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SAFETY RAZOR WITH BUTTRESS THREAD

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FIG. 1

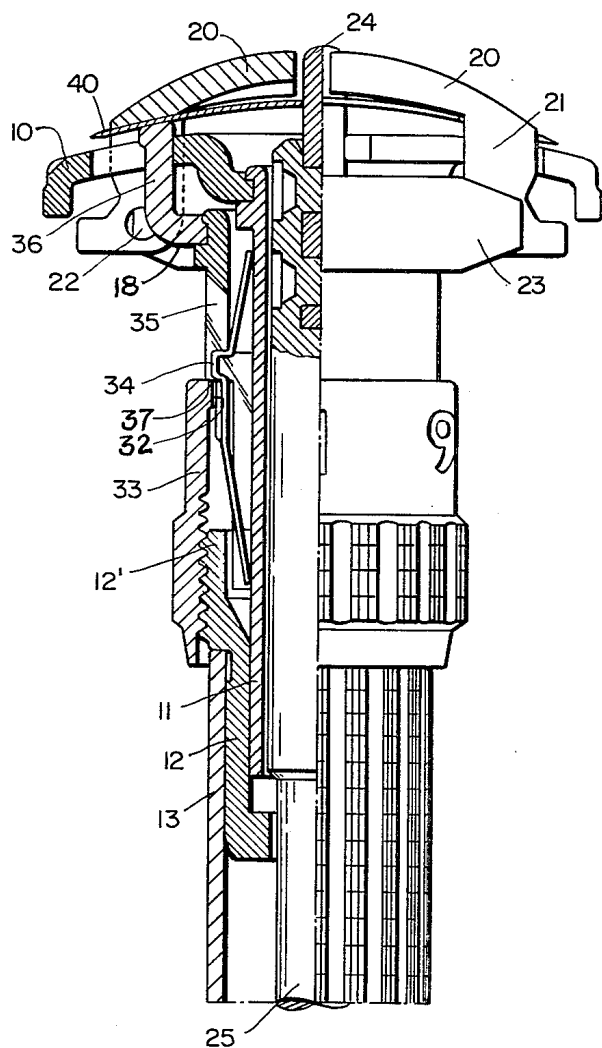
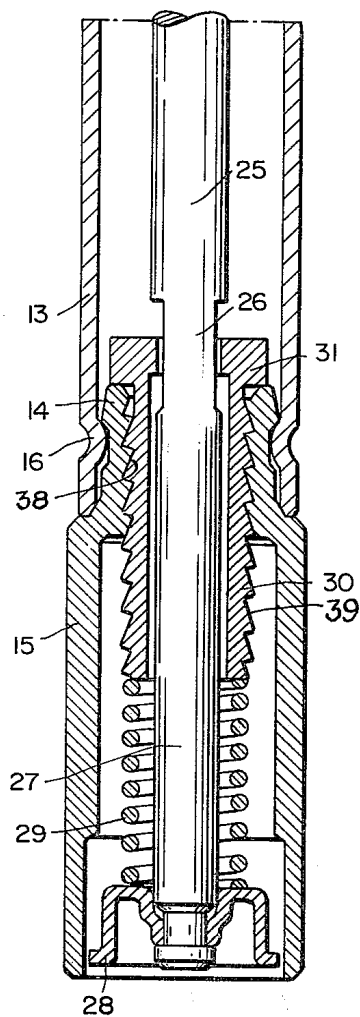


FIG. 2



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SAFETY RAZOR WITH BUTTRESS THREAD
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1 Claim. (Cl. 30-34)

This invention relates generally to one-piece safety razors of the sectional cap type and more particularly to an improved quick-acting operating mechanism for such razors.

In one-piece safety razors now available relatively movable members are provided between which a flexible and resilient blades is clamped in a position of transverse curvature with a predetermined and safe blade edge exposure. The blade clamping operation is usually effected through the medium of a screw threaded element adapted to be conveniently reached by the user and arranged to turn, sometimes provided with a high pitch and/or multiple lead thread to reduce the number of turns necessary to operate the blade clamping mechanism. There is a practical limit to which the pitch can be increased since a very large pitch may reduce the frictional holding characteristics of the element to such an extent that the element may back off or become accidentally loosened during use. If this were to occur the edge exposure of the clamped blade would of course be increased beyond the predetermined safe amount.

For this long-standing problem I have discovered a solution which not only obviates the problem discussed above but provides an improved safety razor in which the blade clamping operation brings about a wedging or binding action when the threaded element is subjected to blade clamping strain thereby in effect frictionally locking the razor in safe condition. The resistance encountered is such that the user soon becomes accustomed to recognize it as indicating safe blade clamping conditions. The frictional drag thus developed also prevents any accidental reverse rotation of the threaded element even when a very large pitch is employed.

In one aspect therefore the present invention comprises a safety razor having operating connections between the blade clamping members which include a sleeve or nut element connected by buttress threads arranged with their long slope in the direction to create wedging and binding action when the threaded element is subjected to longitudinal or axial stress in clamping the blade.

This construction will be best understood and appreciated from the following description of a preferred embodiment of the invention, selected for purposes of illustration and shown in the accompanying drawing in which:

FIG. 1 is a view in elevation, partly in longitudinal section of the razor head shown on an enlarged scale, and

FIG. 2 is a view in longitudinal section of the razor handle.

The invention is herein described as embodied in a safety razor having a head construction of the general type shown in United States Letters Patent 2,848,806, August 26, 1958, Shnitzler et al., which head has a stationary guard member 10. As herein shown the blade clamping members comprise cap sections 20 and a platform or blade-supporting member 18 and these elements are arranged to clamp a flexible blade 40 in position, with a predetermined transverse curvature.

