

May 9, 1939.

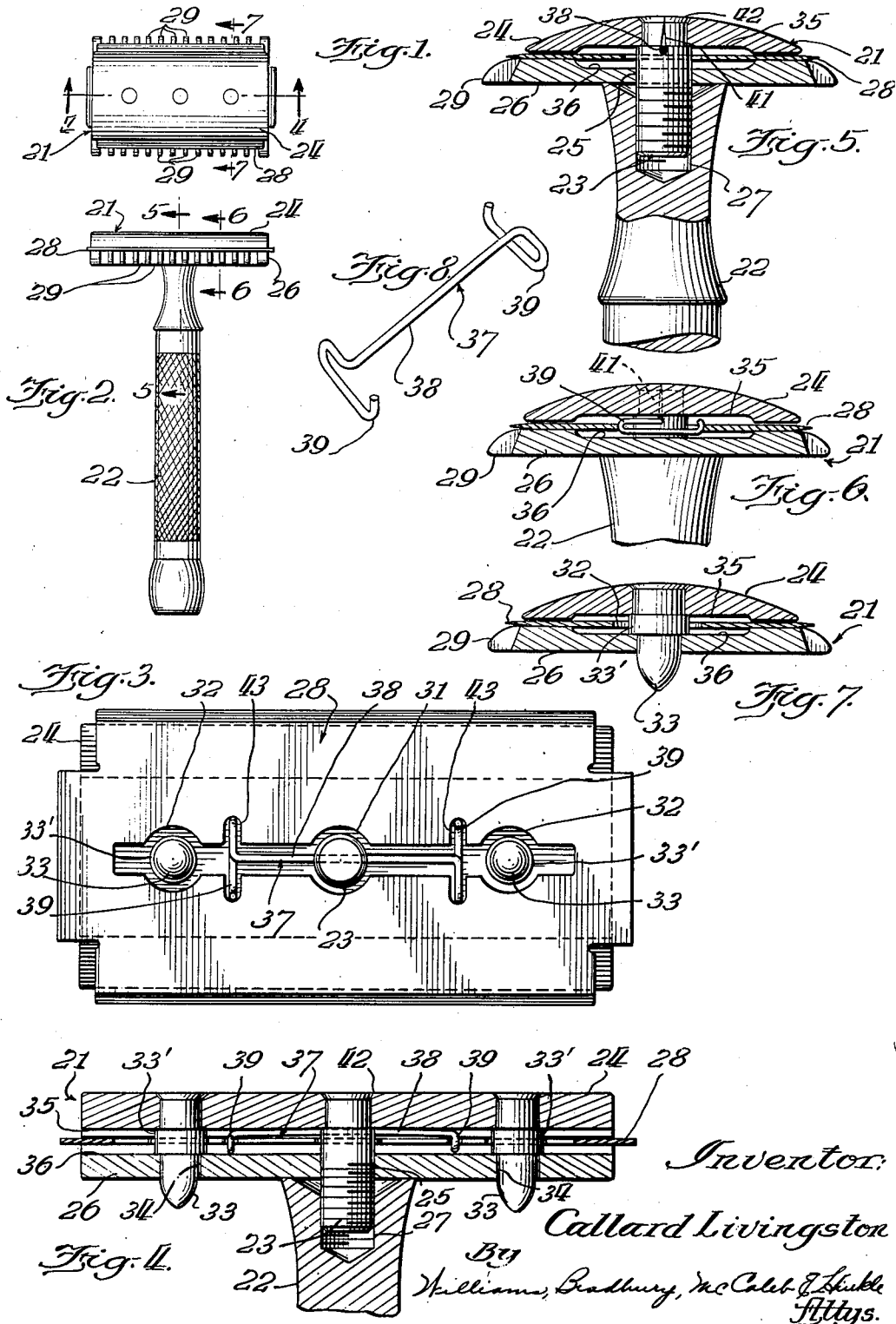
C. LIVINGSTON

2,157,492

RAZOR

Filed April 8, 1935

2 Sheets-Sheet 1



Inventor:

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By  
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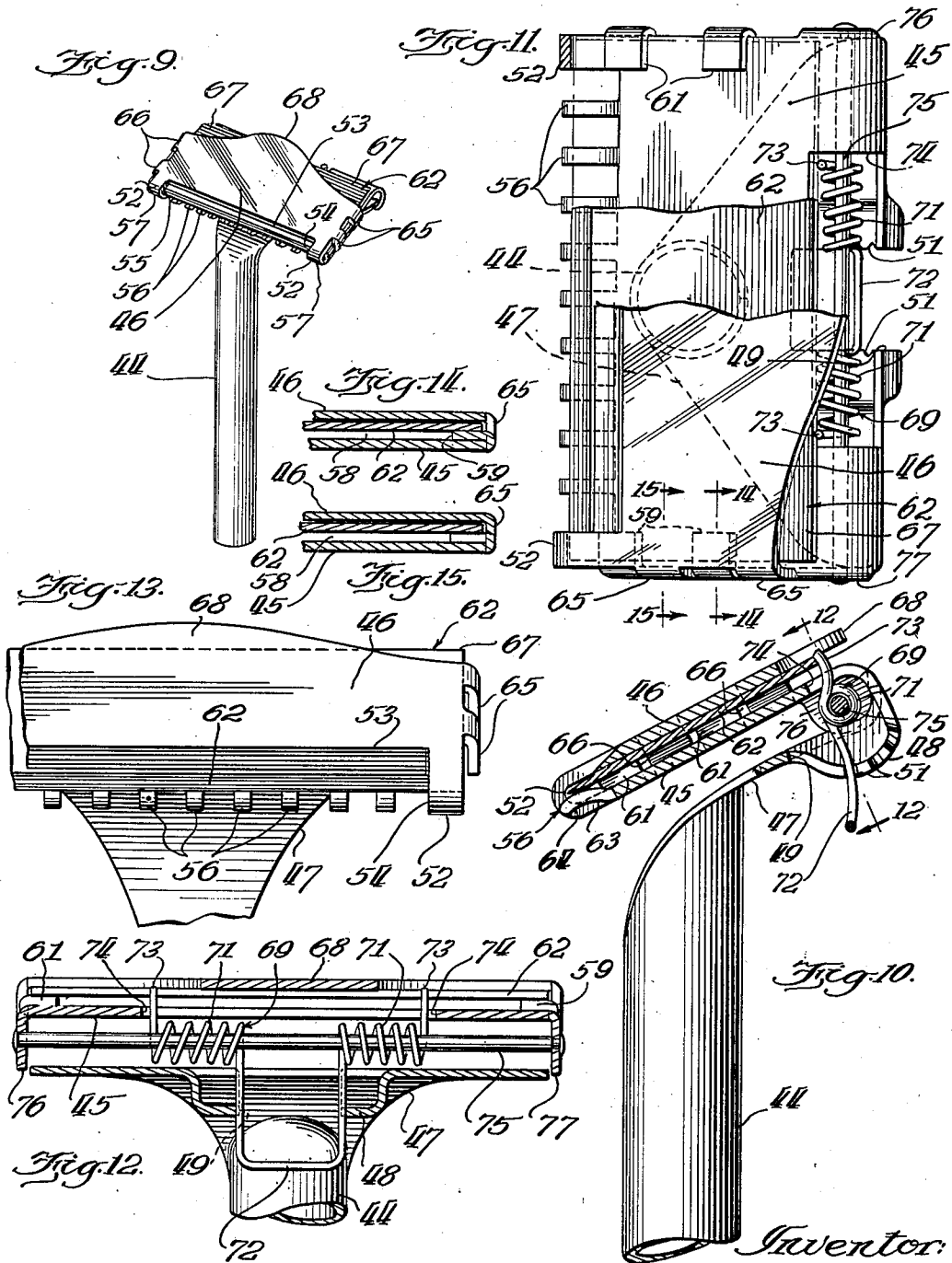
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# UNITED STATES PATENT OFFICE

2,157,492

RAZOR

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Application April 8, 1935, Serial No. 15,200

17 Claims. (Cl. 30—44)

This invention relates to razors, and has more particular reference to safety razors.

The invention includes among its objects, the provision of a razor with a reciprocable cutter or blade which is capable of actuation in one direction by the cutting resistance encountered in the use of the razor. That actuation energizes an operative member which opposes or resists the movements of the cutter or blade caused by the cutting resistance and tends to, and may, drive the cutter in the opposite direction. The cutter or blade may thus be reciprocated in the line of the shaving stroke or at an angle thereto, whereby to minimize the likelihood of a shaver cutting himself; whereby to render shaving more comfortable than it ordinarily is; whereby to provide more uniform results over a surface being shaved; whereby, in the case of the cutter reciprocations being at an angle to the line of stroke, to facilitate the cutting by effecting a kind of drawing movement in addition to the usual stroke of the cutter; and whereby, in general, to improve cutting action of the cutter.

