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3,552,006

POWER OPERATED SHAVER AND HAIR TRIMMER

Filed April 29, 1968

4 Sheets-Sheet 1

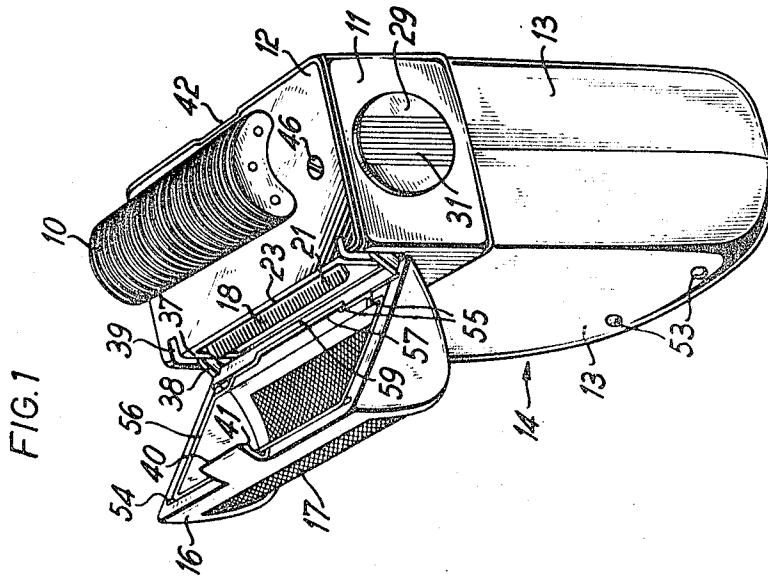


FIG. 1

FIG. 3

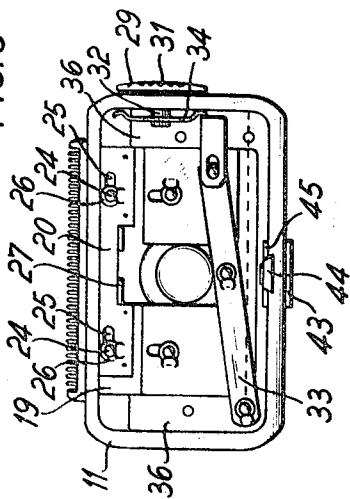
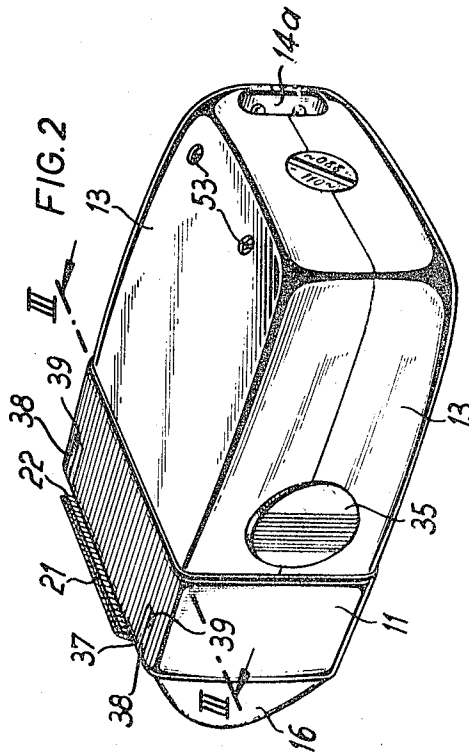


