

Nov. 9, 1937.

M. AMSLER

2,098,849

DRY SAFETY RAZOR

Filed Feb. 20, 1937

2 Sheets-Sheet 1

Fig. 1.

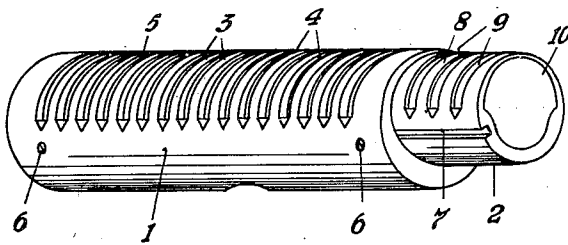


Fig. 2.

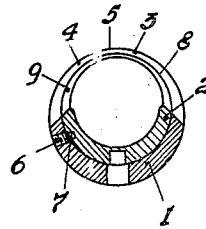


Fig. 3.

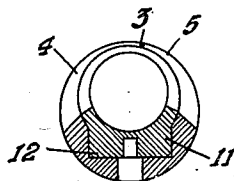


Fig. 4.

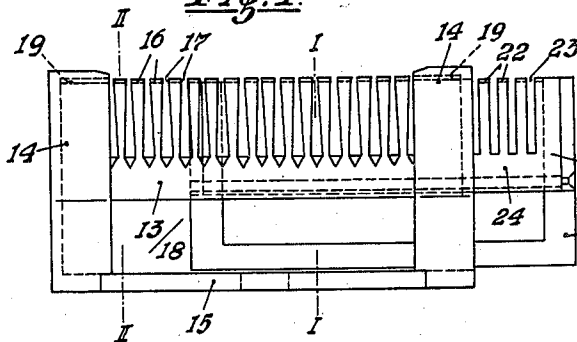


Fig. 5.

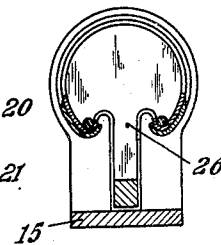


Fig. 6.

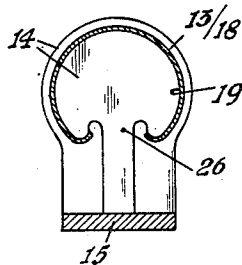
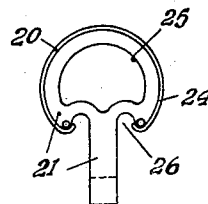


Fig. 7.



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2 Sheets-Sheet 2

Fig. 8.

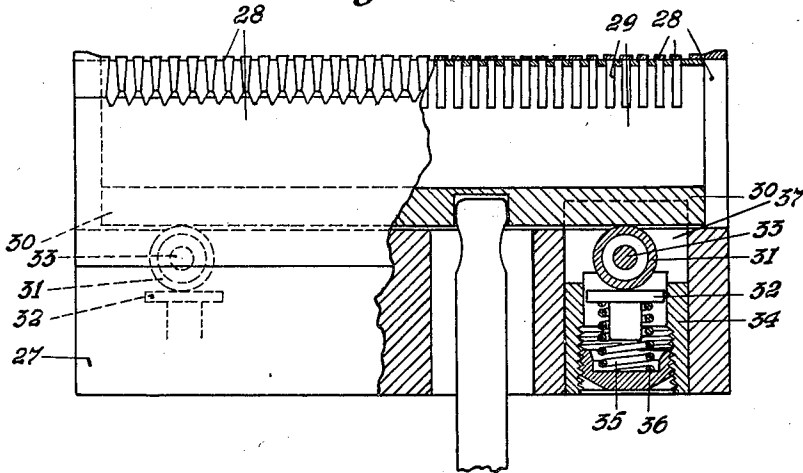


Fig. 9.

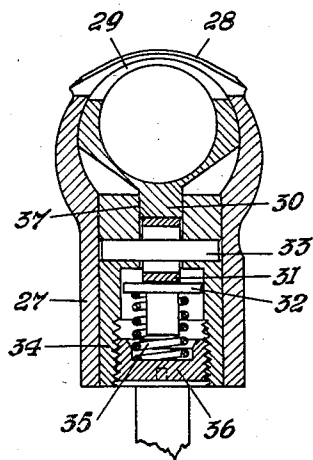


Fig. 10.

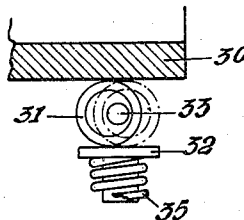
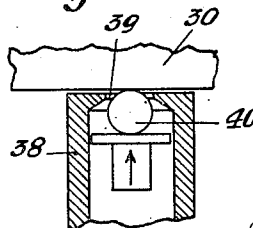


Fig. 11.



