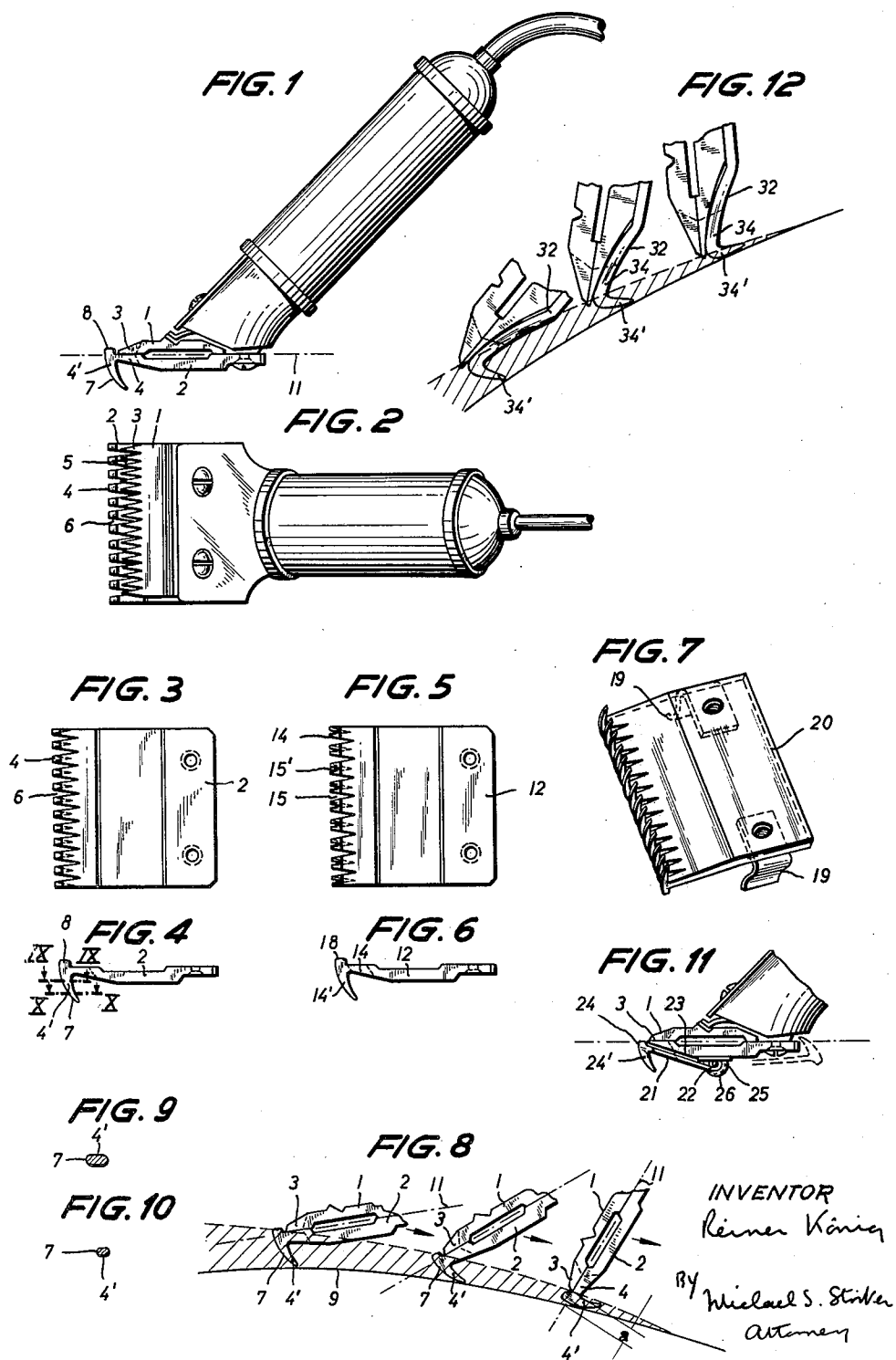


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HAIR CLIPPER

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HAIR CLIPPER

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The present invention relates to hair clippers.

Conventional hair clippers which are motor driven or hand operated include an upper cutter plate which reciprocates on a lower comb plate. These conventional clippers suffer from several disadvantages. Thus, a considerable amount of training and skill is required to operate them properly. Furthermore, it is sometimes desired merely to taper cut the hair, and conventional hair clippers cannot be used for this purpose. Also, with conventional clippers there is a danger of injuring the scalp by contact between the scalp and the cutter plate. Furthermore, when it is desired to cut the hair in such a way that the hair length gradually varies along the scalp, great skill and care are required to operate a conventional hair clipper. In addition, it is always necessary to use with a conventional hair clipper a comb for setting the hair up to be cut by the clipper.

