March 18, 1952 R. P. M. DAVIS ET AL 2,589,230

HAIR TRIMMING DEVICE

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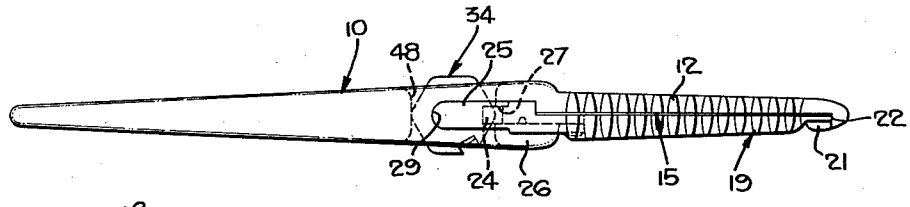


Fig. 1.

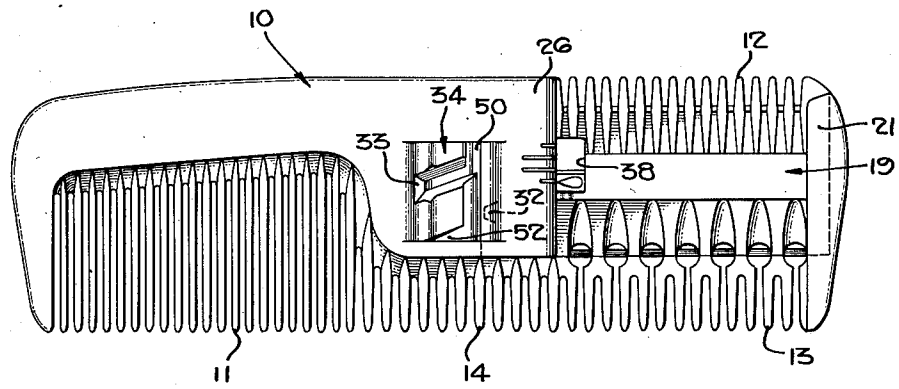


Fig. 2.

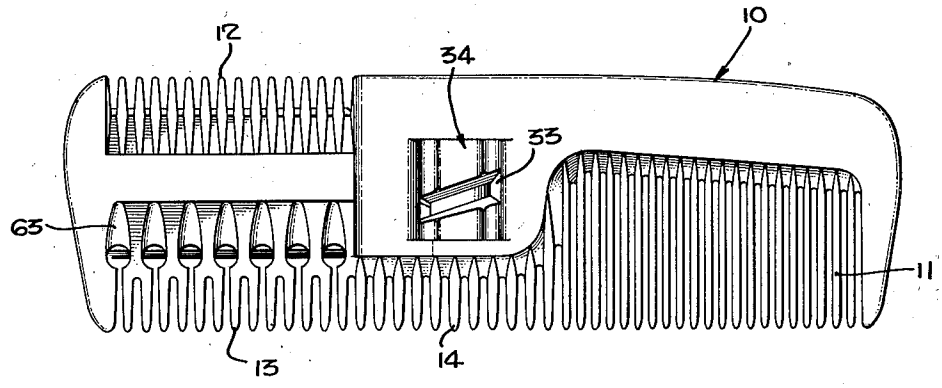


Fig. 3.