FIG. 2



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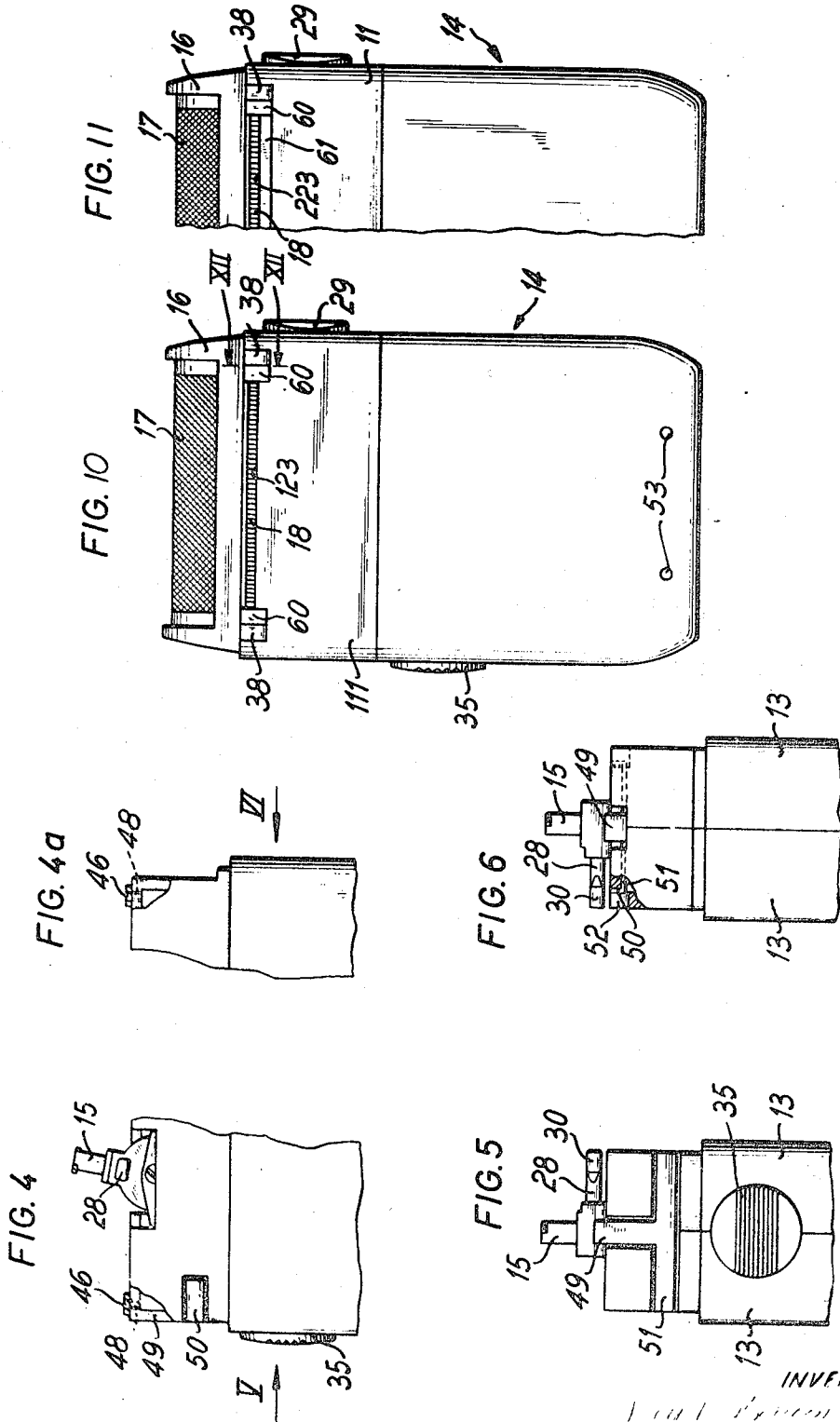
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POWER OPERATED SHAVER AND HAIR TRIMMER

