March 1, 1938. M. SALZ 2,109,507

HAIR CLIPPING AND SHAVING DEVICE

Filed Oct. 30, 1936 2 Sheets-Sheet 1

Fig. 1

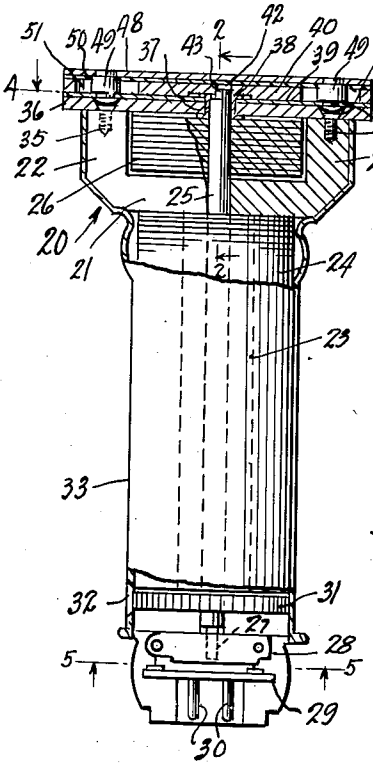


Fig. 2

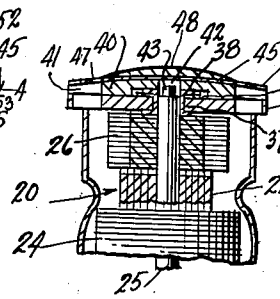


Fig. 3

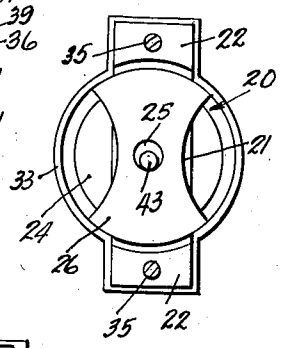


Fig. 4

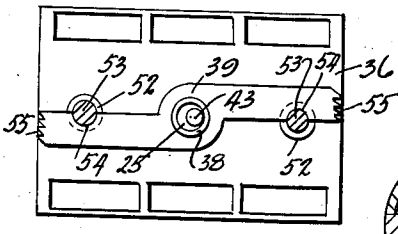


Fig. 5

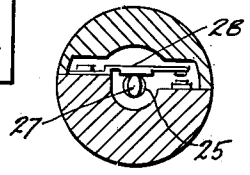


Fig. 6

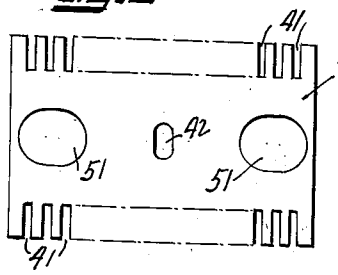


Fig. 7

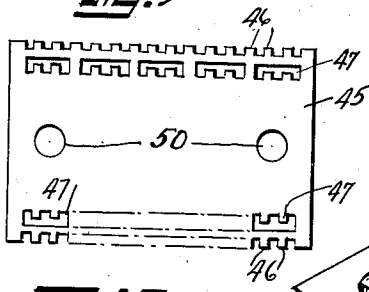


Fig. 8

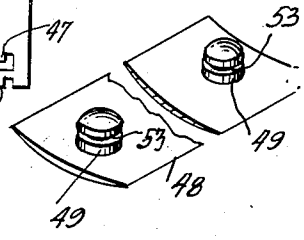


Fig. 9

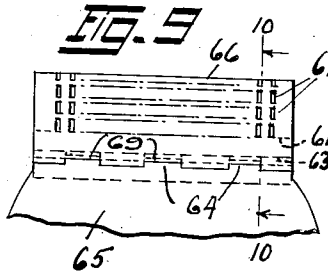
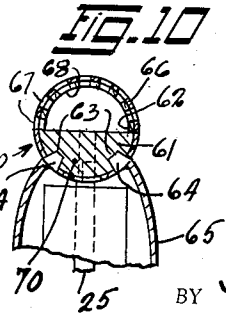


