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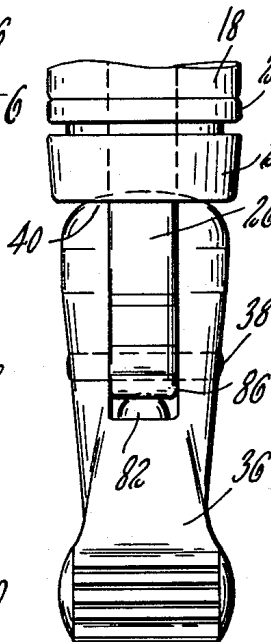
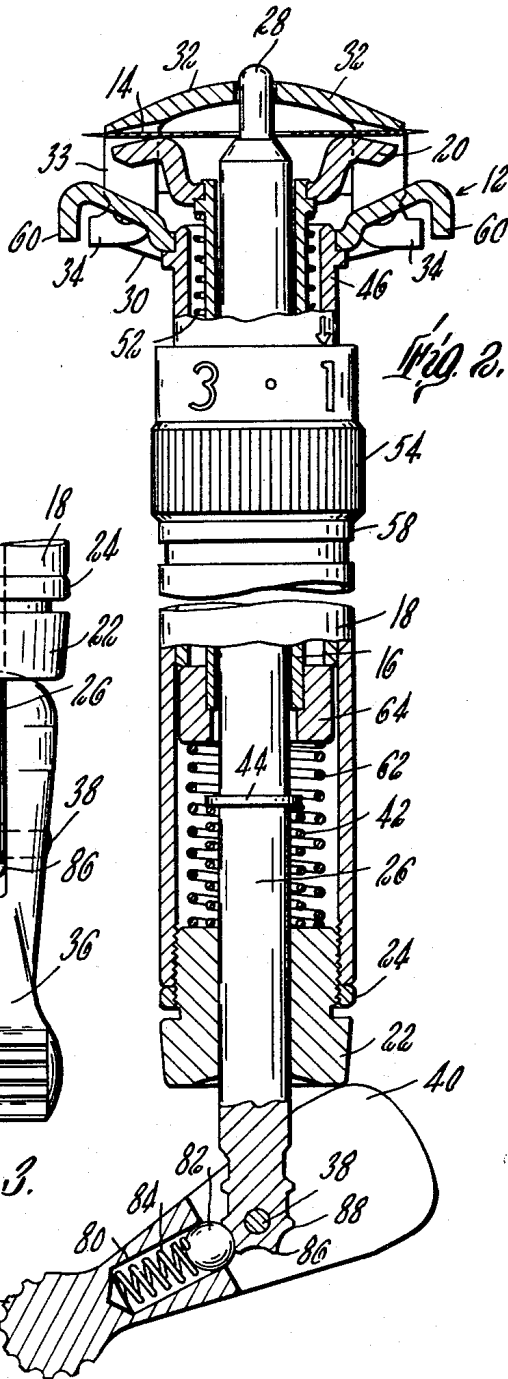
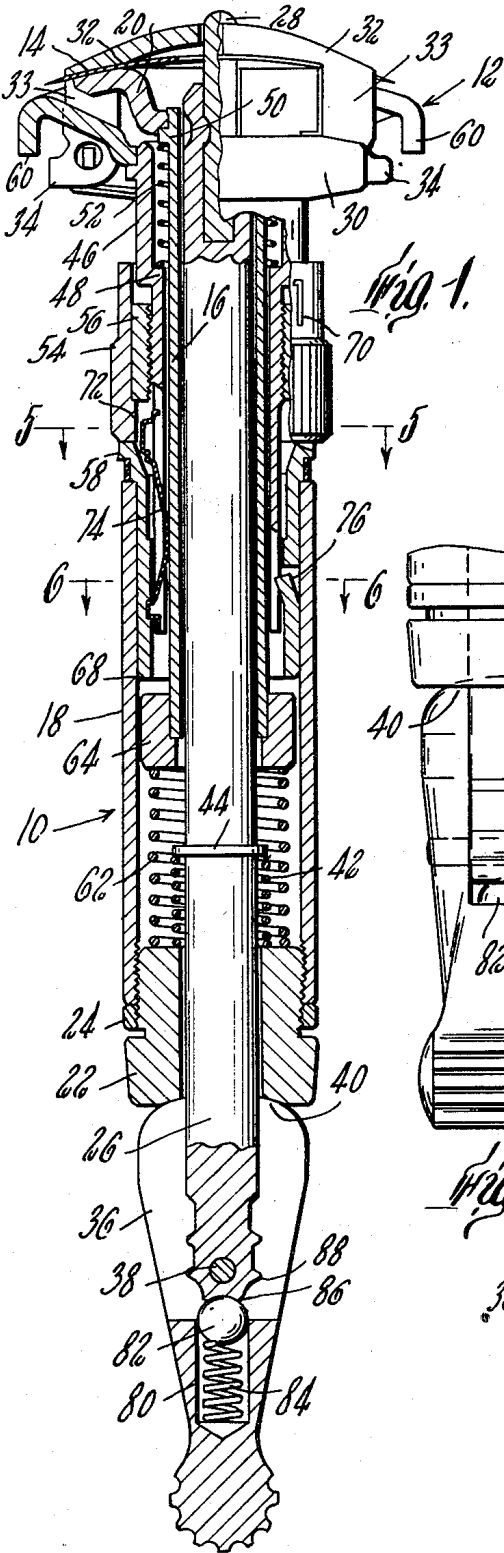
V. R. BAILEY ET AL