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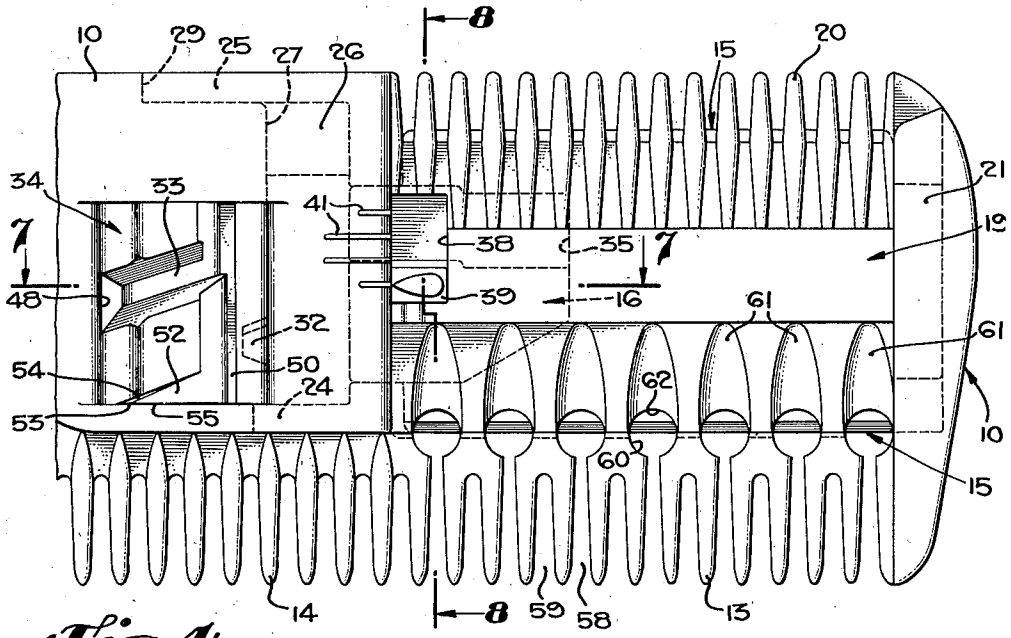


Fig. 4.

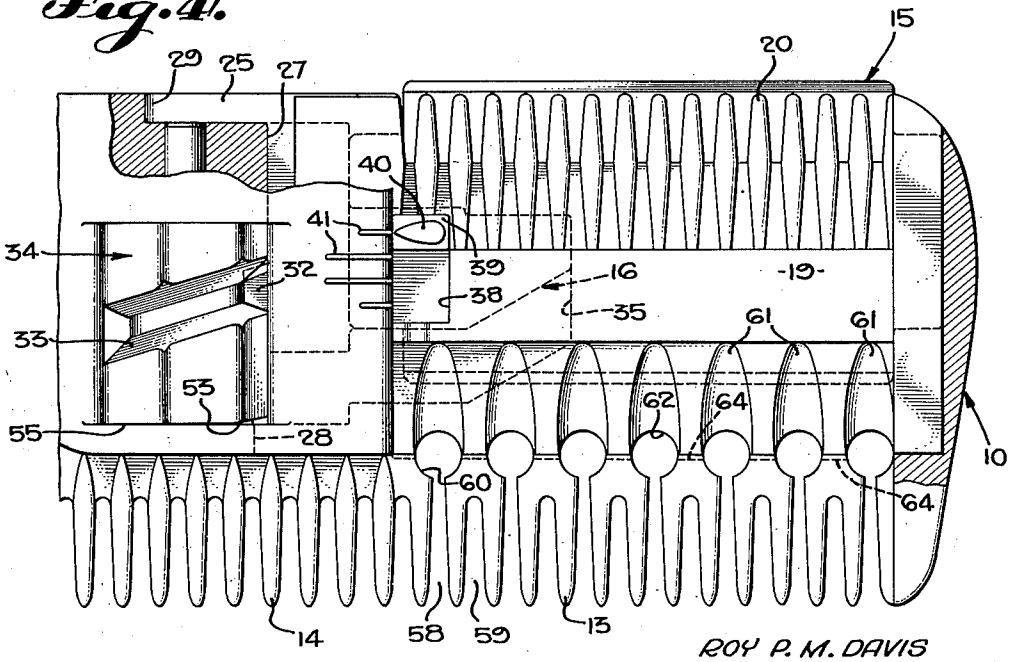


Fig. 5.