One of the objects of the present invention is to provide a hair clipper which does not require a comb to be used in addition to the hair clipper, or where such a comb, if it is used, participates only superficially in the operation.

Another object of the present invention is to provide a hair clipper which can be used for thinning the hair.

A further object of the present invention is to provide a hair clipper which can be easily operated even by relatively unskilled people to provide a hair length which varies gradually along the scalp.

It is also an object of the present invention to provide a hair clipper which will taper cut the hair.

The objects of the present invention also include the provision of an attachment for a conventional hair clipper which will enable the conventional hair clipper to accomplish the above objects.

Still another object of the present invention is to provide a hair clipper which reliably maintains the cutter plate away from the scalp so that the latter cannot become injured by the cutter plate.

The objects of the present invention also include the provision of a hair clipper which can be operated by unskilled people without difficulty while producing professional results.

With the above objects in view, the invention includes a hair clipper provided with a lower comb plate and an upper cutter plate adapted to reciprocate in a conventional manner with respect to the comb plate. Both of these plates are provided with front edges formed with teeth, and the hair which becomes located in the gaps between the teeth of these plates will be cut at least in part. In accordance with the present invention the teeth of the lower comb plate are provided at their free ends with projections extending downwardly away from the cutter plate.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a side elevation of a motor driven clipper according to the present invention;

FIG. 2 is a top plan view of the hair clipper of FIG. 1;

FIG. 3 is a top plan view of the lower comb plate of the hair clipper of FIGS. 1 and 2;

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FIG. 4 is a side view of the plate of FIG. 3;

FIG. 5 is a top plan view of another embodiment of a lower comb plate according to the present invention;

FIG. 6 is a side view of the comb plate of FIG. 5;

FIG. 7 is a perspective illustration of a lower comb plate as seen when looking toward the bottom thereof and provided with a means for releasably fixing the comb plate to the hair clipper;

FIG. 8 diagrammatically illustrates the operation of the hair clipper of the invention;

FIG. 9 is a transverse section through one projection taken along the line IX-IX of FIG. 4;

FIG. 10 is a transverse section through one projection taken along line X-X of FIG. 4;

FIG. 11 is a fragmentary view of the lower portion of a hair clipper provided with yet another embodiment of the present invention; and

FIG. 12 diagrammatically illustrates the operation of a further embodiment of the present invention.

Referring now to FIGS. 1 and 2, the motor-driven hair clipper illustrated therein includes an upper cutter plate 1 which is reciprocated in a conventional manner not forming part of the present invention. The cutter plate engages at its underside the top face of a lower comb plate or lower comb means 2 which is fixed by suitable screws at its rear edge portion to a support means formed by the casing of the mechanism which is connected to and reciprocates the cutter plate. The cutter plate 1 is formed along its front edge with teeth 3 defining between themselves the gaps 5, and it will be noted that at the front edge of the plate 1 the gaps 5 are considerably wider than the tips of the teeth 3. The comb plate 2 is formed along its front edge with the teeth 4, and these teeth 4 extend forwardly beyond the teeth 3 and define between themselves the gaps 6 which extend rearwardly beyond the tips of the teeth 3 and which have the rear ends located to the rear of the tips of the teeth 3 by approximately the same distance as the rear ends of the gaps 5. The front ends of the gaps 6 are also wider than the tips of the teeth 4. While the number of teeth 3 and their distribution along the plate 1 may correspond with the number of teeth 4 and the distribution of the latter along the plate 2, it is possible to have any desired relationship between the number and distribution of the teeth and the plates 1 and 2.

In accordance with the present invention the teeth 4 are respectively provided with downwardly directed projections 4', and these projections extend rearwardly as well as downwardly and provide the plate 2 with teeth similar to the teeth of a rake. The projections 4' are of a generally arcuate configuration and their front edges 7 are convexly curved. Moreover, as is apparent from FIGS. 9 and 10, each of the projections 4' tapers.

Also in accordance with the present invention the teeth 4 are respectively provided with upwardly directed projections 8 which are located forwardly of the teeth 3.