Other objects of the invention include the combinations and arrangements of parts hereinafter disclosed in connection with the accompanying drawings, wherein like reference characters designate similar parts throughout the following views.

Fig. 1 is a top plan view of a safety-razor embodying some of the features of the invention;

Fig. 2 is an elevational view of the razor shown in Fig. 1;

Fig. 3 is a bottom plan view of the blade cover with a blade in place thereon as employed in the razor of the preceding figures;

Fig. 4 is a fragmentary cross-section taken substantially along the lines 4—4 of Fig. 1;

Fig. 5 is a fragmentary cross-section taken substantially along the lines 5—5 of Fig. 2;

Fig. 6 is a cross-section taken along the lines 6—6 of Fig. 2;

Fig. 7 is a cross-section taken substantially along the lines 7—7 of Fig. 1;

Fig. 8 is a perspective view of a blade driver suitable for use in the razor of Fig. 1;

Fig. 9 is a perspective view of another safety razor embodying some of the features of the invention;

Fig. 10 is a fragmentary elevation partially in cross-section of the razor shown in Fig. 9;

Fig. 11 is a top view of the razor of Fig. 9 with parts broken away to bring out certain details of construction and assembly;

Fig. 12 is a cross-section taken substantially along the lines 12—12 of Fig. 9;

Fig. 13 is a fragmentary front elevation of the razor shown in Fig. 9;

Fig. 14 is a fragmentary cross-section taken substantially along the lines 14—14 of Fig. 11; and

Fig. 15 is a cross-section similar to that of Fig. 14, but taken substantially along the lines 15—15 of Fig. 11.

As illustrated in Figs. 1 to 7, inclusive, a safety razor is provided of the type wherein a suitable blade carrier or holder 21 and a handle 22 are separably attachable together by an externally threaded lug 23 projecting from a carrier member or blade cover 24 through an aperture 25 in another carrier member or a blade seat 26 and threadably receivable in an internally threaded recess 27 in an end of the handle 22.

The carrier 21 is adapted to accommodate a cutter illustrated as a two-edged blade 28. The blade seat 26 is therefore provided with guard edges or teeth 29 at its opposite sides. The blade is positionable between the blade cover 24 and the blade seat 26 before the carrier is secured to the handle in the manner just described, and has an aperture 31 through which the lug 23 may pass.

A general object of the invention is to provide a novel and an improved razor wherein a cutter is reciprocable by the cutting resistance and an operative member or driver, the latter being energized as a result of movements of the cutter caused by the cutting resistance.

To that end the lug 23 is made of smaller diameter than the diameter of the aperture 31. The blade is provided with an aperture 32 at each side of the aperture 31 to accommodate correspondingly positioned lugs 33 projecting from the blade cover 24, and adapted to extend through the blade apertures 32 and through apertures 34 in the blade seat, when the blade is assembled in the carrier for attachment to the handle.

Each lug 33 has an enlarged portion 33' at the portion thereof extending through the blade aperture 32 for spacing the blade seat and cover apart such a distance as to permit sliding of the blade therebetween, and the enlarged portions 33' are smaller than the apertures 32. Thus the blade 28 may be movably assembled in the carrier. When the razor is drawn over the surface being shaved, the cutting resistance encountered thereby will act as a force substantially opposite to the direction of stroke and will tend to move

the blade in the carriage either in a direction opposite to that of the stroke or, when the cutting resistance is unequal at opposite ends of the blade, at an angle to the direction of stroke.

5 That movement is limited by the peripheries of the apertures 31 and 32 engaging the lug 23 and the enlarged portions 33' of the lugs 33, respectively, at the sides thereof nearer the blade edge being used.

10 The juxtaposed surfaces of the blade cover 24 and the blade seat 26 are provided with recesses 35 and 36, respectively, in the regions including the lugs 23 and 33 and the apertures 25 and 34, respectively, whereby to provide a chamber for  
15 accommodating therein a blade driver, for example, a spring or resilient member 37. That spring 37 has a rectilinear central portion 38 joining abutment portions 39. The spring is secured in the spring chamber between the blade  
20 cover and the blade seat by inserting the central portion 38 in a transverse slot 41 in the unthreaded end of the lug 23 before the lug is secured as at 42 to the blade cover 24. The arrangement is such that the abutment portions  
25 39 will engage in blade apertures 43 at opposite sides of the aperture 31 when the blade is assembled in the carrier.

