

Specification

This invention relates to a hair cutting apparatus, in particular an electric hair cutting apparatus, with a shearing head comprised of a shear plate and a cutting element, with a spacer comb adapted to be seated on the shearing head for sliding contact with the skin surface to be treated, with the position of the forward edge of the cutting element being adjustable relative to the skin surface, and with a slide control means for enabling and disabling the drive of the hair cutting apparatus (see DE-A-34 41 060).

In the use of hair cutting apparatus of this type, the accompanying spacer comb mounts simply by being slipped on the shearing head of the apparatus by hand. The spacer comb thus seated on the shearing head of the hair cutting apparatus is secured thereto according to the requirements of its use by means of a detent spring cooperating with a detent nose on the shearing head. However, in order to cut the hair to different lengths, it is absolutely necessary for the spacer comb to be positioned at different distances from the forward or cutting edge of the shearing head comprising a shear plate formed fast with the apparatus and an oscillating cutting element cooperating therewith. In known hair cutting apparatus, including to some extent also commercially available hair cutters, this possibility of locking the spacer comb in positions relating to the distance between the plane of its tooth-shaped supports sliding over the skin surface to be treated and the forward or cutting edge of the shearing head or the associated cutting element of the hair cutting apparatus is afforded by parallel ratchet bars formed at the outer side or sides of the shearing head housing which cooperate with lever-type detent members provided on or in the side walls of the spacer comb to operate as a ratchet gear. While such hair cutting apparatus do allow an axial displacement of the spacer comb seated on the shearing head for the purpose of varying its ratchet position in accordance with the desired length of the hair cut, it is to be considered also that such a ratchet gear on the outer wall of the body of the hair cutting apparatus, being always gripped by the user's hand, is subject to substantial wear resulting particularly from the fact that, as the spacer comb is slipped on the shearing head, at least one but mostly several or all of the outwardly projecting tight ratchet knobs are overtraveled by the inwardly projecting detent members of the spacer comb and are frictionally engaged by them in the process. The knobs on the shearing head housing are worn off or

abraded by the sharp edges of the teeth of these detent members already after a relatively short period of use, so that accurate positioning of the spacer comb on the shearing head is no longer possible.

Fixing the spacer comb in place on the shearing head of the hair cutting apparatus in this manner incurs another shortcoming, that is, in order to vary the length of the cut it is necessary for the spacer comb to be gripped by two fingers, spread apart, of the hand not holding the hair cutting apparatus, and to be subsequently displaced relative to the casing of the apparatus in the slip-on or slip-off direction--depending on the desired length of the cut--until its detent member engages into the respective notch on the casing which corresponds to the selected ratchet position. This operation requires the user to abandon the position of use of the hair cutting apparatus and to seize it subsequently with his one hand to enable his other hand to adjust the spacer comb on the shearing head while keeping a close eye on the hair cutting apparatus and the spacer comb.

It is an object of this invention to provide a hair cutting apparatus of the type initially referred to which uses one single control element for adjustment of the spacer comb to positions of use or ratchet positions which correspond to different lengths of the cut, for securing the spacer comb in its slipped-on condition on the hair cutting apparatus, and for enabling and disabling the electric drive of the hair cutter.

In the hair cutting apparatus identified in the preamble of claim 1, this object is accomplished by the invention providing the spacer comb and the slide control means with engageable coupling means, providing further ratchet positions for the spacer comb in addition to the on and off positions of the slide control means, and securing in the individual ratchet positions the engaged coupling means of the spacer comb and the slide control means from becoming disengaged by means of an arrest.

This solution of the invention permits the operation of the hair cutting apparatus, that is, its turning on and off as well as the adjustment of the spacer comb to its individual ratchet positions by means of a single control means. The awkward procedure of gripping the spacer comb on the shearing head for adjustment of the desired ratchet position is thereby avoided.

Advantageous embodiments of the invention are described in the subclaims.

