June 16, 1936. D. B. HADJOPOULOS 2,043,998

SAFETY RAZOR AND RAZOR BLADE

Filed March 28, 1933

Fig. 1

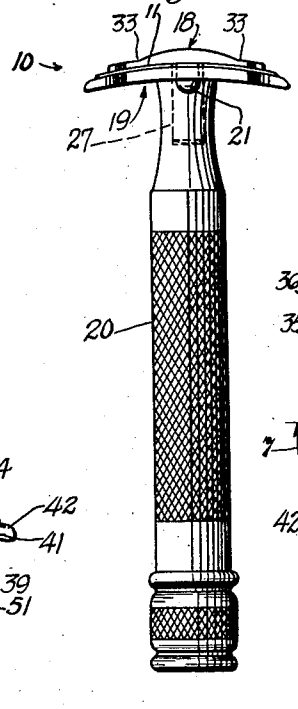


Fig. 2

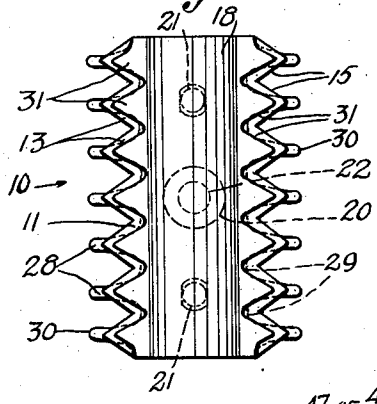


Fig. 6

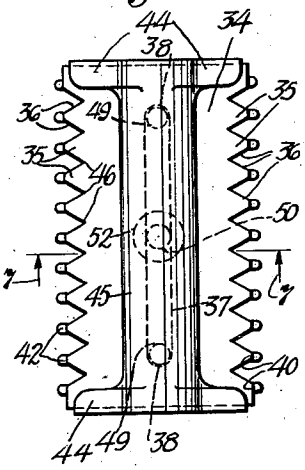


Fig. 7

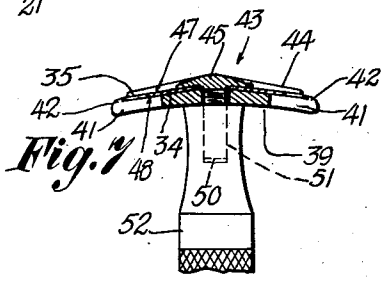


Fig. 5

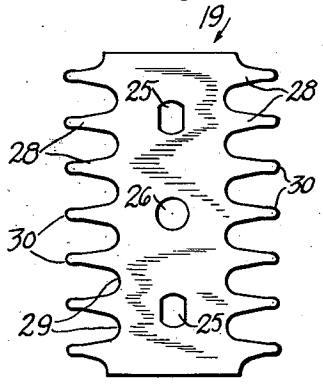


Fig. 4

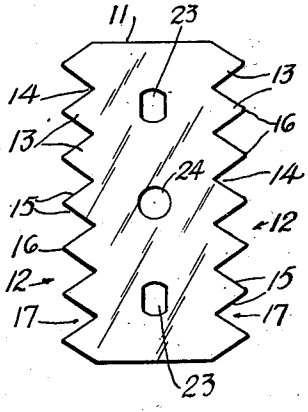
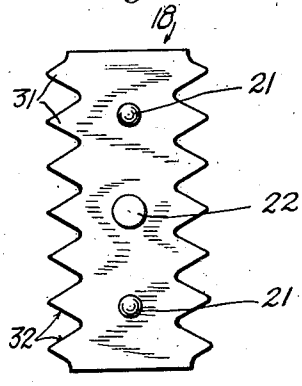


Fig. 3



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SAFETY RAZOR AND RAZOR BLADE

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3 Claims. (Cl. 30—48)

This invention relates to devices such as razors and razor blades.

One object of the invention is to provide a device of the character described, having improved means for oblique or angular cutting or shaving action as distinguished from that which is performed in a straight line as with a straight edged blade.

More particularly I have observed that in shaving, an easier and cleaner severance of the hair is obtained if the cutting thereof is accomplished by a substantial relative movement produced between the strands of hair and the cutting edge of the blade longitudinally thereof. Differently expressed, the movement of the cutting edge relative to a hair is compound, as it includes a movement laterally of the hair as well as toward the hair. In the razors heretofore known, the blades have been provided with a uniformly straight edge, which has caused a pulling and tugging on the hair as the cutting edge entered the hair strands and before complete severance thereof. Such pulling on the hair is not only irritating to the skin and tends more rapidly to dull the cutting edge thereof, but also raises portions of the skin and hence causes the same to be cut or scratched. If it were attempted to use a straight edged razor obliquely, there would be danger of cutting the skin, and, moreover, the guard would interfere with the accessibility of the hair to the cutting edge of the blade; however, even such oblique use of the straight edged razor can be practised only to a limited degree and at a small angle so that the essential benefit of the foregoing principle is not available.

