

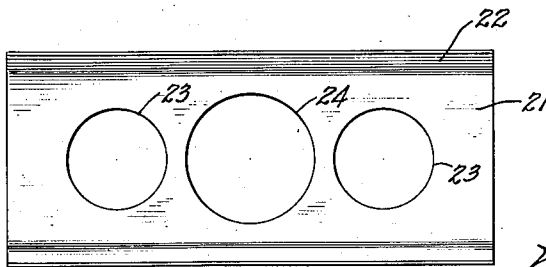
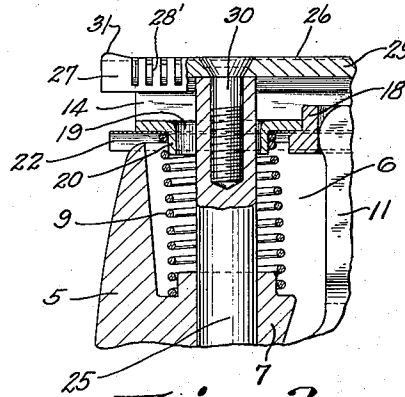
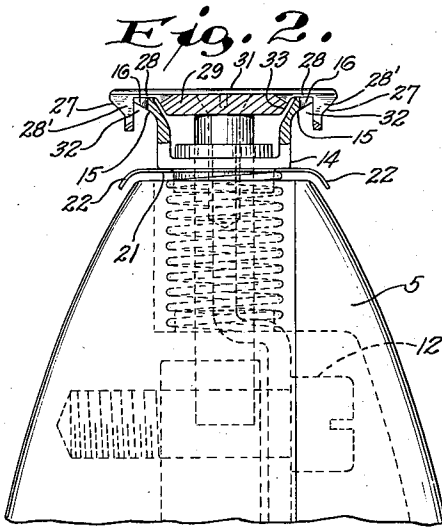
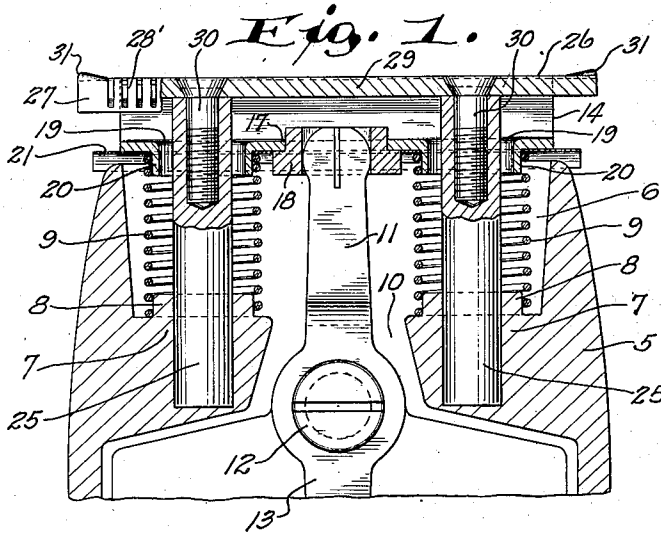
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SHAVING DEVICE

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SHAVING DEVICE

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4 Claims. (Cl. 30-43)

This invention relates to improvements in shaving devices.

The invention relates more particularly to shaving devices of the type having a reciprocating cutter, driven by an electric motor or other suitable means and movable beneath a slotted face engaging part or fixed blade, whereby the device may be used without soap or other beard softening agent to greatly facilitate the shaving operation.

In devices of this type the shaving is accomplished by a shearing action between the fixed blade and reciprocably movable cutter, and efficiency of operation is dependent, among other things, upon a close contact between said members during operation. Heretofore various arrangements have been proposed for yieldingly urging the cutter into contact with the fixed blade. These prior methods, however, have resulted in friction between the yielding means and cutter with objectionable wear upon the parts and noise during operation.

It is therefore an object of this invention to provide a shaving device as above described, wherein novel means is utilized for applying a floating tension to the lower surface of the cutter, and wherein sliding frictional contact between the lower surface of the cutter and the yielding means is eliminated.

A more specific object of the invention is to provide in a device as above described having supporting means and having a cutter spaced therefrom, coil springs mounted between said supporting means and the lower surface of the cutter, said springs being anchored at their lower ends to the supporting means and at their upper ends to the cutter and being adapted to flex laterally to permit reciprocation of the cutter while yieldingly urging said cutter into close contact with the fixed blade during such reciprocation.

