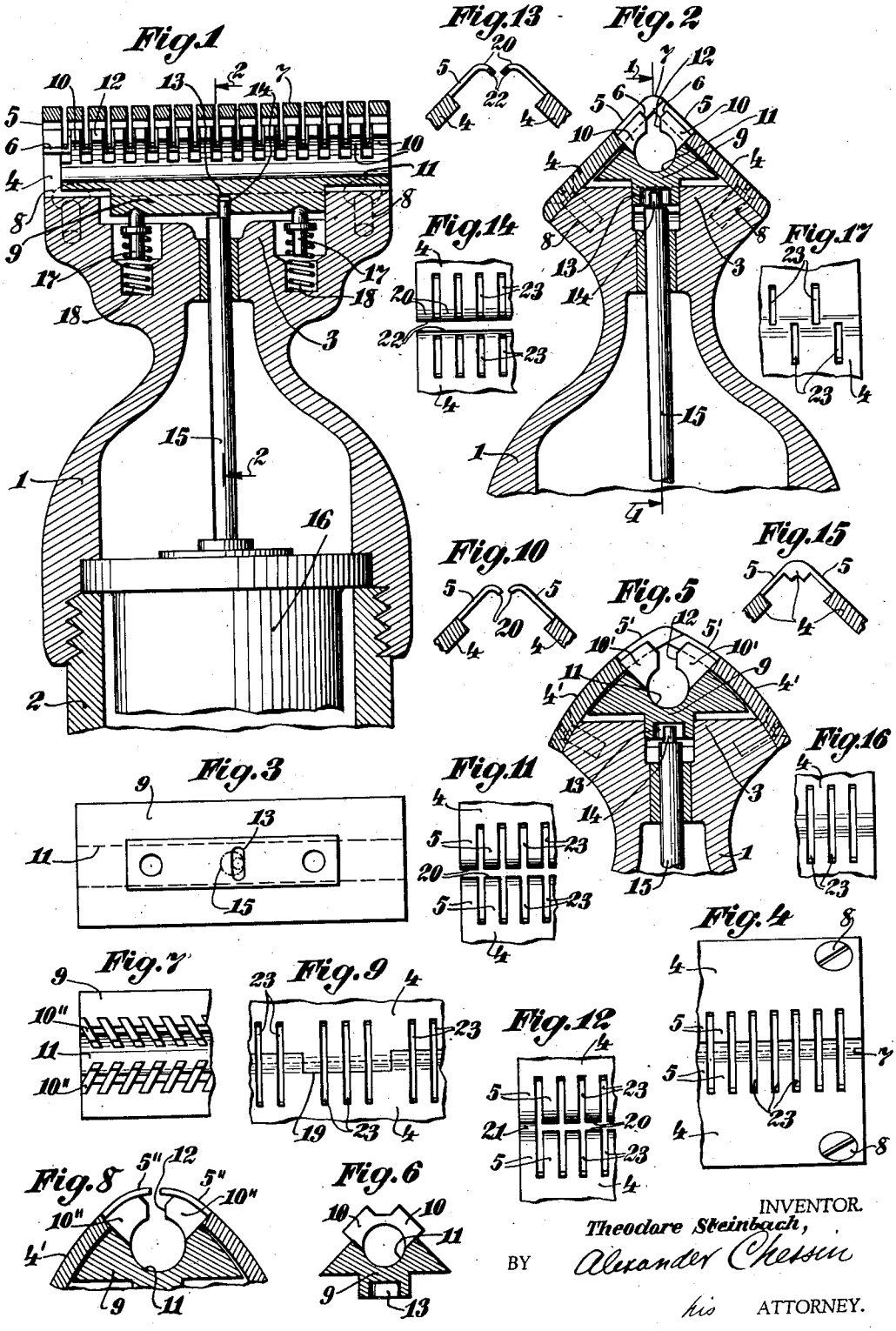
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HAIR CLIPPER

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HAIR CLIPPER

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1

My invention relates to hair clippers for use as razors and sometimes referred to as "dry" razors because they require no softening of the surface operated upon by soap or similar preparations prior to use.