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## UNITED STATES PATENT OFFICE

2,098,849

## DRY SAFETY RAZOR

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Application February 20, 1937, Serial No. 126,917  
In Switzerland April 8, 1936

## 7 Claims. (Cl. 30-43)

Dry safety razors or hair clipping apparatus are already in commerce by means of which it is possible to shave and cut hair without soap or other auxiliary means by imparting a cutting-movement to the shearing comb by means of a motor and lever transmission gear. These razors are open to the objection that the hairs of the face are not cut sufficiently short so that a clean shave can be obtained. The cutting surface is a flat surface which is formed by a hollow body difficult to produce in which the shearing comb is movably accommodated. Moreover, this flat surface does not enable the skin of the face to be stretched as is essential when shaving.

The invention endeavours to overcome these objections. With this object the shearing head differs from the known constructions in that the cutting surface both of the stationary comb and also of the movable cutting comb arranged within the stationary comb are bulged transversely to the direction of movement of the movable comb.

Several embodiments of the invention are illustrated by way of example in the accompanying drawings in which:—

Fig. 1 shows in perspective view the two shearing combs.

Fig. 2 is a cross section of Fig. 1.

Fig. 3 is a cross section of a modification of Fig. 2.

Fig. 4 shows another construction in elevation.

Fig. 5 is a section on line I—I of Fig. 4.

Fig. 6 is a section on line II—II of Fig. 4.

Fig. 7 is an end view of the movable shearing comb illustrated in Figs. 4, 5, 6.

Fig. 8 shows a third form of construction of the shearing comb in front elevation and partly in longitudinal section.

Fig. 9 is a cross section of Fig. 8 and through the shearing comb.

Fig. 10 illustrates in part longitudinal section the action of the rolling bodies, whereas

Fig. 11 shows a modification of the structure illustrated in Fig. 10.

The dry safety razor according to the form of construction illustrated in Figs. 1 and 2 comprises a stationary cylindrical shearing comb 1 in which a second cylindrical shearing comb 2 is reciprocally guided. Transversely, that is at right angles or obliquely to the longitudinal direction bulged cutting bars 3 extend, which are formed by the milling of slots 4. The strongly bulged or convex cutting surface 5 is formed by these cutting bars. The shearing comb 2 has cutting

bars 8 and slots 9. These slots also extend transversely to the direction of movement and are likewise bulged. At least one end face of the shearing comb 2 has a relatively large aperture 10 to enable cut hairs which pass into the comb to easily drop out of the same. Rotation of the movable comb 2 in the stationary comb 1 is prevented by a longitudinal slot 7 in the form. Said slot 7 seats the end of a screw 6 threadedly mounted in the stationary comb 1. Owing to the cutting bars being bulged they can be made extremely thin. The shearing head described is extremely simple to produce. It can be mounted on an electric motor or on a mechanical part by any suitable means which do not constitute part of the invention.

According to Fig. 3 the movable shearing comb 2<sup>a</sup> has a downwardly extending projection 11 seating in a similarly shaped recess 12 formed in the lower portion of the stationary cutting part 1<sup>a</sup>.

According to the second form of construction shown in Figs. 4 to 7 the stationary shearing part 13 is composed of two U-shaped holders 14 connected by a strap 15. A bulged steel plate 16 provided with cutting bars 16 and slots 17 is exchangeably fitted in the holders 14 held in its bent shape by these holders owing to the fact that its ends fit in corresponding recesses 19 in the holders. The movable shearing comb 20 also carries a U-shaped body 21 over which is stretched a curved steel plate 24 having cutting bars 22 and slots 23. The whole is adapted to be slipped into the stationary cutting part 13. 25 is an aperture in one of the end faces of the movable comb but is not absolutely necessary as the cut hairs can drop out at 26 seeing that the bent steel plates are not in the form of a closed cylinder as in the first form of construction.

In the form of construction shown in Figs. 8 to 11, 27 is the shearing head of the shearing apparatus or of the hair clipping machine, said head being equipped with the curved stationary shearing comb 28. A movable comb 29 is reciprocable in this head 27 and bears against the stationary shearing comb 28 with adjustable pressure. The movable shearing comb 29 is of hollow but cylindrical shape and tapers to a guide bar 30 projecting from its under side.

This guide bar 30 is supported (as shown in Figs. 8-10) by two rollers 31 which are not anchored in position. These rollers can each roll backwards and forwards on a spring controlled guide bolt 32. The rollers 31 are secured with play on guide cylinders 34 by transverse pins 33 extending through the rollers. The guide cylin-

ders are pressed into the solid outer part of the shearing head 27. Pressure springs 35 bear at their upper end against the heads of the guide bolts 32 and at their lower end against pressure regulating screws 36 inserted in the guide cylinders 34.