The guard member 10 is substantially rectangular in contour. Its longitudinal edges are turned down to form rounded guard bars. It is centrally perforated and permanently connected to the upper end of a long tube 11 shown as shouldered and spun at its upper end to

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form a retaining flange for engagement with the body of the guard.

The tube forms an inner part of the razor handle and is fitted at its lower end into a stationary sleeve 12 having at its upper end an elongated externally threaded portion 12' formed with an annular recess in its upper end providing clearance space about the tube 11. The sleeve 12 in turn is fitted into an outer stationary tube 13 and against the lower end of this tube abuts a shoulder formed in the upper end portion 14 of a rotatable sleeve 15 having connections for raising and lowering the cap sections 20 as will presently appear. The sleeve 15 constitutes the lower section of the razor handle. It is held against separation from the outer tube 13 by an internal rib 16 in the tube 13 that projects into a circular groove or recess in the upper end portion 14 of the sleeve 15.

The cap sections 20 provide a downwardly concave blade clamping face and have downwardly extending arms 21 connected by pivots 22 to the outer ends of cross arms 23 for opening and closing movement. The cross arms 23 are part of a vertically movable spider which includes a central bar 24 fast to the upper end of a rod 25. This rod which extends throughout the handle of the razor has an intermediate flat section 26 and a lower section 27 to the end of which is crimped a cap 28 received with clearance within the lower end of the rotatable sleeve 15. The lower section 27 of the rod is encircled by a compression spring 29 which bears at its lower end upon the cap 28 and at its upper end against a non-rotatable sleeve 30. It will be seen therefore that the spring 29 tends at all times to move the rod 25 downwardly and the spring is so designed as to transmit first cap-closing and then fully adequate blade-clamping pressure to the blade beneath the cap sections 20. The non-rotatable sleeve 30 is provided at its upper end with a collar 31 which is provided with a slot for the passage the flat section 26 of the rod 25, this connection being effective to prevent rotation of the sleeve 30.

The platform or blade-supporting member 18 comprises a pair of spaced upright arms 36 that extend parallel to the edges of the cap sections 20 and pass upwardly through slots in the guard member 10 to provide the blade-supporting surfaces for cooperation with the blade-clamping surfaces of the cap sections 20. The blade-supporting member 18 is carried by a collar 35 which is mounted to slide freely in the handle of the razor. The collar 35 is provided with a shoulder 37 that abuts against the upper edge of the sleeve 33 and is adjustably limited in its operative position by the rotatable sleeve 33 which has as already stated threaded connection with the stationary sleeve 12. The inner surface of the recess in the sleeve 33 is provided with a series of axially extending grooves 32 in the upper end thereof arranged to be selectively engaged by a spring detent 34. The edge exposure of the blade may be adjustably controlled by turning the sleeve 33 to set the blade-supporting member 18 at the proper height with reference to the guard 10. The amount of edge exposure is increased as the platform is lifted and the blade edge carried away from the guard 10. The razor head is represented in FIG. 1 as set for intermediate blade edge exposure.

It will be understood from the foregoing description that the opening and closing movements of the cap sections 20 and also their blade-clamping movements with respect to the platform 18 are controlled by axial movement of the rod 25. This movement is effected by rotation in one direction or the other of the sleeve 15 which moves the non-rotatable sleeve 30 axially through its threaded connection therewith. The movement of the sleeve 30 is transmitted to the rod 25 through the spring 29 and cap 28.

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The double threads 38 of the sleeve 15 and the mating threads 39 of the sleeve 30 are of the buttress type but they are reversed in shape from buttress threads heretofore employed; that is to say, the longer sloping face of the thread is the driving face. When the sleeve 15 is rotated in clockwise direction the long sloping face of the thread moves the sleeve 30 downwardly imparting blade-clamping movement to the rod 25 through the spring 29. Ordinarily the driving face of a buttress thread is nearly perpendicular to the axis of the thread but this conventional arrangement is reversed in accordance with the present invention with the result that any axial stress developed between the sleeves 15 and 30 creates the desired wedging or binding effect between the threads 38 and 39 when the collar 31 of the non-rotatable sleeve 30 engages the upper end portion 14 of the rotatable sleeve 15. This wedging or binding effect will frictionally lock these two elements so as to prevent accidental relative rotation therebetween.

The binding effect developed by the buttress threads is sufficient to lock the sleeve 15 against reverse turning in the casual handling of the razor, but may be overcome by the application of a comfortable amount of force by the user when he desires to clean the razor or replace a used blade.

Having thus disclosed my invention and described in detail an illustrative embodiment thereof, I claim as new and desire to protect by Letters Patent:

A safety razor comprising a handle and cooperating members which members are relatively movable to clamp a flexible blade therebetween; said members having op-

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erating connections including an axially movable rod having an abutment thereon, a spring and sleeves; said sleeves being connected by buttress threads; one of said sleeves being non-rotatable and axially movable; the other of said sleeves being rotatable and forming a portion of said handle; said spring being positioned within said rotatable sleeve and bearing against said non-rotatable sleeve and said abutment for urging the non-rotatable sleeve in an axial direction to move said rod to transmit blade clamping pressure to said members upon rotation of said rotatable sleeve; the buttress threads being arranged with their long slope in a direction to create wedging action when the spring is subjected to compression through rotation of said rotatable sleeve and axial movement of said non-rotatable sleeve.

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