

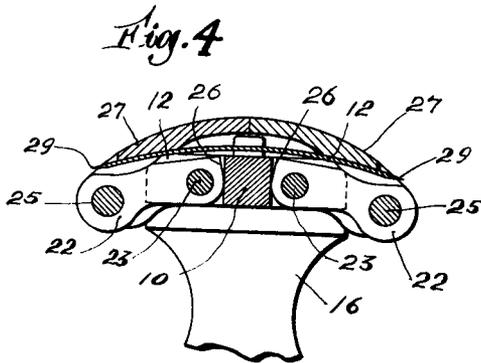
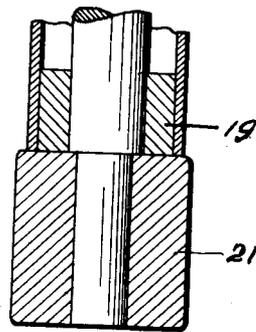
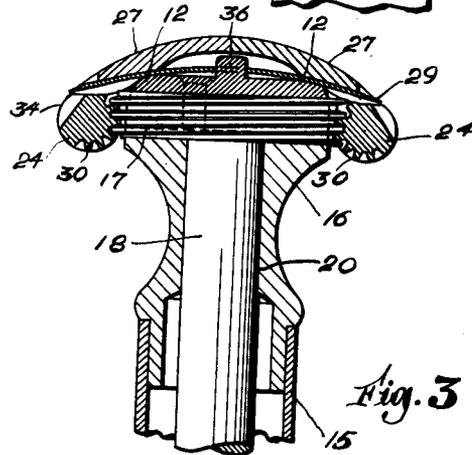
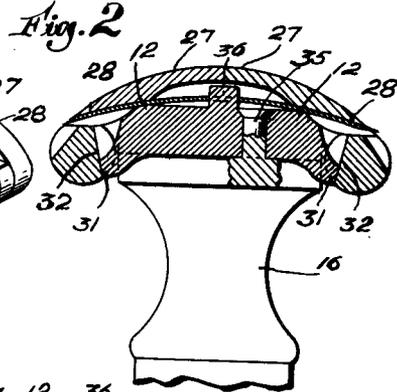
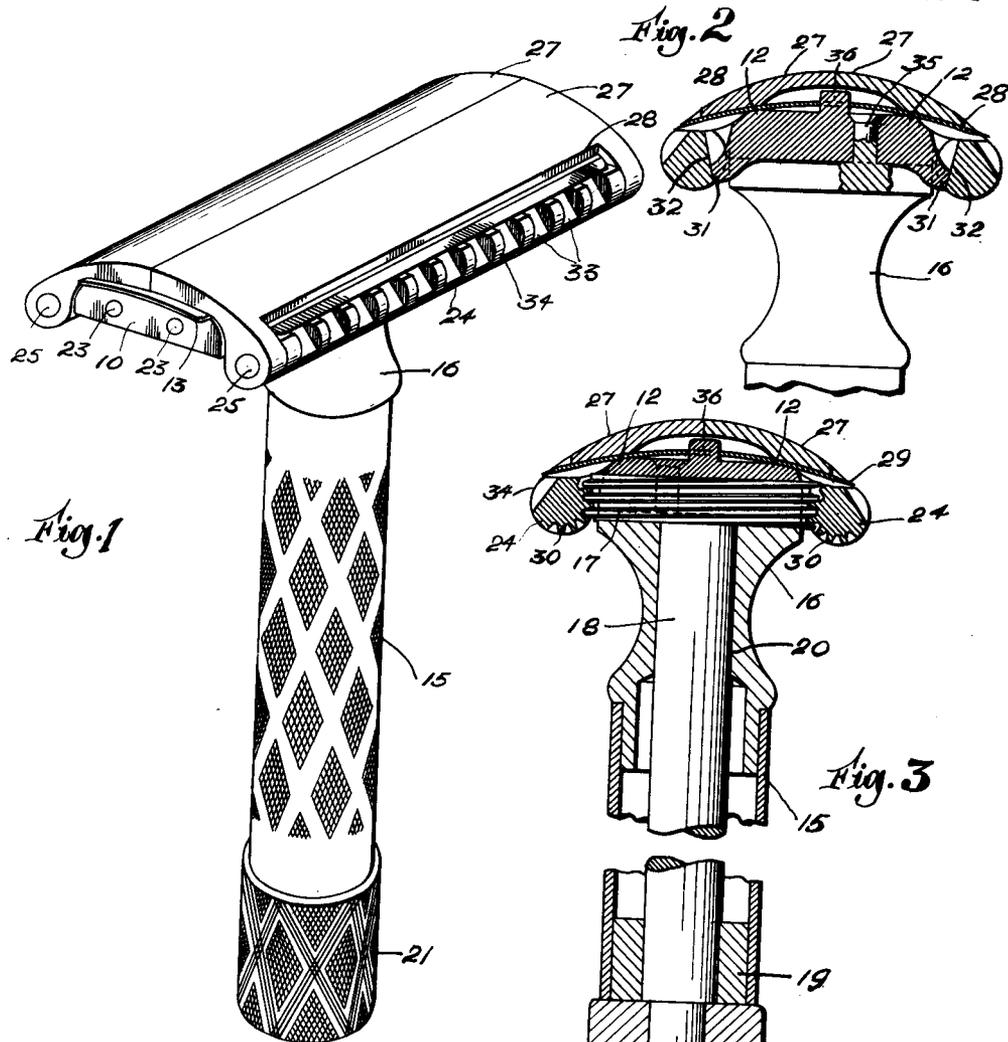
July 11, 1933.