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HAIR TRIMMING DEVICE

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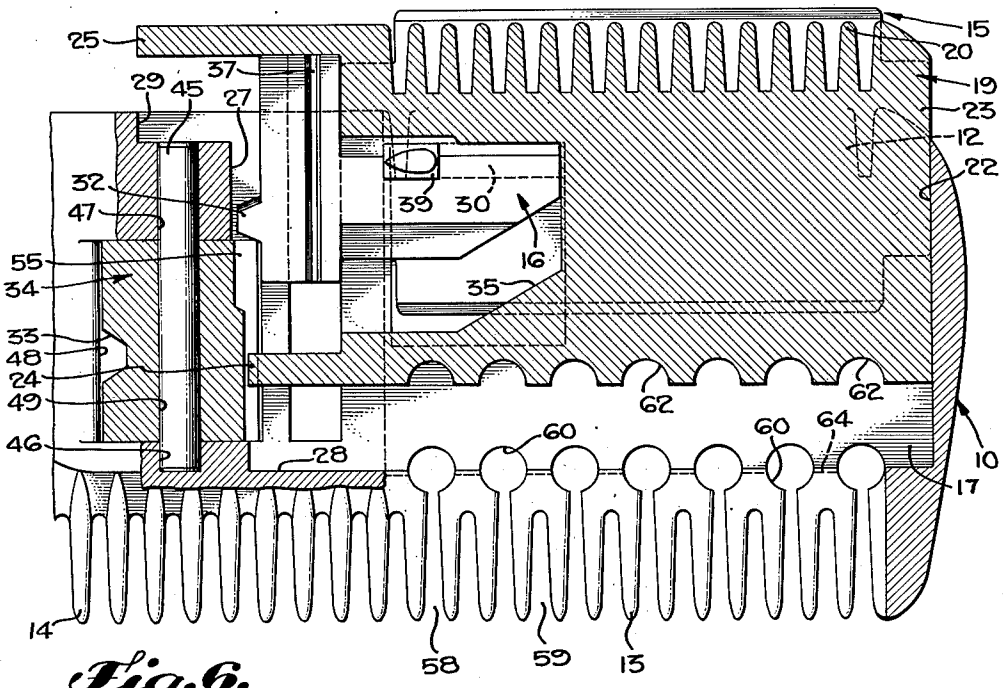


Fig. 6.

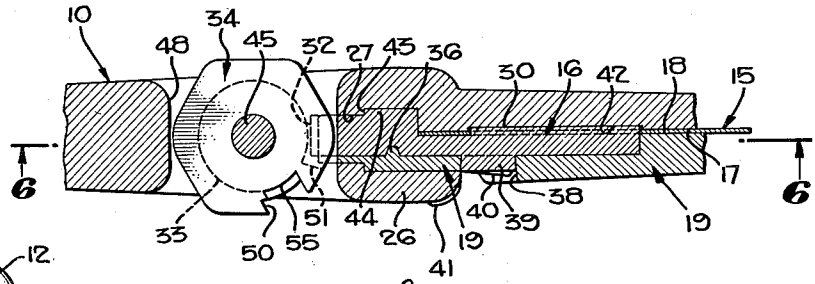


Fig. 7.

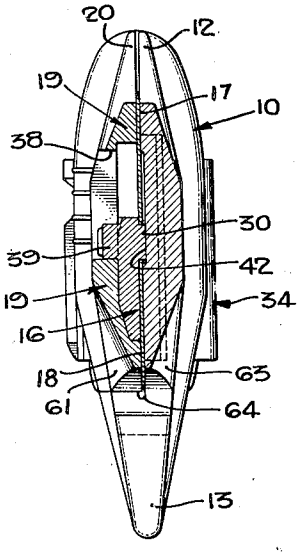


Fig. 8.

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HAIR TRIMMING DEVICE

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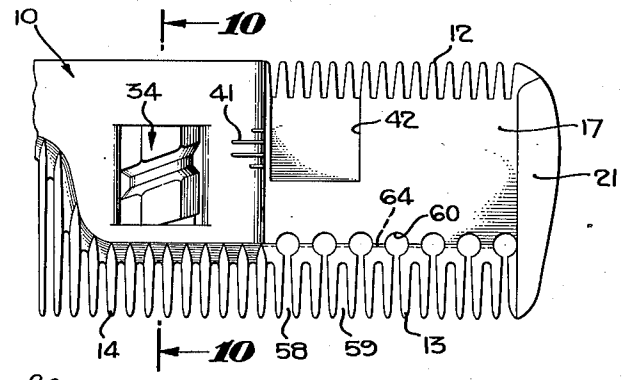


Fig. 9.