The subject of the invention will be described in more detail in the following by way of an example encompassing several particular embodiments, reference being had to the accompanying drawings, in which:

FIG. 1 is a perspective view of the hair cutting apparatus of the invention;

FIG. 2 is a front view of the hair cutting apparatus of the invention, showing the spacer comb in its seated position;

FIG. 3 is also a front view of the hair cutting apparatus of the invention, with the spacer comb removed;

FIG. 4 is a side view of the hair cutting apparatus of FIG. 3, shown partially in longitudinal section taken along the line I-I of FIG. 3;

FIG. 5 is a schematic of the basic coupling structure between the hair cutting apparatus and the spacer comb seated on the shearing head;

FIG. 6 is a view of the ratchet gear of the hair cutting apparatus of the invention for positioning the spacer comb at different distances relative to the forward edge of the shearing head;

FIGS. 7 to 10 are functional schematics of the embodiment of the hair cutting apparatus of FIG. 5, showing its various phases of engagement;

FIG. 11 is a schematic of an advantageous modification of the embodiment of the hair cutting apparatus of FIG. 5;

FIGS. 12 to 14 are views of an embodiment having an additional laterally displaced force guide; and

FIGS. 15 to 17 are views of an embodiment having an additional lateral forced deflection structure.

As becomes apparent from FIGS. 1 to 4, the hair cutting apparatus 1 of the invention comprises substantially a slim, haptical body having a shearing head 2 obstructed in FIGS. 1 and 2 by a spacer comb 3 seated on the shearing head 2. The spacer comb 3 operates to maintain a predetermined distance of the forward edge 4 of

the shearing head 2 comprised of a fixed shear plate 5 and a cutting element 6 reciprocating thereon relative to the skin surface to be treated, for example, the scalp of a person whose hair is to be cut, with the spacer comb being adjustable to different positions on the shearing head relative to the body 7 of the hair cutting apparatus 1, to be explained later as the description proceeds.

The spacer comb 3, being a hollow body, embraces the body 7 of the hair cutting apparatus 1 in the region of its shearing head 2 on all four sides, with tooth-shaped supports 8 formed at the comb enabling the hair which is to be cut to extend therebetween up to the shearing head 2, to be eventually cut off by its cutting element 6. The remaining length of the hair after the cut corresponds to the distance between the forward edge of the tooth-shaped supports 8 contacting the skin surface and the forward or cutting edge of the shearing head or its cutting element, this distance being variable in the present hair cutting apparatus, as already mentioned.

For an efficient use of the hair cutting apparatus by means of the spacer comb determining the length of the hair to be cut, the spacer comb includes coupling means cooperating with appropriate coupling members of the body 7 of the hair cutting apparatus.

As shown particularly in FIGS. 4 and 5, the hair cutting apparatus 1 has for this purpose a coupling rod 10 which is slidable in the direction of the longitudinal axis x of the hair cutting apparatus 1 in a guideway 9 of T-shaped cross section provided in the casing. The coupling rod 10 is operatively connected with a slide control means 11 extending over the entire width of the hair cutting apparatus 1, thereby permitting a safe operation of the device by the user's left or right hand, that is, a one-hand operation. The slide control means 11 fulfils several functions, first it serves to enable or disable the electrical or mechanical drive of the hair cutting apparatus, then it provides for engagement or disengagement of the spacer comb 3 with or from the hair cutting apparatus according to the requirements of its use, and finally it functions to adjust the coupled spacer comb to its individual positions of use resulting in different distances.

FIGS. 5 to 10 show, in various phases of engagement, the function of the coupling rod 10 slidable in longitudinal direction by means of the slide control means 11 within and below the front wall 12 of the hair cutting apparatus 1 as it cooperates with the coupling means of the spacer comb 3.

In this arrangement, FIG. 5 shows the basic mode of operation of the coupling 13 between the slide control means 11 of the hair cutting apparatus 1, which control means is operatively connected with the coupling rod 10, and the spacer comb 3 adapted to be seated on the shearing head 2 of the body 7 of the hair cutting apparatus.

As shown, the coupling rod 10 operatively connected with the slide control means 11 includes a coupling nose 14 which is pivoted about the axis of a film hinge 15 formed at the rod 10, such that the coupling nose 14, following each pivot movement, automatically returns to its initial position shown in FIG. 5.

