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SHAVING IMPLEMENT

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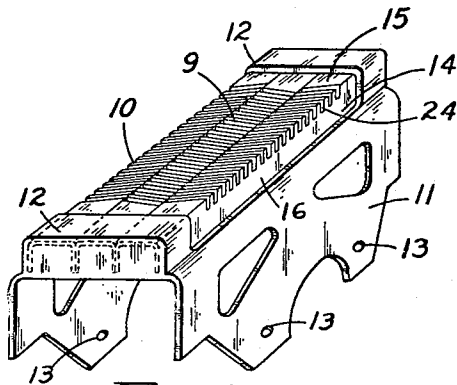


Fig. 1

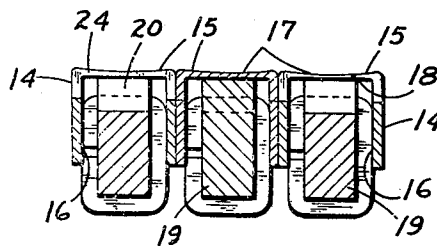


Fig. 3

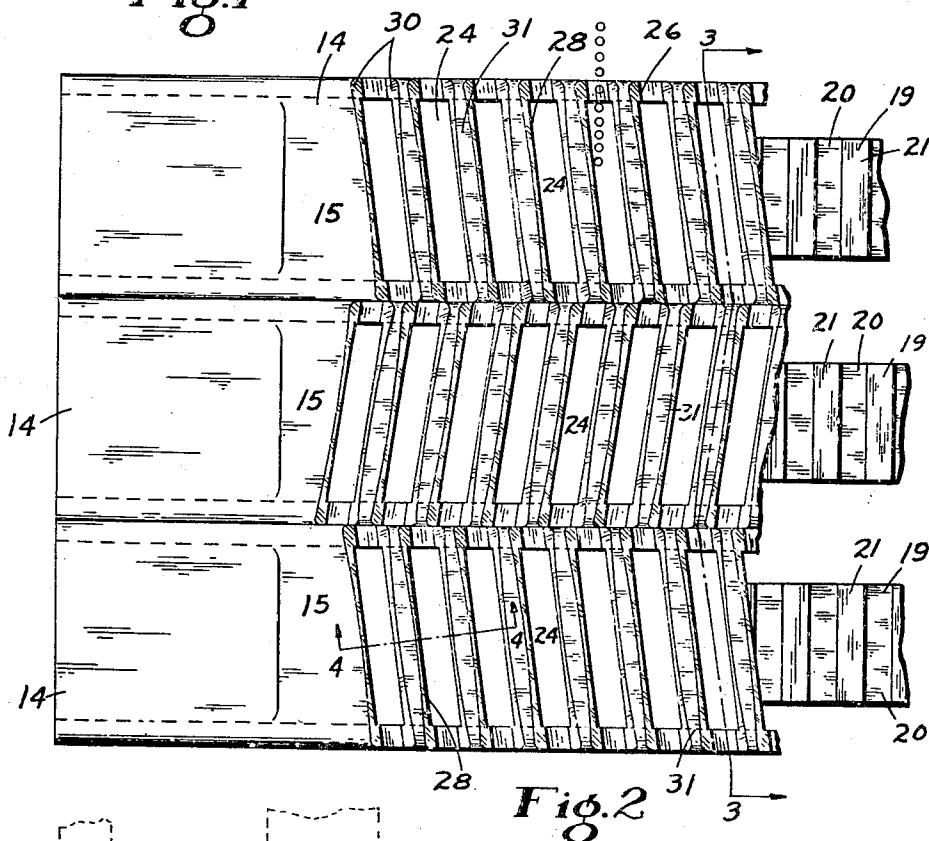


Fig. 2

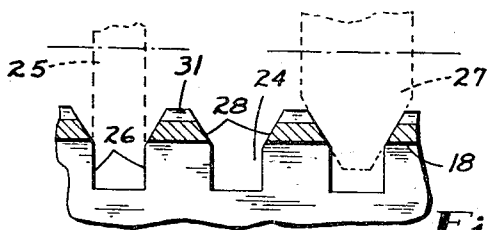


Fig. 4

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SHAVING IMPLEMENT

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6 Claims. (Cl. 30—43)

This invention relates broadly to dry shavers, but more particularly to an improved shear plate or guard that rests against the skin and has reciprocatory cutters operatively engaging its under side for cutting or shearing hairs.

One object of this invention is to produce an improved guard for dry shavers formed with alternate slots and teeth disposed in a manner affording positive contact of the hairs with the shearing edges of the guard's teeth during normal translation of the shaver over the skin, overcoming thereby the possibility of the hairs being bent by the cutter preparatory to the shearing action, and consequently resulting in a clean and efficient shave.