J. MUROS
SAFETY RAZOR

1,918,227

Filed July 30, 1932

2 Sheets-Sheet 1



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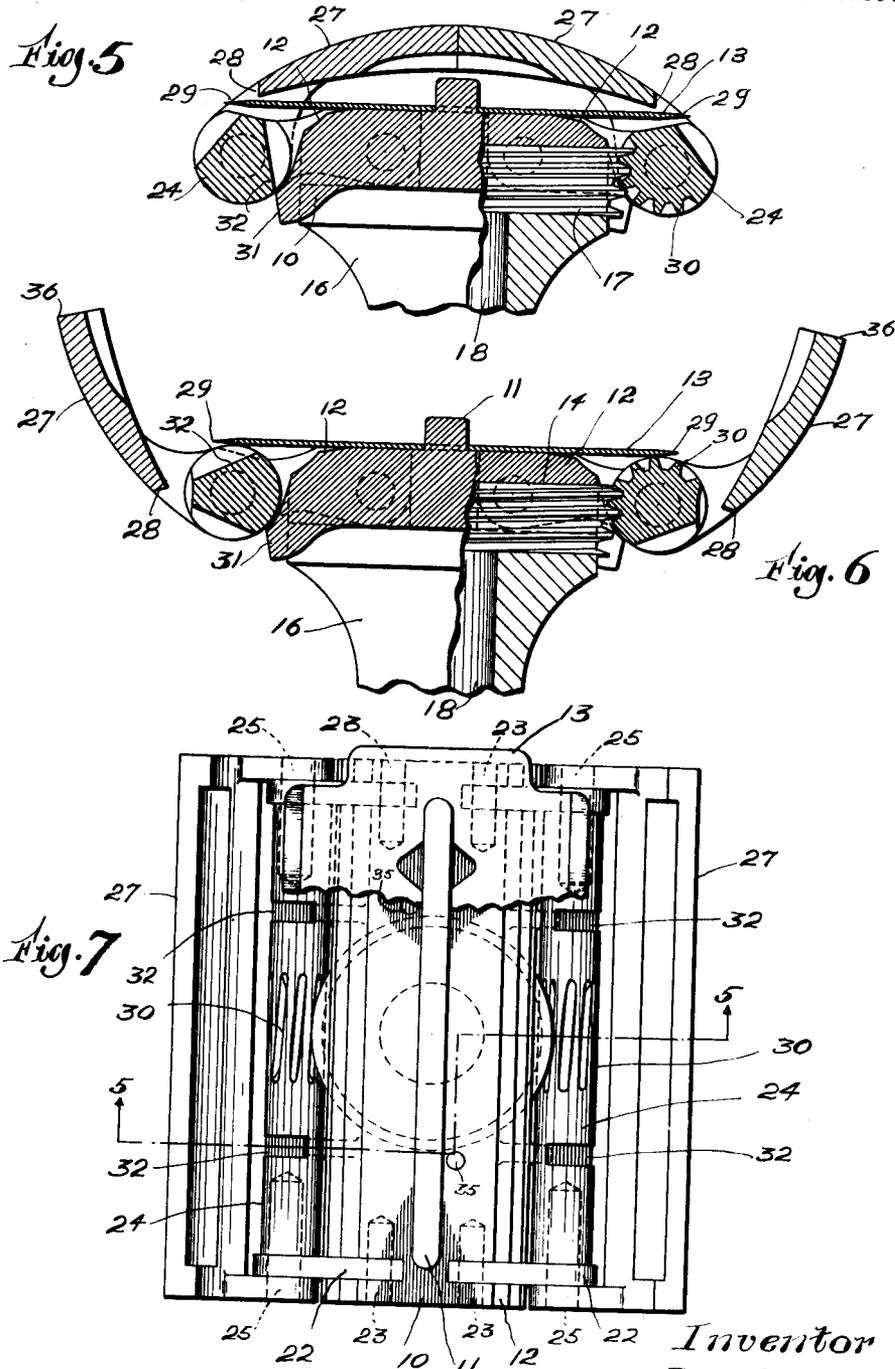
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SAFETY RAZOR