Fig. 10



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Fig. 11

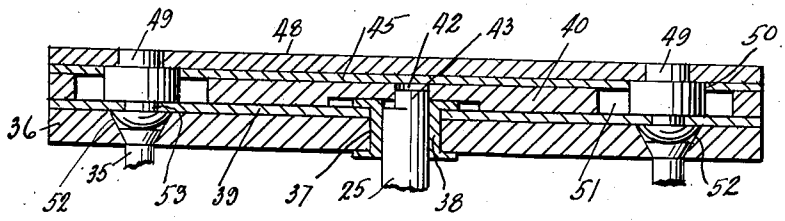
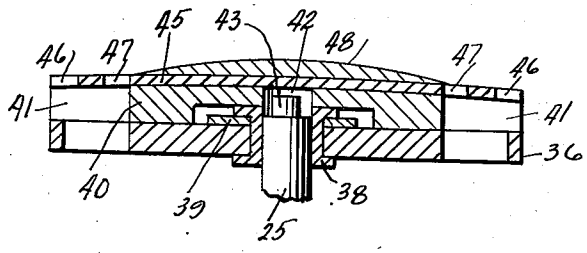


Fig. 12



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Patented Mar. 1, 1938 2,109,507

UNITED STATES PATENT OFFICE

2,109,507

HAIR-CLIPPING AND SHAVING DEVICE

Max Salz, New York, N. Y.

Application October 30, 1936, Serial No. 108,421

12 Claims. (Cl. 30—43)

This invention relates to razors and hair clippers of the power driven type and has for one of its objects the provision of a tonsorial device of this nature in which an exceedingly thin face plate is used so that a very close shave may be had.

Another object of the invention is to provide a device of the character referred to in which the cutting means comprises a stationary plate, a reciprocatory plate underlying the stationary plate and magnetic means for maintaining the said plates in close contact with each other throughout their entire areas.

A further object of the invention is to provide such a tonsorial device in which the use of pressure springs is avoided.

Another object is to produce a device of the character described in which the maximum simplicity of construction and operation is secured.

Other objects and advantages will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel arrangement and co-relation of parts herein fully described and illustrated in the accompanying drawings, wherein similar reference characters are used to describe corresponding parts throughout the several views, and then finally pointed out and specifically defined and indicated in the appended claims.

The disclosure made the basis of exemplifying the present inventive concept suggests a practical embodiment thereof, but the invention is not to be restricted to the exact details of this disclosure, and the latter, therefore, is to be understood from an illustrative, rather than a restrictive standpoint.

The inventive idea involved is capable of receiving a variety of mechanical expressions, one of which, for the purpose of illustration, is shown in the accompanying drawings, in which:

Figure 1 is a side elevation, partly in section, of one form of my invention;

Figure 2 is a sectional view of the upper portion thereof, taken on line 2—2 Fig. 1;

Figure 3 is a top plan view of the device with the cap, guard and plates removed;

Figure 4 is a horizontal sectional view taken on line 4—4 Fig. 1;

Figure 5 is a cross sectional view of the lower portion of the device taken on line 5—5 Fig. 1;

Figure 6 is a top plan view of the reciprocatory cutting plate;

Figure 7 is a top plan view of the stationary or face plate;

Figure 8 is a perspective view of the cap;

Figure 9 is a fragmental side view of modified form of my invention,

Figure 10 is a sectional view thereof taken on line 10—10 Fig. 9, and

Figs. 11 and 12 are enlarged sectional views of the mechanism shown at the top of Figs. 1 and 2 respectively.

Referring now to the drawings in detail, 20 indicates the driving or motor mechanism, which comprises a preferably laminated core 21 terminating at the top thereof with a pair of poles 22 and at the opposite end with a shank 23 about which a magnetic coil 24 is wound. Passing centrally through the core 21 is a shaft 25 carrying at the top thereof a balance or fly wheel 26. The shaft 25 is provided at the bottom thereof with an extension 27 which is elliptical in cross section and it engages a make-and-break switch 28 commonly used in this type of razor. The said switch is electrically connected to a plate 29 (see Fig. 1) which carries a pair of pins or prongs 30 for engaging an electric socket (not shown) leading to an electric source of supply. The said switch is also electrically connected to the magnetic coil 24 in the usual manner. A knurled thumb wheel 31 secured to the shaft 25 and operable through an opening 32 in an outer casing or housing 33 provides means for starting the motor mechanism 20.