The particular object of the present invention is to provide a generally more efficient hair clipper which lends itself to use under various, sometimes difficult, conditions. The tool being of a substantially triangular cross section with a rounded apex and the clipping or shearing elements being near the apical line, i. e., the line which is to the entire structure what the apex is to its triangular cross section, it is possible with this tool to reach the skin in places more than usually depressed, as, for instance, between heavy wrinkles or folds in the skin, or where the surface operated upon makes a sharp angular change. It is also the object of the present invention to provide a tool which lends itself to a rocking motion about its apical line. By rocking the clipper from one side to the other, while simultaneously reversing the direction in which the tool is being moved over the surface of the skin, hair filaments which are often and variously inclined are caught in the shearing action of the tool no matter which way these filaments are inclined. It is a further object of the invention to provide means for the protection of the skin from injury during the operation of the clipper. Still another object is to facilitate the passage of the hair filaments into the operating part of the clipper as well as to facilitate the passage of the clipped hair out of the tool. These and many other objects of the present invention will be readily perceived and understood from the specifications which follows and from the accompanying drawing.

In the drawing,

Figure 1 is a cross section of one form of the invention taken along the line 1—1 of Figure 2.

Figure 2 is a cross section of the same device taken along the line 2—2 of Figure 1.

Figure 3 is a view of an operating part of the same device, hereinafter referred to as the "cutter," looking at it from the bottom.

Figure 4 is a broken off top view of the device shown in the preceding figures.

Figure 5 is a cross section similar to that shown in Fig. 2 of another form of the invention.

Figure 6 is a detail showing a modified form of cutter.

Figure 7 is a top view of still another form of cutter.

Figure 8 is a modification of the device illustrated in Fig. 5, showing converging walls which do not meet.

2

Figure 9 is a detail showing one way of interlocking the side walls when they meet.

Figure 10 is a detail showing the teeth on the side walls when provided with guards.

Figure 11 is a top view of the arrangement shown in Fig. 10.

Figure 12 is a top view of a arrangement similar to that shown in Figure 11, but with closed ends.

Figure 13 is a detail of another form of guards which, in this case, have their ends connected.

Figure 14 is a top view of the teeth and guards shown in Figure 13.

Figure 15 is still another form of the device in which the side walls are made of a bent, single sheet of metal.

Figure 16 is a top view of the form shown in Figure 15.

Figure 17 is a top view detail showing a staggered arrangement of the slots in the side walls.

In all of the figures, from 5 to 17, only so much of the structure is shown as is necessary to distinguish it from that fully disclosed in Figures 1 to 4.

Referring to Figures 1–4 in detail, 1 is the head of a hair clipper embodying the present invention, shown as removably attached to a handle 2. The lower part of the handle is broken off in the drawing to make room for other figures. The upper part of the head 1 comprises a channel member 3, shown here as an integral part of the head. The channel member 3 has side walls 4 converging into contact with one another, the plane surfaces of the walls 4 being rounded up in the region of contact into a cylindrical surface 7. Near the contact region of the walls 4, thin, narrow bands 5 are formed by longitudinal recesses or grooves 6 in the walls 4. In the bands 5, a plurality of teeth are formed by parallel slots 23. These teeth are denoted by the same numeral 5 as the bands because, actually, the teeth and the slotted bands are one and the same thing. The walls 4 are fixedly attached to the head 1, as by means of screws 8. Within the channel member 3 is a movable cutter 9 provided with teeth 10. The cutter 9 has a longitudinal bore 11 and a longitudinal aperture 12 connecting with the bore 11. The teeth 10 are cut through to the bore 11. The cutter 9 is given a reciprocating motion by the action of the eccentric 14 rotating in the oblong opening 13 at the bottom of the cutter 9, the eccentric 14 being on the shaft 15 of a motor 16 within the handle 2. This action

is made clear in Figure 3 which is a view of the cutter looking upward from the bottom. The teeth 10 of the cutter 9 are urged against the bands or teeth 5 by means of the studs 17 and springs 18, which arrangement permits this yielding means to oscillate in unison with the reciprocating motion of the cutter 9. The slots 23 in the bands of the walls 4 are extended into the region of contact of the walls where, at least in this illustration, the slots of one of the bands are shown as communicating with the slots of the other band.

