Dec. 14, 1937. J. A. HANLEY 2,102,529

HAIR CLIPPER

Filed Feb. 7, 1935

Fig. 1.

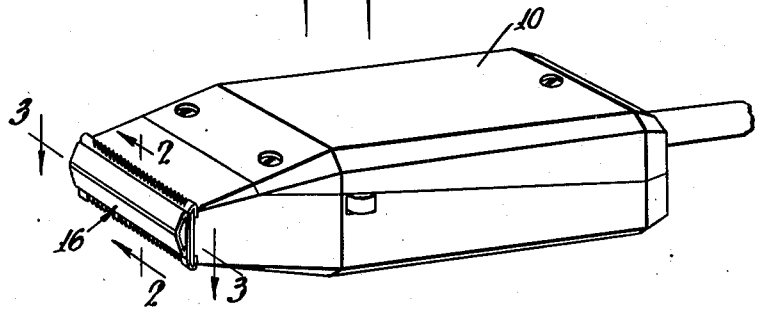



Fig. 2.

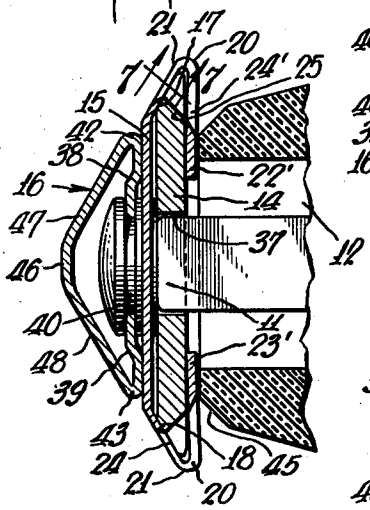



Fig. 3.

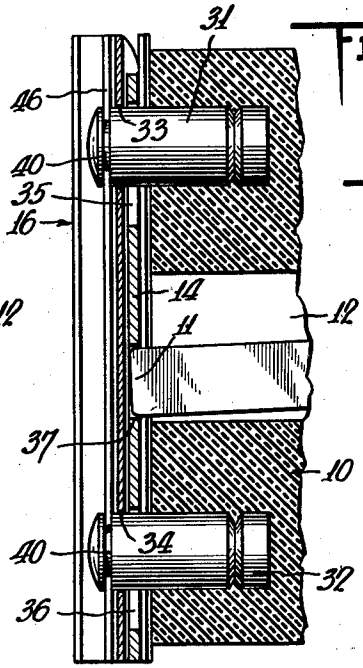



Fig. 4.

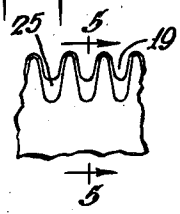
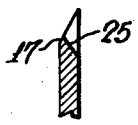



Fig. 5.



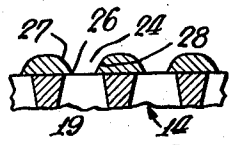




Fig. 8.

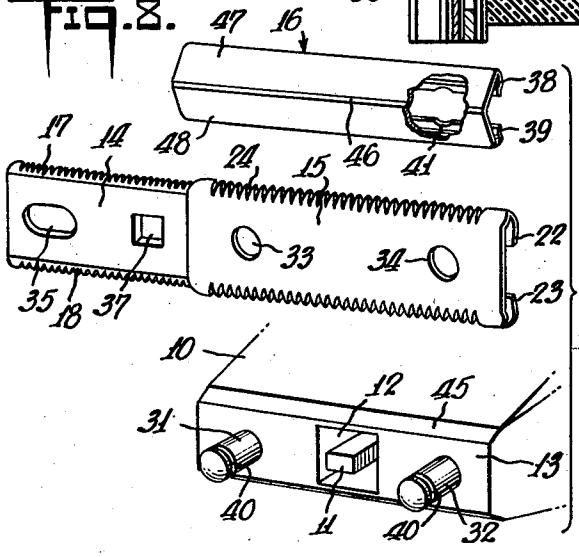



Fig. 7.

