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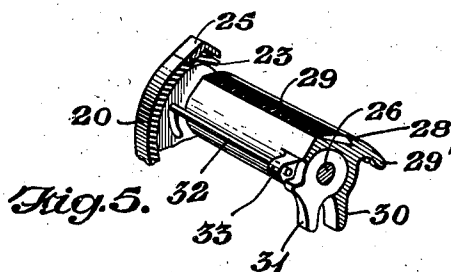
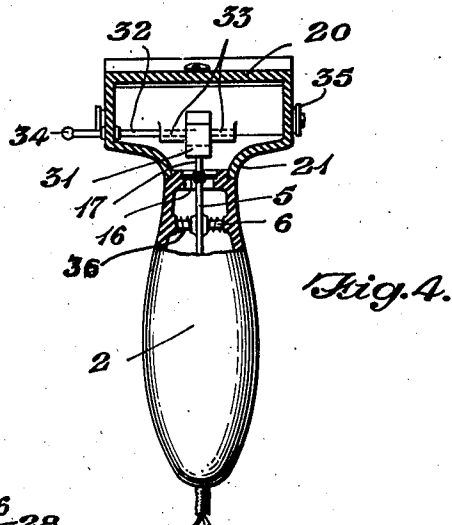
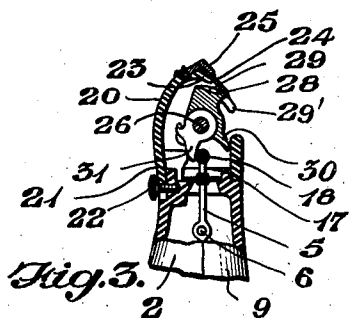
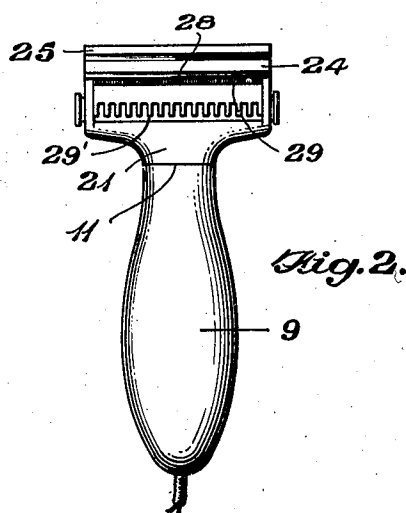
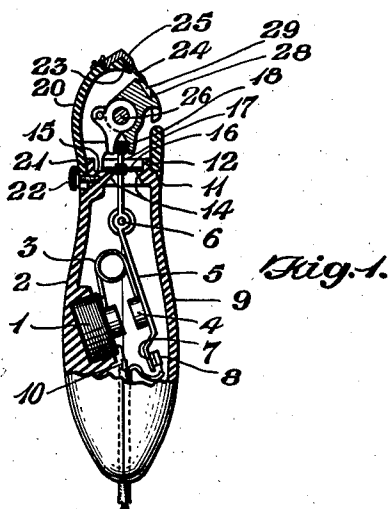
R. T. BASSETT ET AL