Referring to the remaining Figures 5–17, they illustrate various modifications of the device, as will now be enumerated.

1. The surfaces of the walls 4 in Figures 1–4 are plane, except for the cylindrical region of contact 7. They may, however, be entirely cylindrical, as, for example, the walls 4' of Figure 5. Of course, the band teeth 5' and the cutter teeth 10' in this case are curved to conform with the curvature of the walls 4'. The term "cylindrical" should not be misunderstood as necessarily meaning a circular cylinder, although a part, or all, of the walls 4' may have circular cylindrical surfaces, as, for instance, in the case of the structure illustrated in Figure 8, to be discussed later. By a cylindrical surface, in accordance with the correct mathematical definition, is meant any surface generated by a straight line moving parallel to itself. Therefore, the walls of the channel member 3 may even be concave, or partly convex and partly concave, instead of convex all the way, as in the illustration, Figure 5. The broad definition of the term cylindrical applies also to the surface 7 in the region of contact of the walls 4 in Figures 1–4.

2. One of the mutually converging walls of the channel member 3 may have a plane surface, while the surface of the other wall is cylindrical.

3. The two walls need not be made of separate pieces, as in Figures 1–4 and Figure 5, but may be made of a single sheet bent about its median line, as is illustrated in Figures 15–16. This is true whether the walls have plane or cylindrical surfaces.

4. The walls of the channel member 3, although mutually converging in all cases, need not meet. This modification is illustrated in Figures 8, 10–11, 12, and 13–14. In this case, the thin, narrow, slotted bands are at the ends of the walls 4 and properly constitute flanges. Distinction, however, must be made between the cases where these flanges have, or have not, a common tangent plane. The first case is illustrated in Figure 8. Here, the flanges and teeth 5'' have a common tangent plane and, accordingly, will rest on the surface of the skin operated upon without nipping it. Therefore, in this case, guards for the teeth 5'' are not necessary, although, of course, they may be provided if so desired. But in the other case, where the slotted flanges or teeth on the walls of the channel member 3 have no common tangent plane, it is necessary to provide guards for the teeth to prevent injury to the skin. This case is illustrated in Figures 10–11, 12, and 13–14. In Figures 10–11, the guards 20 are formed by turning down the teeth 5 at their ends, or by rounded extensions of the teeth. In Figures 13–14, the ends of the guards 20 are connected by a bar 22, which may be an unslotted part of the flange itself. In Figure 12, the aperture between the walls is closed at the ends 21.

5. Among some of the minor variations of the device may be noted the manner of interlocking the side walls 4 in the region of their contact, as illustrated in Figure 9, the apical line being replaced in this case by the broken line 19; also, the omission of the aperture 12 in the hollow cutter 9, as illustrated in Figure 6; or, the staggered arrangement of the slots 23, as illustrated in Figure 17; also, the herring bone pattern of the teeth 10'' of the cutter 9, as illustrated in Figure 7.

It will be noted in Figure 6, that the cutter 9 has a longitudinal depression between the two rows of teeth. This is necessary to prevent injury to the skin by too close a proximity to it of the cutter teeth. The same function is performed by the aperture 12 in the cutter of Figure 2.