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FIG. 7

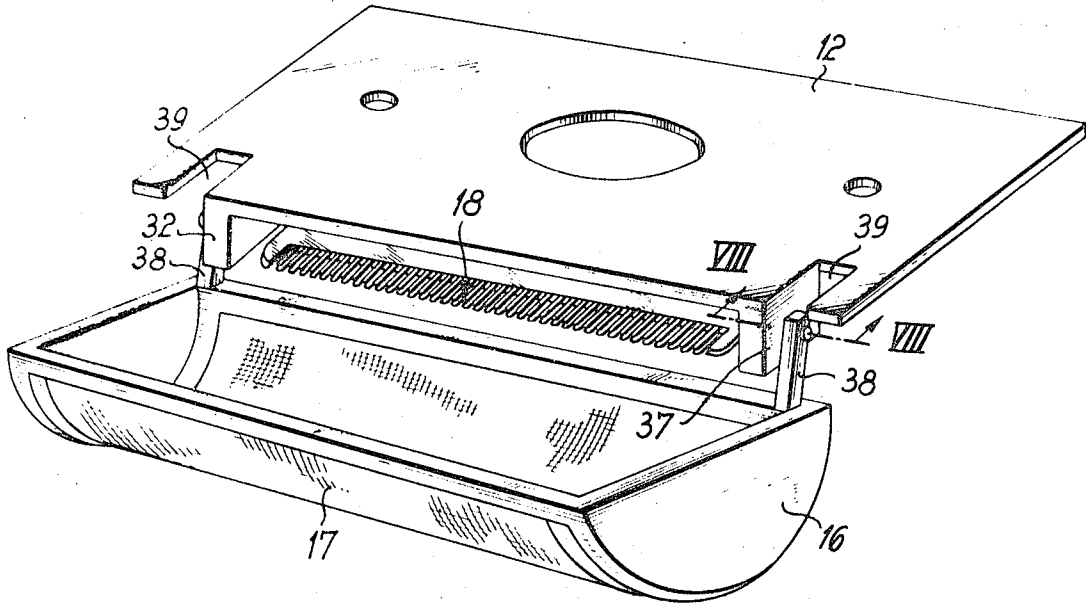
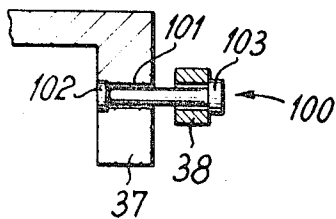


FIG. 8



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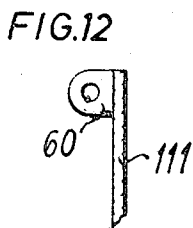
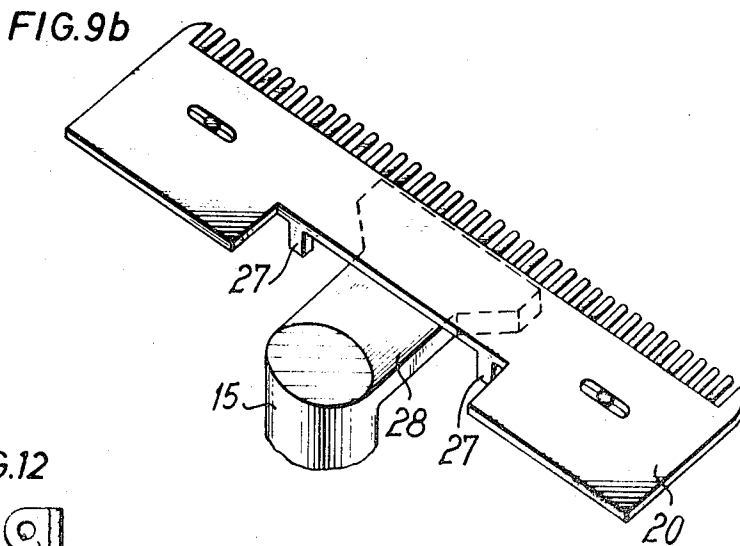
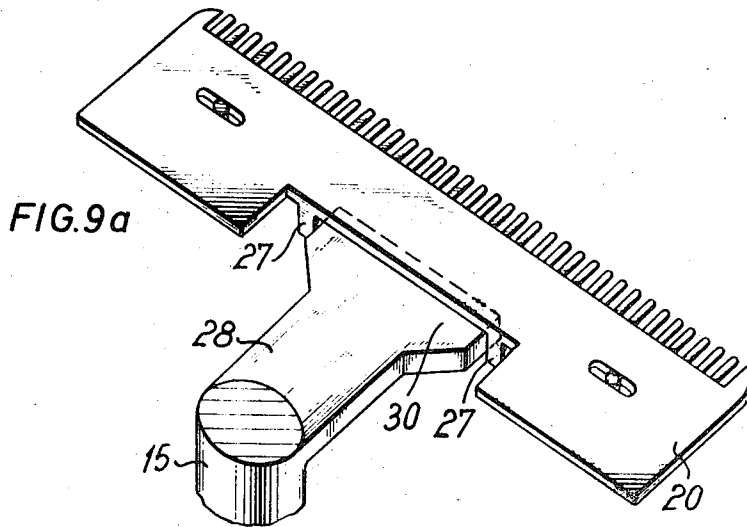
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POWER OPERATED SHAVER AND HAIR TRIMMER

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4 Sheets-Sheet 4



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3,552,006
**POWER OPERATED SHAVER AND
HAIR TRIMMER**

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15 Claims

ABSTRACT OF THE DISCLOSURE

A power operated shaver and hair trimmer wherein the casing supports the movable cutter of the dry shaver and a pivotable frame for the comb foil of the dry shaver. The hair trimmer can be extended through a lateral slot provided on or adjacent to a rectangular carrier which surrounds the head of the casing, and the slot is flanked by two bearing members which define a pivot axis for the frame.