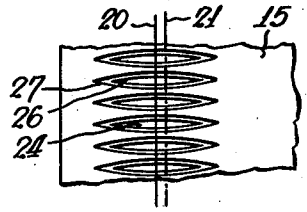



Fig. 9.




Fig. 6.

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Patented Dec. 14, 1937 2,102,529

# UNITED STATES PATENT OFFICE

2,102,529

## HAIR CLIPPER

John A. Hanley, Stamford, Conn., assignor, by mesne assignments, to Clipshave Inc., a corporation of New York

Application February 7, 1935, Serial No. 5,319

25 Claims. (Cl. 30—43)

My present invention relates more particularly to the clipping or shear head of hair clipping apparatus of the type for use primarily as a substitute for a razor and while the invention is applicable to hand-operated instruments, it has its major utility in connection with power driven apparatus.

Among the objects of the invention are to provide hair clipping apparatus involving a minimum number of parts of simple, compact and rugged construction, easily handled to clip the hair close to the skin for expeditiously producing the effect of a close shave.

Another object is to provide hair clipping apparatus of the above type, in which the effectiveness of the shear action is brought about with a minimum frictional load, for efficient utilization of the power of a small electric motor and with substantial assurance against stalling during use.

Another object is to provide a device of the above type in which the coacting shear plates or members are correlated for effective shearing action without resort to auxiliary springs, or other parts subject to deterioration or looseness, and for inherent shedding of the hair clippings from the shear edges during use.

Another object is to provide a device of the above type which permits of the use of stainless steel parts not specially hardened and yet of sufficient ruggedness to avoid buckling thereof.

Another object is to provide a device of the above type, in which the means for attaching the shear head to the handle casing is completely covered, to afford not only an attractively finished unit, devoid of protruding parts apt to injure the skin, but one of conformation serving as a guide for proper angular positioning of the device with respect to the face, for facility in clipping by manipulation closely similar to that of shaving with a hoe type safety razor.

Another object is to provide a device of the above type which is serviceable both for clipping short hair or stubble and for clipping long hair, without clogging in either use.

Another object is to provide a device of the above type which can be readily made at low cost with a minimum of machining and with automatic accommodation to wear.

A feature of the invention is the use of thin preferably resilient sheet stock for at least one of the two shear plates or members, preferably for the fixed, outer or guide plate, the shearing action of which is produced at the edges of slots therethrough coordinated with shearing serrations at the edge of the coacting reciprocatory inner or shear plate. The resilient shear member is preferably conformed as a sheathing plate with an inturned flange to extend closely around the serrated shear edge for frictional engagement of the sheathing plate with both faces of the margin of the inner plate, and the slots of the sheathing plate are closed at both ends to afford a construction of adequate security, as compared to one in which free ended tongues are used, which might easily become distorted.

In a preferred embodiment, the inner shear plate which is relatively thicker has a beveled margin with a thin edge, said margin presenting an outer shearing face and an inner hair shedding face.

Preferably the serrations on the inner plate and the slots on the sheathing plate are so conformed as to afford enlarged preferably flaring ports through which the clippings are readily shed without clogging. To this end the teeth or serrations of the inner plate may be undercut both longitudinally and laterally from the outer or shearing face to the inner or shedding face thereof, and the slots of the sheathing plate extend along the inturned flange thereof to expose the corresponding serrations and are preferably also undercut.

The stiffer shear plate may be and preferably is serrated at both its lateral edges and the more resilient shear plate has a corresponding pair of inturned lateral flanges frictionally to embrace both beveled margins of the inner plate. The inturned flanges are held in the complete assembly against the carrying handle.

Another feature is the resilient attachment of the shear head to the handle or casing. In one embodiment metal studs rising from the front of said casing extend through corresponding openings in the outer plate for positioning the latter, the inner plate having clearance with respect to said studs to permit operation thereof by an oscillatory operating member protruding from the casing. A convex plate may coact with the protruding studs to latch the shear head in position. This plate preferably has inturned flanges keyed into corresponding undercuts in the studs, which are thus covered and protected by the latch plate. Preferably the latch plate is conformed to engage the sheathing plate adjacent the margins thereof for resilient pressure near the shearing surfaces and the plate is also of dihedral angle conformation to serve as an angle guide in clipping.