The device operates by causing a shearing action to take place between the teeth 5 (5', 5'', etc.) of the bands or flanges of the side walls and the teeth 10 (10', 10'', etc.) of the cutter 9. The hair enters the clipper through the slots 23 in the apical region of the side walls and, after being sheared off, falls through the open spaces between the teeth of the cutter 9 into the hollow space 11, from which it is readily blown out, or otherwise removed. By rocking the head 1 about the line to which the side walls of the channel member 3 converge and, at the same time, reversing the direction of movement of the tool over the surface of the skin, as was mentioned in the preamble, no matter how the hair filaments may be inclined, they will be caught in the shearing action of the tool.

I claim:

1. A hair clipper comprising a pair of mutually converging but not meeting plates, a supporting member secured to said plates adjacent their diverging ends, teeth formed in said plates by slots opposite said ends, a movable channel shaped cutter having sides adjacent the inner faces of said plates and slotted along the free edges to form cutter teeth, and means for giving said cutter a reciprocating motion.

2. A hair clipper comprising a pair of mutually converging but not meeting plates, a supporting member secured to said plates adjacent their diverging ends, longitudinal recesses in said plates opposite said ends, teeth formed by slots in said recesses, guards for said teeth, a movable channel shaped cutter having sides adjacent the inner faces of said plates and slotted along the free edges to form cutter teeth in sliding contact with the teeth of said plates, and means for giving said cutter a reciprocating motion.

3. In a hair clipper, a head comprising a stationary channel member having mutually converging but not meeting side walls, thin flanges flush with the outer surface of said walls formed by longitudinal recesses therein, teeth formed by parallel open end slots in said flanges, guards for said teeth formed by inturned extensions thereof, a bar connecting the ends of said guards for each set of said teeth, a movable cutter within said channel member provided with teeth in sliding contact with said flanges, and means for giving said cutter a reciprocating motion.

4. In a hair clipper, a head comprising a stationary channel member having mutually converging side walls made of a single piece of bent sheet metal, thin, narrow bands formed by grooves in said walls near the line about which the sheet is bent, teeth formed by a plurality of parallel slots in said bands, the slots in the two bands extending to and connecting at said

line, a movable cutter within said channel member provided with teeth in sliding contact with said slotted bands, and means for giving said cutter a reciprocating motion.

5. In a hair clipper, a head comprising a stationary channel member having mutually converging side walls made of a single bent sheet of metal, said sheet having a longitudinal aperture along the line about which it is bent closed at both ends of said line, thin, narrow flanges flush with the outer surface of said walls formed by recesses therein parallel to said line, teeth formed by parallel slots in said flanges intermediate said ends, a movable cutter within said channel member provided with teeth in sliding contact with said flanges, and means for giving said cutter a reciprocating motion.

6. A hair clipper comprising a pair of flat plates converging into one another to form a closure having a cylindrical outer surface, a supporting member secured to said plates at their diverging ends, thin, narrow bands formed by longitudinal recesses in said plates adjacent said closure, teeth formed by slots in said recesses, said slots extending into and connecting in said closure, a hollow movable member provided with teeth cut through to the hollow part thereof and in sliding contact with the teeth in said plates, and means for giving said cutter a reciprocating motion.

7. A hair clipper comprising a pair of cylindrical plates converging into one another, a supporting member secured to said plates adjacent their diverging ends, thin, narrow bands formed by grooves in said plates opposite said ends, teeth formed by slots in said bands, each slot in one band communicating with a corresponding slot in the other band, a movable channel shaped cutter having sides adjacent the inner faces of said plates and teeth along the free edges in sliding contact with the teeth in said bands, and means for giving said cutter a reciprocating motion.

8. In a hair clipper, a head comprising a stationary channel member having mutually converging but not meeting side walls, the outer surfaces of said walls being plane, very thin flanges on said walls formed by recesses therein, each flange flush with the corresponding plane wall surface, teeth formed by a plurality of parallel slots in said flanges, guards for said teeth formed by rounded extensions thereof, a movable cutter within said channel member provided with teeth in sliding contact with said flanges, and means for giving said cutter a reciprocating motion.