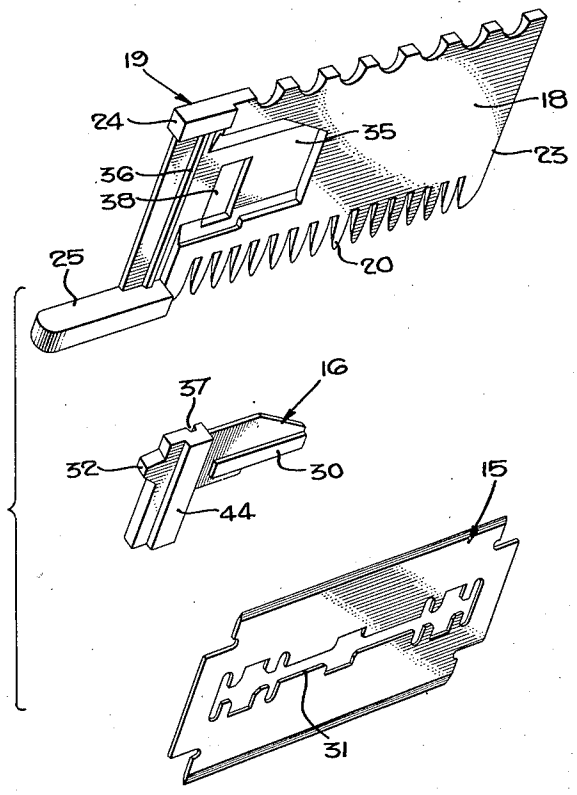


Fig. 11.

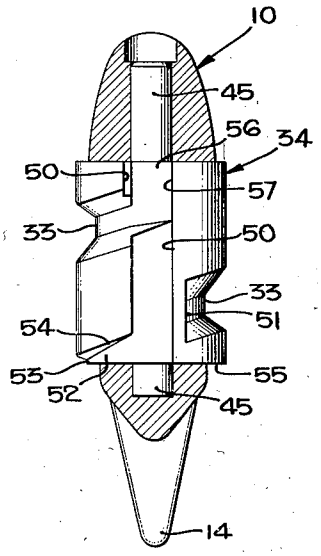


Fig. 10.

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Patented Mar. 18, 1952

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UNITED STATES PATENT OFFICE

2,589,230

HAIR TRIMMING DEVICE

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Application March 21, 1949, Serial No. 82,656

15 Claims. (Cl. 30—30)

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This invention relates to a hair trimming device of the general type shown in the copending application of Roy P. M. Davis, Serial No. 691,448, filed August 19, 1946, now Patent No. 2,519,954, dated August 22, 1950. This invention is particularly directed to improved mechanism for advancing and retracting the cutting blade. In the copending application of Norbert Shaeffer, Serial No. 69,885, filed January 8, 1949, there is disclosed a nonreversible drive mechanism for advancing and retracting the sharpened blade with respect to the body of a comb.

It is object of our invention to provide an improved form of nonreversible drive in which the sharpened blade may be advanced or retracted to either of its extreme end positions without the possibility that the parts of the device may become disassembled.

Another object is to provide a comb body having a movable carrier for a sharpened blade, the carrier being advanced and retracted by nonreversible drive and being held by a retainer member against inadvertent disassembly with respect to the comb body.

Another object is to provide a device of this type in which the retainer, carrier and blade are insertable as a unit into operative position on the comb body.

Another object is to provide a drive device for advancing and retracting the carrier relative to the comb body and retainer, the drive device further acting to lock the retainer against disassembly from the comb body.

Another object is to provide a blade carrier movable with respect to a retainer member having a window opening, the carrier being provided with an indicator movable in said window opening for indicating the position of the blade with respect to the comb body.