BACKGROUND OF THE INVENTION

The present invention relates to power operated shaving and hair trimming apparatus. More particularly, the invention relates to improvements in the mounting of certain parts of the dry shaving and hair trimming units in such apparatus.

It is already known to provide a power operated shaver and hair trimmer with a frame which is movably secured to the casing and supports the perforated comb foil of the shaving unit. The casing normally comprises two narrower and two wider sides and is provided with projections at its narrower sides. The projections flank the frame for the comb foil and define a pivot axis about which the frame can turn. An advantage of such apparatus is that the frame for the comb foil need not be bodily separated from the casing for the purpose of cleaning and that it can be invariably returned to an optimum position prior to shaving. However, it is rather difficult to properly clean the comb foil, the movable cutter of the dry shaver, and certain other parts which are likely to collect severed bristles or hairs.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a novel and improved shaver and hair trimmer wherein the frame for the comb foil of the dry shaver need not be detached from the casing but is easier to clean and permits more convenient cleaning of the interior of the shaver than in heretofore known apparatus of this character.

Another object of the invention is to provide a novel mode of mounting the frame for the comb coil on the casing of a power operated shaver and hair trimmer.

A further object of the invention is to provide a power operated shaver and hair trimmer which is of simple and compact design, which can be readily taken apart and re-assembled by resorting to simple tools, and wherein the dry shaver can be used independently of the hair trimmer.

An ancillary object of the invention is to provide a novel mode of assembling the stationary parts of a power operated shaver and hair trimmer.

Briefly outlined, the improved power operated shaver and hair trimmer comprises a casing, a dry shaving unit supported by the casing and including movable cutter means and a perforated comb foil movable with reference to the cutter means between operative and inoperative positions in the first of which it overlies the cutter means

and constitutes a stationary cutter of the dry shaving unit and in the second of which it exposes the cutter means and the area around the cutter means for convenient cleaning, a frame supporting the foil for movement between operative and inoperative positions, hinge means including a pair of spaced bearing members supported by the casing and defining a pivot axis for the frame, and an elongated trimming unit supported by the casing and extending laterally between the bearing members.

The bearing members may be provided on a longitudinally extending marginal portion of a plate-like platform which overlies the head of the casing and beyond which the movable cutter means of the dry shaving unit extends. Such bearing members may be recessed into a rectangular carrier which surrounds the casing in the region adjacent to the platform or they may constitute eyes which extend beyond the carrier.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The improved apparatus itself, however, both as to its construction and its mode of operation, together with additional features and advantages thereof, will be best understood upon perusal of the following detailed description of certain specific embodiments with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an apparatus which embodies one form of the invention, the frame for the comb foil of the dry shaving unit being shown in open position;

FIG. 2 is another perspective view of the apparatus but showing the frame in closed position;

FIG. 3 is a view as seen in the direction of arrows from the line III—III of FIG. 2 but with the casing removed;

FIG. 4 is a fragmentary side elevational view of the casing, with the carrier, platform and frame removed;

FIG. 4a is a fragmentary side elevational view of a modified casing;

FIG. 5 is a view as seen in the direction of arrow V in FIG. 4;

FIG. 6 is a view as seen in the direction of arrow VI in FIG. 4a;

FIG. 7 is a perspective view showing the pivotal connection of the frame to the platform;

FIG. 8 is a cross-sectional view taken along lines VIII—VIII of FIG. 7;

FIGS. 9a and 9b are perspective views illustrating the drive for the trimming unit in engaged and disengaged positions, respectively;

FIG. 10 is a side elevational view of a slightly modified apparatus;