The guide bar 30 is laterally guided by the side walls of longitudinal recesses 37 in the guide cylinders 34. The rollers and springs are fitted in the guide cylinders 34 and can then be fitted therewith in the outer part of the shearing head 27.

The arrangement acts in such a manner that the springs 35 press against the spring guiding bolts 32 and through these against the rollers or similar roller bodies, for instance balls, which transmit this pressure on to the reciprocating guide bar 30. The shearing combs 28 and 29 are therefore pressed one against the other with a pressure which can be regulated as desired by turning the pressure regulating screws 36. The pins 33 prevent the rolling bodies from dropping out when the movable shearing comb 29 is pushed out of or removed from the outer part of the shearing head 27. As the bore in the rollers 31 is of larger diameter than the diameter of the pins 33 and as consequently the rollers can move in the guide cylinders 34 in the moving direction of the movable shearing comb, each roller 31 rolls both on the spring guide bolt 32 and also on the guide bar 30 during the reciprocating movement of the movable cutting comb 29, that is the sliding friction is replaced by the much smaller rolling friction coefficient. The degree of efficiency of the apparatus is thereby considerably increased as compared with the hitherto employed apparatus in which sliding friction existed.

According to Fig. 11 a ball 40 forms the rolling body. The guide cylinder 38 has in this instance a bore 39 which is smaller than the diameter of ball 40 so as to prevent the ball from falling out when the movable shearing comb 29 is pushed out of the outer part of the shearing head. The ball 40 can also roll on the guide bar of the movable cutting comb 29 and on the spring guide bolts owing to the play allowed in the guide cylinder 38.

Owing to the bulged cutting surface the apparatus, contrary to the known dry safety razors, can be held at an incline, it is no longer necessary to bring the razor into contact with the surface to be shaved perpendicularly thereto, as the cutting surface can adapt itself to any angular position on the skin and automatically stretches the skin during the shaving operation. Furthermore, owing to the curved cutting surface it is possible to shave without difficulty places which are difficult of access, such as the arm pits and the like.

I claim:—

1. A dry safety razor, comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, rolling elements in the stationary comb supporting the movable shearing comb, springs pressing said rolling elements against said movable shearing comb, a guide bar on said movable comb adapted to guide said comb on said rolling element, cylinders mounted in said stationary comb and accommodating said rolling elements and said springs, said cylinders having portions thereof formed to provide means for slidably receiving said guide bar to laterally guide said movable comb, and spring-guide bolts

one in each of said cylinders and each carrying one of said springs and adapted to guide one of said rolling elements, set screws arranged one in each of said cylinders and adapted to regulate the pressure exerted by said springs, and transverse pins fixed one in each of said cylinders and extending with clearance one through each of said rolling elements.

2. A dry safety razor, comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, cylindrical rolling elements in the stationary comb supporting the movable shearing comb, springs pressing said rolling elements against said movable shearing comb, means for adjusting the pressure exerted by said springs on said rolling elements, and cylindrical members mounted in said stationary comb and accommodating said rolling elements and said springs, said cylindrical members being formed to provide means to laterally guide said movable comb.

3. A dry safety razor, comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, rolling elements in the stationary comb supporting the movable shearing comb, springs pressing said rolling elements against said movable shearing comb, means for adjusting the pressure exerted by said springs on said rolling elements, said rolling elements comprising annular members, and fixed pins extending through said elements to limit the rolling movement thereof.

4. A dry safety razor, comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, substantially cylindrical rolling elements carried by said stationary comb and supporting said movable comb, said stationary member being formed to provide rolling element receiving grooves therein, said grooves permitting said rolling elements to roll backwards and forwards therein with said movable shearing comb, means limiting said rolling movement of said rolling elements in both directions, said means comprising members rigidly seated in said stationary comb and extending axially through said cylindrical rolling elements, and means pressing said rolling elements against said movable shearing comb.

5. A dry safety razor comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, rolling elements in said stationary comb supporting said movable comb, springs pressing said rolling elements against said movable comb, substantially vertically disposed cylindrical members mounted in said stationary comb and mounting said rolling elements and said springs in the upper ends thereof, the upper ends of said cylindrical members being formed to provide means to laterally guide said movable comb, and a transverse pin in each of said cylindrical members and extending with clearance through each of said rolling elements to limit the rolling movement thereof.

6. A dry safety razor, comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, annular rolling elements interposed between said stationary and movable combs and providing an anti-friction support for said movable comb, and fixed means extending with clearance through each of said annular rolling

elements for limiting the rolling movement thereof in both directions.

7. A dry safety razor, comprising in combination a stationary shearing comb and a movable shearing comb accommodated within said stationary comb, annular rolling elements interposed between said stationary and movable combs and

providing an anti-friction support for said movable comb, pins fixed in one of said combs, one of said pins extending with clearance through each of said annular rolling elements for limiting the rolling movement thereof in both directions. 5

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