Another object is to provide a nonreversible drive device for moving a sharpened blade relative to a comb body, the drive device incorporating a non-circular rotatable member provided with a peripheral cam groove.

Other and more detailed objects and advantages will appear hereinafter.

In the drawings:

Figure 1 is a top plan view showing a preferred embodiment of our invention.

Figure 2 is a front elevation thereof.

Figure 3 is a rear elevation.

Figure 4 is a front elevation on an enlarged scale partly broken away and showing the parts in position corresponding to the fully retracted position of the sharpened blade.

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Figure 5 is a view similar to Figure 4 showing the parts in position corresponding to the fully advanced position of the sharpened blade.

Figure 6 is a sectional view partly broken away taken substantially on the lines 6—6 as shown in Figure 7 and illustrating the carrier, retainer and blade in partially assembled relationship with the comb body.

Figure 7 is a sectional view partly broken away taken substantially on the line 7—7 as shown in Figure 4.

Figure 8 is a transverse sectional view taken substantially on the lines 8—8 as shown in Figure 4.

Figure 9 is a front elevation partly broken away showing the comb body with the carrier, blade and retainer removed.

Figure 10 is a transverse sectional view taken substantially on the line 10—10 as shown in Figure 9.

Figure 11 is an exploded view of the retainer, carrier and blade.

Referring to the drawings, the comb body generally designated 10 may be provided on one end with a conventional series of comb teeth 11 extending from one side and on the other end may be provided with two different series of teeth 12 and 13 extending from the opposite sides of the comb body. An intermediate series of teeth 14 connect the series 11 with the series 13. A sharpened blade 15 is connected to a carrier 16 which is movable relative to the comb body 10. The blade 15 is confined between the flat surface 17 on the body 10 and the underside 18 of a retainer generally designated 19. The retainer 19 is provided with a series of teeth 20 which overlie the body teeth 12 when the retainer is in operative position. A lip 21 at one end of the body 10 provides a groove 22 for reception of the outer end 23 of the retainer 19. The inner end of the retainer 19 is provided with a pair of spaced lugs 24 and 25 positioned on extreme edges of the retainer. The comb body 10 is provided with a flange 26 which defines a transverse slot 27 between the flange and the comb body. The lug 24 on the retainer 19 moves through this slot 27 into operative position, in which position the lug 24 is received within the recess 28 and the lug 25 is received within the recess 29. The retainer 19 remains fixed in its operative position during normal use of the device and is only withdrawn from the comb body when it is necessary to reverse or replace the sharpened blade 15. The carrier 16 is provided with a protuberance 30 adapted to fit within the longitudinal slot 31 provided in a con-

ventional form of Gillette type safety razor blade. The carrier 16 slides within the transverse body slot 27 and is guided thereby in its movement. A projecting tooth 32 or follower is provided on the carrier 16 and engages within a peripheral cam groove 33 provided on the control knob 34. Turning movement of the knob 34 then serves to advance and retract the carrier on the body by virtue of the inter-engagement between the follower 32 and the helical groove 33.

Referring more particularly to the detailed construction of the carrier 16 and retainer 19, a recess 35 is formed in the underside of the retainer 19 for reception of the carrier 16 (see Figure 11). This recess extends for the full length of the carrier 16 but is considerably wider so that the carrier may move transversely relative thereto. A transverse rail 36 on the carrier 19 fits in sliding relationship within a groove 37 provided on the carrier so that movement of the carrier 16 is guided with respect to the retainer 19. An elongated window opening 38 in the retainer receives a projecting part 39 formed on the upper side of the carrier 16. An indicator or pointer 40 may be mounted on the upper surface of this projecting part 39 and may coact with indicia on the comb body 10 to indicate the relative position of the blade 15 with respect to the body 10. The indicia may take the form of a series of spaced parallel ribs 41 mounted on the overlapping flange 26. The projecting part 39 on the carrier 16 may taper slightly as shown clearly in Figure 7 so that the carrier 16 does not fall out of the retainer 19 when the latter is disassembled from the comb body 10. The degree of taper is such that the parts can be initially assembled by springing and distorting the projecting part 39 and the sides of the window opening 38 to an extent sufficient for insertion of the part 39 through the window opening 38. However, inadvertent disassembly is provented. The longitudinal protuberance 30 on the carrier 16 extends through the slot 31 in the sharpened blade 15 and into the clearance recess 42 provided in the comb body 10.