In the region of its wall 16 serving as coupling means, the spacer comb 3 which embraces the shearing head 2 of the hair cutting apparatus 1 when seated thereon includes a coupling groove 17 receiving the rod 10 together with its coupling nose 14. The coupling groove 17 comprises a shoulder 18 which is formed at the coupling wall 16 of the spacer comb 3 and is overcome by the coupling nose 14 of the coupling rod 10 by their withdrawal into a recess 20 formed in the region of the coupling groove 17 by a wall 19 of the hair cutting apparatus 1 as the spacer comb 3 is being seated.

The seated spacer comb 3 is then retained by the coupling nose 14 of the rod 10 engaged behind the detent shoulder 18 of the comb and is thereby secured from inadvertent disengagement from the hair cutting apparatus. In this seated position of the coupling members 10, 14 of the hair cutting apparatus 1 and the coupling means 16, 17, 18 of the spacer comb 3 thus brought into relative engagement, the slide control means which also operates on electric switching means 21 for the drive is still in its "zero" or off position in which the supply circuit of the hair cutting apparatus is open. By subsequent shifting of the slide control means 11 and consequently also of the coupling rod 10 into the direction of the axis x of the hair cutting apparatus 1--which corresponds to the direction of movement x of the spacer comb 3--from the "off" position shown in FIG. 5 to the "on" position

shown in dotted lines, the slide control means 11 will actuate the switching means 21, thereby closing the supply circuit of the hair cutting apparatus 1 and thus enabling its drive not shown.

In this "on" position, the end wall 23 of the coupling rod 10 abuts a shoulder 24 formed on the coupling wall 16 of the spacer comb 3, while the side wall 25 on the side remote from the coupling nose (according to FIG. 5) becomes slidably engaged by the outer wall 26 of a force guide 27 formed by the casing wall 19 of the hair cutting apparatus 1 and the coupling wall 16 of the spacer comb 3. In the "on" position of the slide control means 11, the force guide 27 thus prevents the coupling rod 10 from yielding to the shoulder 24. Accordingly, the beveled edge 28 of the coupling rod 10 which, as the spacer comb 3 is being seated, cooperates with the beveled edge 29 of the detent shoulder 18 of the coupling wall 16 of the comb to facilitate yielding, has no effect in this position.

FIG. 6 is a schematic front view of a vertically slidable grip member 30 comprising both the coupling rod 10 and the slide control means 11 and serving as the central control means of the hair cutting apparatus 1. Provided on the grip member 30 in this FIG. is a detent pawl 32 which is pivoted about a film hinge 31 formed thereon and has a tongue 33 which, due to its inherent resilience, engages into notches of a ratchet bar 34 formed fast with the casing of the hair cutting apparatus 1 to thereby provide a ratchet gear. The "zero" or "off" position of the slide control means 11 is determined by engagement of the tongue 33 into the lowermost notch 34.1 (according to FIG. 6). If the slide control means 11 is pushed upwards by one index position, the tongue 33 will engage the notch 34.2 which determines the "on" position of the slide control means 11. The coupling rod 10, in leaving its "off" position it has assumed after overcoming the detent shoulder 18, will thus assume the "on" position in which its coupling nose 14 abuts the stop shoulder 24 and the outer wall 26 of the force guide 27, thereby accomplishing the coupling of the hair cutting apparatus 1 with the spacer comb 3 for the purpose of positioning the spacer comb.

Pushing the slide control means 11 in the direction x (FIG. 5) by another index position causes the tongue 33 to engage into the notch 34.3. As a result of the abutting engagement of its end wall 23 with the stop shoulder 24 of the coupling wall 16, the coupling rod 10 which is made to follow this movement in the direction x causes

the spacer comb 3 to be shifted into its first ratchet position. In this first ratchet position, a relatively short length of the hair extending through the spacer comb is cut. In this embodiment, the ratchet positions are indicated by a graduated scale 35 provided on the shearing head 2 of the hair cutting apparatus 1 and showing the digits "1" to "4" in a window 36 arranged between and below two adjacent tooth-shaped supports 8 of the spacer comb 3. A mark 37 provided on the front side of the spacer comb 3 indicates the respective ratchet position of the spacer comb 3--in the FIG. shown, the minimum possible ratchet position "1".

