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(54) Cutter device particularly useful for cutting fingernails or toenails.

(57) The cutter device for cutting fingernails and toenails includes a housing (102) grippable by a user. A slot (106a) is formed in a conical end portion (106) of the housing (102) and is elongated in the circumferential direction for receiving a nail to be cut. A rotatable head (108) having an outer conical surface is rotatably mounted within the conical end portion (106) of the housing (102). A blade (110) is fixed to the rotatable head (108) and has a plurality of cutting edges extending substantially radially of the conical surface of the head (108) and perpendicularly to the slot (106a). A motor (112) within the housing (102) rotates the head (108), and the blade (110) fixed thereto, such that the cutting edges of the blade (110) are rotated substantially perpendicularly to the direction of elongation of the slot (106a) and the nail received therein.

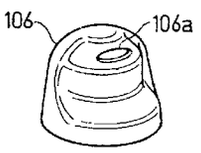
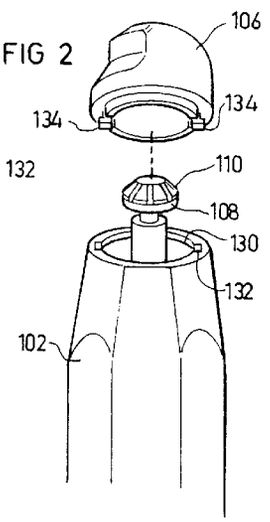


FIG 5

FIG 2



EP 0 526 386 A1

The present invention relates to improvements in the cutter device described in EP-A- 438 968.

Our above prior application discloses a cutter device particularly useful for cutting fingernails and toenails, comprising: a housing grippable by a user for holding and manipulating the device, and having a conical end portion; a slot formed in the conical end portion of the housing and elongated in the circumferential direction thereof for receiving a nail to be cut; a rotatable head having an outer conical surface rotatably mounted within, the conical end portion of the housing; a blade fixed to the rotatable head and having a cutting edge extending substantially radially of the conical surface of the head and perpendicularly to the slot; and a motor within the housing and coupled to the head to rotate the head, and the blade fixed thereto, such that the cutting edge of the blade is rotated substantially perpendicularly to the direction of elongation of the slot and the nail received therein.

In the embodiment of the invention described in that patent application, the outer conical surface of the head is formed with a radially-extending recess bordered on one side by a seat, and the blade includes a single cutting edge. The blade is fixed to the head so as to overlie the one side of the recess, with the cutting edge of the blade spaced from, and substantially parallel to, the other side of the recess.

The present application relates to an improved device having a number of advantages, as will be described more particularly below.

According to the invention of the present application, the blade is also of conical configuration conforming to the outer conical surface of the head; and the blade is formed with a plurality of radially- extending slots around its circumference, defining a plurality of cutting edges extending substantially radially of the conical surface of the blade and perpendicularly to the slot.

A cutter device constructed in accordance with the foregoing features more quickly and efficiently cuts the nails because of the provision of a plurality of cutting edges rather than a single cutting edge; moreover, the improved construction requires simpler parts which can be produced and assembled in volume and at low cost.

Further features and advantages of the invention will be apparent from the description below.

The invention is herein described, by way of exmaple only, with reference to the accompanying drawings, wherein:

Fig. 1 is a side view, with parts shown in section, illustrating one form of cutter device constructed in accordance with the present invention;

Fig. 2 is an exploded view of the end of the cutter device mounting the cutting blade;

Fig. 3 is an exploded view illustrating the cutting blade and the rotatable head to which it is mounted;

Fig. 4 is a plan view of the cutting blade; and

Fig. 5 is a plan view of the housing cover at the cutting end of the device.

The cutter device illustrated in the drawings comprises a housing, generally designated 102, comprising a main section 104, and a removable cover 106 at one end. The removable cover 106 is of generally conical configuration. The main section 104a is of generally cylindrical configuration to facilitate manually gripping and manipulating the device, but its end portion 104b, receiving the removable cover 106, is of frusto-conical configuration to provide a smooth juncture with the cover.

As shown particularly in Fig. 5, the removable cutter 106 is formed with a slot 106a elongated in the circumferential direction for receiving a nail to be cut by a cutting blade within the housing. Thus, as shown particularly in Figs. 2 and 3, the cover 106 encloses a cutter head 108 to which the cutting blade 110 is fixed. The cutter head 108 is coupled to an electric motor 112 disposed within the housing 102 and supplied by electrical batteries 114 also disposed within the housing.

The cutter head 108 is of a solid, preferably metal, construction. It includes an outer conical (or frusto-conical) surface 108a substantially conforming to the inner conical surface of cover 106. A flat surface 108b is formed centrally of conical surface 108a and includes a central cylindrical projection 108c for use in securing the cutter blade 110 to the head 108. The cutter head 108 is further formed with a cylindrical skirt section 108d and a stem 108e depending from the latter section, i.e., on the side of the cutter head opposite to that receiving the cutter blade 110.