As is apparent from FIG. 8, when the above-described hair clipper is used the projections 4' engage the scalp 9 and the clipper is turned in a clockwise direction, as indicated by the arrows in FIG. 8, so that the hair is cut in the direction of growth, which is to say from the roots toward the hair ends. The teeth 4 particularly at their projections 4' act as a comb and divide the hair up into fine bundles or hanks within the gaps 6. As the clipper is moved along the scalp the hanks of hair within the gaps 6 progressively approach the rear closed ends of these gaps and thus progressively approach the cutting region of the cutter plate 1. Inasmuch as this action takes place while the clipper is moved along the scalp, the individual hairs are cut to different lengths, and when this operation is repeated several times the hair is simul-

taneously taper cut and shortened to the selected average hair length.

This average hair length remaining after use of the clipper of the invention will correspond approximately to the distance at which the plane 11 (FIG. 1) at the interface between the plates 2 and 3 is located from the scalp. When the clipper is maintained at the attitude shown at the right of FIG. 8 where the plane 11 extends substantially perpendicularly to the scalp, the length of the hair remaining after the use of the clipper will be determined by the distance between the tips of the teeth 3 and the scalp, and of course this distance is determined by the thickness a of the projections 4', shown at the right in FIG. 8.

During use of the clipper of the invention, the teeth 4 rest at their curved end of faces 7 on the scalp to be guided in this way for movement along the scalp. In order to provide a variation in the average hair length remaining after use of the clipper the angular position of the latter relative to the scalp is changed while moving the clipper along the scalp, as indicated in FIG. 8, so that in this way it is possible to easily provide a gradual change in the hair length along the scalp. The curved end of faces 7 allow the hair clipper to be rocked on the scalp while moving therealong to produce a variation in the hair length.

While the above-described structure will provide taper cutting, it may be desired to taper cut the hair very rapidly, and in this event the embodiment of FIGS. 5 and 6 is used. The lower comb plate or lower comb means 12 of FIGS. 5 and 6 differs from that of FIGS. 3 and 4 in that in addition to the gaps 15 which correspond to the gaps 6, the teeth 14 of the plate 12 are formed at their front end portions which extend forwardly beyond the tips of the teeth 3 with additional gaps 15'. As may be seen from FIGS. 5 and 6 the teeth 14 correspond to the teeth 4 and are provided with downwardly directed projections 14' and upwardly directed projections 18 corresponding to the projections 4' and 8 described above. With this embodiment, the hair which becomes located in the gaps 15 will be cut by the teeth 3 in the manner described above. However, some of the hair will be located in the gaps 15' and the hair in these gaps 15' is maintained away from the teeth 3 so as not to be cut thereby, and thus the comb plate 12 will provide a rapid thinning of the hair. As is apparent from FIGS. 1-6, it is a simple matter to unscrew the plate 2 from the hair clipper and replace it with the plate 12.

In order to be able to use the invention with conventional hair clippers which have conventional lower comb plates, a plate 20 (FIG. 7) having the construction of either the plate 2 or the plate 12 is fixed to a pair of leaf springs 19 which are adapted to snap over the conventional lower comb plate and to engage the casing which surrounds the mechanism driving the cutter plate, so that in this way the plate 20 of FIG. 7 may be releasably attached to a conventional hair clipper in engagement with the underside of the comb plate thereof, the conventional comb plate and plate 20 together comprising comb means. Since the front edge of such a conventional comb plate is aligned with the front edge of the cutter plate, the projections 8 or 18 will simply be located forwardly of the teeth of both plates of the conventional hair clipper, and the plate 20 will then function in the manner described above.

In the embodiment of the invention which is illustrated in FIG. 11, the conventional hair clipper shown fragmentarily therein has a conventional comb plate 23. A pair of lugs 25 are fixed to and extend downwardly from the opposed side edges of the conventional plate 23, and these lugs 25 are respectively provided with coaxial pivot pins 22 directed toward each other and respectively extending into opposite ends of a bore formed at the rear end of an additional comb plate 21 which engages the underside of the plate 23 in the manner illustrated in

