71** as the adjusting knob **15** is rotated during selection of the desired blade clearance. The cam track is illustrated as being formed integral with the adjusting knob **15**, however, it will be appreciated that the cam track may be formed separately and positioned in the knob by any suitable means.

In the assembled cross sectional view of FIG. 2, it can be seen that the adjusting knob **15** has a lower end portion **75** which engages the upper end surface of the tubular handle **18**, to resist downward urging of the spring, while permitting free rotation during adjustment. The index ring **16**, which may be numbered from 1 to 9 as described previously, is tightly fitted around a reduced portion of the knob **15** with a key-way engaged with a key **76'** on the reduced portion of the knob to prevent relative rotation between the index ring **16** and knob **15**. The lower end of the neck **46** terminates short of the upper end of the tubular handle **18** even when adjusted to the position of maximum clearance. The coil spring **13** continuously urges the guard and neck member downwardly thereby urging the cam follower formed by the lower end of the key **54** into engagement with the cam surface **71** on the knob **15** with the end of the tubular handle resisting the thrust.

The guard bars **48** and **49** at opposite margins of the guard member may be elevated and lowered by simply

rotating the adjusting knob to select the desired blade clearance. As shown in FIG. 2, a razor blade **76** having cutting edges **77** and **78** at opposite margins is clamped between the blade seat **31** and the cap sections **25** and **26**. Each of the cutting edges is positioned over the associated guard bar **48** and **49**, which may be elevated and lowered to vary the clearance, with the extremes of the adjusted positions being generally illustrated in FIGS. 2 and 6.

Referring now to FIG. 3, the lower end of the handle **18** is illustrated in cross section with the adjusting knob **20** assembled to the threaded end **23** of the spider stem **22**. The upper end of the adjusting knob **20** has a cylindrical bearing portion **80** of reduced diameter, which merges into an enlarged knob-like formation **81'** defining the area in which the split bearing collar **19** is positioned. The split bearing collar **19** may have the longitudinal split positioned on opposite sides of a key or the like formed in the lower end of the handle to prevent the bearing from rotating relative to the handle, thereby confining relative rotation between the bearings **19** and the reduced cylindrical portion **80** on the knob **20**. The knob **20** is provided with an internal bore **81** having threads **82** at the lower end which engage the threaded end **23** of the spider stem **22**. A washer **83**, riveted to the lower end of the stem, is positioned within an enlarged bore **84** in the lower end of the knob and movable into engagement with a radially extending shoulder **85** to limit the total upward movement of the steam. The total movement available is sufficient to open the cap sections **25** and **26** without complete disengagement of the spider body **24** with the guide slots **36–39**. Rotation of the knob **20** merely serves to open and close the cap sections **25** and **26** without affecting the previously established adjusted relation between the blade edge and the guard member. Accordingly, the caps may be loosened for flushing, razor storage between shaves, or the like, without affecting the preferred setting of the adjusting knob **15**.

In operation, the razor blade **76** is positioned on the blade seat **31** and cap sections **25** and **26** are moved to the closed position by rotation of the operating knob **20**. The desired degree of blade clearance may be obtained by rotation of the adjusting knob **15** which causes a shift in the location of the guard **14** inasmuch as the lower end of the key **54** will ride on the cam track **71**. Accordingly, the clearance between the sharpened edges **77** and **78** of the double edge razor blade **76** relative to the guard bars **48** and **49** will be varied to obtain the preferred degree of clearance suited to the shaver's skin and beard.

Referring now to FIG. 8, a modified form of the adjustable safety razor forming the present invention is illustrated with the parts in exploded relation. The modified form of safety razor includes a spider and cap assembly indicated generally at **111**, a blade seat assembly **112**, a guard assembly **114**, adjusting knob **115**, and index ring **116** adapted to fit around the adjusting knob **115**. Also included is a tubular handle **118**. coil spring **113** adapted to be received in the handle **118**, bearing assembly **119**, and operating knob **120** joined to the spider stem by a rivet washer **183** and covered by a trim cap **110**. A cam follower **117** is shown positioned to the immediate right of the lower end of the blade seat assembly and upper end of the guard assembly **114**. A rivet **121**, shown to the immediate left of the tubular handle **118**, serves to join the handle and guard member in a manner to become apparent.

The spider cap assembly **111** includes a spider stem **122** having threads **123** formed at its lower end with a spider body **124** of known form mounted on the upper end. Cap sections **125** and **126** are pivotally supported on transverse spider arms **128** and **129** at opposite ends of the spider body **124**. The cap sections **125** and **126** are of identical construction and include downwardly projecting arms **127** and **128** which facilitate pivotal mounting in the manner described. A more detailed description of the construction of the spider and cap assembly may be had in the application alluded to above.