Application filed July 30, 1932. Serial No. 626,287.

It is an object of this invention to provide a safety razor of the sectional pivoted cap variety utilizing a flexible blade which may be supported on a member having a curved supporting surface without fulcrum shoulders or a surface curved or flat having fulcrum shoulders. The blade being flexed across said surface to aid in holding it and in which the blade may be securely clamped and amply adjusted without disturbing the unitary bodily movement relation of the pivoted cap sections or members with reference to each other in making the blade adjustment.

It is a further object of this invention to produce an organization in which the cap sections have tilting as well as unitary bodily movement and in which the blade is engaged by the caps as closely as practical to its shaving edges thereby permitting the manufacturer to locate accurately the desired positions of the critical edges of the cap sections.

It is still a further object of this invention to provide a razor in which the parts remain connected while the blade is being applied or removed therefrom and providing ample space resulting from bodily movement of said cap sections whereby this operation may be made with safety, facility and expedition.

It is also an object of this invention to provide an organization having ample space for manipulation and adjustment and location of critical edges on the cap sections and in which the invention lends itself to ample reinforcement yet provides ample clearance for the escape of lather and hair thereby to facilitate the cleansing and drying of the razor.

It is a further object to produce a pivoted sectional cap razor providing unitary automatic synchronized control mechanism operating at substantially uniform speed for the cap sections whereby they may be moved bodily to produce the blade adjustments and pivotally to open and closed positions.

The invention is illustrated in the following embodiments in which the details of structure and the relation of said details, in-

cluding the functions thereof, will be readily understood by any one skilled in the art to which it appertains.

Fig. 1 is a perspective view of the razor in condition for shaving.

Fig. 2 is a transverse section of the blade, the cap and guard construction, and the blade support, showing the manner of securing the blade support to the upper part of the handle.

Fig. 3 is a central transverse section of the razor head including a longitudinal section of the handle in the same plane.