Similarly, a further upward shift of the coupling rod 10 by means of the slide control means 11 it is operatively connected with moves the spacer comb 3 into further ratchet positions increasing the distance between the shearing head 2 and the spacer comb 3, these positions being identified by the tongue 33 falling into the respective notches 34.4, 34.5 and 34.6 and being indicated on the graduated scale 35 by the mark 37 corresponding with the scale digits "1", "2", "3" or "4", or by reading the lowermost scale digit not obstructed by the spacer comb, when viewed in the shifting direction.

Retracting the spacer comb 3--for example, to adjust the hair cutting apparatus to a shorter length of the cut--is accomplished simply by pushing the slide control means 11 back in opposition to the direction of the arrow x. The coupling rod 10 will thus be moved in the same direction, and the action of the force guide 27 will cause the coupling wall 16 of the spacer comb 3 to be entrained as a result of the abutting engagement of the beveled edge 38 of the rod with the corresponding beveled edge 39 of the coupling wall 16, until the ratchet position "1" is reached in which the length of the cut is at a minimum and which is identified by the tongue 33 falling into the notch 34.3. As the coupling rod 10 continues to be pushed back in opposition to the direction of the arrow x by means of the slide control means 11, the coupling nose 14 of the rod 10, after having overcome the stop edge 40 which in FIG. 5 extends slightly below the plane of the stop shoulder 24 formed by the coupling wall 16, that is, protrudes relative to the latter by a small amount in the coupling direction x, reaches the area of the coupling groove 17 in which the coupling nose 14 of the coupling rod 10, abutting the detent shoulder 18 of the comb, is allowed to withdraw into the recess 20.

Accordingly, on further backward movement of the coupling rod 10 by means of the slide control means 11, the coupling nose 14 will overcome the detent shoulder 18 by the rod 10 pivoting counterclockwise about the film hinge 15, thereby releasing the spacer comb 3 for removal by hand. The slide control means 11 of the hair cutting apparatus thereby assumes the "on" position identified by the engagement of the tongue 33 into the notch 34.2, in which position the hair cutting apparatus is still enabled. Shifting the slide control means 11 back still further until its detent pawl 32, 33 drops into the notch 34.1 finally disables the entire drive of the hair cutting apparatus 1 by means of the electric switch 21 controlled or actuated by the slide control means 11.

FIGS. 7 to 10 show schematically the individual phases of engagement between the hair cutting apparatus 1 and the spacer comb 3 seated on its shearing head 2.

FIG. 7 shows the hair cutting apparatus 1 in its disabled position identified by "off". In this FIG., the control rod 10 is still below the spacer comb 3 loosely seated on the shearing head 2. It is not yet coupled with the latter.

In FIG. 8, the coupling rod 10 is shown as shifted into its "on" position by means of the slide control means 11, in which position the hair cutting apparatus 1 is operative without displacement of the seated spacer comb. In this position, the coupling nose 14 of the rod 10 which is pivoted by means of the film hinge 15 has overcome the detent shoulder 18 of the spacer comb 3 and secured the spacer comb 3 to the shearing head 2 of the hair cutting apparatus 1 to prevent it from unseating itself. In this coupled position, the spacer comb 3 may be lifted clear of the shearing head 2 at any time, which is accomplished by the coupling nose 14 of the rod 10 being urged back into the recess 20 of the guideway 9 of the hair cutting apparatus 1 by the detent shoulder 18 of the spacer comb 3.

FIG. 9 shows the spacer comb 3 in its first locked coupling position on the shearing head 2 of the hair cutting apparatus 1, in which the spacer comb 3 is in the position "1" resulting in the shortest possible length of the cut. In this position, the coupling nose 14 of the coupling rod 10--after having overcome the stop edge 40--is already in an area defined by the casing wall 19 of the hair cutting apparatus 1 on the one hand and by the coupling wall 16 of the spacer comb 3 on the other hand. As a result of this force guide 27, the coupling rod 10

is not allowed to withdraw by pivoting about the axis of its film hinge 15, instead it is moved solely in the coupling direction x, that is, in or parallel to the longitudinal axis of the hair cutting apparatus 1 as the slide control means 11 is notched. This enables the spacer comb 3 to be moved to further ratchet positions by means of the butt end 23 as described in the foregoing.