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QUICK-OPENING TOGGLE RAZOR

Filed June 26, 1957

2 Sheets-Sheet 1



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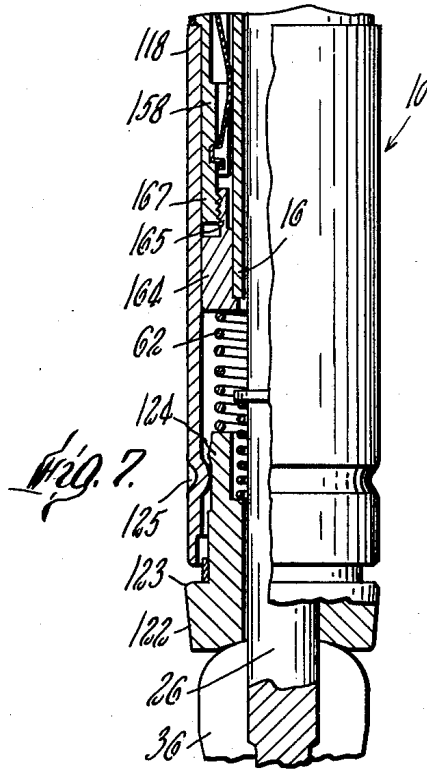
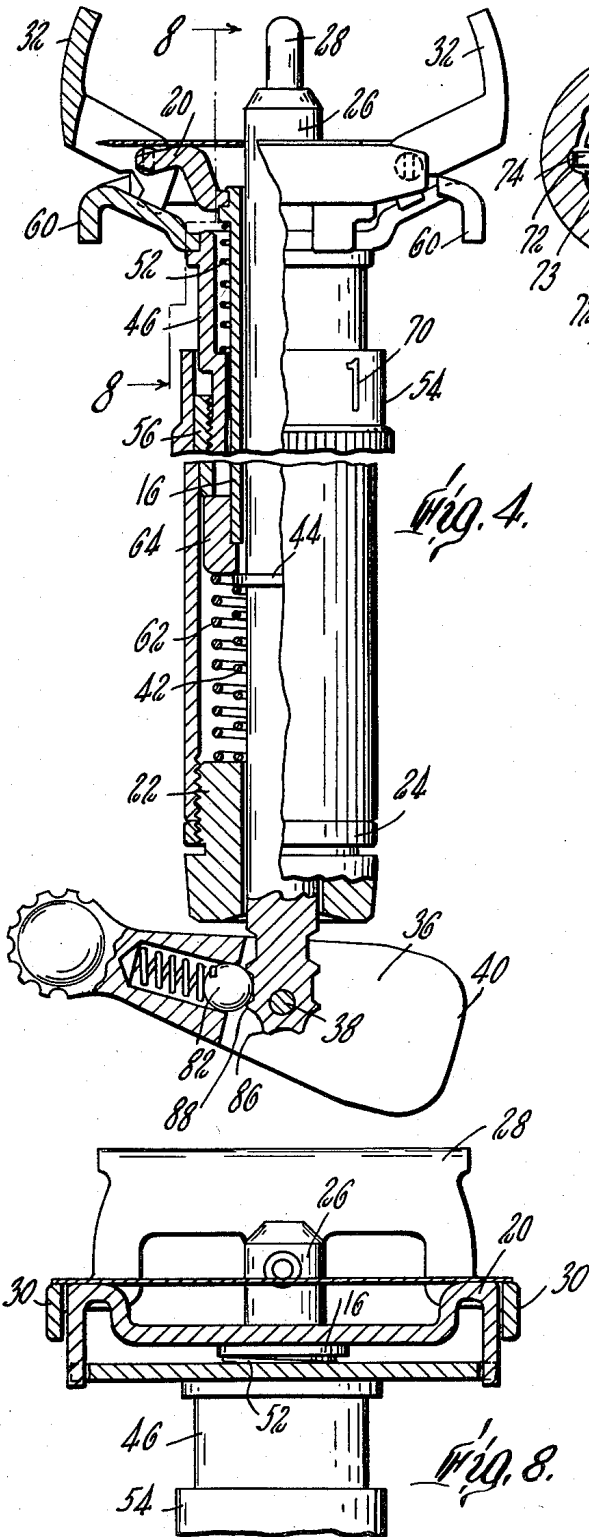
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## QUICK-OPENING TOGGLE RAZOR