9. A hair clipper comprising a pair of mutually converging but not meeting cylindrical plates, a supporting member secured to said plates adjacent their diverging ends, teeth formed by slots in said plates opposite said ends, a movable channel shaped cutter having sides adjacent the inner faces of said plates and slotted along the free edges to form teeth in sliding contact with the teeth in said plates, and means for giving said cutter a reciprocating motion.

10. In a hair clipper, a head comprising a stationary channel member having side walls converging into contact with one another, means for interlocking said walls in the region of said contact, thin, narrow bands formed in said walls by longitudinal grooves therein, teeth formed in said bands by a plurality of parallel slots, said slots extending into said region of contact, a movable cutter within said channel member provided with teeth in sliding contact with said bands, and means for giving said cutter a reciprocating motion.

11. A hair clipper comprising a channel shaped outer shear plate having a pair of flat sides converging towards a closed side, a supporting member secured to said flat sides adjacent their diverging ends, said outer shear plate and supporting member forming a closed hollow section, said flat sides being slotted adjacent the closed side, a channel shaped cutter movable within said hollow section and having a pair of flat sides diverging towards the closed side and slotted along the free edges, and means for giving said cutter a reciprocating motion.

12. A hair clipper comprising a channel shaped outer shear plate having a pair of flat sides converging towards a closed side, a supporting member secured to said flat sides adjacent their diverging ends, said shear plate and supporting member forming a closed hollow section, said flat sides having slotted recesses adjacent the closed side, a channel shaped cutter movable within said hollow section and having a pair of flat sides diverging towards the closed side and slotted along the portions facing said recesses, said cutter contacting the outer shear plate at said recessions only, and means for giving said cutter a reciprocating motion.

13. A hair clipper comprising a channel shaped outer shear plate having a pair of flat sides converging towards a closed side, the outer face of said closed side being transversely curved, teeth formed by slots in said flat sides adjacent to and extending into said closed side, a channel shaped cutter within said channel shaped shear plate open on one side and having teeth along the edges of said open side, and means for giving said cutter a reciprocating motion.

14. A dry shaver head, comprising a channel shaped outer shear plate with a pair of flat sides converging towards a closed side, said channel being slotted on the flat sides adjacent the closed side so that the slots are open ended thereat, and an inner reciprocable channel shaped cutter with a pair of flat sides adjacent the inner faces of the pair of flat sides of the outer shear plate and slotted along the free edges to form cutter teeth.

15. A dry shaver as described, comprising a pair of oppositely facing telescoped channel members, each having a pair of flat sides extending from a closed side, the flat sides of the outer member being slotted adjacent the closed side and the flat sides of the inner member being slotted along the edges remote from the closed side, said outer member being fixed and said inner member being reciprocable.

16. A shaving device comprising a handle and hair shaving means secured to said handle, said hair shaving means comprising a plurality of individual spaced apart laterally-shearing cutting units, each of said units comprising cooperating stationary and movable shearing elements, said stationary shearing elements provided with shearing edges disposed laterally with respect to the top face of said units, the movable shearing elements engaging the stationary shearing elements in cutting relation along a plane which is at an angle to the plane tangent to the tops of the units, actuating means arranged within said handle and extending therefrom to engage the said movable elements to move the same in unison and transversely of said handle,

and a guard extending at least in part over the movable teeth.

17. A shaving device comprising a handle and a plurality of shaving heads, each of said heads including a stationary member and a movable member, said members provided with cutting teeth and hair passages, at least portions of said shaving heads having cutting teeth which are laterally disposed and engage in shearing relation along a plane which is at an angle to a plane perpendicular to the longitudinal axis of the handle, the hair passages defining said laterally disposed teeth arranged to receive the hair on a bulge of the skin immediately in advance of the shaving head when the shaving device is applied against the skin, such hair entering into said laterally disposed hair passages and intersecting the said angularly disposed shearing plane, whereby an enlarged area of shaving contact between the skin and said shaving head is provided as the bulge of the skin wipes against the shaving head.

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