In such a razor, the blade driver 37 resiliently and yieldingly resists the movement of the blade  
30 28 in the opposite direction from the direction of the stroke, and tends to urge the blade forwardly when it is so displaced by the cutting resistance.

The invention is not limited to a particular  
35 type of safety razor, whether it be of the type wherein more than one edge of a blade is exposed for use or of the type wherein only a single blade edge is exposed for use. That fact will be seen by reference to the drawings wherein as described  
40 above Figs. 1 to 8 disclose a razor exemplifying the first mentioned type, and Figs. 9 to 15 disclose a razor exemplifying the second mentioned type.

The razor illustrated in Figs. 9 to 15 has a handle  
45 member 44, a blade seat member 45, and a blade cover member 46 suitably formed, for example by stamping, as an integral unit with a web portion 47 joining the handle member and the blade seat member and having a central depression or recess 48 provided with an aperture  
50 49. The edges at the sides of the aperture are provided with notches or slots 51 for a purpose appearing more fully hereinafter.

The seat member 45 and the cover member 46  
55 are joined or connected by blade stops 52 made by severing the material along lines 53, 54, and 55, forming a guard edge or guard teeth 56 between the lines 54 and 55 at the side of the seat member opposite the web portion 47, and folding  
60 as at 57 the cover member 46 back to a position spaced from and overlying the seat member 45 to provide a blade receiving space 58 between the cover and seat members. In order to avoid fatigue and crystallization of the metal at the  
65 fold 57, the space 58 is made greater than the thickness of a usual blade, and a pair of seating or spacer lugs 59 and 61 are formed at each end of the seat member 45. Those lugs 59 and 61 are folded back upon the seat member to provide  
70 a blade support in the space 58 properly spaced from the cover member 46.

The spacing thus provided between the cover  
75 member 46 and the lugs 59 and 61 is such that a blade 62 may be inserted between the cover member and the seating lugs 59 and 61 and may

be moved forwardly until it engages the stops  
52. In that position the shaving edge of the blade between the stops 52 is exposed and is positioned adjacent the guard edge or teeth 56,  
5 which, as shown more particularly in Fig. 10, are curved upwardly as at 63 from the seat member 45 and then slightly downwardly as at 64 whereby to locate them adjacent that position of the blade edge.

The blade carrier thus provided has a pair of  
10 guiding lugs 65 and 66 depending from each end of the cover member in staggered relationship to the lugs 59 and 61, respectively, and serving to limit endwise displacement of the blade. For the purpose of facilitating the removal of the  
15 blade 62 from the blade carrier, the cover member 46 is made of lesser width than the blade whereby portions of the blade will be exposed as at 67 when the blade is in the carrier and may be employed for withdrawing it from the carrier.  
20 Where desired, a tab 68 may be formed at the free side of the cover member to be used as a handle in urging the cover member away from the seat member about the line of fold 57 for further facilitating the removal of the blade, the  
25 stops 52 being sufficiently resilient and yieldable to permit such separation of the cover and seat members for that purpose.

The blade 62 is thus slidably receivable in the  
30 blade carrier, and the novel safety razor illustrated in Figs. 9-15 will permit the blade to move away from the stops 52 under the force of cutting resistance encountered in shaving. Instead of providing a rigid member or mechanism for  
35 positively preventing such movement of the blade, a resilient member or holder 69, preferably in the form of a spring having spaced coils 71, a U-shaped handle member 72 connecting adjacent ends of the coils, and blade engaging  
40 members 73 at opposite ends of the coils, is provided for resiliently or yieldably opposing movement of the blade 62 in the blade carrier away from the stops 52.

In order to assemble the spring or holder 69  
45 in the razor, the U-shaped handle member 72 is inserted in the aperture 49 so that the legs of the U-shaped handle may engage in opposed slots 51 at opposite sides of the aperture. The U-shaped handle member is thus threaded or  
50 pulled through the aperture until the coils 71 pass through an aperture 74 provided at the rear margin of the seat member 45. When the spring or holder 69 is in that position a pintle or pin 75  
55 is passed through an aperture in a lug 76 depending from one side of the seat member 45 through the convolutions of the coils 71, and through an aperture in a lug 77 depending from the other side of the seat member 45. The ends  
60 of the pin 75 are then upset or otherwise secured in the apertures to prevent axial displacement of the pin.