Vincent R. Bailey, Westwood, Paul Davis, Beverly, and Raphael Decker, East Weymouth, Mass., assignors to The Gillette Company, Boston, Mass., a corporation of Delaware

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8 Claims. (Cl. 30—60.5)

This invention relates to a safety razor of the so-called "one-piece" construction in which all of the components remain permanently attached to each other at all times to permit replacement of the blade without separation of the parts, and pertains more specifically to such a razor of the quick-opening type.

One object of the invention is to provide a razor of the type described having an improved construction.

Another object is to provide a razor of the type described having improved means for adjusting the shaving relation between the blade and an associated guard member.

Still another object is to provide, in a razor of the type described having a toggle control for clamping and releasing the blade, an improved means for yieldingly and releasably locking the toggle in an intermediate position in which the blade is loosely held in the clamping means to permit rinsing of the razor without removal of the blade therefrom.

Other and further objects will be apparent from the drawing and from the description which follows.

In the drawing:

Fig. 1 is a view in side elevation, partly broken away and in section, showing one embodiment of the present invention with the blade clamped in shaving position;

Fig. 2 is a view similar to Fig. 1 showing the blade loosely held in position for rinsing;

Fig. 3 is a view in front elevation of the lower portion of the embodiment of Fig. 1;

Fig. 4 is a view in side elevation, partly broken away and in section, showing the embodiment of Fig. 1 in open position to permit removal and replacement of the blade;

Fig. 5 is a view in cross-section taken along line 5—5 of Fig. 1;

Fig. 6 is a view in cross-section taken along line 6—6 of Fig. 1;

Fig. 7 is a view in side elevation, partly broken away and in section, showing another embodiment of the invention; and

Fig. 8 is a view taken along line 8—8 of Fig. 7.

Referring to the drawings, the embodiment of the razor shown in Figs. 1 to 6 inclusive generally comprises a handle portion 10 and a head portion 12 in which a razor blade 14 is clamped. Handle 10 is hollow, comprising two telescopically arranged tubular members 16, 18. In the embodiment shown in Figs. 1 to 6 these tubular members 16, 18 are movable axially with respect to each other to a slight extent to and from an extended position and a retracted position. Adjacent the upper end of tubular member 16 is rigidly mounted a blade-supporting platform 20 while the lower end of tubular member 18 is tapped for threaded engagement with a seat element 22. A knurled lock nut 24 is provided for locking seat element 22 in its desired position at the lower end of tubular member 18.