2,227,996

CONVERTIBLE SAFETY RAZOR

Filed April 15, 1938

2 Sheets-Sheet 1



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*Fig. 7.*

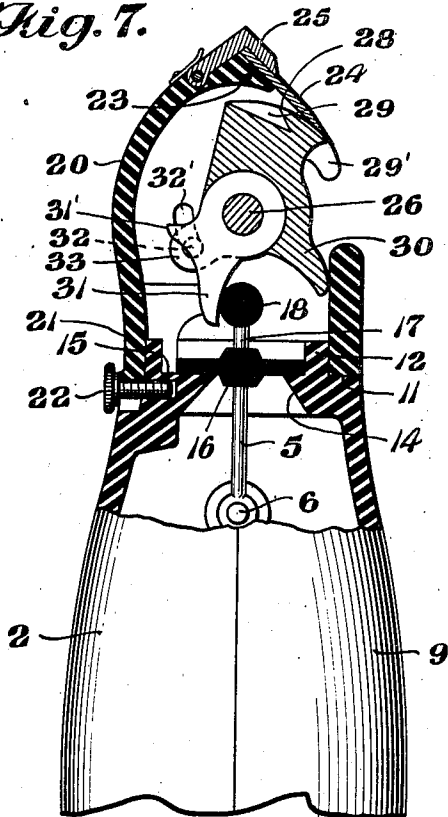


*Fig. 8.*

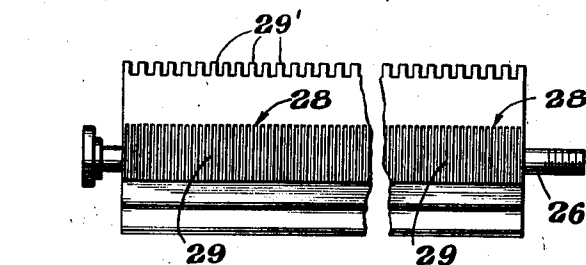
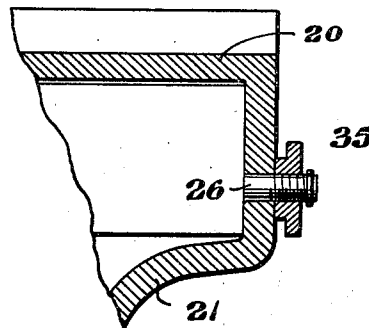


*Fig. 9.*

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## UNITED STATES PATENT OFFICE

2,227,996

## CONVERTIBLE SAFETY RAZOR

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Application April 15, 1938, Serial No. 202,340

14 Claims. (Cl. 30-43)

This invention relates to safety razors.

The object of this invention is to so construct a power driven shear type razor so that it may be converted into a conventional manually actuated safety razor.

More specifically this invention provides a blade holder and a power driven shear member co-acting therewith, the shear member carrying or being formed with a guard element so constructed and arranged that it may be positioned with respect to the blade so that the latter may be utilized as the conventional safety razor.

Another object resides in the provision of means for rendering the power for the shear member ineffective, when the assembly is to be used as a conventional safety razor.

Still another object resides in the arrangement of the motor casing so that it is sealed from the cutting element, and further utilizing the sealing means as a silent mounting for certain of the drive mechanism.

Reference will be had to the accompanying drawing forming a part of this specification and wherein like numerals of reference designate corresponding parts throughout the several views, in which

Fig. 1 is a side elevation partly in section.

Fig. 2 is a front elevation.

Fig. 3 is a fragmentary section with the guard shifted to operative position.

Fig. 4 is a rear elevation partly in section.

Fig. 5 is a perspective of the shear and guard assembly.

Fig. 6 is a perspective of a modified form of guard and shear member.

Fig. 7 is an enlarged fragmentary elevation partly in section.

Fig. 8 is a fragmentary section showing the lock for the shear member and,

Fig. 9 is a top plan view of the shear block.

The present disclosure is illustrative of an arrangement wherein a safety razor is provided with a conventional razor blade which cooperates with a power actuated shear member of the general type illustrated in our co-pending application Serial No. 187,292 filed January 27, 1938. Incorporated in such an assembly there is provided a guard for cooperation with the blade in manual shaving. This combined structure is so arranged that the blade, shear member or guard can each, any or all be shifted relatively to provide for either power or manual shaving. By such a combination a power razor is obviously of service where no power is available by a simple shifting of the parts to enable use as a conven-

tional safety razor, and can, when desired be again converted for power actuation.

In the present application no claim is made as regards the source of power, there being illustrated a motor of the oscillating type. This motor embodies the magnet 1, seated in a socket of one section of the shell or casing 2 formed of suitable insulating material for convenience. A spring 3, also forming a conductor carries the armature 4, and to this armature is attached the elongated arm 5 which is pivoted intermediate of its length at 6 and terminates at its lower extremity in contact 7. The contact 7 is positioned to function with contact 8 fixed to the other insulated shell section 9 and this contact 8 is connected to the source of power. The other lead 10 necessarily goes to the coil or magnet 1 to complete the operative circuit and make and break mechanism therefor.

The casing is flanged inwardly at its upper end to form the shoulder 11 and an offset wall extension 12 provides a neck member for joining the casing and head. It will be noted that an annular inner projecting portion 14 is provided by increasing the wall thickness immediately below the neck member, and the upper face thereof is flattened at 15 to provide for the seating of a rubber sealing gasket 16. The gasket 16 is vulcanized or otherwise bound to the flattened surface 15 and at a central point is thickened and perforated to engage and tightly seal the projecting end 17 of the actuating arm 5. The arm 5 extends into the head portion and may terminate in a resilient extremity 18 for engaging the shear member as will more clearly appear.