FIG. 10 finally shows the spacer comb 3 shifted further upwards into one of its other ratchet positions increasing the length of the cut and identified by the digits "2", "3" or "4" on the graduated scale 35. In this FIG., the end wall 23 of the coupling rod 10 is in abutment with the stop shoulder 24 of the coupling wall 16.

According to FIG. 10, pushing the spacer comb 3 back occurs in the reverse direction, that is, by the slide control means 11 moving the coupling rod 10 in its force guideway back in opposition to the direction of the arrow x, with the abutting engagement of the beveled edge 38 of the coupling nose 14 with the beveled edge 39 of the coupling wall 16 of the comb causing the spacer comb 3 to be retracted into one of its other ratchet positions. If the previous ratchet position was "4", this may be one of the ratchet positions "3", "2" or "1", for example. Only on returning the slide control means 11 into its "on" or "off" position is the coupling rod 10 allowed to withdraw into the recess 20 formed by the guideway 9 and to release the spacer comb 3 seated on the shearing head 2 so that it can be lifted clear of the hair cutting apparatus 1.

FIG. 11 shows a modification of the hair cutting apparatus of the invention in which the engagement means with the slip-on spacer comb is completed by an advantageous coupling structure 13 affording greater ease of operation.

The cooperation of the coupling members 10, 14 of the hair cutting apparatus 1 with the coupling means 16, 18 of the spacer comb 3 described in the foregoing becomes apparent from FIG. 11. In this embodiment, however, the casing wall 19' of the hair cutting apparatus 1 has on the side close to the coupling a coulisse 41 formed by a curved groove in a side wall 42 bounding the guideway 9 for the coupling rod 10 and lying adjacent to the casing wall 19'. Engaging into the coulisse 41 is a guide pin 43 formed on the coupling rod 10, which may also be a guide roller fitted to such a pin. As the coupling rod 10 is shifted upwards by the slide control

means 11 of the hair cutting apparatus being switched from its "off" to its "on" position, the guide pin 43 co-operates with the coulisse 41 in the sense of facilitating the movement of the rod 10 into its coupled position in which it is retained behind the detent shoulder 18 of the coupling wall 16 of the comb, thereby securing the spacer comb 3 in its merely slipped-on position on the shearing head 2.

As becomes apparent, the coulisse 41 provides for lifting of the coupling rod 10 together with its coupling nose 14 formed thereon over the detent shoulder 18 of the coupling wall 16 of the comb (first position shown in broken lines), subsequently moving it into its "on" position behind the detent shoulder 18 (second position shown in broken lines), whereupon the rod 10 enters the region of the force guide 27' in which the coupling rod 10--with its butt end 23 hitting against the stop shoulder 24 of the coupling wall 16 of the comb--moves the spacer comb 3 into its respective ratchet positions resulting in longer lengths of the cut.

Providing the coupling rod 10 with the guide pin 43 engaging into the coulisse 41 makes it possible to design also the force guide 27 as a continuation of the coulisse 41, that is, unlike the embodiments of FIGS. 5 to 10, to form this force guide from the casing wall 19 of the hair cutting apparatus 1 and from the coupling wall 16 of the spacer comb 3. A coulisse 41 of this type which thus includes also the force guide 27' ensures a particularly secure and wear-resistant guide, insusceptible to jamming, for the coupling rod 10 of the slide control means 11 of the hair cutting apparatus 1, causing the rod to be merely pivoted about the film hinge 15 and to be guided in a straight line.

For pre-centering the spacer comb 3 seated on the shearing head 2 of the hair cutting apparatus 1, detent cams 44 may be provided on the inner sides of the two parallel side walls of the spacer comb, for cooperation with corresponding recesses 45 provided in the outer sides of the corresponding outer walls of the shearing head of the body 7 of the hair cutting apparatus 1.

FIGS. 12 to 14 show a further embodiment of the hair cutting apparatus and the spacer comb. In this embodiment, FIG. 12 shows a detail of the front view of the hair cutting apparatus with the spacer comb removed, FIG. 13 shows the coupling between the hair cutting apparatus and the seated spacer comb in a sectional side view (according to FIG. 5), and FIG. 14 shows a detail of the

coupling wall of the spacer comb as viewed from the inside. As becomes apparent from this embodiment, the spacer comb 3 is retained by the coupling nose 14 of the coupling rod 10 already in the "off" position and thus securely held in place. In the embodiments so far described, this effect is not accomplished until the hair cutter is in the "on" position.