Secured to magnetic poles 22 by means of screws 35 is a guard plate 36 having a central opening 37 through which passes a sleeve 38 upon which there is pivotally mounted a lever 39. Overlying the said guard plate 36 and lever 39 is a cutting plate 40 having elongated slots 41 along both side edges thereof and is further provided with a central elongated slot 42 for the reception of an extension 43 which is eccentrically positioned with respect to the shaft 25 for reciprocating the plate 40 during a hair clipping or shaving operation.

Overlying the reciprocatory cutting plate 36 is a stationary face plate 45 having outer rows of teeth 46 at its side edges and inner rows of teeth 47 spaced inwardly from the said side edges, the distance from the top of the teeth 46 to the bottom of the teeth 47 being equal to approximately the depth of the slots 41. Due to the fact that the blade 45 is exceedingly thin a long tooth would tend to move or spring from its base; to overcome this the two rows of teeth 46 and 47 are provided. Furthermore two such rows of shallow or short teeth provide a greater cutting area than but a single row of such teeth and the solid metal between the outer and inner teeth acts as a rein-

forcement for the outer teeth. A cap 48 is provided at the top of the device, and has pins 49 on the inner surface thereof extending downwardly through openings 50 in the face plate 45 and elongated openings 51 in the reciprocatory plate 40 and extend into the countersunk openings 52 in the guard-plate 36 which openings 52 admit the heads of the screws 35. The pins 49 have reduced portions 53 with which notches 54 on the lever 39 are adapted to lockingly engage to unite or to tie together the guard plate 36, reciprocatory plate 40, stationary plate 45 and cap 48. It is to be understood that the holes 50 in the stationary face plate are of the same diameter as the body of the pins 49. The end edges 55 of the lever 39 are roughened or serrated so that the said lever may be manipulated by the thumb nail of the user.

To operate my novel tonsorial device, it is first electrically connected to an electric source of supply by inserting the prongs 30 into an electric socket and then turning the thumb wheel 31. The electric current which operates the motor 20 to rotate the shaft 25 and oscillate or reciprocate the plate 40 by means of the eccentric extension 43, also energizes or magnetizes the poles 22 thus causing the stationary face plate 45 to contact the reciprocatory plate 40 evenly throughout its entire area, thus eliminating the use of pressure springs and enabling the face plate to be made as thin as .001 of an inch and insuring a very close shave.

It will be readily understood that through the use of magnetism for keeping the plates 40 and 45 in cutting engagement, no buckling of the face plate 45 is possible as is in the case where springs are used for this purpose, as the magnetic force acts evenly throughout the entire surface areas of the said plates. It is also to be understood that due to the aforesaid, magnetic use, expensive stationary face plates or housings are avoided, as when the face plate 45 becomes worn it can readily be replaced. It will further be understood that instead of using an electromagnet I may employ a permanent magnet for drawing the plates 40 and 45 together.

In Figs. 9 and 10, I have shown a modified form of my invention, wherein, instead of using flat cutting plates, where the cutting area is limited to the depth of the slots 41, I employ curved or cylindrical cutting plates. In this modified form the reciprocatory plate 60 comprises a solid bottom 61 and a slotted upper shell 62. The bottom portion 61 is provided with a pair of slideways 63 which are in sliding engagement with extensions 64 on the frame or handle portion 65 of the device. The face plate 66 like the face plate 45 comprises an exceedingly thin wafer which is magnetically held against the outer circumference of the reciprocating plate 60. The said plate 60 may be magnetized and the poles thereof may be so positioned relatively to the poles of the magnet within the frame 65 as to cause same to be repelled against the outer or face plate 60. The said plate 66 is provided with cutting slots 67 which cooperate with the slots 68 in the shell 62 for shaving or hair cutting. The slots 67 and 68 are rectangular in front elevation and are normally in alinement one with the other, and when the plate is reciprocated a shearing action takes place at the vertical edges of the said slots. The plate 66 is further provided with cut-outs or slots 69 which are adapted to engage the projections 64 to maintain same stationary.

To assemble the cutting mechanism of this modified form of my invention, the face plate 66 is flexed and snapped into position so that the cutouts 69 engage, the projections 64 on the stationary frame 65 and the inner or reciprocating plate 60 is slid in from one end, after which the operating shaft 25 is inserted into the opening 70 in the bottom of the plate 60. In this form of the invention the cutting surface extends over one half the circumference of the blades 60 and 66.