It is therefore an object of my invention to produce an improved razor which shall obviate the defects above mentioned, and which shall utilize to the fullest degree the principle of oblique or angular cutting of hair as above set forth.

A further object of the invention is to provide a device of the type mentioned having few and simple parts, and which is inexpensive to manufacture, neat in appearance, durable, reliable, convenient and efficient to a high degree in use.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a view in elevation of a device embodying the invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is a bottom plan view of the cap.

Fig. 4 is a plan view of the razor blade.

Fig. 5 is a top plan view of the guard.

Fig. 6 is a top plan view of a modification of the invention.

Fig. 7 is a fragmentary vertical sectional view taken on line 7—7 of Fig. 6.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which this invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Referring in detail to the drawing, 10 denotes a device embodying the invention. The same may include a razor blade 11 of any desired form and which may be made of relatively thin sheet metal, that may be flexible or inflexible, preferably the former, for which purpose the blade may be of uniform thickness throughout. Said blade is characterized in that it may have one or more serrations or series of teeth 12 which may be arranged parallelly along opposite longitudinal edges thereof, and the blade being suitably elongated. Each of said series may have one or more teeth 13, preferably a plurality thereof, and the various teeth being arranged in contiguous or side by side and relatively close relation to each other, forming corners such as 14 of any desired shape. In the preferred embodiment of my invention as herein shown, oppositely disposed teeth in the different series 12 are arranged in alinement with each other.

Each tooth 13 has opposite diagonal cutting edges 15 which may extend continuously from the corners 14 to the point or ends 16 of the tooth that may be of any desired shape. Hence there are provided between the different teeth 13, reentrant angular cutting regions 17 each of which is enclosed on two sides by the oblique cutting edges 15, all of which lie in a common plane throughout the blade. The angle formed between the oblique cutting edges 15 may vary consider-

ably, and may in actual practise range between 30 degrees and 90 degrees, although in principle any angle may be used regardless how large or small. All of the oblique cutting edges are of uniform length and other characteristics, and all of them form angles of uniform size with each other.

For holding the blade 11, any suitable means may be utilized, including, for example, a cap 18, a guard 19, and a handle 20. The cap may have a pair of spaced studs 21, and a screw member 22 intermediate thereof, the studs and screw member being upstanding and lying in a common plane, and being permanently connected to the cap on the underside thereof. The blade 11 may have holes 23 and an intermediate hole 24 alined therewith, and adapted respectively to receive the studs 21 and the screw member 22, so that the blade may rest against and along the cap 18 in uniform relation therewith. Similarly, the guard member may have end holes 25 and an intermediate hole 26 alined therewith for respectively receiving the studs 21 and the screw member 22 so as to lie against the blade on an opposite side thereto relatively to the cap. The handle may have an internally screw threaded opening 27 for releasably engaging the screw member 22 and thereby pressing the cap and guard snugly together for reliably holding the blade. The handle 20 may extend centrally and at right angles with respect to the cap and guard members, and the latter may be suitably transversely curved for correspondingly flexing and holding the blade 11.

The guard 19 may have along its opposite edges a series of fingers 28 which extend inward to 29 considerably beyond the points 16 of the blade and have their outer ends 30 preferably rounded. The various fingers terminate in lines parallel to each other and to the points 16 of the blade so as to maintain a uniform guard spacing relation throughout. Correspondingly positioned fingers on opposite sides of the guard are in alined relation with each other and with the teeth 13 of the blade 11, so that the fingers underlie and extend beyond the points 16 of the teeth, whereby to assure maximum safety in the use of the razor.

The cap 18 may have a pair of series of projections 31 arranged to coact with the teeth 13 of the blade and to form a supplemental guard therefor. Various possible arrangements of these projections may be utilized, bearing in mind that the primary purpose thereof is to bear down on the teeth 13, and finally to permit the oblique cutting edges to approach closely to the skin for clean shaving action, and yet to space said edges from the skin so as to assure safety in the use of the razor. Hence the edges 32 of the cap may diverge from the adjacent cutting edges 13 of the blade, and the projections 31 may be thinner than the rest of the cap, as shown at 33 in Fig. 1, to permit the cutting edges to approach the skin as closely as may be necessary for clean shaving action.