The cutter blade 110 is formed with a conical (or frusto-conical) section 110a conforming to the conical surface 108a of the cutter head 108. Blade 110 is further formed with a flattened surface 110b engageable with flat surface 108b of the cutter'head, and with a central opening 110c for receiving projection 108c of the cutter head. Opening 110c of the blade is of non-circular (e.g., square) configuration. Thus, blade 110 is fixedly secured to the head 108 by passing projection 108c through opening 110c and then splaying the projection, e.g., by an impact implement, to spread or turn out the projection and to fill the opening 110c.

Conical section 110a of the cutter head 110 is punched out with a plurality of radially-extending slots 110d around the circumference of the blade. The opposite sides 110e of each slot 110d thus define cutting edges 110e, each separated by a recess (namely the respective slot 110d). It will thus be seen that the cutting edges 110e of the cutting blade 110 extend substantially radially of the conical surface 108a of head 108 and perpendicularly to the slot 106a formed in the cover 106 receiving the fingernail to be cut.

The cutter head 108 is coupled to the electric motor 112 by a flexible tubular coupling 120 (Fig. 1) re-

ceiving the cutter head stem 108e at one end, and the shaft 112a of the electric motor 112 at the opposite end. The flexible tubular coupling 120 passes through a plastic bushing 122 mounted within the housing 102 between motor 112 and the cutter head 108. Bushing 122a is formed with a passageway 122a for receiving the flexible tubular coupling 120, which passageway terminates at one end in an opening 122b of smaller diameter than the passageway for receiving the stem 108e of the cutter head. The opposite end of bushing 120 is formed with a disc section 122c closing the respective end of the housing so as to define a compartment 124 with the housing for receiving the nail clippings.

The end of housing 102 closed by cover 106 is formed with a circumferentially-extending rib 130 and with a pair of axially-extending slots 132 on diametrically-opposite sides of the rib 130, to define, with the rib, a bayonet-type slot for receiving a pair of bayonet-type projections 134 formed in the end of the cover 106. The cover 106 may be easily attached to the housing 102 by merely passing the projections 134 of cover 106 through slots 132 in the housing, and rotating the cover; and may be as easily removed by reversing this sequence of steps.

Housing 102 carries an electrical switch 140 which may be operated to energize motor 112 and thereby to rotate head 108, and the blade 110 carried thereby.

The illustrated cutter device is used in the following manner:

Whenever a fingernail or toenail is to be cut, electric motor 12 is energized by operation of switch 140 to rotate the cutter head 108 and the cutter blade 110. The nail to be cut is inserted into slot 106a.

As head 108 rotates, the cutting edges 110e of the cutting blade 110 move substantially perpendicularly to the direction of elongation of the slot 106a in the cover 106, and to the nail received in the slot. Accordingly, the cutting edges 110e will neatly cut the nail received in the slot. The cuttings will accumulate within compartment 124 defined by the housing 102 and the disc section 122c of the bushing 122.

Emptying the housing of the cuttings accumulated within compartment 124 may be easily done by merely rotating cover 106 to align its projections 134 with slots 132, and then removing the cover from the housing.

In the arrangement illustrated in Fig. 5, the cover 106 is formed with a single slot 106a. Accordingly, if desired, the cover may be rotated 180° to selectively position the slot on one side of the housing for use by right-hand persons, or on the opposite side for use by left-hand persons.

Claims

1. A cutter device particularly useful for cutting fingernails and toenails, comprising: a housing grippable by a user for holding and manipulating the device, and having a conical end portion; a slot formed in said conical end portion of the housing and elongated in the circumferential direction thereof for receiving a nail to be cut; a rotatable head having an outer conical surface rotatably mounted within the conical end portion of the housing; a blade fixed to said rotatable head and having a cutting edge extending substantially radially of the conical surface of the head and perpendicularly to said slot; and a motor within the housing and coupled to said head to rotate the head, and the blade fixed thereto, such that the cutting edge of the blade is rotated substantially perpendicularly to the direction of elongation of the slot and the nail received therein; characterized in that: said blade is also of conical configuration, conforming to the outer-conical surface of the head; and said blade is formed with a . plurality of radially-extending slots around its circumference, defining a plurality of cutting edges extending substantially radially of the conical surface of the blade and perpendicularly to said slot.

2. The device according to Claim 1, wherein said blade is formed with a central opening, and said conical head is formed with a central projection received within said opening and securing the blade to said head.

3. The device according to Claim 2, wherein said central opening is formed in a flat face centrally of the blade and is of non-circular configuration, and said stem projection is formed in a flat surface centrally of the head and is splayed to secure the blade to the head.

4. The device according to any one of Claims 1-3, wherein said head is formed with a central stem on the side facing away from said blade, and said head is coupled to said motor by a flexible tubular coupling having one end receiving the shaft of the motor, and the opposite end receiving said stem of the head.