It is to be understood that in both forms of my invention the strength of the magnet is such that while it will maintain the cutting plates in even close contact, nevertheless it will permit of reciprocatory movement of the lower plates.

From the foregoing it will be seen that I have provided a simple and efficient hair cutting or shaving device wherewith an exceedingly close shave can be had, and one in which no sharp cutting edges come in direct contact with the skin or face of the user.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the nature described, a stationary toothed plate, a reciprocatory cutting plate underlying the stationary plate, means for reciprocating the cutting plate, and magnetic means for maintaining the plates in close contact during a cutting operation.

2. In a device of the nature described, a stationary toothed plate, a reciprocatory cutting plate underlying the stationary plate, a motor for reciprocating the cutting plate, and a pair of magnetic poles on the motor for exerting a magnetic force upon the plates for maintaining the overlying surfaces of the said plates in contact during a cutting operation.

3. In a device of the nature described, a stationary toothed plate, a reciprocatory cutting plate underlying the stationary plate, a motor for reciprocating the cutting plate, a pair of magnetic poles on the motor for exerting a magnetic force upon the plates for maintaining the overlying surfaces of the said plates in contact during a cutting operation, and a guard plate underlying the reciprocatory plate, said guard plate being secured to the magnetic poles.

4. In a device of the nature described, a stationary toothed plate, a reciprocatory cutting plate underlying the stationary plate, a motor for reciprocating the cutting plate, a pair of magnetic poles on the motor for exerting a magnetic force upon the plates for maintaining the overlying surfaces of the said plates in contact during a cutting operation, a guard plate underlying the reciprocatory plate, the said guard plate having holes near its ends, screws passing through the said holes for securing the guard plate to the magnetic poles, a cap overlying the stationary plate, pins on the said cap extending through the stationary plate, reciprocatory plate and into the guard plate holes, and a pivotally mounted lever for releasably engaging the said pins for operatively uniting the guard plate, cap, stationary and movable cutting plates.

5. In a device of the nature described, a guard plate having a pair of openings, one near each end, a movable plate overlying the guard plate and having elongated slots in alinement with the guard plate openings, a stationary plate overlying the movable plate the said stationary plate being provided with holes in alinement with the aforementioned openings, a cap, a pair of pins on the cap passing through the stationary plate holes, movable plate slots and extending into the guard plate openings and a lever pivotally mount-

ed on the guard plate for releasably engaging the said pins to operatively unite the cap, guard, movable and stationary plates.

6. In a device of the nature described, a stationary cutter-plate, a movable cutter-plate and magnetic means for maintaining the said plates in close surface contact with each other during a cutting operation.

7. In a device of the nature described, a support, a cylindrical cutter slidably mounted on the support, an outer blade encircling the inner cutter held stationary by the support, and magnetic means for maintaining the outer blade in close contact with the inner cutter.

8. In a device of the nature described, a support, a cylindrical cutter slidably mounted on the support, an outer blade encircling the inner cutter held stationary by the support, magnetic means for maintaining the outer blade in close contact with the inner cutter and means for sliding the slidable cutter.

9. In a device of the nature described, a support, a cylindrical member slidably mounted on the support, the said cylindrical member comprising a substantially solid bottom portion, a shell-like perforated upper cutting portion, and a thin perforated blade bent about the cylindrical member and held stationary on the support, and magnetic means to maintain the slidable member and outer blade in close contact with each other.

10. In a hair cutting device, a stationary cutter and a movable cutter and magnetic means for maintaining the said cutters in close contact with each other and means for moving the movable cutter relatively to the stationary cutter.

11. In a device of the nature described, a movable cutting blade having slots near each side edge thereof, a stationary blade overlying the movable blade, a plurality of parallel rows of cutting teeth at each side edge of the stationary blade, and means for moving the movable blade in relation to the stationary blade, the slots in each edge of the movable blade being of sufficient length to cooperate simultaneously with the plurality of parallel rows of cutting teeth on the corresponding edge of the stationary blade.

12. In a device of the nature described, a movable cutting blade having slots near each side edge thereof, a stationary blade overlying the movable blade, a plurality of parallel rows of cutting teeth at each side edge of the stationary blade, means for moving the movable blade in relation to the stationary blade, and magnetic means for maintaining the blades in close contact with each other.

MAX SALZ.