FIG. 11 is a fragmentary side elevational view of a further apparatus; and

FIG. 12 is a cross-sectional view taken along line XII—XII of FIG. 10.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIGS. 1 to 3, there is shown a power operated shaver and hair trimmer which comprises a casing 14 supporting a platform 12 surrounded by a rectangular carrier 11. The casing 14 comprises two separable shells 13 of synthetic plastic material. The platform 12 extends across the outer end of the carrier 11 and the latter is fitted around a hub or head of the casing 14. The interior of the casing accommodates a suitable electric motor (not shown) of known design whose construction forms no part of the present invention. The bottom wall of the casing 14 has a socket 14a which accommodates two terminals connectable to an outlet by a suitable cord, not shown. Screws 53 are provided to releasably secure the shells 13 to the housing of the motor

in the interior of the casing 14. The carrier 11 surrounds the upper portions of the shells 13 which are of reduced thickness so that the carrier need not extend beyond the general outline of the casing 14.

The actuating member 15 for the dry shaving and trimming units of the apparatus is shown in FIGS. 4, 5 and 6. This actuating member is pivotable about a transverse horizontal axis and can rock back and forth when the circuit of the motor is completed. The movements of the actuating member 15 take place in the plane of FIG. 4. The upper arm of the actuating member 15 extends upwardly through and beyond an opening in the platform 12.

The platform 12 supports a frame 16 which is hinged-ly connected thereto and carries a stationary cutter 17 of the dry shaving unit. This stationary cutter is a strip of suitably arched thin perforated metal (also called comb foil) and overlies the blades of a movable cutter 10 when the frame 16 is moved to the operative position shown in FIG. 2. The cutter 10 is coupled to the actuating member 15 and can be moved lengthwise in the space surrounded by the foil 17.

The platform 12 supports the hair trimming unit 18 of the apparatus. The trimming unit 18 comprises a first cutting member or comb 19 which is stationary when the trimming unit is in use, and a reciprocable second cutting member or comb 20 which is movable back and forth in the longitudinal direction of the platform 12. The comb 19 is mounted for sliding movement at the underside of the platform 12. When the trimming unit 18 is in use, the teeth 21, 22 of the combs 19, 20 extend through and beyond an elongated opening or slot 23 provided in the carrier 11. The comb 19 is provided with two guide pins 24 which extend into elongated slots 25 provided in the comb 20. The ends of the pins 24 carry washers 26 or like retaining elements which prevent movement of the comb 20 away from the comb 19. The inner portion of the comb 20 (i.e., that portion which is accommodated in the interior of the carrier 11) is provided with two bent-over lugs or projections 27 which can receive motion from an enlargement 30 of a portion 28 of the actuating member 15 as shown in FIG. 9a. A flat-shifting or displacing knob 29 is provided adjacent to one end wall (narrower side) of the carrier 11 and serves to move the trimming unit 18 to operative or extended or to retracted or inoperative position. When the unit 18 is retracted, the lugs 27 of the comb 20 are spaced from the enlargement or boss 30 on the portion 28 of the actuating member 15 as shown in FIG. 9b so that the latter cannot reciprocate the comb 20.

The shifting knob 29 is provided with ribs and grooves 31 which extend at right angles to the direction in which the knob must be moved in order to shift the trimming unit 18 to extended or retracted position. The inner end portion 32 of the knob 29 is received in a recess or slot of the slider 34 which is elastic and is coupled to one arm of a lever 33 which is fulcrumed on the platform 12. The other arm of the lever 33 is articulately connected with the inner portion of the comb 19. This comb is guided by ways 36 provided on the platform 12.

A flat starter knob 35 is provided on the casing 14 to control the motor. The knob 35 is located opposite the knob 29, i.e., adjacent to the other narrower side of the casing 14. This starter knob 35 is movable toward and away from the carrier 11; therefore its ribs extend at right angles to the ribs 31 on the knob 29. Otherwise, the knobs 29, 35 are of similar size and shape.

The frame 16 for the comb foil 17 is hingedly connected to the platform 12 in the following way: The platform 12 has as best shown in FIG. 7 two bearing brackets 37 which extend downwardly into two recesses 39 of the carrier 11, i.e., toward the casing 14. The frame 16 has arms or brackets 38 which can also extend into the recesses 39 of the carrier 11. The brackets 37 flank the ends

of the combs 19, 20 and their upper ends are either rigid or integral with the platform 12. In the embodiment which is shown in FIGS. 1 to 3, the bearing brackets 37 are flush with the adjoining longer wall of the carrier 11. The arms 38 can be fully accommodated in the respective recesses 39. The lower ends of the bearing brackets 37 are connected to the corresponding arms 38 by pintles 100 which extend through bores 101 in the brackets 37 into the recesses 39 and define a pivot axis for the frame 16. The pintles 100 are formed with rivet heads 102, 103 on opposite ends, which respectively secure the pintles in the bores 101 and the arms 38 on the pintles as best shown in FIG. 8.