This application is to an improvement on that of my earlier application Serial No. 739,432, filed August 11, 1934.

In the accompanying drawing, in which is shown one of various possible embodiments of the several features of the invention:

Fig. 1 is a perspective view of a complete hair clipping unit,

Fig. 2 is a view in transverse cross-section on a larger scale, taken on the line 2—2 of Fig. 1, and showing the clipping or shear head conformation,

Fig. 3 is a view similar to Fig. 2 in longitudinal cross-section taken on line 3—3 of Fig. 1, and showing the clipping or shear head conformation,

Fig. 4 is a fragmentary detail view of the shear tooth serrations on the movable shear plate,

Fig. 5 is a cross-sectional detail view on line 5—5 of Fig. 4,

Fig. 6 is a plan view on a larger scale of a detail of the sheathing or guide plate prior to inturning the latter,

Fig. 7 is a cross-sectional view on a greatly enlarged scale on line 7—7 of Fig. 2,

Fig. 8 is a dropped perspective view of the elements making up the shear head, showing the sheathing plate partly withdrawn from the thicker shear plate, and,

Fig. 9 is a sectional view of a slightly modified head.

Referring now to the drawing, there is shown in Fig. 1 the general outline of insulating a desirable form of handle 10 which serves as a casing to house a suitable electric motor (not shown) for oscillating the operating lever, the extremity 11 of which protrudes through a corresponding port 12 in the reduced forward end 13 of the casing, for coaction with the moving shear plate 14.

The motor (not shown) is preferably that shown, described and claimed in my copending application Serial No. 757,755, filed December 17, 1934.

The clipping or shear action is performed by a shear head including coacting shear plates 14 and 15 and a latch means, desirably a plate 16, all preferably of stainless steel, and co-ordinated in manner best shown in Figs. 2 and 8. The moving shear plate 14 as shown, is of somewhat thicker and stiffer stock, preferably about .015 to .020 inch in thickness and is provided with lateral bevelled margins 17 and 18 affording thin edges and provided with serrations 19 affording outer shear edges and shedding gaps between consecutive teeth which discharge at the inner face of the plate. The cooperating fixed shear plate or member 15 is preferably a sheet of relatively thinner resilient steel stock about .008 to .010 inch in thickness, turned inward at its opposite edges about fold lines 20 and 21 (Fig. 6) to form flanges 22 and 23 which afford a sheath for the thicker shear plate 14. The sheath, as shown, has transverse slots 24, a portion of the edges of which contact the shearing edges 17 and 18 of shear plate 14, to cause shearing by the movement of the serrations of the latter thereacross.

In a preferred embodiment, the serrations 19 of the shear plate 14 are formed by undercutting from the wider or under face thereof, as best shown in Figs. 4 and 5, in cuts generally V-shaped in cross-section, which progressively widen and deepen as at 25 toward the free edge and break through the shedding edge to form the enlarged serrations 19 thereat. The slots 24 in the fixed or guide shear plate 15, as best shown in Fig. 6, are spindle-shaped, being preferably formed by means of formed milling cutters (not shown) to afford openings 26 of length and width considerably less at the inner face than the corresponding openings 27 at the outer face, the walls of the slots as shown at 28 extending at an inclination through the thickness of the plate. The blank shown in Fig. 6 is appropriately folded to fit closely against the beveled margin of the shear plate 14, the thin edge of which it closely straddles, in frictional engagement therewith, as best shown in Fig. 2. The fold 20—21 of said shear plate is nearer the inner than the outer ends of the slots; so that, as best shown in Fig. 2, the slots 24' transversely of the inturned flanges 22 and 23 of the guide plate extend substantially the length and width of the undercut gaps 25 between consecutive serrations 19, to permit automatic clearing of hair clippings. Of course the sheathing or straddling construction could be made in other manner than from flat stock, but the construction described is preferred.

By the arrangement shown and described, the shear edges of the guide shear plate 15 are not merely prongs which would be apt to become distorted in use, due to the thinness of the stock of which the guide plate is made, but are turned in loops, the exposed roots of which are an integral part of the main area of the guide plate, and the inturned ends of which are an integral part of the border strips 22' and 23' of the respective flanges 22 and 23. Moreover, the guide plate 15, despite the thinness and resiliency of the stock of which it is made has adequate stiffness by reason of its channel sheathing formation.