As the spacer comb 3 is slipped on the shearing head of the hair cutting apparatus, the coupling nose 14 of the coupling rod 10 slides in the slip-on groove 47 of the coupling wall 16 of the spacer comb. At the beveled edge 29' of the detent shoulder 18' of the spacer comb, the coupling rod 10 is urged into the recess 20 of the casing wall 19 by pivoting about the film hinge 15. After having thus overcome the detent shoulder 18', the coupling rod 10 pivots back into the position shown in FIG. 13. While this position corresponds to the position shown in FIG. 5, FIG. 13 shows the slide control means 11 still in its "off" position whereas it is already in its "on" position in FIG. 5, so that in FIG. 13 the spacer comb is resiliently retained already in the "off" position. In this embodiment, too, pulling the comb off the shearing head in this position is accomplished by cooperation of the beveled edge 38 on the coupling nose 14 of the coupling rod 10 with the beveled edge 39 on the detent shoulder 18' of the spacer comb.

When the hair cutting apparatus with the spacer comb seated thereon is switched on by means of the slide control means 11, the coupling nose 14 of the coupling rod 10 is guided not only in upward direction, but also in a laterally displaced direction (see FIG. 12). This guiding of the coupling nose 14 in a leftward upwardly inclined direction is accomplished by means of a coulisse 51 provided in the front wall 12 of the hair cutting apparatus. Coulisse 51 in the front wall 12 is congruent with the coupling coulisse 46 in the coupling wall 16 of the spacer comb (FIG. 14), so that the spacer comb does not engage the coupling nose 14 when the coupling rod 10 is guided from the "off" into the "on" position (and vice versa).

In this "on" position, the apparatus is enabled and the spacer comb can no longer be slipped off, because the coupling rod 10 is already in the force guide 27 preventing the coupling rod 10 from withdrawing backwards as described with reference to the other embodiments. Lateral withdrawal of the coupling rod 10 is not possible either in this position when an attempt is made to remove

the spacer comb, because its coupling nose 14 is retained in the coulisse 51 of the front wall, abutting the stop edge 50 of the coupling coulisse 46 in the coupling wall 16 of the spacer comb.

If the slide control means 11 is shifted upwards into its further ratchet positions to increase the length of the cut, the lateral guide of the coupling nose 14 is accomplished in a force guide 48 which is displaced in parallel to the longitudinal axis x of the hair cutting apparatus. The end wall 23 of the coupling rod 10 thus abuts the stop shoulder 24' of the coupling coulisse 46 of the spacer comb, shifting it upwardly as described above.

Pushing the control means back involves a movement in the reverse order. Until the "on" position, the coupling rod 10 will entrain the spacer comb, because the coupling nose 14 is in abutment with the stop edge 50 of the coupling coulisse 46 of the spacer comb, and the coupling rod is prevented from withdrawing either laterally due to the force guide 48 or backwards due to the force guide 27. Only in the "off" position can the coupling rod 10 withdraw backwards again to thus allow the removal of the spacer comb.

Another advantageous embodiment of the coupling means is shown in FIGS. 15 to 17. The views of FIGS. 15, 16 and 17 correspond to those of FIGS. 12, 13 and 14, respectively. In this embodiment, too, the spacer comb is retained already in the "off" position. As the spacer comb is slipped on the shearing head, the coupling means cooperate by analogy with the description given with reference to FIGS. 12 to 14. This embodiment differs in the construction of the coulisse 51' in the front wall 12 (FIG. 15) and the congruent coupling coulisse 46' of the coupling wall 16 (FIG. 17). Both are shaped in the manner of a circular sector.

In moving from the "off" to the "on" position, the coupling nose 14 of the coupling rod 10 is laterally guided in the coulisse 51' (FIG. 15) around the cam 53 along the line of an arc, so that in the "on" position the coupling rod lies again in the longitudinal axis x of the hair cutting apparatus.