The frame is provided with one part 40 of a detent structure which can releasably lock the foil 17 in the operative position shown in FIG. 2. The part 40 is a tongue which extends beyond the frame 16 and has a tooth 41 adapted to enter a notch 42 in the carrier 11 and to engage with a complementary tooth 44 provided on a leaf spring mounted in the interior of the carrier. A portion 43 of the leaf spring extends through an opening in the carrier 11 and can be depressed by a finger in order to disengage the tooth 44 from the tooth 41. The user is then free to pivot the frame 16 to the open position shown in FIG. 1 so that the inner side of the foil 17 and the blades of the movable cutter 10 can be readily cleaned by a brush or by blowing. The carrier 11 preferably consists of synthetic plastic material. The tooth 44 can be riveted or welded to the leaf spring or it may form an integral part of this spring. The latter is preferably of dovetailed cross-sectional outline (see FIG. 3) and is guided between blocks 45 mounted in the carrier 11 and between the internal surface of the carrier.

The anchoring means for securing the carrier 11 to the casing 14 comprises screws 46 which are recessed into the platform 12 and extend through tapped bores 48 of clamps or brackets 49 anchored in that portion of the casing 14 which is surrounded by the carrier. As shown in FIG. 4, the clamps 49 are located at the narrower sides of the apparatus and they preferably consist of suitably profiled sheet metal stock. Extensions 50 (FIGS. 4-5) of the clamps 49 are received in suitable recesses or sockets of the casing 14. The tips 51 of the extensions 50 are bent at right angles to the plans of such extensions and are received in recesses provided therefor in the side faces of the casing within the confines of the carrier 11. FIGS. 4 and 5 illustrate one mode of anchoring the clamps 49. A second mode is shown in FIGS. 4a and 6. The extensions 50, 51 of the clamps 49 shown in FIGS. 4a and 5 extend into recesses 52 provided in the internal surface of that portion of the casing 14 which is surrounded by the carrier 11. The latter is secured to the casing by way of the platform 12.

The longitudinally extending marginal portions of the foil 17 are rolled and their ends accommodate pins 54 (FIG. 1) which are received in complementary holes provided therefor in the frame 16. The foil 17 is releasably held in the frame 16 by a wire-like retainer 56 which can be moved with reference to the frame and is provided with a suitably configured portion 55 received in and turnable in a groove 57 of the frame. The turnable portion 55 is adjacent to the slot 23 in the carrier 11. The groove 57 receives only the straight centrally located part 59 of the turnable portion 55. The means for holding the part 59 in the groove 57 can include deformed or pinched portions of the material of the frame 16. That portion of the retainer 56 which is located opposite the part 59 can be held by the tongue 40 of the detent device, for example, by being snapped behind the tooth 41.

In the embodiments which are shown in FIGS. 10 and 11, the arms 38 of the frame 16 are adjacent to bearing eyes 60 best shown in FIG. 12 which extend from the carrier 11 and flank the trimming unit 18 when the latter is moved to extended position. The slot 123 in the carrier 111 is located directly below the platform 12. The ap-

paratus of FIG. 11 differs from the apparatus of FIG. 10 in that the slot 223 is defined by the platform 12 and by a ledge 61 which is integral with the platform. The underside of the ledge 61 is flush with the lower ends of the bearing eyes 60.

An important advantage of the improved apparatus is that the frame 16 is pivotable about an axis which is adjacent to one longer side of the casing 14. In this way, the foil 17 can be moved to an inoperative position (FIG. 1) in which the movable cutter 10 is fully exposed for convenient cleaning and in which the user can also reach the inner side of the foil 17 as well as the area around the movable cutter 10. Another advantage of the apparatus is that the bearing members 37 or 60 are provided on a member (platform 12) which is readily separable from the casing 14. In this way, the manufacturing cost of the casing is reduced considerably and the cost of repair is also reduced because, when the bearing members are damaged or worn, it is only necessary to replace the platform 12.