A still more specific object of the invention is to provide a structure as above described, wherein the fixed blade is carried by supporting posts which extend through openings in the cutter, said openings being of such size with respect to the diameter of the posts as to permit reciprocation of the cutter, and there being coil springs surrounding said posts which are substantially the same diameter as the openings in the cutter whereby said springs may flex while the cutter is moving, without contacting said posts.

A further object of the invention is to provide a shaving device as above described wherein the cutter is guided in its movement by the fixed blade and the depending flanges thereof.

A still further object is to provide a shaving device having supporting posts for the fixed blade wherein said posts have lower ends molded into the material forming the shaver handle.

A further object of the invention is to provide in a device as above described having a reciprocably movable cutter, a guard member carried by and movable with said cutter shaped to prevent cut hair from entering the end of the handle.

With the above and other objects in view, the invention consists of the improved shaving device and all its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawing illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a fragmentary longitudinal sectional view through the head showing it attached to a portion of the handle;

Fig. 2 is an end view of the structure shown in Fig. 1, parts being broken away and shown in section;

Fig. 3 is a fragmentary sectional view of part of the structure shown in Fig. 1, showing the spring laterally flexed during movement of the cutter; and

Fig. 4 is a plan view of the hair guard.

Referring more particularly to the drawing, the shaver handle is designated by the numeral 5 and may be formed of any suitable material such as "Bakelite," and the handle may comprise two complementary longitudinal sections. The assembled handle has its outer end provided with a recess 6, and below said recess are shoulders 7 formed with bosses 8, or equivalent means, for cooperation with the lower ends of coil springs 9. Between the shoulders 7 is a central opening 10 through which the end 11 of an actuating member projects. The actuating member may be of any desired type, but as shown is pivoted to the handle structure at 12 and has an end 13 which is operated by an electric motor in any well known manner.

The cutter or reciprocable blade 14 is preferably U-shaped in cross section, as shown in Fig. 2, and has outwardly directed flanges 15 which are slotted as at 16 to form a plurality of cutting teeth, the slots communicating with the outer edges of the flanges 15. The cutter flanges 15 have teeth thereon formed substantially as shown in Fig. 7 of co-pending application Serial No. 124,416 filed February 6, 1937. The bottom portion of the cutter is formed with a central

opening 17 within which a ring 18 is inserted, and the outer end of the actuating arm 11 is received within the ring 18 to impart reciprocating movement to the cutter. The cutter is also formed on each side of the central opening 17 with openings 19, there being annular bosses 20 depending from said openings as shown in Fig. 1, for cooperation with the upper ends of the coil springs 9. Any other suitable means for anchoring the upper ends of the springs to the lower surface of the cutter around the openings 19 may be employed.

A guard member 21 (see Fig. 4) having downwardly bent edge portions 22, is positioned adjacent the lower side of the cutter, and said guard has openings 23 which register with the openings 19 of the cutter and an opening 24 which fits around the ring 18 of the cutter. The upper ends of the springs 9 will serve to hold the guard in position as shown in Fig. 1. By referring to Fig. 2, it is apparent that the downwardly flanged edges 22 of the guard serve to direct cut hair away from the end of the handle and to the exterior.

Supporting posts 25 have their lower ends molded in the shoulders 7 of the handle with the posts projecting from said shoulders substantially centrally of the bosses 8. The outer ends of the posts extend through the openings 19 in the cutter and serve as supports for the fixed blade or face engaging member 26. The fixed blade is preferably formed with a substantially flat upper surface and is provided with downwardly projecting flanges 27 on each edge. Each edge of the fixed blade is slotted as at 28, and said slots extend down into the flanges 27 as at 28' (Fig. 1) and terminate short of the lower edges of the flanges.

The center of the fixed blade has a depending portion 29 to increase the thickness of the blade at the center, and the slots 28 terminate adjacent the edges of said thickened portion. The material of the fixed blade at each side of the thickened portion, wherein the slots are located, is of extreme thinness, but is nevertheless of sufficient rigidity to support itself against flexing. Screws 30 which have their heads countersunk into the thickened portion of the fixed blade may be employed to secure the fixed blade to the upper ends of the supporting posts 25.

The fixed blade may have its end edges formed with a rounded ridge as at 31 for the purpose of preventing injury to the face from contact with the edges and corners of the fixed blade.