A pull rod 26 passes through the center of the hollow handle 10 and is axially movable with respect to tubular

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members 16, 18. Pull rod 26 carries fixed to its upper end a spider 28 on cross arms 30 of which are pivotally mounted cap sections 32, 32 by means of arms 33, 33. Projecting lugs 34, 34 integral with arms 33, 33 are provided adjacent their pivotal mounting.

Adjacent the lower end of pull rod 26 a toggle 36 is pivotally mounted at 38, being swingable to and from a first position in axial alignment with the pull rod, in which position its upper convex end 40 seats against seat element 22, and a second position in which toggle 36 is transverse to the pull rod. A compression spring 42 encircles the lower portion of pull rod 26, being seated between the upper end of seat element 22 and a flange 44 secured to pull rod 26, thus urging pull rod 26 to a raised position when toggle 36 is in transverse position. Rotation of toggle 36 about its pivot 38 to a position in axial alignment with pull rod 26 serves to draw the pull rod downwardly, drawing with it spider 28 and associated cap sections 32, 32 which clamp blade 14 against blade-supporting platform 20.

An end extension 46 of tubular member 18 is provided which likewise is telescopically slidable over tubular member 16 and which is provided with an internal annular shoulder 48. Mounted between shoulder 48 of extension 46 and a flange 50 adjacent the upper end of tubular member 16 is a compression spring 52 which serves to urge tubular member 16 with its blade-supporting platform 20 upwardly while forcing end extension 46 downwardly. The lower end of extension 46 is threaded to engage with a rotatable collar 54 carrying a tapped insert 56 mounted within it in a press fit. The lower margin of collar 54 abuts against an annular bearing member 58 which is press fitted within the upper end of tubular member 18 and forms a part thereof, collar 54 being rotatable with respect to tubular member 18 and its bearing member 58. Fixedly mounted adjacent the upper end of extension 46 is a blade-guard member 60. Guard 60 is so arranged that movement of spider 28 and associated cap sections 32, 32 axially upwardly with respect to tubular member 18 and guard member 60 causes lugs 34, 34 which are integrally connected with cap sections 32, 32 to abut against an under surface of guard member 60, thus rotating cap sections 32 to open position when spider 28 is raised, as shown in Fig. 4. Similarly, when spider 28 is moved downwardly by swinging of toggle 36, arms 33, 33 supporting cap sections 32, 32 strike against an upper surface of guard member 60, rotating the cap sections to closed or clamping position.

In order to adjust the shaving relation between guard member 60 and blade 14 which is clamped on blade-carrying platform 20, collar 54 may be rotated, thus advancing or retracting extension 46 and varying the overall distance between guard member 60 and seat element 22. Inasmuch as the length of pull rod 26 and spider 28 is fixed, rotation of collar 54 serves to vary the spacing between guard member 60 and the edge of clamped razor blade 14 independently of the clamping pressure exerted upon the blade.

The clamping pressure exerted upon the blade is determined by the strength of spring 52 which may be supplemented if desired by a second compression spring 62 mounted between seat element 22 and a fixture 64 press fitted on the lower end of tubular member 16 and forming a part thereof. Spring 52 and optional spring 62 together urge tubular member 16 and its associated blade-carrying platform 20 upwardly with respect to tubular member 18 against the underside of cap sections 32, 32. The upward movement of tubular member 16 to its extended position in the "rinse" setting of Fig. 2 is limited by the axial clearance between fixture 64 and the lower end 68 of bearing member 58. Downward movement of

tubular member 16 to retracted position is limited only by the stiffness of springs 52 and 62, which keep platform 20 and blade 14 pressed against cap sections 32 so that the latter determine the lowermost position of tubular member 16.