The casing head 20 is transversely elongated and includes the hollow neck portion 21 which encloses the wall extension 12 and seats on the shoulder 11. A thumb screw 22 may be utilized to fasten the parts against accidental displacement although any type of fastener can be substituted. The upper portion of the head section is illustrated as somewhat oval in cross section and the front face of this head section is cut away to define an opening which extends substantially the width of a conventional razor blade. The upper wall defining the top of the opening is beveled at 23 to furnish a supporting face for the blade 24 removably clamped thereagainst by hinged clamp 25. Other means for removably positioning the blade 24 may be substituted including means whereby the blade may be shifted as to angle or position to facilitate the operation to which it may be subjected.

Arranged within the head section is the shear

member, the form of which being such as to function in cooperation with the blade 24. This shear member is of general cylindrical shape, and is mounted in the end wall of the head section on pivots or journals formed by shaft 26 which is shown as extending therethrough, so that an oscillatory movement may be provided from the motion heretofore mentioned. The shear faces 28 are illustrated as relatively short and are partitioned by transverse walls 29 which function to partially support and align the blade 24. The shear faces are necessarily positioned immediately and in cooperative engagement with the blade 24 and are manipulated through the motor to move across the cutting edge of the blade to distance essential for proper and successful actuation.

Immediately below the shear faces there is provided a guard 29' of spaced teeth of the general type utilized in the Gillette type of razor although as shown in Fig. 6 at 30 the bar type of guard may be substituted therefor. The paramount feature of the guard is its location so that it will be in a position to be moved to the blade for cooperation therewith. In the event the guard is not arranged to be shifted the blade may be shifted to the guard.

To actuate and release the power drive a connection is illustrated in which the shear block has a depending portion 30 preferably midway of its length and adjacent this extension and about the shaft 26 the block is cut away to permit the mounting of the hinged finger 31. The resilient end of the arm extremity 17 is clamped between the depending portion 30 of the shear block and the hinged finger 31 and these parts are locked together by the sliding pin 32 which extends through the perforated ear 33 extending from the rear of the shear block. This pin 32 extends through the arcuate slot in the ends of the casing head and terminates in the button 34 which facilitates its actuation. A thumb nut 35 on the end of the shaft 26 is shown to lock the combined shear block and guard in adjusted positions.

Springs 36 are arranged on the pivot pin 6 to retain the member 5 in normal position. These springs engage the shell at one end and at the other ends are fixed in the enlarged portion of the arm 5 forming the bearing on the pin 6. The springs shown and described, and which function to retain the shear block in a normal position cooperate with the resilient gasket member 16 in this function, it being obvious that the relative movement of the member 5, under its motor power may require a slight tensioning because of the presence of the spring 3. The arrangement of the drive for the shear block is not essential to the successful manipulation of the development, as other mechanisms may be substituted therefor. The primary feature essentially resides in the convertible nature of the development and it is only necessary that the power utilized be such as to permit the successful operation.

The use and operation of the device is as follows: For power shaving the shear faces 28 together with the guards 29, are caused to oscillate across the cutting edge of the blade 24 through the medium of the elongated arm 5 which is pivoted at 6 and caused to oscillate by the motor mechanism contained in the handle. The upper end 18 of the elongated arm 5 engages the shear block and oscillates the same by virtue of the depending portion 30 of the shear block and the

hinged finger 31 which straddle the upper end of the arm 5 and form a close fitting working socket for these parts. The shaving action of the shear faces in cooperation with the blade 24 is more fully set forth in copending application Serial No. 187,292 filed January 27, 1938, heretofore mentioned. When electric current is not available for the actuation of the motor whereby power shaving is not possible then the pin 32 is withdrawn from the perforation in the ear 33 at the rear of the shear block, this movement of the pin disengages the same from contact with the upper shoulder 31' of the finger 31 and permits the latter to move independently of the shear block. When this pin is thus released the shear block is shifted counter-clockwise to bring the guard fingers 29' into working position with respect to the cutting edge of the blade 24, this movement simultaneously shifting the shear block from engagement with the upper extremity of the oscillating arm 5 and rendering any accidental motor movement ineffective insofar as the shear block is concerned. The arcuate slot 32' permits the pin 32 to swing with the shear block. When the shear block is shifted in the manner described to bring the guiding fingers 29' into engagement with the blade for manual shaving, the thumb nut 35 on the shaft 26 can be turned to lock the pivot pin against shifting and thus retain the guard 29' in fixed relation to the blade as is conventional in safety razor assemblies. It will be apparent that other means may be provided for connecting the motor to the shear block and for releasing the drive from the motor. It will also be apparent that other means than the thumb nut 35 may be substituted for locking the shear block for manual shaving operation. Other changes in details of construction can be made without departing from the spirit of the invention.