The spring or holder 69 is thus so mounted in  
the razor that the blade engaging members 73 extend upwardly through the aperture 74 to a  
65 blade engaging position, and are adapted to urge the blade forwardly against the stops 52 with forces which may be adjusted in accordance with the desired shaving requirements by adjusting the U-shaped handle member 72 to one or the other  
70 pairs of slots 51 at opposite sides of the aperture 49. The reciprocable blade may be inserted in the blade carrier by sliding it forwardly at a slight angle until the rear edge of the blade clears the blade engaging members 73, and then they  
75 urge the blade into its position for shaving. It may

be removed from the blade carrier by grasping the exposed portions 67 and first moving them in a direction away from the seat member 45 until the blade clears the engaging members 73, and then withdrawing the blade. The stops 52 yield sufficiently to permit the insertion and withdrawal of the blade at the angle sufficient to clear the engaging members 73.

In shaving with the safety razor of the invention, the cutting resistance is transmitted as a force by the blade to the resilient member or spring which is adapted (Figs. 1 to 8), or which may be adjusted (Figs. 9 to 15) to yield or to give in response and in proportion to the cutting resistance or the force produced thereby. Such yielding of the resilient member or spring permits the blade to be moved by that force of cutting resistance in a direction opposite or at an angle to the direction of the normal or usual shaving movement or stroke of the blade, or in a direction inwardly of the blade carrier, and away from the line of cutting or shaving.

That movement of the blade is important because it tends to enhance the safety feature of the razor, whereby the shaver is not so likely to cut himself as he would be if the blade were held rigidly in its outer position, and because, being proportional to the cutting resistance, it tends to adjust the blade to such a position with respect to the angle between the blade and the surface being shaved, that comfortable shaving may be secured.

It is important to note that the force of cutting resistance acting to move the blade as described above, also serves to energize the blade driver or spring. The energy thus imparted to the blade driver produces forces which oppose the forces of cutting resistance and the movements of the blade caused thereby. Thus, the novel razor tends to equalize the effective cutting forces whereby to produce more uniform results over an entire surface being shaved.

From the foregoing, it will be seen that the blade driver when energized tends to urge the blade in a forward direction outwardly of the blade carrier. When the cutting resistance acting at a given instant against the blade edge becomes less than the force produced by the energized blade driver, the blade will be driven forwardly substantially in the same direction as that of the usual shaving stroke of the blade. Thus, in the use of the razor, the blade may be reciprocated to produce relatively short shaving strokes while the razor is being moved over the surface being shaved, whereby to shave the surface effectively.

While I have described a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. A safety razor comprising a blade seat, a blade cover, a blade slidable therebetween in response to the force of cutting resistance in the direction opposite the direction of cutting movement of the blade, and a blade driver mounted between said blade seat and said blade cover and energizable by the sliding of the blade in the first said direction for driving the blade in the opposite direction.

2. A razor having a carrier, a blade movable therein in response to cutting forces in a direction opposite the direction of the stroke, means for moving said blade in said carrier in the direction of the stroke, and adjustment means for adjusting the last said means to adjust blade's resistance to movement.

3. A safety razor comprising a blade, a blade holder including a pair of spaced parallel plate members, the inner of which constitutes a blade seat, the outer of which constitutes a blade cover, and spaced connecting members at opposite ends of said plate members integrally joining said members and constituting blade stops for blade movements in one direction, said outer plate member being relieved along the edge between said blade stops to expose the cutting edge of a blade in said holder and said inner plate member having a plurality of guard teeth at its marginal portion between said blade stops to provide a guard edge, said blade being slidable in said blade holder between said spaced plate members, a handle formed integrally with said inner plate member of said blade holder at the side thereof opposite said blade stops, and a spring between said handle and said inner plate member having a blade engaging portion and an adjustable portion for varying the force exerted by said blade engaging portion on said blade, said spring being yieldable in response to the force of cutting resistance whereby the cutting edge of said blade is exposed between said blade stops in inverse proportion to the force of cutting resistance.

4. A safety razor comprising a handle, a blade seat, a blade cover including means for slidably securing a cutter blade between said blade seat and said blade cover, and a resilient means carried by said securing means and operatively engaging with said cutter blade for permitting the movement of the cutter blade in a direction opposite to that of the shaving movement of the blade in response to the force of cutting resistance.