5. The device according to Claim 4, further including a bushing mounted within said housing between the motor and head, said bushing having a central passageway for receiving said flexible tubular coupling and terminating in an opening of smaller diameter than the passageway for receiving said stem.

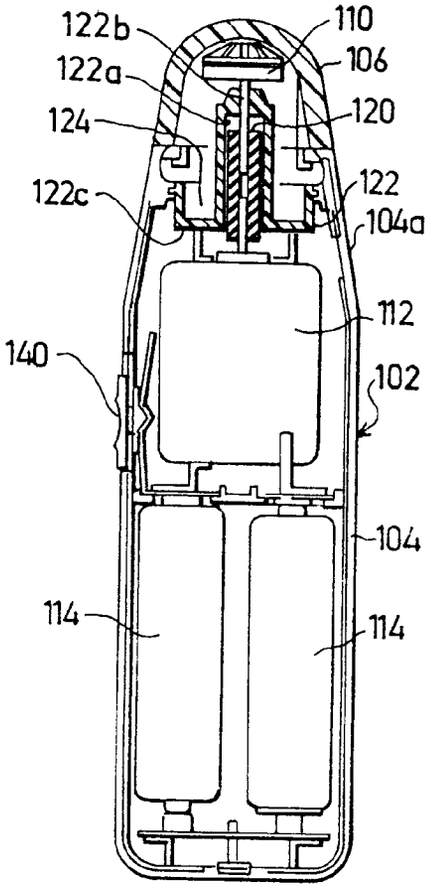
6. The device according to Claim 5, wherein said

bushing further includes a disc defining, with said housing, a compartment for receiving nail cuttings, and said conical end portion of the housing is in the form of a cover removably attached to the remainder of the housing to facilitate emptying said compartment of nail cuttings accumulated therein.

7. The device according to Claim 6, wherein said cover is formed with a single slot, the cover being rotatable 180° to selectively position the slot on one side for use by left-hand persons, or the opposite side for use by right-hand persons.

8. The device according to Claim 6, wherein said cover is formed with two slots on diametrically-opposite sides thereof, one for use by right-hand persons and the other for use by left-hand persons.

FIG 1



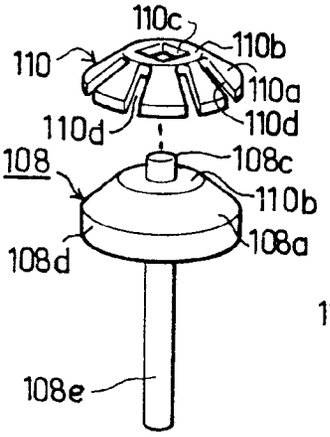


FIG 3

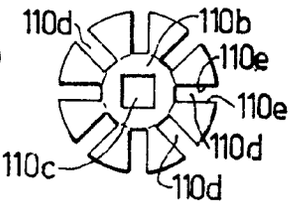
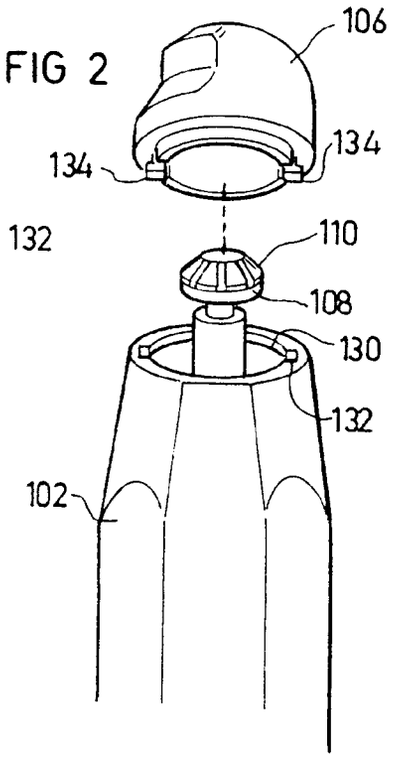


FIG 4

FIG 2



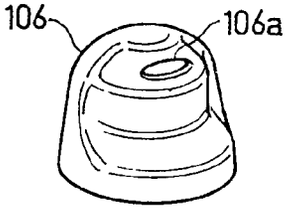


FIG 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 92 63 0066

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,P, A	EP-A-0 438 968 (DAVIDOVITZ) * the whole document *	1	A45D29/02
A	DE-U-8 616 675 (DE SANTIS) * figures 2,3,7,8 *	1	
A	DE-A-1 815 542 (GRASSMANN) * figures 3,4 *	1	
A	BE-A-814 625 (GONAY) * the whole document *	1	
A	US-A-2 532 370 (PERRIL)		
A	DE-A-1 457 446 (ALFRED PAUL)		
A	US-A-2 056 379 (ACOCELLA)		
A	FR-A-1 572 359 (GONTARD)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A45D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 OCTOBER 1992	SIGWALT C.

CATEGORY OF CITED DOCUMENTS

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