What we claim and desire to secure by Letters Patent is:

1. A safety razor structure including a cutting blade, a power driven member arranged for shearing operating with said blade, a guard carried by said power driven member for cooperation with said blade for manual shaving operation, and means for disconnecting said power driven member from its source of power and simultaneously releasing said guard to permit its movement into cooperative relation with said blade to permit manual shaving operation.

2. A safety razor structure including a blade, a power driven shear member arranged for shearing relation with said blade, a power source for said power driven member, a guard member for cooperation with said blade for manual shaving, and means for shifting said guard member into cooperative relation with said cutter upon disconnecting said shearing member from its source of power.

3. A safety razor structure including in combination, a removable safety razor blade, a motor driven shearing member for cooperation with said blade, said shearing member being provided with a multiplicity of shearing faces each defined by relatively thin wall portions which form supporting elements for said blade, a blade guard for cooperation with said blade for manual shaving and formed in parallel relation with said shearing member and carried thereby and means for shifting said shearing member from cooperative relation with said razor blade and moving said guard member into cooperative position with said blade for manual shaving.

4. A safety razor including a casing, a motor in said casing, a removable cutting blade carried by said casing, a shearing member arranged for cooperative relation with said blade, drive means between the motor and the shear member, blade guards carried at each side by the shear member, one of said guards cooperating with said blade during operation of said shearing member and the other guard functioning with said blade during manual shaving operation, means for disconnecting the shear member from said motor, and means for shifting said shear member to bring either of said guards into cooperative position with said blade.

5. The substance of claim 4 characterized in that the shear member and guards are formed as a unitary structure.

6. The substance of claim 4 characterized in that the motor is sealed from the shear member and cutter by a rubber gasket, which gasket forms a resilient mounting for the drive connection between the motor and the shear member.

7. A safety razor including a cutting blade, a shear member cooperating with said blade, a blade guard carried by said shear member for cooperation with said blade for manual shaving operation, and means for shifting the blade and shear member relatively to position said guard in cooperative relation with said blade.

8. A safety razor structure including a frame, a safety razor blade carried by said frame, a power driven shear block having a multiplicity of shear faces for cooperative shearing movement with relation to the blade, guard members arranged forwardly and rearwardly of the shear faces, the rearwardly positioned guard member being positioned away from said shear faces, the forwardly arranged guard member supporting and aligning said blade during the operation of the shearing block thereagainst, means for shifting said power driven shearing block out of cooperative position with said blade and positioning said rearwardly arranged guard into cooperative relation therewith.

9. The substance of claim 8 characterized in that the shifting of power shear member simultaneously moves the guard into operative position.

10. A safety razor structure including a cutting blade, a power driven shear member cooperating therewith for dry shaving operation, a

guard fixed to the outer longitudinal edge of said shear member, and means for shifting said shear member to position said longitudinal guard adjacent said blade for manual shaving operation.

11. A safety razor structure including a cutting blade, a power driven shear member for cooperating therewith for dry shaving operation, a guard adapted for use in cooperation with said blade for manual shaving operation, and means for moving said parts to permit the selective cooperation of said blade with said shear member or guard.

12. A safety razor structure including a cutting blade, a source of power, a shear block having shear faces for cooperation with said blade and supported for operation from said source of power, a blade guard carried by said shear block for cooperation with said cutting blade for manual shaving, said shear block being shiftable to two positions, one position bringing the shearing faces into cooperation with said blade for power shaving, and the other position bringing said guard into cooperation with said blade for manual shaving and means for connecting the source of power with said shear block when the shearing faces are in position for cooperation with said blade.

13. A razor structure including a blade, a power driven shear member cooperating with said blade for dry shaving, a source of power, drive means including a shaft connecting the source of power with the shear member, said drive member including a coupling comprising a fixed portion of said shear block and a movable element associated therewith, and means for locking the fixed portion of the shear block and movable element in fixed relation and in engagement with said shaft, said last named means being operable when said shear block is positioned adjacent said blade for dry shaving.

14. The substance of claim 13 characterized in that the shear block includes a blade guard for association with said blade for dry shaving, and said blade guard is movable to operative position with respect to said blade when the movable element of said coupling is in its unlocked position with respect to the fixed portion of the shear block.

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