The blade seat assembly **112** consists of a blade seat member **131** joined to a tubular seat mounting member **132**. An opening **133** is formed in the seat mounting member **132** for reasons to become apparent. The blade seat member **131** is provided with spider guide grooves **134** and **135** which accommodate the downwardly extending ends of the spider body **124** and guidingly engage it as it is elevated and lowered during adjustment of the blade clearance as well as during opening and closing of the cap sections **25** and **26**. The opposite margins of the blade seat engage a razor blade during clamping by the cap sections in the manner previously described in connection with FIG. 9.

The guard assembly **114** includes a guard member **145** joined to a tubular mounting neck **146** by swaging or the equivalent. As best seen in FIGS. 8 and 9, the guard member **145** includes a main body **147** having guard bar portions **148** and **149** at opposite margins. Elongated slots **150** are provided intermediate the body **147** and the guard bar **148** while similar slots **151** are formed intermediate the guard bar **149** and the body **147**, both of which function to permit the shaving product to flow beneath the guard member during the shaving operation. At opposite ends of the body **147** is provided elongated slots **157'** and **158** which receive the downwardly projecting arms on the spider body **124**, to maintain the parts properly oriented during shaving, adjustment, and opening and closing of the cap sections.

On opposite sides of the guide slots **157'** and **158** are formed guide slots **136** and **137**, **138** and **139**, respectively. These slots guidingly engage the pivot arms on the cap sections **125** and **126** and also engage a flange (not shown in FIG. 8) on the lower end of each pivot arm as the spider and cap assembly **111** is elevated, thereby to cause opening and closing of the cap sections **125** and **126**. The opening and closing of the caps occurs only on substantial shifting of the spider relative to the guard member, the caps remaining tightly closed during adjustment.

The tubular mounting neck **146** is provided with an enlarged portion **152** at the upper end and a portion of smaller diameter at the lower end. Elongated slots **153** and **154** are formed in the enlarged tubular portion **152** and extend downwardly into the tubular portion of reduced diameter. The lower end of the tubular mounting neck **146** is fastened to the handle **118** by the rivet **121** and opening **133** in the seat mounting member is large enough to permit shifting between the two.

The cam follower **117** includes a tubular body portion **155** having outwardly projecting cam track engaging portions **156** and **157** disposed at the lower end portion thereof. The cam track engaging portions **156** and **157** are slidably received in the slots **153** and **154** and move upward and downward in response to rotation of the adjusting knob **115**. The cam track engaging portions **156** and **157** may be positioned in the slots **153** and **154** before the mounting neck is joined to the guard member **47**, so that the cam follower **117** will be permanently assembled to the guard assembly **114**.

As is best seen in FIG. 9, the adjusting knob **115** is provided with a counterbored portion **160** terminating in cam tracks or surfaces **161** and **162** which are of identical construction each occupying slightly less than 180° of knob rotation. The shape of the cam tracks is best appreciated by reference to FIG. 15 which illustrates them in a developed view. An upstanding stop **163** separates the two tracks **161** and **162** and serves to limit the total rotation during adjustment to about ½ turn. Each cam track consists of repeating undulations formed along an imaginary line which is angularly disposed relative to the longitudinal axis of the adjusting knob.

Referring again to FIG. 9, it is obvious that the cam

tracks **161** and **162** may be formed separately and positioned in the knob in any desired manner. The cam track engaging portions **156** and **157** are held in engagement with the cam tracks **161** and **162** through the biasing action of the spring **113**, which in the present modification is disposed in the lower end of the handle. Biasing force is transferred to the cam follower **117** through the tubular body **155** which engages a radial shoulder **164** formed at the upper end of the mounting member **132** on the blade seat assembly **112**.

The manner in which the biasing force is transmitted from the lower end of the handle to the cam follower is best understood with reference to FIG. 10 in which the lower end of the handle **118** and operating knob are shown assembled and in cross section. The lower end of the blade seat mounting member **132** is joined to the bearing collar **119** by swaging the lower end of the mounting member **132** into an annular groove **164** formed within the bearing assembly **119**. An enlarged circumferentially raised portion **165** having a frusto-conical surface **166** at one end and an abrupt shoulder **167** at the opposite end is formed on the outer periphery of the bearing **119**. The operating knob **120** has a counterbore **168** provided with an annular groove **169** of sufficient width to receive the raised portion **165** on a bearing assembly **119**. Suitable threads **170** are formed in a bore of reduced diameter in the operating knob **120**.