Fig. 4 is a transverse section through the razor head adjacent the end of the blade support and cap members showing the link connections between the blade support and the guard rails or spindles of the cap members.

Fig. 5 is a stepped transverse section through the razor head and a part of the handle as indicated by the line 5-5 of Fig. 7 but with the cap members closed preparatory to flexing and adjusting of the blade.

Fig. 6 is a section similar to Fig. 5 in which the cap members are open and the blade lies on the blade support in flat condition, and

Fig. 7 is a plan view of the razor with the cap members open and with the major portion of the blade broken away to disclose details of construction including the particular functional and structural relation of the worm and the worm-wheel sectors formed on the guard rails or spindles of the cap members.

The blade support or base 10 is provided with blade positioning means 11 and fulcrum shoulders 12 across which the blade 13 may be flexed to desired position of adjustment for shaving.

The lower portion of the base 10 is provided with a housing recess 14 which in combination with the upper recessed section 16 of the handle 15 forms a housing and thrust bearings or supports for the worm 17 on the shaft 18. The shaft 18 is aligned longitudinally by the bore 20 in the handle section 16 and the bushing 19 in the lower portion of the handle 15. The lower end of the shaft 18 is provided with a finger grip 21 fixedly secured to said shaft.

The combined guard and cap member

sections are connected to the blade support 10 by the use of links 22 which are pivotally connected to the blade support 10 by pins 23 and to the guard rails or spindles 24 by pins 25. The links 22 are provided with stop shoulders 26 at inner upper corners to limit the upward swinging movement of said links which also arrest the translatory or bodily movement of the combined cap and guard construction.

The cap member sections 27 are fixedly secured at their ends to the ends of the guard or spindles in any suitable manner. The remote or critical edges 28 of the cap sections are arranged as closely as practical to the shaving edges 29 of the blade 13 thereby minimizing the vibration of the blade when it is flexed to adjusted positions over the fulcrum shoulders 12 of the blade support 10.

The worm gear control mechanism comprises the inverted frusto-conical gear 17 having a thread to engage with the worm-wheel sectors 30 on the guards or spindles 24. The blade support 10 and the guards are provided with co-operating stop engaging surface portions located at 31 and 32 respectively. These co-operating portions 31 and 32 prevent the cap and guard construction from tilting until the portions 32 on the guard 24 clear the portions 31 on the blade support as clearly shown in Fig. 5, thereby providing for flexing of the blade 13 and adjusting of the blade edges 29 to suit the user of the razor.

The planes defined by the surface portions 31 and 32 are substantially parallel to the chords of the arcs generated by the movement of the adjacent outer ends of the links 22. Likewise the surface inclination of the frusto-conical worm at the ends of the diameters transverse to the razor head, are also substantially parallel to the planes defined by the adjacent portions 31 and 32. It will be apparent from this detailed description that the cap and guard members are controlled by synchronized control mechanism, whereby they may be moved bodily to produce blade adjustments and pivotally or angularly to open and close the cap members. In this connection it is to be noted that the frusto-conical worm 17 by having the larger portion uppermost maintains proper engagement with the worm-wheel sectors 30 as the links 22 permit the guards 24 to swing slightly away from the axis of the worm 17.

The spindle or guard 24 comprises a guard rail having recesses 33 forming on said rail guard teeth 34.

The handle section 16 is provided with rivets 35 which secure the handle section 16 to the blade support 10 as clearly indicated in Figs. 2 and 7.

During the movement of translation of the cap and guard members the meeting edges 36 of the cap members are maintained in con-

tact. When the co-operating stop portions 31 and 32 are out of engagement as indicated in Fig. 5 further movement of translation is prevented by the stop shoulders 26 as also clearly indicated in Fig. 5. Further rotation of the worm 17 propels the tilting of the cap sections which results in widely spacing of the sections to facilitate the removal and replacement of a blade on the blade support. The link connection in combination with the frusto-conical worm and gear mechanism results both in ample clearance for the manipulation of the blade and permits engagement of the critical edges 28 of the cap close to the shaving edge 29 thereby producing a mechanical means to amply grip the blade and reduce vibration of the blade while shaving.