Shifting the control means into the next ratchet positions urges the coupling nose 14 laterally into a force guide 52 whose longitudinal axis is identical with the longitudinal axis x of the apparatus or the longitudinal axis of the coupling rod 10. As a result, by contrast

with the embodiment of FIGS. 12 to 14, the coupling rod 10 is not loaded by the film hinge 49 in all ratchet positions. When the control means is shifted back from higher to lower ratchet positions (down to the "on" position), the lower edge of the coupling nose 14 abuts the stop edge 50' of the coupling coulisse 46' or the stop nose 54 of the spacer comb. Otherwise the mode of operation of this embodiment is the same as the one of FIGS. 12 to 14.

List of References

- 1 Hair Cutting Apparatus
- 2 Shearing Head of 1
- 3 Spacer Comb, adapted to be seated on 1
- 4 Forward Edge of 2
- 5 Fixed Shear Plate of 2
- 6 Cutting Element of 2, reciprocating on 5
- 7 Body of 1, accommodates drive and shearing mechanism
- 8 Tooth-shaped Supports of 3 (teeth of comb)
- 9 Guideway in 1 for 10
- 10 Coupling Rod of 1
- 11 Slide Control Means
- 12 Front Wall of 1
- 13 Coupling between 1 and 3
- 14 Coupling Nose of 10
- 15 Film Hinge on 10 for rearward pivoting
- 16 Coupling Wall of 3
- 17 Coupling Groove of 3
- 18, 18' Detent Shoulder of 16 for 14
- 19, 19' Casing Wall of 1
- 20 Recess for 10, 14, opposite 17
- 21 Electric Switch of 1
- 23 End Wall of 10
- 24, 24' Stop Shoulder of 16, cooperating with 23
- 25 Side Wall of 10
- 26 Outer Wall of 19, acting as arrest
- 27 Force guide, formed by 19 and 16
- 27' Force guide, formed by 42 (extension of 41)
- 28 Beveled Edge at 10, cooperating with 29
- 29, 29' Beveled Edge at 18, cooperating with 28
- 30 Grip Member of 1, comprising 10 and 11
- 31 Film Hinge of 32
- 32 Detent Pawl at 30
- 33 Tongue at 32
- 34 Ratchet Bar on or in 1
- 34.1 Lowest Notch = "off" position
- 34.2 Second Notch from below = "on" position
- 34.3 Third Notch from below = first spacing of 3 ("1")
- 34.4 Fourth Notch from below = second spacing of 3 ("2")
- 34.5 Fifth Notch from below = third spacing of 3 ("3")
- 34.6 Sixth Notch from below = fourth spacing of 3 ("4")
- 35 Graduated Scale at 2 (indicates comb spacing)
- 36 Window in 3 between two toothed supports 8, for 35
- 37 Mark for 35 on 3

- 38 Beveled Edge at 14, cooperating with 39
- 39 Beveled Edge at 18, cooperating with 38
- 40 Stop Edge of 27 (19), adjacent to 26
- 41 Coulissee for 43 in 42
- 42 Side Wall, adjacent to 19'
- 43 Guide Pin at 10, engaging into 41
- 44 Detent Cam at 3, engaging into 45
- 45 Recesses in 2, cooperating with 44
- 46, 46' Coupling Coulissee of 3
- 47 Slip-on Groove of 3
- 48 Force Guide for 14, laterally displaced
relative to the longitudinal axis x of 1
- 49 Film Hinge on 10, for lateral pivotal movement
- 50 Stop Edge of 46
- 50' Stop Edge of 46'
- 51, 51' Coulissee in 12 to guide 10
- 52 Lateral Force Guide for 14 in longitudinal
axis x of 1
- 53 Cam of 51'
- 54 Stop Cam of 46'
- x Longitudinal Axis of 1, coupling direction or
spacing direction of 3



Patent Claims:

1. A hair cutting apparatus (1), in particular an electric hair cutting apparatus, with a shearing head (2) comprised of a shear plate (5) and a cutting element (6), with a spacer comb (3) adapted to be seated on the shearing head (2) for sliding contact with the skin surface to be treated, with the position of the forward edge of the cutting element (6) being adjustable relative to the skin surface, and with a slide control means (11) for enabling and disabling the drive of the hair cutting apparatus (1), characterized in that the spacer comb (3) and the slide control means (11) are provided with engageable coupling means (16, 18, 24, 10, 14, 23), that further ratchet positions (34.3, 34.4, 34.5, 34.6) are provided for the spacer comb (3) in addition to the on and off positions (34.1, 34.2) of the slide control means (11), and that in the ratchet positions (34.3, 34.4, 34.5, 34.6) the engaged coupling means of the spacer comb (3) and the slide control means (11) are secured from becoming disengaged by means of an arrest (26).