The shear unit composed of the shear plate 14 slipped into the sheath conformation of the guide plate 15 is readily mounted upon the forward end of the casing 10 by means of a pair of metal studs 31 and 32 protruding from the narrow forward end 13 of said casing. For this purpose, the guide plate 15 is provided with apertures 33 and 34 which snugly fit over said studs and are positioned thereby. The shear plate 14 is provided with apertures 35 and 36 also passing over said studs, but sufficiently elongated as shown, to permit oscillatory movement of the shear plate 14 guided longitudinally both by the studs 31 and 32 and by the tracks of the guide plate sheath. The guide plate 15 as shown, covers a central rectangular aperture 37 in the shear plate, into which extends the forward extremity 11 of the oscillatory operating lever.

Resilient latch means is provided for holding the shear unit in place upon the studs 31 and 32. In a preferred embodiment, a resilient latch plate 16 is provided for this purpose. This plate has inturned flanges 38 and 39 adapted to be slipped longitudinally over the mounted shear unit for its said flanges to enter at their edges into grooves or key notches 40 in said studs 31 and 32. Preferably the inturned edges of the latch plate have a pair of shallow notches 41 which snap about the respective studs when the latch plate is in home position.

In a preferred embodiment, the inturned flanges 38 and 39 are longitudinally concave, as shown, so that the stiff lateral edges 42 and 43 of the plate unit form reaction surfaces, to exert resilient pressure against the shear unit along lines closely adjacent the bevelled shear margins. Thus, the shearing portions of the guide plate are caused resiliently and intimately to enter in face to face engagement with the bevelled margins 17 and 18 of the shear plate 14, for efficient shearing action, the main area of plate 15 being spaced at 15' from the main area of shear plate 14.

The front end of the casing 10 is preferably bevelled inward as at 45 and the pressure exerted by the latch plate 16 is exerted against said casing solely at the inturned borders 22' and 23' of the guide plate 15. Accordingly, in the reciprocatory movement of the shear plate 14, the friction is substantially localized at the regions where it is required, namely at the bevelled shear margins 17 and 18, and at the inturned flanges 22 and 23. The torque of the small electric motor is therefore efficiently applied, for performing the useful work of hair clipping, without substantial waste or heat due to friction.

By virtue of the close frictional engagement of both faces of the sheathing margin of the outer plate with the respective faces of the corresponding beveled margins of the inner plate, shearing is reliably performed, which would not be the case if there were any possibility of hair entering laterally between the faces of the respective plates at which the shearing is to take place.

The latch plate 16, it is seen, completely covers the positioning studs 31 and 32, so that there is no possibility of the latter engaging, marking or injuring the face of the user and said latch plate is preferably formed of dihedral angular conformation as shown, with a central symmetrical formed ridge 46 and oblique flanks 47 and 48, which latter serve for angularly positioning the device with respect to the face, to facilitate manipulation closely similar to that resorted to in the use of a hoe type safety razor.

In use, the inclined walls 28 of the slots 24 serve as guides or combs to direct the hair or stubble to enter the serrations 19 of the inner or movable shear plate 14, where they are cut at a distance from the skin, determined by the relative width of slot and thickness of resilient guide plate 15. Inasmuch as the pressure of the shear head against the skin depresses the mounds of the hair follicles, the hair is clipped at least as closely as is possible with a razor and without injury to the skin.

By reason of the close face to face contact at the beveled margins 17 and 18 between the coacting shear plates, the parts are automatically lapped during use, to maintain the shearing edges serviceable without the need for sharpening or replacement, until such time as these metal parts have worn out.

In use, the fine hair clippings readily drop from the shear head through the undercuts 25 and the inturned ends 24' of the slots 24 at the lower face of the head. However, if and when desired, the latch plate 16 can be readily slipped off the shear unit, the shear plate 14 removed from the sheathing guide plate 15 and the parts cleaned and readily reassembled.