In addition to being guided by the rail 36 the carrier 16 is guided for movement with respect to the comb body 10. A transverse recess 43 on the comb body receives the projecting guide 44 which extends transversely of the carrier.

The control knob 34 may be mounted in any convenient fashion for rotation on the comb body 10. As shown in the drawings a pin 45 extends transversely of the comb body and is received in axially spaced sockets 46 and 47 formed therein. The pin extends across an opening 48 which is provided in the body 10 and which receives the control knob 34. While the knob 34 may be fixed to the pin and the latter may be arranged to rotate within the sockets 46 and 47, we prefer to fix the pin 45 in the sockets 46 and 47 and to provide clearance in the bore 49 of the knob 34 so that the knob rotates relative to the pin 45.

The control knob is provided with an axially extending slot 50 in its outer periphery which is proportioned to provide clearance for the lug 24 of the retainer 19 so that the latter may be moved into the recess 28 at the time of assembly. As shown in the drawings, the slot 50 is of shallower depth than the helix groove 33 and intersects this groove only at one end. The other end of the groove 33 terminates at 51. One end of the slot 50 merges with the cylindrical surface 52 which extends angularly for a relatively short distance around the periphery of the knob 34. This cylindrical surface 52 dies out at 53 (see Figure 4). One side of this cylindrical surface 52 is bounded by the wedge surface 54 and the other by the lower face 55 of the knob 34.

The retainer 19, carrier 16 and blade 15 are insertable as a unit relative to the comb body 10. As shown in Figure 6 the retainer lug 24 passes along the axial slot 50 in the knob 34 to reach the recess 28. During the assembly operation the follower 32 of the carrier 16 enters the axial continuation 56 of the groove 33 which is in alignment with the relatively shallow slot 50. When the lower lug 24 is fully received within the recess 28 the upper lug 25 is fully received within the recess 29 and its outer surface lies flush with the comb body 10 as shown in Figure 4. The wedge surface 54 on the knob 34 contacts the upper surface of the lower lug 24 to move it fully into the recess 28 in the event that it had not reached the bottom of the recess 28 during manual assembly. As the knob 34 is turned on the pin 45 the follower 32 is caused to travel in the helical groove 33 to move the carrier 16 and blade 15 relative to the retainer 19. Turning movement of the knob 34 away from the assembly position shown in Figure 6 serves to lock the retainer 19 relative to the comb body 10. This locking function is accomplished by the lower end face 55 of the knob 34 which then overlies the extreme end of the retainer lug 24.

When it is desired to remove the blade 15 for replacement or reversal the knob 34 is rotated to move the carrier follower 32 to its fully advanced position as shown in Figure 5. Rotary movement of the knob 34 is arrested when the side face 57 of the continuation groove 56 engages the follower 32. The knob cannot be rotated beyond this point, and therefore it is not possible to inadvertently move the carrier 16 beyond the position shown in Figure 5 through rotation of the knob. When rotation of the knob 34 is thus arrested the retainer 19 may be moved manually in a direction transverse of the comb body 10 and disassembled as shown in Figure 6. The above described construction constitutes a particularly advantageous feature of our invention since it enables us to use a nonreversing drive for the carrier and blade which has a positive stop for both advancing and retracting movement and without the possibility that the various parts may be inadvertently disassembled through rotation of the knob.

We prefer to form the knob 34 with a plurality of flat sides rather than to make it of cylindrical form since the operation of the knob between the thumb and forefinger of the user is improved by the construction shown. We have found that although this has the effect of varying the depth of the helical groove 33, the follower 32 extends for a sufficient distance into the groove to avoid any disadvantageous effects.