5. A safety razor comprising a blade seat, a blade cover, a blade therebetween capable of movement co-planar with the blade and at an angle to the direction of shaving movement of the blade determined by a resultant of the forces of cutting resistance, and a blade driver energizable by the blade movement in response to the force of cutting resistance for urging the blade in the opposite direction.

6. A safety razor comprising a blade carrier, a blade therein, said blade being movable in said carrier about an axis substantially normal to the face of the blade, and resilient means engaging said blade and yieldable in response to the force of cutting resistance for yieldably opposing pivotal movement about said axis in response to the force of cutting resistance.

7. A safety razor comprising a blade, a seat and a cover therefor providing a blade carrier having blade guiding mechanism therein, said blade being movable in said blade carrier away from the line of cutting by the force of cutting resistance and in a direction determined by a resultant of the forces of cutting resistance, and a resilient member supported between said seat and cover and engaging said blade for yieldably opposing the movement of the blade away from the line of cutting.

8. In a safety razor, a blade capable of movement responsive to cutting resistance in a direction co-planar with the blade and at an angle to the direction of the cutting stroke of the blade

- determined by a resultant of the forces of cutting resistance, and a driver engaging the blade for returning it to its initial position after such movement.
- 5 9. In a safety razor, the combination of a blade and a blade cover constituting a blade carrier, with a cutter reciprocable therein and having a cutting edge exposable outside of said carrier for shaving, and a resilient member mounted in said carrier between said blade seat and said blade cover and engaging said cutter for permitting the movement of the cutting edge inwardly of the carrier in response to the force of cutting resistance and for normally yieldably holding the cutter with its cutting edge exposed for shaving.
- 10 10. A safety razor comprising a head portion including a blade seat, a blade cover, a blade slidable therebetween in response to the force of cutting resistance in a direction co-planar with the blade and at an angle to the direction of the shaving stroke determined by a resultant of the forces of cutting resistance, and resilient means operatively engaging a marginal edge of said blade for yieldably holding it against the sliding movement.
- 15 11. A safety razor comprising a head portion including a blade seat, a blade cover, a blade slidable therebetween in response to the force of cutting resistance and in a direction determined by a resultant of the forces of cutting resistance and away from the direction of cutting movement of the blade, resilient blade driving means operatively engaging a marginal edge portion of said blade and mounted in said head portion between said blade seat and cover, said driving means being energizable by the sliding of the blade in the first said direction for driving the blade in the opposite direction by a force exerted in the plane of the blade.
- 20 12. A safety razor comprising a blade carrier with a blade seat and a blade cover, a blade there-in movable in response to the force of cutting resistance and in a direction determined by a resultant of the forces of cutting resistance, a blade driver energizable by the movement in the first said direction for driving the blade in the opposite direction, and means in said blade carrier for limiting the movement of the blade in both said directions.
- 25 13. A safety razor comprising a blade seat and a blade cover providing a blade carrier, a blade between said seat and said cover and rockable in said carrier about an axis substantially normal to the face of the blade by the force of cutting resistance, and resilient means mounted in said blade carrier between said blade seat and cover and engaging said blade for yieldably opposing rocking of the blade.
- 30 14. A safety razor comprising a blade seat, a blade cover, a blade between said blade seat and said blade cover and movable away from the line of cutting by the force of cutting resistance and in a direction determined by a resultant of the forces of cutting resistance, and resilient means engaging said blade at opposite sides of its transverse center line for yieldably opposing the movement of the blade away from the line of cutting.
- 35 15. A safety razor comprising a head portion including a blade seat and a blade cover, a blade slidable between said blade seat and said blade cover in response to the force of cutting resistance and in a direction determined by a resultant of the forces of cutting resistance, and resilient means engaging a marginal edge of said blade at spaced points therealong for yieldably opposing the sliding movement.
- 40 16. A safety razor comprising a head portion including a blade seat and a blade cover, a blade movable between said blade seat and said blade cover in response to the force of cutting resistance and in a direction determined by a resultant of the forces of cutting resistance, and resilient means engaging a marginal edge of said blade at opposite sides of its transverse center line of yieldably opposing the movement of the blade away from the line of cutting.
- 45 17. A safety razor comprising a head portion including a blade seat and a blade cover, a blade movable between said blade seat and said blade cover in response to the force of cutting resistance in a direction co-planar with the blade and at an angle to the direction of the shaving stroke determined by a resultant of the forces of cutting resistance, and resilient means engaging said blade at opposite sides of its transverse center line for yieldably opposing movement of the blade away from the line of cutting.