It is seen that the device includes no parts so extremely thin as to be serviceable only when hardened and backed by a rigid element.

According to the present invention the shear plates are of stainless steel, as set forth, not subjected to any special hardening operation and of adequate hardness to afford assurance against buckling or distortion of the parts during use and sufficiently wear resisting and is sufficiently wear resistant.

The device can be used as readily for clipping long hair, since the lateral clipping discharge prevents clogging.

In the embodiment of Fig. 9, the shear plate 14' is an unbeveled sheet approximately as thin as the fixed plate. The serrations 19' are cut through the thickness of said plate as shown, in slightly inclined relation. The slots 24*a* in the fixed shear plate 15' register at their ends, as shown, with the serrated edges of plate 14', and preferably extend farther under plate 14' than they do over said plate, substantially as in the other embodiment. The respective ends of the slots 24*a* substantially register with the corresponding parts of the serrations as shown in Fig. 9, and the shearing action occurs as shown at the outer face of plate 14' by movement of the serrated outer face of plate 14' past the corresponding end portions of slots 24*a*. The latch plate and other related parts are not shown, but are similar to those of the other embodiment.

It will thus be seen that there is herein described apparatus in which the several features of this invention are embodied, and which apparatus in its action attains the various objects of the invention and is well suited to meet the requirements of practical use.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

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

1. Hair clipping apparatus comprising a plate having parallel faces and a beveled margin, serrations across said margin, the wider face of said plate being undercut in registry with said serrations, an outer and thinner sheet metal shear plate straddling said beveled margin and slots transversely of said straddling edge, closed at both ends and determining shearing edges coacting with the portions of the serrations exposed at said beveled margin.

2. Hair clipping apparatus comprising a thicker shear plate having parallel faces and a beveled margin, said beveled margin being serrated, the wider face being undercut in registry with said serrations, a coacting shear plate of thinner sheet metal straddling said beveled margin, said plate having closed ended slots transversely across said straddling edge, the portions of said slots along the bevel margin having a shearing coaction at their edges with the portions of the serrations exposed at said bevel margin.

3. Hair clipping apparatus comprising a thicker shear plate having parallel faces and a serrated beveled margin, the wider face being undercut in registry with said serrations, a shear plate of thinner sheet metal straddling said beveled margin, said plate having closed ended slots transversely across said straddling edge, the portions of said slots along the bevel margin having a shearing coaction at their edges with the portions of the serrations exposed at said bevel margin, said slots having the shearing ends thereof substantially nearer the fold than the non-shearing ends thereof.

4. Hair clipping apparatus comprising a shear plate having parallel faces and a serrated beveled margin, the metal of the wider face thereof being undercut in registry with said serrations, a shear plate straddling the beveled margin of said first plate and having slots transversely across the straddling edge thereof, said slots terminating near the extreme straddling part, substantially in registry with the undercut portions of the straddled plate.

5. Hair clipping apparatus comprising a movable plate having a serrated margin with a shearing face and a shedding face, a coacting fixed shear plate having a flange sheathing and straddling said serrated margin and transversely slotted across said serrated margin to form coacting shear teeth, said fixed shear plate with its flange being in snug engagement with both faces of said serrated margin, the faces of said plate being substantially free from engagement at areas other than said shearing face, a handle, means attaching said fixed plate thereto and thereby retaining said movable plate in place, and operating means in said handle to engage and reciprocate said movable plate.

6. Hair clipping apparatus comprising the combination of a reciprocating relatively stiffer plate having a toothed bevelled margin and presenting a shearing face and a shedding face, the said teeth tapering in width to a maximum spacing therebetween at the shedding face of said plate, a coacting resilient plate of sheet metal having a portion thereof sheathing and in close engagement with both faces of said bevelled margin and having slots straddling the sheathing edge of said resilient plate and coacting at their outer parts with the shearing face of the reciprocating plate serving as the shear teeth thereof and at their inner parts affording free egress for clippings from the shedding face of said reciprocating plate, the major frictional engagement between said plates being substantially localized at said bevelled margin.