In order to provide for ready adjustment of guard member 60 to any desired predetermined spacing from blade 14, indicia 70 may be provided on the outer face of collar 54 and a plurality of axially extending flutes 72 may be provided on the inner face of collar 54 into which a spring member 74 enters as collar 54 is rotated, thus yieldingly and releasably maintaining collar 54 in a position determined by any one of the flutes. A stop 73 is provided on the inner face of collar 54 to limit rotation of the collar to less than one revolution. Spring 74 may be mounted in an axial slot in the wall of extension 46 of tubular member 18. Into a diametrically opposite slot in extension 46 there extends a detent 76 bent inwardly from the wall of bearing member 58 to serve as a spline connection between tubular member 18 (to which bearing 58 is secured) and its extension 46.

In practice the user of the razor may clamp a blade against platform 20 by actuating toggle 36 and then may independently vary the spacing between guard member 60 and clamped blade 14 by rotating collar 54 to any selected position. Seat element 22 in this embodiment is normally threaded into tubular member 18 during assembly of the razor at the factory and locked in a pre-set position to provide the desired spacing between guard member 60 and platform 20 for any selected position of collar 54. In order to avoid any possible misadjustment of the position of seat element 22, a hardenable liquid cement such as a polymerizable resin solution may be introduced between the threads of seat element 22, tubular member 18 and lock nut 24 and permitted to harden or set up in situ, thus permanently fixing seat element 22 in the desired position.

Inasmuch as it is frequently desirable during use of the razor to rinse the head portion without removing the blade completely therefrom, there is provided a hollow bore 80 extending axially of toggle 36 within which is mounted a generally spherical detent 82 which is urged toward pivot 38 by means of compression spring 84. The end of push rod 26 is provided with a plurality of shoulders 86, 88 and intervening recesses within which detent 82 seats. Accordingly, detent 82 serves to maintain toggle 36 yieldingly and releasably in any one of three positions: a first position as shown in Fig. 1 in which the toggle 36 is in axial alignment with pull rod 26 and its upper end 40 is seated against seat element 22; a second position as shown in Fig. 4 in which toggle 36 extends transversely of pull rod 26; and a third intermediate position as shown in Fig. 2 in which toggle 36 extends diagonally on either side of pull rod 26. In the latter intermediate position, pull rod 26 is permitted to rise slightly with respect to tubular member 18, but is restrained, by the abutment of the shoulder of toggle 36 against the margin of seat element 22, from rising to a point where lugs 34 are engaged by guard 60 to rotate cap sections 32, 32 to completely open position. Since the upward movement of tubular member 16 and its associated blade-carrying platform 20 is limited by fixture 64, the blade is thus released from its tightly clamped position and is free to move slightly with respect to platform 20 and cap sections 32 while still being retained within the head portion of the razor. This arrangement facilitates thorough rinsing of the head portion of the razor without removal of the blade.

It should be noted that toggle 36 may be actuated in either direction for clamping and unclamping the blade and also for reaching the intermediate rinsing position.

In another embodiment of the invention, as shown in Fig. 7, seat element 122 is slidably mounted in the lower end of tubular member 118, the extent of axial movement of seat element 122 being limited by the axial

clearance between its shoulder 123 and the lower end of tubular member 118 on the one hand and by the clearance between shoulder 124 and an inwardly swaged ring 125 in tubular member 118 on the other hand. The axially movable mounting of seat element 122 in tubular member 118 together with spring 62 provide the clamping pressure exerted upon the blade in this embodiment of the invention, so that tubular member 16 may in this case be fixed within tubular member 118 by means of fixture 164 which carries a threaded portion 165 threadedly engaged within a tapped portion 167 at the lower end of bearing member 158 which in turn, together with fixture 164, is press fitted to tubular member 118. Tubular member 16 is a press fit within fixture 164. In this embodiment, the upper part of which is identical with that shown in Figs. 1 to 6 except that detent 76, being unnecessary, may be omitted, spring 52 serves only to keep extension 46 and collar 54 pressed against bearing member 158 and does not affect the clamping pressure on blade 14.