The operating knob **120** may be assembled to the bearing by merely pushing the knob into place since the frusto-conical shoulder **166** will expand the counterbore **168** at the upper end of the knob allowing it to snap into position permanently. Thereafter, rotation of the knob **120** causes the spider stem **122** to reciprocate within the mounting member **132**.

The upper end of the bearing **119** serves as an abutment for the spring **113** which is received in a counterbore **171** and bottomed on the opposite end against a shoulder **172** in the handle **118**. The spring urges the bearing assembly **119** away from the handle **118** thereby constantly urging mounting member **132** downwardly whereby the upper end portion described above will resiliently urge the cam followers into engagement with the cam tracks **161** and **162**.

The operating knob is maintained in threaded engagement with threads **123** on the lower end of the spider stem **122** by washer **183** which is riveted or otherwise suitably attached to the lower end of the spider stem **122**. The washer **183** is carried with the stem and moves into an enlarged bore **173** formed in the lower end of the knob **120**. A radial shoulder **174** is formed at the bottom of the enlarged bore and terminates at the threads **170**. When the cap sections **125** and **126** are in the fully opened position, the washer **183** engages the shoulder **174** to prevent further upward travel of the spider stem **122**. A trim cap **110** may be knurled or the like at its upper end and press fitted into the lower end of the counterbore **173** to prevent ingress of foreign matter into the area of the threads and also to lend a finished appearance to the assembly.

The razor illustrated in FIGURES 8–15 may be prepared for use by inserting a conventional double edge razor blade of the type shown in FIGURE 9 and specifically described in connection with FIGURE 2. The operating knob **110** is then rotated to close the sectional caps **125** and **126**, clamping the blade to the blade seat **131**. The desired degree of blade clearance relative to the guard bars **148** and **149** may be obtained by rotation of the adjusting knob **115**. Such rotation causes the track-engaging portions **156** and **157** of the cam follower **117** to follow the contour of the cam tracks **161** and **162**. This causes a change in the elevational position of the blade seat **131** relative to the fixed guard bars **148** and **149**, varying the clearance to permit the shaver to select the desired degree of clearance most satisfactory to his skin and beard and providing for maximum shaving comfort.

After a consideration of the foregoing, it is obvious that the present invention embodies a novel safety razor design which permits incremental adjustment of the blade clearance which is unaffected by opening and closing of the cap due to the unique design of the operating mechanism. The parts forming the safety razors may be economically manufactured and easily assembled without detracting from the accuracy and high quality of the finished product. The simplified form of adjustment is accurate and easily operated, and as may be seen in the drawings, particularly FIGS. 2, 6, 9 and 14, a rather wide range of blade clearance is available for maximum shaving comfort.

In the embodiment of FIGS. 1–7, since the guide flanges are disposed inside the vertical guides, the ends of the guard bars **48** and **49** may be adequately spaced from the sides of the vertical guides to preclude pinching of the flesh or pulling of the whiskers and provide good clearance for ease in flushing.

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 claims.

I claim:

1. 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 having a tubular mounting portion extending into said tubular handle and a pair of cap sections co-operating with said blade supporting seat member to clamp a razor blade to said blade supporting seat member, a guard member positioned below said blade supporting seat member, means to incrementally vary the distance between said guard member and said clamped razor blade, said last named means including an adjusting knob having a portion thereof engaging said tubular handle to hold it against axial movement, cam track means carried on said adjusting knob, cam follower means carried on said guard member and engageable with said cam track means on said adjusting knob, spring means urging said cam follower means against said cam track means whereby said portion of said adjusting knob will be urged against said handle, and one of said members being engageable with said cam follower means and shiftable in response to rotation of said adjustment knob.

2. 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 having a tubular mounting portion extending into said tubular handle and a pair of cap sections co-operating with said blade supporting seat member to clamp a razor blade to said blade supporting seat member, a guard member having guard bar portions at opposite margins and being positioned below said blade supporting seat member, means to incrementally vary the distance between said guard bar portions and said clamped razor blade, said last named means including an adjusting knob having a portion thereof engaging said tubular handle to hold said adjusting knob against axial movement in one direction, cam track means carried on said adjusting knob, cam follower means engageable with said cam track means on said adjusting knob, spring means having one end thereof urging said cam follower means against said cam track means whereby said portion of said adjusting knob will be urged against said tubular handle, the opposite end of said spring means urging said blade supporting seat member away from said guard member, first guide means formed on said guard member, and second guide

means on said blade supporting seat member and slidably engaged by said first guide means during movement of said adjusting knob thereby to maintain said guard bar portions properly oriented relative to said razor blade.

3. The adjustable safety razor of claim 2 wherein said first guide means is positioned inwardly of said guard bar portions to permit increase clearance between said guard bar portions and said blade supporting seat member for easy flushing of said razor.

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