While the particular form of comb teeth constitutes no part of our present invention, we prefer to use double teeth in the series 13 and single teeth in the series 11, 12 and 14. As shown clearly in the drawings, the series 13 of double teeth includes alternating long and short recesses 58 and 59. The long recesses 58 extend from circular apertures 60 formed in the comb body. As shown in Figure 4 one edge of the sharpened blade projects into these apertures 60 when the blade is in the fully retracted position. The top side of the retainer 19 may

be provided with relatively wide shallow grooves 61 registering with the circular apertures 60 in the comb body. A series of half round openings 62 may be provided in the lower edge of the retainer 19, and these are aligned with the shallow grooves 61 and with the circular apertures 60. As shown in Figure 3 the backside of the comb body may also be provided with shallow grooves 63 corresponding to the grooves 61 so that the two sides of the hair trimming portion of the comb are substantially identical.

Clearance grooves 64 are provided in the comb body at the base of each of the double teeth in the series 13 and extend between adjacent circular apertures 60 to provide clearance for the sharpened edge of the blade 15.

The term "nonreversing" as used in this specification and in the claims is intended to mean a drive in which the driven member is incapable of becoming a driving member and vice versa. More specifically, the term is intended to mean that the rotary element 27 cannot be driven by the follower lug or tooth 26, but it is not intended to infer by the use of the term "nonreversing" that the rotary element can be rotated in one direction only.

Having fully described our invention, it is to be understood that we do not wish to be limited to the details herein set forth, but our invention is of the full scope of the appended claims.

We claim:

1. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, means for mounting the carrier for movement relative to the comb body, cooperating parts on the comb body and carrier forming a drive for moving the carrier relative to the comb body, one of said parts including an element mounted for turning movement on the comb body, and a retainer member on the comb body held in place by said element and arranged to limit movement of the carrier.

2. In a hair trimming device, the combination of a comb body, a blade carrier mounted for sliding movement relative to the comb body, a rotary element on the comb body and a follower element on the carrier cooperating to form a nonreversible drive for moving the carrier relative to the comb body, and a retainer member on the comb body held in place by said rotary element and arranged to limit movement of the carrier.

3. In a hair trimming device, the combination of a comb body, a blade carrier having a follower element fixed thereto, a screw element mounted for rotation on the comb body and cooperating with the follower element to move the carrier on the comb body, a retainer member adapted to limit the extent of movement of the carrier, the rotary screw element and retainer member having interengaging surfaces for securing the retainer member in operative position on the comb body.

4. In a hair trimming device, the combination of a comb body, a blade carrier having a follower element fixed thereto at one end, an element mounted for rotation on the comb body having a helical groove cooperating with the follower element to move the carrier on the comb body, a retainer member adapted to limit the extent of movement of the carrier, the rotary element and retainer member having interengaging surfaces for securing the retainer member in operative position on the comb body.

5. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, a retainer cooperating with the comb body to provide a guide for the carrier, cooperating parts on the comb body and carrier forming a drive for moving the carrier relative to the comb body, one of said parts including a rotary element mounted for turning movement on the comb body, stop elements on the retainer arranged to limit movement of the carrier, and a lug on the retainer arranged to engage an end face of the rotary element to maintain the retainer against displacement relative to the comb body.

6. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, a retainer cooperating with the comb body to provide a guide for the carrier, a control knob mounted for rotation on the comb body and provided with a helical groove, a follower fixed on the carrier and received in said groove so that turning of the control knob serves to advance and retract the carrier, stop elements on the retainer arranged to limit movement of the carrier, and a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body.

7. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, a retainer cooperating with the comb body to provide a guide for the carrier, a control knob mounted for rotation on the comb body and provided with a helical groove, a follower fixed on the carrier and received in said groove so that turning of the control knob serves to advance and retract the carrier, the retainer having a window, a projection on the carrier extending through the window, and a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body.

8. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, a retainer cooperating with the comb body to enclose a major portion of said blade and to provide a guide for the carrier, a control knob mounted for rotation on the comb body at one end of the retainer and provided with a helical groove, a follower fixed on the carrier at one end and received in said groove so that turning of the knob serves to advance and retract the carrier, the retainer having a window, a projection on the carrier extending through the window, and a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body.

9. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, a retainer cooperating with the comb body to provide a guide for the carrier, a control knob mounted for rotation on the comb body and provided with a helical groove, a follower fixed on the carrier and received in said groove so that turning of the knob serves to advance and retract the carrier, the retainer having a window, a projection on the carrier extending through the window, a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body, the control knob having an axially extending slot on its periphery providing clearance for the lug during movement of the retainer to operative position on the comb body.

10. In a hair trimming device, the combination of a comb body, a carrier for a sharpened blade, a retainer transversely insertable into

operative position on the comb body to provide a guide for the carrier, a control knob mounted for rotation on the comb body and provided with a helical groove, a follower fixed on the carrier and received in said groove so that turning of the knob serves to advance and retract the carrier, the retainer having a window, a projection on the carrier extending through the window, an indicator on the projection cooperating with indicia on the comb body to provide a visual indication of the position of the blade on the comb body, a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body, the control knob having an axially extending slot in its periphery providing clearance for the lug for insertion and withdrawal of the retainer.

11. In a hair trimming device, the combination of a comb body, a blade carrier mounted for sliding movement transverse of the comb body, cooperating parts on the comb body and carrier forming a drive for moving the carrier relative to the comb body, one of said parts including a control knob mounted for turning movement on the comb body, a retainer having a window, a projection on the carrier extending through the window, a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body, the control knob having an axially extending slot on its periphery providing clearance for the lug during movement of the retainer to operative position on the comb body.

12. In a hair trimming device, the combination of a comb body, a blade carrier mounted for sliding movement transverse of the comb body, cooperating parts on the comb body and carrier forming a drive for moving the carrier relative to the comb body, one of said parts including a control knob mounted for turning movement on the comb body, a retainer having a window, a projection on the carrier extending through the window and proportioned to prevent dis-assembly of the carrier and retainer, a lug on the retainer arranged to engage an end face of the control knob to maintain the retainer against displacement relative to the comb body, the control knob having an axially extending slot on its periphery providing clearance for the lug during movement of the retainer to operative position on the comb body.

13. In a hair trimming device, the combination of a comb body, a blade carrier mounted for sliding movement transverse of the comb body, a rotary element on the comb body cooperating with an element on the carrier for moving the carrier on the comb body, a retainer insertable as a unit with the blade carrier into operative position on the comb body, a stop element on the retainer limiting relative movement of the carrier, the retainer having a lug engageable under a portion of the rotary element for maintaining the retainer in operative position, the rotary element having a slot in its periphery providing clearance for the lug when the retainer is inserted.

14. In a hair trimming device, the combination of a comb body, a blade carrier, a retainer transversely insertable with respect to the comb body to provide a guide for the carrier, a polygonal control knob mounted for rotation on the comb body and provided with a helix groove in its periphery, a follower on the carrier received in said groove so that turning movement of the control knob serves to advance and retract the carrier, the retainer having a stop element arranged to limit movement of the carrier, a lug on the retainer arranged to engage an end face on the control knob to maintain the retainer against displacement relative to the comb body, the control knob having a slot in its periphery adapted to provide clearance for the lug when the retainer is inserted to operative position.

15. In a hair trimming device, the combination of a comb body, a blade carrier, a retainer transversely insertable with respect to the comb body to provide a guide for the carrier, a polygonal control knob mounted for rotation on the comb body and provided with a relatively deep helix groove in its periphery, a follower on the carrier received in said groove so that turning movement of the control knob serves to advance and retract the carrier, the retainer having a stop element arranged to limit movement of the carrier, a lug on the retainer arranged to engage an end face on the control knob to maintain the retainer against displacement relative to the comb body, the control knob having a relatively shallow axial slot in its periphery intersecting the helix groove adapted to provide clearance for the lug when the retainer is inserted to operative position.

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