In Figs. 6 and 7 is shown a modification of the invention including an elongated razor blade of thin rigid or flexible steel 34 having along its opposite longitudinal edges series of teeth 35 that may be generally of smaller size than the teeth aforementioned, and having their oblique edges 36 sharpened to form cutting edges. Extending longitudinally of the blade and intermediate of the said series of teeth is a slot 37 closed ended at 38 adjacent to the opposite ends of the blade. The guard member 39 may underlie the blade and may have lip means for protecting the ends 40 of the teeth. For example, the guard may have teeth 41 individually alined with the different teeth 35, and having individual lips 42 for the ends of the teeth extending to lie in the plane thereof. A cap 43 may have holding portions or extensions 44 for overlying and clamping down on the end portions of the blade at the ends of the slot 37, and extending into proximity to the opposite edges of the blade. Any suitable means may be provided for supporting or actuating the extensions 44, as by providing a bar 45 integrally interconnecting the same, and extending along and confined to the central longitudinal region of the blade remotely from the teeth 35 and the reentrant angles 46 therebetween. The cap and guard may preferably have plane seats 47, 48 respectively, for opposite longitudinal portions of the blade and lying in angular relation as shown, so that the teeth 35 lie in planes. The cap may have studs 49, and an intermediate screw 50 for extending through the slot 37 and through corresponding alined holes in the guard, the screw being removably threaded into a hole 51 in the handle 52. Fingers 41 and 28 may be similar to each other.

The manner of using the invention will now be described. The razor may be moved along the face or other body portion to be shaved, in any desired direction, and the shaving action will always occur obliquely. In course of shaving the fingers 28 and 41 exert a stretching action on the skin to facilitate smooth and uniform shaving. The oblique cutting of the hair produces a movement toward and laterally of the hair strands, causing a compound motion which facilitates severance of the hair. In theory, a simultaneous angular motion or twist of the hair strands may occur, which causes a cutting at increased speed. In any case, the cutting occurs more easily and smoothly without any pulling or tugging on the hair than has heretofore occurred and without irritating, cutting, or scratching the skin. If the reentrant angles between the teeth be inaccessible for cutting action, the same may serve as accumulators for the lather and thereby facilitate the cutting by the oblique edges of the teeth, and hence those reentrant angles need not be sharpened, if so desired. However, in the device shown in Figs. 6 and 7, the edges of the teeth are fully accessible for shaving, including the reentrant angular portions, and the blade may be of standard thinness or slightly thicker for increased rigidity of the teeth. Moreover, the bar 45 may coact for suitably inclining the razor to the surface to be shaved. The portions 44 being at the ends of the razor will not interfere with the disposition of the oblique cutting edges closely along the surface to be shaved. It will be noted that the teeth 35 of the razor blade form their own guard, and by making these teeth of proper size and angularity, complete safety in shaving is assured. The projections on the cap and the fingers on the guard means may separately or together exert a stretching action on the skin to aid the shaving.

It will be appreciated that various changes and modifications may be made in the device as shown in the drawing, and that the same is submitted in an illustrative and not in a limiting sense, the scope of the invention being defined in the following claims.

I claim:

1. A razor including a blade having a serrated edge providing a series of angular teeth lying sub-

stantially in a plane and disposed alongside of each other, the opposite edges of each of said teeth being sharpened, and holding means for the blade including a cap and a guard disposed on opposite sides thereof, said cap having projections individually overlying the blade teeth and spaced inward from the cutting edges thereof, said guard having fingers underlying the blade teeth in alinement with the points thereof and extending therebeyond, and the portion of the cap adjacent to said teeth being relatively low and flat to cause the cutting edges of said teeth to closely approach a surface to be shaved.

2. A razor including a flexible blade having a plurality of angular uniform teeth disposed side by side substantially in a plane and in a straight continuous series, said teeth having the oblique edges thereof sharpened for angular cutting action, and curved means for flexing and holding the blade including a cap and a guard disposed on opposite sides of the blade, said cap having holding projections individually overlying said teeth, said projections being spaced more remotely from the corners between the teeth than from the oblique cutting edges of the teeth, and said guard having spaced fingers underlying the teeth in alinement with the points thereof.

3. A razor including a blade having a series of teeth extending along opposite edges thereof, the different teeth being of uniform angularity and having the oblique edges thereof sharpened for cutting action, and holding means for the blade including a cap and a guard disposed on opposite sides of the blade, the guard having fingers underlying the blade teeth and extending therebeyond, the cap having projections individually overlying the blade teeth, said projections being spaced more remotely from the corners between the teeth than from the cutting edges of the teeth, and the cap being relatively thin and parallel to the blade to cause said cutting edges to closely approach a surface to be shaved.

DEMOSTHENES B. HADJOPOULOS.