In assembling this embodiment of the invention, the parts of the head portion and upper handle portion (exclusive of tubular member 118) are assembled together, fixture 164 being driven home upon the lower end of tubular member 16. Collar 54 is then rotated to a selected setting, and bearing member 158 is rotated with respect to fixture 164 and tubular member 16, the threaded engagement between portions 165 and 167 causing collar 54 and end extension 46 to move axially, thus varying the axial spacing between guard member 60 and platform 20. When this spacing has been adjusted to the desired value for the selected setting of collar 54, tubular member 118, which is a press fit with both fixture 164 and bearing member 158, is forced over these elements to lock them together and thus maintain the pre-set relation between the guard member 60 and platform 20.

It will be noted that the telescopically nested tubular construction of the handle portion not only provides an axially elongated bearing which serves to avoid rocking or tilting of guard member 60 with respect to platform 20 and the consequent varying of the shaving relation between guard member 60 and blade 14, but in addition is highly versatile, permitting as it does pre-adjustment of the relationship between guard and blade during assembly in a variety of ways, two of which are illustrated in detail above and others of which will be apparent to those skilled in the art.

Although specific embodiments of the invention have been described herein, it is not intended to limit the invention solely thereto, but to include all of the obvious variations and modifications within the spirit and scope of the appended claims.

What is claimed is:

1. A safety razor having a hollow handle comprising a pair of tubular members telescopically connected with respect to each other, a blade-supporting platform connected adjacent the outer end of one said member, a seat element connected adjacent the opposite end of the second said member, at least one of the connections being axially movable to permit movement of said platform and said seat element to and from an extended and a retracted position with respect to each other, a spring urging said platform and seat element to extended position, an axially movable solid pull rod extending through said handle and carrying adjacent one end means for releasably clamping a blade to said platform and adjacent the other end a pivotally mounted toggle movable to and from a first position in axial alignment with said pull rod in which position an end of said toggle seats against said seat element to maintain said pull rod and clamping means in position to clamp said blade against said platform under the pressure of said spring, and a second position in which said toggle is transverse to said pull rod and said clamping means is completely open to release said blade.

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2. A safety razor as defined in claim 1 in which said seat element is mounted for axially sliding movement with respect to said second member, said first and second members are axially fixed to each other, said element has toggle receiving means, and in which a spring is mounted between said element and said second member to urge said element to extended position and toward said toggle to resiliently resist rotation of said toggle when seated in said toggle receiving means.

3. A safety razor as defined in claim 1 in which means is provided for yieldingly and releasably locking said toggle in a position intermediate between said first and second positions to hold a blade loosely within said clamping means to permit rinsing thereof.

4. A safety razor as defined in claim 3 in which said locking means includes a detent yieldingly mounted in said toggle for movement toward and away from the pivotal mounting of said toggle and an end portion of said pull rod extending beyond said pivotal mounting, said end portion having detent receiving means for mating engagement with said detent when said toggle is in the desired intermediate position.

5. A safety razor as defined in claim 1 in which a blade guard is mounted on an end extension of said second tubular member adjacent said platform and in which means is provided for adjusting said end extension and guard axially with respect to said second tubular member.

6. A safety razor as defined in claim 5 in which said adjusting means comprises a collar threaded on one of said extension and said second tubular member, and abutting against the other, and said spring extends between said first tubular member and said end extension to urge said extension toward said second tubular member.

7. A safety razor having a hollow handle comprising a pair of tubular members telescopically mounted with respect to each other and slidable to and from extended position and retracted position, a blade-supporting platform mounted adjacent the outer end of one said member, a seat element mounted adjacent the opposite end of the second said member, a spring mounted between

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said members urging them to extended position, an axially movable solid pull rod extending through said handle and carrying adjacent one end means for releasably clamping a blade to said platform and adjacent the other end a pivotally mounted toggle movable to and from a first position in axial alignment with said pull rod in which position an end of said toggle seats against said seat element to maintain said pull rod and clamping means in position to clamp said blade against said platform under the pressure of said spring, and a second position in which said toggle is transverse to said pull rod and said clamping means is completely open to release said blade, said seat element having toggle receiving means effecting momentary depression of said pull rod against the opposition of said spring as said toggle is rotated in either direction from said first position.

8. A safety razor as defined in claim 7 in which said seat element is threadedly mounted on said second member and in which means is provided for locking said seat element in fixed position on said second member.

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