2. The hair cutting apparatus as claimed in claim 1, characterized in that the coupling means on the slide control means (11) is a resiliently yielding coupling rod (10) having a coupling nose (14) and an end wall (23).

3. The hair cutting apparatus as claimed in claim 1, characterized in that the coupling means on the spacer comb (3) is a coupling groove (17) provided in the coupling wall (16) and having a stop shoulder (24) and a beveled edge (39).

4. The hair cutting apparatus as claimed in claim 1, characterized in that the arrest (26) is formed by abutting engagement of the side wall (25) of the coupling rod (10) with the outer side of the casing wall (19).

5. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that the coupling rod (10) is guided in a force guide (27).

6. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that the force guide is comprised of a coulisse (41) provided in the casing wall (19) and a guide pin (43) arranged on the coupling rod (10).

7. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that a recess (20) is provided in the casing wall (19).



8. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that a guideway (9) is provided in the casing wall (19).

9. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that a ratchet bar (34) is provided on or in the casing of the hair cutting apparatus (1) into a which a detent pawl (32) provided on the slide control means (11) engages resiliently to establish predetermined ratchet positions (34.1 to 34.6).

10. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that the slide control means (11), the coupling rod (10) and the detent pawl (32) are integrally formed and that a film hinge (15, 31) each is provided between the slide control means (11) and the coupling rod (10) and the detent pawl (32).

11. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that the coupling nose (14) of the coupling rod (10) has beveled edges (28, 38) which, as a result of the pivoted withdrawal of the rod (10) by means of an integrally formed film hinge (15), cooperate with beveled edges (29, 39) of the detent shoulder (18) of the coupling wall (16) of the comb during the forward and backward movement of the coupling rod (10) into and, respectively, out of its coupled position with the spacer comb (3).

12. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that a graduated scale (35) indicating the individual positions of the spacer comb (3) is constructed such as to be visible in a window (36) between and below two adjacent tooth-shaped supports (8) of the spacer comb (3).

13. The hair cutting apparatus as claimed in one or several of the preceding claims, characterized in that a further coulisse (51, 51') is provided in the front wall (12) for laterally guiding the coupling nose (14) of the coupling rod (10), and that said further coulisse (51, 51') is congruent with a coupling coulisse (46, 46') provided in the coupling wall (16) of the spacer comb (3).



14. The hair cutting apparatus as claimed in claim 13, characterized in that the spacer comb (3) is resiliently held on the shearing head (2) in the "off" position, and that it is securely held on the shearing head in all other positions.

15. The hair cutting apparatus as claimed in claim 13, characterized in that a further film hinge (49) is provided between the slide control means (11) and the coupling rod (10) to allow the lateral displacement of the coupling nose (14).

16. The hair cutting apparatus as claimed in claim 13, characterized in that said further coulisse (51) in the front wall (12) is constructed in such a manner that the coupling nose (14) of the coupling rod (10), in moving from the "off" to the "on" position, that is, from the first to the second position, is guided in an upwardly inclined direction, while sliding in all other positions in a laterally acting force guide (48) having a longitudinal axis extending parallel to the longitudinal axis of the coupling rod (10) when in its position of rest.

17. The hair cutting apparatus as claimed in claim 13, characterized in that said further coulisse (51') is shaped in the manner of a circular sector so that the coupling nose (14) of the coupling rod (10), in moving from the "off" to the "on" position, is guided around a cam (53), while sliding in all other positions in a laterally acting force guide (52) having a longitudinal axis which is identical with the longitudinal axis of the coupling rod (10) when in its position of rest.

30 Jan 89/BH.