In addition to the new results pointed out it is also to be noted that the construction retains a very important feature disclosed in applicant's application Serial No. 587,551, filed January 19, 1932, which lends itself to maintenance of ample clearance for cleansing purposes. The cap and guard members are lock-controlled by the worm-gear mechanism hence the cap and guard members are maintained in adjusted or set positions until and unless the worm-gear mechanism is operated through the medium of the shaft 18 and the finger grip 21. The lock control feature is very desirable and important since it facilitates manipulation and cleansing and assures a set position of adjustment at all times of the cap and guard members with reference to the blade or blade support.

It is to be further observed that during the movement of pure translation of the cap and guard members these members are additionally locked against angular or pivotal movement by the co-operative engagement of the portions 31 and 32.

Although I have disclosed a specific embodiment of my invention I desire to have it understood that my claims shall cover a range of equivalents commensurate with the invention disclosed.

What I claim is:—

1. A safety razor comprising a razor head and a handle, said head including a blade support, a blade positioned on said support, a cap comprising pivoted sections provided with guards forming pivotal supports for said sections, mechanical means movably connecting said guards to the blade support, means on said razor to produce bodily or translatory movement of said cap and guards as a unit for a limited distance, and angular or pivotal movement of the cap sections with reference to each other as well as the blade or blade support, whereby the blade may be clamped effectively in shaving position and when the cap sections are open and spaced apart the blade may be easily removed and replaced.

2. A safety razor comprising a head and a

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handle, said head including a blade support, a blade positioned on said support, and a sectional cap having guards, means comprising links pivotally connecting each cap and guard, as a unit, to the blade support, means on said razor to produce bodily or translatory movement of said cap and guards, as a unit, for a limited distance, and subsequently an angular or pivotal movement of said cap sections and guards relatively to each other and to the blade.

3. A safety razor comprising a head and a handle, said head including a blade support, a blade positioned on said support, and combined cap section and guard units, a plurality of links pivotally connecting said units to the blade support, gear mechanism on said razor to actuate the cap sections and guards, means on said guards and blade support to guide said cap sections and guards, as a unit, in a substantially straight line movement for a limited distance, and means to subsequently produce angular or pivotal movement of each cap and guard unit relatively to each other and to the blade support.

4. A safety razor comprising a head and a handle, said head including a blade support, a blade positioned on said support, and individual cap and guard units, a plurality of links pivotally connecting said units to the blade support, worm gear mechanism on the razor to actuate the cap and guard units, coacting means on said guards and blade support to guide said units in a substantially straight line movement for a limited distance and means to subsequently produce angular or pivotal movement of said cap and guard units relatively to each other and to said blade support.

5. A safety razor comprising a head and a handle, said head including a blade support, a blade positioned on said support and a plurality of cap and guard members pivotally connected to the blade support by links, said links being mounted for limited oscillation between planes located below the plane of the blade, said guard members comprising rails or spindles having on each spindle a worm wheel sector whereby the cap and guard members may be oscillated to any desired position of adjustment with reference to each other and to the blade, a shaft in said handle provided with a frusto-conical worm having its threads in engagement with the worm wheel sectors, the larger part of the worm being uppermost whereby effective engagement is maintained between the worm and worm wheel sectors as the guard rails move through upwardly slightly receding arcs.

6. A safety razor comprising a head and a handle, said head including a blade support, a blade positioned thereon, and cap and guard members, links pivotally connecting said guard members to said blade support

for swinging and tilting movement of said cap and guard members with reference to each other and the blade support and blade, the pivotal connections of links and blade support being located in a common plane and the pivotal connections of the links with the guard members being located in a common plane below but parallel with the first named plane, coacting stop engaging portions on said blade support and links to limit the swinging movement of said guard members to small upwardly slightly receding arcs no longer than the distance between the planes above mentioned, coacting operating mechanism on said razor engaging said guard members to actuate said cap members from blade clamping position to open position and to any position of adjustment between the two extreme positions mentioned.