FIG. 11. This plate 21 is provided with teeth 24 of the same construction as the teeth 4 or 14 except that the top ends of the teeth 24 do not extend to an elevation higher than the teeth of the comb plate 23. The projections 24' are, however, identical with the projections 4' or 14'. The lugs 25 are provided with detents which releasably hold the plate 21 in the position shown in solid lines in FIG. 11. Thus, the lugs 25 may be provided with spring-pressed ball members engaging the underside of the plate 21 to releasably maintain it in the solid line position of FIG. 11. In this position it is apparent that the plate 21 and the conventional plate 23 together form comb means which will operate in the same way as the comb plates of the invention described above. When the operator does not wish to use the plate 21, it is simply swung back to the dotted line position shown in FIG. 11, and it is releasably maintained in this latter position by another pair of detents carried by the lugs 25, respectively. It will be noted that in the operative position of the plate 21 the teeth 24 extend forwardly beyond the plate 23 so as to prevent engagement of the cutter plate with the scalp. Thus, the parts 22, 25 form a means supporting the plate 21 for pivotal movement between the operative and inoperative positions shown in solid and dotted lines, respectively, in FIG. 11. When the plate 21 is in its inoperative position, the clipper will be guided by the arcuate peripheries of the lugs 25, these peripheries engaging the scalp so that the clipper can be easily rocked on the lugs 25 to any desired inclination. In order to reduce the friction between the lugs 25 and the scalp, these lugs are formed with grooves 26 extending longitudinally along the peripheral edges of the lugs.

The above-described embodiments of the invention can be used by professional hair cutters as well as by non-professional purchasers. For example, any of the above-described embodiments may be used in the home. It may be desired, however, to provide a clipper for professional use which can cut very close to the scalp, and for this purpose the embodiment of FIG. 12 is provided. With this embodiment the plate 32 has the construction of the plates described above and engages the underside of the conventional comb plate, being fastened to the clippers by the same screws which fasten the conventional comb plate thereto, for example. The plate 32 does not extend forwardly beyond the conventional comb plate and the teeth 34 thereof have only projections 34', respectively, which extend downwardly, so that the plate 32 will produce all of the above-described results while at the same time permitting the conventional comb plate as well as the cutter plate to approach very close to the scalp, as shown at the right of FIG. 12.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of hair clippers differing from the types described above.

While the invention has been illustrated and described as embodied in hair clipper comb plates, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a hair clipper, in combination, lower comb means and upper cutter means adapted to slidably reciprocate with respect to said lower comb means, both of said

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means having front edge portions formed with teeth, the teeth of said cutter means being adapted to reciprocate with respect to the teeth of said comb means for cutting hair located in the gaps between the teeth thereof, said lower comb means having at its front edge portion a plurality of projections respectively extending downwardly from free end portions of said teeth at said front edge portion of said lower means, at least the free ends of said projections being located beneath said comb means.

2. In a hair clipper according to claim 1 wherein said lower comb means comprises a lower comb plate and an additional turnable comb plate located next to the underside of said lower comb plate and having a front edge portion formed with said teeth which respectively have said downwardly directed projections adjacent their front ends when said additional comb plate engages the front edge portion of said lower comb plate; and means pivotally connecting said additional plate to said lower plate for turning movement between an operative position where said additional plate engages the front edge portion of said lower plate and an inoperative position where said additional plate is located rearwardly of said front edge portion of said lower plate.

3. In a hair clipper according to claim 1 wherein said lower comb means comprises a lower comb plate and an additional turnable comb plate located next to the underside of said lower comb plate and having a front edge portion formed with said teeth which respectively have said downwardly directed projections adjacent their front ends when said additional comb plate engages the front edge portion of said lower comb plate; and means pivotally connecting said additional plate to said lower plate for turning movement between an operative position where said additional plate engages the front edge portion of said lower plate and an inoperative position where said additional plate is located rearwardly of said front edge portion of said lower plate, said additional plate when in its operative position having a front edge located at substantially the same elevation as the front edge of said lower plate.

4. In a hair clipper according to claim 1 wherein said lower comb means comprises a lower comb plate and an additional turnable comb plate located next to the underside of said lower comb plate and having a front edge portion formed with said teeth which respectively have said downwardly directed projections adjacent their front ends when said additional comb plate engages the front edge portion of said lower comb plate; and means pivotally connecting said additional plate to said lower plate for turning movement between an operative position where said additional plate engages the front edge portion of said lower plate and an inoperative position where said additional plate is located rearwardly of said front edge portion of said lower plate, said means pivotally connecting said additional plate to said lower plate including a pair of lugs respectively extending downwardly from opposite sides of said lower plate and having curved edges on which the clipper may be tilted.