When the arms 38 of the frame 16 extend into recesses 39 of the carrier 11 in a manner as shown in FIGS. 1 to 6, the parts of the two hinges for the frame need not extend beyond the outline of the carrier 11 when the foil 17 is moved to operative position. On the other hand, the mounting of the frame 16 in a manner as shown in FIGS. 10 and 11 (wherein the bearing members 60 extend laterally beyond the carrier) renders it possible to attach or detach the frame 16 in a simpler and time-saving way.

The slot 23, 123 or 223 is just wide and long enough to permit passage of teeth 21, 22 when the trimming unit 18 is moved to extended position. This insures that the slot cannot permit entry of hairs or bristles into the space between the platform 12 and frame 16 when the foil 17 is moved to operative position.

The entire apparatus can be rapidly taken apart by resorting to simple tools. All that is necessary is to remove the screws 46 and 53. The clamps 49 need not be positively fixed to the casing 14, i.e., it suffices to insert portions of such clamps into recesses provided therefor in that part of the casing which is surrounded by the carrier 11 or 111.

The apparatus can be readily manipulated by one hand of the user. This is due to the fact that the knobs 29, 35 are mounted at the narrower sides of the casing. The manufacturing cost is reduced if the knobs 29, 35 are of identical size and shape. Flat knobs of the type shown in FIGS. 1-5, 10 and 11 occupy little room when the apparatus is stored in a bag, box or a like receptacle.

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 which fairly constitute essential characteristics of the generic and specific aspects of the above outlined contribution to the art and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. In a power operated shaver and hair trimmer, a combination comprising a casing; a shaving unit supported by said casing and including movable cutter means and a perforated foil movable with reference to said cutter means between an operative position in which it overlies said cutter means and an inoperative position in which said cutter means is exposed; a frame supporting said foil for movement between said positions; a hinge means including a pair of spaced bearing members supported by said casing and defining a pivot axis for said frame; and

an elongated trimming unit supported by said casing and extending between said bearing members.

2. A combination as defined in claim 1, wherein said frame comprises a pair of arms each adjacent to one of said bearing members and each connected to the respective bearing member for movement about said axis.

3. A combination as defined in claim 1, further comprising a platform mounted on said casing, said bearing members being provided on said platform.

4. A combination as defined in claim 3, further comprising carrier means surrounding a portion of said casing adjacent to said platform.

5. A combination as defined in claim 4, wherein said bearing members are integral with said platform and extend into recesses provided therefor in said carrier means.

6. A combination as defined in claim 5, wherein said frame comprises a pair of arms each extending into one of said recesses and connected with the respective bearing member for pivotal movement about said axis.

7. A combination as defined in claim 4, wherein said bearing members are eyes located externally of said carrier means.

8. A combination as defined in claim 4, wherein said trimming unit is movable with reference to said casing between extended and retracted positions and wherein said carrier means is provided with an elongated slot through which a portion of the trimming unit extends, at least in one of said positions thereof, the ends of said slot being adjacent to said bearing members.

9. A combination as defined in claim 3, wherein said trimming unit is movable with reference to said casing between extended and retracted positions and wherein said platform is provided with an elongated slot through which a portion of the trimming unit extends, at least in one of said positions thereof, the ends of said slot being adjacent to said bearing members.

10. A combination as defined in claim 4, further comprising anchoring means for securing said carrier means to said casing by way of said platform, said anchoring means comprising clamps mounted in said casing and threaded members connecting said platform to said clamps.

11. A combination as defined in claim 10, wherein said clamps comprise portions received in recesses provided therefor in said casing.

12. A combination as defined in claim 1, wherein said casing has two wider sides and two narrower sides and wherein said trimming unit is movable with reference to said casing, and further comprising displacing means provided at one of said narrower sides for moving said trimming unit with reference to said casing.

13. A combination as defined in claim 12, further comprising motor-driven actuating means for said units and starter means for said actuating means, said starter means being mounted at the other narrower side of said casing.

14. A combination as defined in claim 13, wherein said displacing means and said starter means comprise knobs movable with reference to the respective sides of said casing.

15. A combination as defined in claim 14, wherein said knobs are similar.

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