7. In a safety razor a blade support, a blade positioned on said support, cap and guard members connected to said support by a plurality of links, said cap members having critical blade clamping edges, the connections of the links and support intersect a common plane and the connections between the guard members and the links also intersect a common plane parallel to but spaced below the first named plane, means on said support engaging said guard members to produce limited swinging movement of said cap and guard in arcs slightly receding upwardly from each other, whereby the critical edges of the cap members may be located as close as practical to the shaving edges of the blade to minimize vibration of the blade while shaving.

8. In a safety razor, a blade support having a blade shaping face, a flexible blade located on said support, cap and guard members movably connected to said support, said cap members having blade shaping faces and critical blade clamping edges, coacting actuating means on said razor engaging said guards in combination with movement control means for said cap and guard members whereby the guards are guided in small arcs which recede from each other upwardly as the clamping members are released from clamping engagement of the blade whereby the critical edges may be brought as nearly as practical to the shaving edges of the blade to minimize vibration while shaving.

9. A safety razor comprising a head and a handle, said head including a blade support, a blade positioned on said support, cap and guard members movably connected to said support in combination with means to produce both swinging and tilting movements of said cap and guard members with reference to each other and to the blade and blade support.

10. A safety razor comprising a head and a handle, said head including a blade sup-

port having a blade-shaping face, a flexible blade positioned on said support, and cap and guard members movably connected to said blade support, said cap members having blade-shaping faces and critical clamping edges, mechanism on said razor engaging said guard members to produce initially a tilting of the cap members toward each other until the critical edges engage the blade and finally a downward blade flexing movement to any desired degree of adjustment of the blade edges for shaving.

11. A safety razor comprising a head and a handle, said head including a blade support having a blade-shaping face, a blade on said support, cap and guard members having links connecting said guards swingably and tiltably to the blade support, said cap members having blade-shaping faces and critical clamping edges, worm gear mechanism to actuate said cap and guard members, said guard members having worm-wheel sectors and the handle having a shaft carrying the worm and maintaining it in engagement with the worm-wheel sectors, stop engaging surface portions on said guards and blade support to guide the cap and guard members in planes substantially parallel with the chords of the arcs described by the outer portions of the links in their swinging movement whereby the blade may be released from its flexed condition, coacting stop means on said links and blade support to limit the swinging movement of the cap and guard members, the stop means to prevent tilting of the guards being synchronized to co-operate with the link stop means to permit tilting of the guard, whereby the blade may be flexed and adjusted to a desired position for shaving.

12. In a safety razor a blade support, a plurality of cap and guard members connected to said blade support by a plurality of links whereby said cap and guard members may tilt and swing with reference to each other and the blade support, in combination with means to actuate and control the movement of the cap and guard members with reference to the support and each other.

13. In a safety razor a blade support, a plurality of cap and guard members connected to said blade support by a plurality of links whereby said cap and guard members may both tilt and swing with reference to each other and the blade support, means on the razor to actuate the cap and guard members, in combination with synchronized control mechanism to control successively the tilting and swinging movements of said cap and guard members.

14. In a safety razor including a blade support, pivotally mounted cap sections thereon, and a rotatable handle member having cam connections for tilting said sections through a wide arc toward blade-flexing position, and means operating thereafter to move them bodily into blade-flexing position for shaving.

15. In a safety razor including a blade support, cap sections pivotally mounted thereon, and a rotatable handle member providing cam connections having camming surface portions of uniform pitch for tilting said sections at a substantially uniform speed through a wide arc toward blade-flexing position, and means to guide, control and propel movement of said sections bodily into blade-flexing position for shaving.

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