5. In a hair clipper according to claim 1 wherein said lower comb means comprises a lower comb plate and an additional turnable comb plate located next to the underside of said lower comb plate and having a front edge portion formed with said teeth which respectively have said downwardly directed projections adjacent their front ends when said additional comb plate engages the front edge portion of said lower comb plate; and means pivotally connecting said additional plate to said lower plate for turning movement between an operative position where said additional plate engages the front edge portion of said lower plate and an inoperative position where said additional plate is located rearwardly of said front edge portion of said lower plate, said means pivotally connecting said additional plate to said lower plate including a pair of lugs respectively extending downwardly from opposite sides of said lower plate and having curved

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edges on which the clipper may be tilted, said curved edges being formed with grooves.

6. In a hair clipper, in combination, lower comb means and upper cutter means adapted to slidably reciprocate with respect to said lower comb means, both of said means having front edge portions formed with teeth, the teeth of said cutter means being adapted to reciprocate with respect to the teeth of said comb means for cutting hair located in the gaps between the teeth thereof, said lower comb means having at its front edge portion a plurality of projections respectively extending downwardly from free end portions of said teeth at said front edge portion of said lower means, said projections having an arcuate configuration and at least the free ends of said projections being located beneath said comb means.

7. In a hair clipper, in combination, lower comb means and upper cutter means adapted to slidably reciprocate with respect to said lower comb means, both of said means having front edge portions formed with teeth, the teeth of said cutter means being adapted to reciprocate with respect to the teeth of said comb means for cutting hair located in the gaps between the teeth thereof, said lower comb means having at its front edge portion a plurality of projections respectively extending downwardly from free end portions of said teeth at said front edge portion of said lower means, at least the free ends of said projections being located beneath said comb means, the teeth of said lower comb means extending forwardly beyond the teeth of said upper cutter means, and said lower comb means also having a plurality of upwardly directed projections respectively extending from the free ends of the teeth of said lower means and located forwardly of the tips of the teeth of said upper means.

8. In a hair clipper, in combination, lower comb means and upper cutter means adapted to slidably reciprocate with respect to said lower comb means, both of said means having front edge portions formed with teeth, the teeth of said cutter means being adapted to reciprocate with respect to the teeth of said comb means for cutting hair located in the gaps between the teeth thereof, said lower comb means having at its front edge portion a plurality of projections respectively extending downwardly from free end portions of said teeth at said front edge portion of said lower means, at least the free ends of said projections being located beneath said comb means, the gaps between the teeth of said lower comb means extending rearwardly beyond the free ends of the teeth of said upper cutter means, and the teeth of said lower comb means respectively having portions extending forwardly beyond the teeth of said cutter means and respectively formed with gaps extending rearwardly up to the region where the free ends of the teeth of said cutter means are located, whereby hair in the gaps between the teeth of both of said means will be cut while hair in the gaps of said portions of said teeth of said comb means will not be cut.

9. In a hair clipper, in combination, lower comb means, comprising a fixed lower comb plate and a releasable lower comb plate superimposed on said fixed lower comb plate, and upper cutter means adapted to slidably reciprocate with respect to said lower comb means, both of said means having front edge portions formed with teeth, the teeth of said cutter means being adapted to reciprocate with respect to the teeth of said comb means for cutting hair located in the gaps between the teeth thereof, said lower comb means having at its front edge portion a plurality of projections respectively extending downwardly from free end portions of said teeth at said front edge portion of said lower means, at least the free ends of said projections being located beneath said comb means; support means carrying said cutter; and spring means connected to said releasable lower comb plate for releasably connecting the latter to said support means.

10. In a hair clipper, in combination, an upper cutter plate and a lower comb plate cooperating with each other

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for cutting hair; and an additional plate engaging the underside of said lower plate and having a front edge portion terminating in a plurality of teeth respectively located beneath the teeth of said lower plate and respectively having projections extending downwardly away from the teeth of said lower plate, at least the free ends of said projections being located beneath said comb means.

11. In a hair clipper, in combination, at least one lower comb plate and an upper cutter plate adapted to slidably reciprocate with respect to said lower comb plate, both of said plates having front edge portions formed with teeth, the teeth of said cutter plate being adapted to reciprocate with respect to the teeth of said comb plate, for cutting hair located in the gaps between the teeth of said plates, said lower comb plate having at its front edge portion a plurality of projections respectively extending

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downwardly from free end portions of said teeth at said front edge portion of said lower plate, at least the free ends of said projections being located beneath said comb means, and said projections being tapered.

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