The diameter of the supporting posts 25 is substantially less than the diameter of the openings 19 of the cutter, and such difference permits reciprocation of the cutter in both directions without having the posts contact the edges of the openings 19. Thus there is no friction whatsoever between the posts and the cutter, and said posts serve solely to support the fixed blade. The coil springs 9 are of substantially greater diameter than the supporting posts 25 and are preferably of just slightly greater diameter than the openings 19 to fit around the depending flanges 20 and to prevent contact between any portion of the springs and the posts during flexing of the springs, said flexing being shown in Fig. 3.

The toothed portions 16 of the cutter reciprocate beneath the slots 28 of the fixed blade in downwardly opening channels 32, which channels are formed between the flanges 27 of the fixed blade, and the inclined edges 33 of the

depending thickened portion of the fixed blade. The fit of the cutter within said channels is such that the cutter is guided in the channels during its reciprocal movement as shown in Fig. 2.

It is apparent from the above, that the springs 9 are so arranged around the supporting posts 25 as not to interfere therewith, and said springs constantly exert tension upon the cutter to keep the cutter teeth in close contact with the teeth of the fixed blade during operation. By having the springs of substantially larger diameter than the supporting posts 25 and by having the openings 19 in the cutter of larger diameter than the supporting posts, flexing of the springs in the manner shown in Fig. 3 is permitted. Thus these springs constantly exert floating tension upon the cutter without being in sliding frictional contact with any part of the device, and furthermore the concentric arrangement of the springs and supporting posts results in a compact shaving head construction.

It is to be noted that the fixed blade has the major portion of its area formed of relatively thick metal as at 29 and has a substantially flat outer surface, opposite longitudinal edges of the blade being very thin as at 28 for a limited distance inwardly from the edges, and said edges being provided with downwardly extending flanges 27. Thus these thin portions 28 are supported against flexing by the thickened central portion 29 and are further reenforced by the downwardly extending flanges 27. The slots 28 terminate short of meeting and preferably at the beginning of the thickened portion, and the outer ends of the slots terminate short of the lower edges of the flanges 27. This structure of a thickened central portion 29 in combination with flanges 27 forms downwardly opening flanges 32 for cooperation with a U-shaped cutter and for guiding the latter, and the construction is still such that the fixed blade has a substantially flat surface from one shaving edge to the other.

Although only one form of the invention has been shown and described, it is obvious that various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. In a shaving device, a supporting structure, posts extending from said supporting structure, a slotted fixed blade supported by the outer ends of said posts, a cutter slotted to cooperate with the slots of the fixed blade and positioned below the latter, said cutter having apertures therein through which the supporting posts extend, and said apertures being of such size with respect to the thickness of the posts as to permit said cutter to reciprocate, and coil springs surrounding the posts and connected at one end to the supporting structure and at the other end to the cutter for applying tension to the cutter, said springs being of such diameter with respect to the posts as to flex laterally during reciprocation of the cutter without interference from said posts.

2. In a shaving device, a supporting structure, posts extending from said supporting structure, a slotted fixed blade supported by the outer ends of said posts, a cutter slotted to cooperate with the slots of the fixed blade and positioned below the latter, said cutter having apertures therein through which the supporting posts extend, and said apertures being of such size with respect to the thickness of the posts as to permit said cutter to reciprocate, bosses depending from the cut-

ter around said apertures, and coil springs surrounding said posts and connected at one end to the supporting structure and at the other end fitting around said bosses of the cutter, said
5 springs being of such diameter with respect to the posts as to flex laterally during reciprocation of the cutter without interference from the posts.

3. In a shaving device, a shaving handle having a recessed end, shoulders projecting inwardly
10 within said recess, posts having lower ends secured to said shoulders and projecting exteriorly of the handle, a slotted fixed blade supported by the outer ends of said posts, a cutter slotted to cooperate with the slots of the fixed blade and positioned below the latter, said cutter having apertures therein through which the supporting posts
15 extend and said apertures being of such size with respect to the thickness of the posts as to permit said cutter to reciprocate, and coil springs
20 surrounding the posts and connected at one end

to the shoulders within the recess of the handle and at the other end to the cutter for applying tension to the cutter, said springs being of such diameter with respect to the posts as to flex
5 laterally during reciprocation of the cutter without interference from the posts, said springs being substantially confined within the recessed end of the handle.

4. In a shaving device, a shaving handle, a slotted fixed blade carried by said handle exteriorly of an end thereof, a cutter reciprocally
10 movable between said fixed blade and the end of the handle and having slots cooperable with the slots of the fixed blade, and a separately formed guard plate secured to the cutter and movable
15 therewith, said plate having inwardly bent edges projecting beyond the sides of the end of the handle to deflect cut hair away from the end of the handle.

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