Another object of this invention is to produce an improved guard for dry shavers formed of a plurality of sections mounted side by side against each other, each section having a skin contacting surface formed with alternate slots and teeth extending from one to the other side thereof, the slots being of a width calculated to enable free passage of the hairs therethrough, while the teeth are of a shape calculated to enable entrance of the skin partway in the slots without danger of extending below the shearing edges of the teeth. The guard being further characterized by the slots and teeth of any two adjacent sections sloping in reversed directions and disposed in staggered relation, thereby enabling positive contact of the hairs with the shearing edges of the teeth of any one of the sections during normal translation of the shaver over the skin.

Another object of this invention is to produce an improved guard for dry shavers, which is relatively inexpensive to manufacture and which may be pressed against the skin without danger of caving or flexing.

In the drawing:

Fig. 1 represents a perspective view of a razor head assembly embodying the invention.

Fig. 2 is an enlarged top plan view of the improved guard partly broken away and illustrating a portion of the cutters normally engaging the under side of the guard.

Fig. 3 is a reduced cross sectional view taken through a line 3—3 in Fig. 2, and also illustrating the cutter in operative position.

Fig. 4 is a longitudinal sectional view taken in a plane indicated by line 4—4 in Fig. 2.

Referring to the drawing, 10 designates a razor head assembly including a substantially channel shaped bracket 11 formed with longitudinally spaced intumed ends 12 between which extends the novel shear plate or guard about to be described. The head 10 may be secured to the upper end of the shaver's housing by any suitable means such as screws or the like extending through holes 13 provided through the side walls of the bracket 11.

The guard proper, generally designated by 9, is made of a plurality of channel shaped sections 14, the number of which may vary but is preferably limited to three. These sections are mounted side by side against each other with the end portions thereof located within the intumed ends 12 of the bracket 11, where they are spot welded to the bracket or otherwise secured thereto against any appreciable movement relative to one another. In practice, the sections 14 are preferably made from a relatively thin plate of steel alloy bent into the desired shape and each formed with a cross wall 15 and two side walls 16, which side walls act as reinforcements preventing caving or flexing of the skin contacting wall of the guard formed by the combined cross walls 15. The upper or outer surface 17 of each cross wall 15 is caved laterally as clearly shown in Fig. 3, while the lower or inner surface 18 thereof is machined perfectly flat and is operatively engaged by a cutter 19 formed with alternate slots and teeth 20 and 21 extending laterally thereof. The cutters are also operatively connected to a single motor (not shown) of any suitable type calculated to impart to the cutters a reciprocatory motion lengthwise of the sections 15.

The cross wall 15 of each section 14 is provided with longitudinally spaced slots 24 extending laterally from one to the other side thereof, and sloping slightly in one direction. These slots may be produced by any suitable manner, but preferably by first gang milling each section with straight cutters 25 to produce slots with straight vertical side walls 26, the depth of the cut being calculated to extend well below the inner surface 18 of the cross wall 15 and consequently through the upper portion of the side walls 16. Subsequently, the section is again gang milled with V-shaped cutters 27 fed to a cutting depth extending slightly below the inner surface 18 of the cross wall 15, thereby producing the slots 24 with inclined side walls 28 extending from one to the other side of the cross wall 15, and forming the upper end portions of the straight walls 26 of the slots in the side walls 16 of the section 14. The nominal width of the slots 24 is calculated to enable free passage of the hairs therethrough, while the upper portions of the ends thereof flare outwardly as clearly shown at 30 in Fig. 2. This enlargement of the upper portions of the ends of the slots is caused by the cutters 27 cutting through the lateral end portions of the cross wall 15, which end portions are slightly higher than the middle portion of the cross wall due to the laterally concaved shape of the outer surface 17.

The land left between any two adjacent slots forms a tooth 31 having inclined side walls formed by the side walls 28 of the slots 24, which side walls constitute with the inner flat surface

18 of the tooth sharp straight cutting edges. Due to the slanted side walls of the teeth 31, the teeth are somewhat wider at the base or across the inner surface thereof than across the outer surface, while the end portions of the teeth, due to the laterally concaved shape of their outer surface corresponding to the outer surface 17 of the cross wall 15, are somewhat thicker or higher than the middle portion thereof, thereby providing the teeth with raised end portions engageable with the skin in a manner causing the skin to bulge slightly between the ends of the teeth for partial penetration into the slots 24.