7. Hair clipping apparatus comprising a shearing assembly including a stiffer shear plate, serrated at its lateral margins to afford shear teeth, a coacting shear member of unhardened stainless steel having lateral portions closely engaging and covering the shearing faces of the stiffer plate margins, and including flanges guarding the points of said teeth, said coacting shear member having slots serving as shear teeth coacting with the serrations of said stiffer plate, a handle casing for said shearing assembly, and clip means releasably affixing said assembly to said casing, said clip means being removably attached to said casing and presenting a flange extending over and engaging said coacting shear member.

8. Hair clipping apparatus comprising the combination of a stiffer shear plate bevelled and serrated at its opposite margins, a resilient coacting shear member having portions closely engaging and covering said bevelled margins, said portions having slots serving as shear teeth coacting with the serrations on said stiffer plate and a resilient plate resiliently pressing said shear member against said bevelled margins and having substantially frictionless coaction with said apparatus at other regions thereof.

9. A shear head comprising a stiffer shear plate having bevelled serrated margins, a resilient shear plate having inturned lateral flanges sheathing said bevelled plate and in close engagement with the bevelled margins of the latter, openings in said sheathing plate to accommodate positioning studs, said bevelled plate having clearance for movement with respect to such studs, and means to press the resilient plate against the bevelled margins of the stiffer plate, while leaving the main area of the stiffer plate substantially free from frictional engagement with the coacting structure.

10. Hair clipping apparatus comprising a shear plate, having serrations at its opposite edges, a guide plate having inturned lateral flanges sheathing said shear plate and snugly engaging both faces of the marginal areas thereof and having shearing notches across the sheathing edges thereof, coacting with said serrations, said notches extending in part across said inturned flanges and under the lower face of said shear plate, a handle member, means securing said guide plate to said handle member with the free edges of said flanges resting against the end of said handle member and the ends of the shearing notches exposed for shedding clippings and an oscillating lever within said handle for reciprocating said shear plate.

11. Hair clipping apparatus, comprising a casing, having a narrow end, a clipping head comprising a shear plate with serrated margins extending laterally beyond said narrow end, a guide plate having lateral flanges turned about said serrated edges, said inturned flanges snugly engaging said shear plate and resting against said casing end, the exposed fold edges of said guide plate being transversely slotted to form shear teeth and means removably affixing said guide plate to said casing.

12. Hair clipping apparatus comprising a shear plate having its opposite margins serrated to form shear teeth, a coacting guide plate comprising a sheath straddling the edges of said shear plate and presenting inturned support flanges, said sheath transversely slotted across the straddling edges for coaction with the serrations of said shear plate, said slots having their walls extending obliquely outward through the thickness of the guide plate for facility in shedding of hair clippings.

13. The hair clipping apparatus recited in claim 12, in which the lateral walls of the shear plate teeth converge through the thickness of the plate from the shearing to the shedding face thereof, and are undercut at the troughs thereof and in which the major portion of the length of the slots of the guide plate extends along the inturned support flanges for uncovering the enlarged shedding area between successive teeth of the shear plate.

14. Hair clipping apparatus comprising a shear plate having its opposite edges serrated to form shear teeth, a coacting guide plate comprising a sheath straddling the edges of said shear plate, presenting inturned support flanges, said sheath transversely slotted across said straddling edges for coaction with the serrations of said shear plate, said slots having their walls extending obliquely outward through the thickness of the guide plate for facility in clearing of hair clippings, the inner face of said guide plate in the region of said slots being in close sliding relation with respect to one part of the serrated edge of the shear plate.

15. Hair clipping apparatus comprising cooperating shear plates, one of relatively stiffer stock having bevelled lateral margins, serrated to form shear teeth, the other plate being of thinner stock and having lateral flanges inturned about the bevelled plate to sheathe the latter, said sheathing plate being transversely slotted across the edges of the beveled margins and engaging the bevels of the margins of the other plate.

16. Hair clipping apparatus comprising cooperating shear plates, one of relatively stiffer stock and having bevelled lateral margins serrated to form shear teeth, the other plate being of thinner stock and having lateral flanges in-

turned about the bevelled plate to sheathe the latter, said sheathing plate being transversely slotted across the edges of the beveled margins and engaging the bevels of the margins, said slots extending partly across the width of the lateral flanges and serving for clearing of hair clippings.