In practice, the marginal end portions 14 are provided with alternate slots and teeth sloping in one direction, while the middle section 14 is provided with alternate slots and teeth preferably sloping in a reversed direction, with its slots staggered relative to the slots of the two portions, thereby resulting in the teeth of the middle section closing the adjacent normally opened ends of the slots of the other two sections.

In operation, it is of course understood that the cutters 19 are operatively engaging the under sides 18 of the cross walls 15 or of the teeth 31, and are reciprocated longitudinally of the sections 14. When moving the razor over the skin in a direction perpendicular to the longitudinal edges of the guard 9, and with the guard resting against the skin, the hairs will enter the slots as shown by a series of small circles in connection with one of the slots in Fig. 2. In this instance, the ends of the slots being somewhat wider than the middle portions thereof, will assist in or facilitate entrance of the hairs into the slots. Due to the inclination of the slots 24 and the consequential inclination of the teeth 31, the teeth, or more specifically one shearing edge of each tooth, will gradually move closer to the hairs to finally result in the tangential engagement of the tooth's shearing edge with the hairs preparatory to the shearing of the hairs by the cutters 19. When the teeth 21 of the cutters 19 slide under the corresponding teeth 31 of the guard 9, the hairs in tangential engagement with the shearing edges of the teeth of the guard will be sheared by the teeth of the cutter without enabling possible bending of the hairs, thereby resulting in a clean and efficient shave.

The shearing edge of the teeth 31 being materially less than 90°, will afford, in combination with the corresponding shearing edges of the cutters' teeth 21, a sharp and efficient shearing action overcoming any tendency to pull the hairs or otherwise cause any discomfort to the skin. Due to the laterally concaved shape of the upper surface of the teeth 31, the raised end portions thereof will engage the skin in a manner causing it to bulge slightly therebetween for partial penetration into the slots 24 or into close proximity to the shearing edges of the teeth 31. The teeth 31 of the middle section 14 of the guard 9 sloping in a reverse direction relative to the teeth of the extreme sections, will enable hairs to be tangentially engaged by opposed shearing edges of the teeth during movement of the razor in one direction, consequently causing the hairs engaged for instance by the right hand sides of the teeth 31 of the extreme sections in Fig. 2 to be sheared during the leftward strokes of the cutters 19, and the hairs engaging the left hand sides of the teeth of the middle section to be sheared during the rightward strokes

of the cutters, thereby enabling shearing action to take place during longitudinal movement of the cutters in both directions and consequently producing a more efficient and rapid shave.

Although the foregoing description is necessarily of a detailed character, in order to completely set forth the invention, it is to be understood that the specific terminology is not intended to be restrictive or confining, and it is to be further understood that various rearrangements of parts and modification of structural detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. In a shaving implement, a guard formed of a plurality of channel shaped sections mounted side by side against each other, and a plurality of longitudinally spaced slots through the cross wall of each section extending from one to the other side thereof in angular relation with the slots of the adjacent section.

2. In a shaving implement, a guard including a substantially rectangular skin contacting relatively thin wall, and a plurality of minute slots through said wall disposed in a herring-bonelike manner.

3. In a shaving implement, a guard including a substantially rectangular skin contacting relatively thin wall, and a plurality of longitudinally extending rows of minute slots through said wall extending laterally thereof with the slots of any two adjacent rows sloping in reverse directions.

4. In a shaving implement, a guard formed of a plurality of channel shaped sections mounted side by side against each other, the cross wall of each section being relatively thin with the outer surface thereof laterally concaved, and a plurality of longitudinally spaced V-shaped slots through the cross wall of each section extending obliquely from one to the other side thereof with the end portions of said slots slightly wider than the middle portions thereof.

5. In a shaving implement, a guard including a relatively thin skin contacting wall, alternate slots and teeth extending laterally of said wall, said slots being of a width enabling free passage of the hairs therethrough, said teeth being disposed in a manner enabling opposite sides thereof to move gradually into tangential engagement with hairs located substantially vertically in said slots during movement of the implement over the skin in one direction, and reciprocatory cutter means engaging the under sides of said teeth for shearing the hairs engaging one side of said teeth during movement of said cutter means in one direction and the hairs engaging the other side of said teeth during movement of said cutter means in the other direction.

6. In a shaving implement, an elongated guard including a relatively thin skin contacting wall, alternate slots and teeth extending laterally of said wall, said slots having outwardly flaring open ends and being of a width enabling free passage of the hairs therethrough, said teeth sloping relative to the marginal longitudinal edges of said guard in a manner causing them to tangentially engage the hairs located in said slots during movement of the implement over the skin in a direction perpendicular to said edges, and cutter means for shearing the hairs when in tangential engagement with said teeth.

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