17. Hair clipping apparatus comprising a rectangular shear plate having serrated lateral margins, a coacting rectangular shear plate having margins engaging those of said first shear plate and having lateral flanges extending inward and guarding said serrated margins, said coacting shear plate being transversely slotted at the margins and at the contiguous flange portions thereof, a handle casing, and means detachably mounting the assembly to said casing, said means comprising a clip structure detachably affixed to said casing and presenting a pair of spaced flanges extending over and engaging corresponding portions of the coacting shear plate.

18. Hair clipping apparatus comprising a relatively thicker rectangular shear plate having serrated bevelled lateral margins, a coacting shear plate of relatively thinner stock having lateral flanges inturned and engaging the lower face of the shear plate to sheathe the lateral margins and closely engaging the shearing faces thereof, the sheathing plate being transversely slotted at said serrations and across said sheathing edge, and means detachably mounting the sheathing plate in fixed position.

19. Hair clipping apparatus comprising a handle, a shear head mounted thereon, including a relatively thicker rectangular shear plate having serrated bevelled lateral margins each presenting an outer shearing face and an inner shedding face, a coacting shear plate of relatively thinner stock having lateral flanges inturned to engage the lower face of the shear plate to sheathe the latter and closely covering the beveled margins, the sheathing plate being transversely slotted at said serrations, and resilient latch means detachably securing the sheathing plate in fixed position to the handle, said latch means exerting resilient pressure on said sheathing plate along lines adjacent the shearing slots thereof.

20. Hair clipping apparatus including a handle, a relatively thicker rectangular shear plate having serrated bevelled lateral margins, each presenting an outer shearing face and an inner shedding face, a coacting shear plate of relatively thinner stock having lateral flanges inturned under the shedding face of the shear plate to sheathe the latter and closely covering the shearing face thereof, the sheathing plate being transversely slotted at the margins, and a longitudinally convex plate detachably secured to said handle, and with its lateral edges engaging said sheathing plate adjacent the respective margins and resiliently exerting pressure thereat.

21. Hair clipping apparatus, comprising the combination of a handle casing having a pair of upstanding studs at its forward end, a shear head including a fixed shear plate, anchored by said studs and a coacting movable shear plate having clearance with respect to said studs, an oscillatory member in said handle engaging said movable shear plate to reciprocate the latter, and a convex latch plate superposed over said shear head, covering the exposed ends of said studs and fixed with respect to said casing.

22. Hair clipping apparatus comprising the combination of a handle casing having a pair of upstanding studs at its forward end, a shear head including a fixed shear plate, anchored by said studs and a coacting movable shear plate having clearance with respect to said studs, an oscillatory operating member in said handle engaging said movable shear plate, and a fixed guard plate having inturned flanges, anchored to said case at corresponding undercuts in said studs.

23. Hair clipping apparatus comprising the combination of a handle casing having a pair of upstanding studs at its forward end, a shear head including a fixed shear plate, positioned by said studs and a coacting movable shear plate having clearance with respect to said studs, an oscillatory operating member in said handle engaging said movable shear plate, and a fixed latch plate having inturned flanges extending into corresponding undercuts in said studs, the edges of said inturned flanges being raised with respect to the fold edges thereof for resilient pressure of the latter against the fixed shear plate.

24. Hair clipping apparatus comprising the combination of a handle casing having a narrow operating end, with an oscillatory operating member protruding therefrom and fixed mounting studs at opposite sides thereof, a shear head including a fixed shear element positioned by said studs and a moving shearing element coacting with said operating member and a latch plate, forming a dihedral angle, covering and releasably locked with respect to said studs, and engaging said fixed shear element at its opposite edges, the shearing edges of said head protruding from between the narrow casing end and the latch plate.

25. Hair clipping apparatus comprising a pair of cooperating sheet metal shear plates, one of said plates having lateral serrations, the other plate having lateral flanges inturned about the serrated edges of the first plate sheathing the latter and frictionally engaging both faces of said serrated plate, said sheathing plate being transversely slotted across the edges of the serrated plate.

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