



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.10.2008 Bulletin 2008/43

(51) Int Cl.:
A45D 29/05 (2006.01)

(21) Application number: **08153456.2**

(22) Date of filing: **27.03.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(72) Inventors:
• **Tagaya, Yasuko**
Chiyoda-ku Tokyo (JP)
• **Hayashi, Kenya**
Matsumoto Nagano (JP)

(30) Priority: **29.03.2007 JP 2007087694**

(74) Representative: **Jenkins, Peter David**
Page White & Farrer
Bedford House
John Street
London WC1N 2BF (GB)

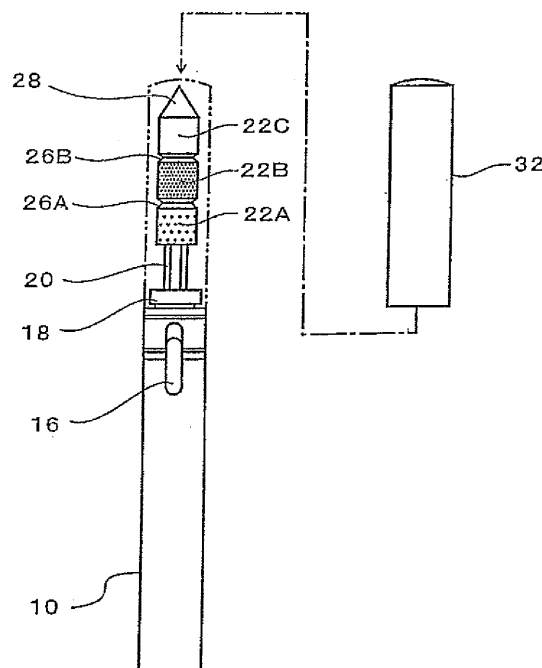
(71) Applicant: **IZUMI PRODUCTS COMPANY**
Matsumoto,
Nagano (JP)

(54) **Electric nail polisher**

(57) An electric nail polisher that includes a file member rotationally driven by a motor 14 is comprised of a substantially tube-shaped grip unit 10 for housing the motor 14 and a battery 12; a rotary shaft 20 that protrudes from the center of one end of that grip unit 10 in the longitudinal direction of the grip unit 10; three file members 26 of a fixed diameter and of different file tooth coarseness, which are closely in contact in the axial direction of that rotary shaft 20, ring-shaped V grooves 26 formed in the outer circumferences of the contact portions of adjacent file members in which file teeth of different coarseness are formed, and a conical file member 28 for nail edge finishing which protrudes from the tip end surface of the file member at the tip end.

ness, which are closely in contact in the axial direction of that rotary shaft 20, ring-shaped V grooves 26 formed in the outer circumferences of the contact portions of adjacent file members in which file teeth of different coarseness are formed, and a conical file member 28 for nail edge finishing which protrudes from the tip end surface of the file member at the tip end.

FIG. 1



Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an electric nail polisher having a file member rotated by a motor.

2. Description of the Related Art

[0002] Electric nail polishers, in which a plurality of file members of different file tooth coarseness are rotated by a motor, so that the file members are brought to contact with the fingernails or toenails, and the nails are shaped or polished, are known commonly.

[0003] Japanese Patent Application Publication (Kokoku) No. 56-39442 discloses a device in which two files (2, 3) of the same diameter are securely provided on a rotary shaft so that they are aligned in the axial direction with a groove (4) in between. In Japanese Utility Model Application Publication (Kokoku) No. 45-28330 and Japanese Utility Model Application Laid-Open (Kokai) No. 63-160707, devices in which a plurality of files having varying diameters are provided so as to be interchangeable on a rotary shaft so that they are aligned in the axial direction. In a device of Japanese Utility Model Application Laid-Open (Kokai) No. 54-58482, a ring-shaped concave groove (6) is formed in a columnar file (grindstone), so that the tip ends of nails are polished to smoothly rounded cross-sections along the cross-sectional shape of the concave groove, without variously changing the angle of contact between the grindstone and the nail.

[0004] The device of Japanese Patent Application Publication (Kokoku) No. 56-39442 has file teeth formed in the outer circumferential surface of a file member; however, since in this device, a file member end surface or groove is not used as a file, the problem is that fine nail polishing cannot be done in accordance with the nail dimensions, shape, location, or stage of polishing.

[0005] In the devices of Japanese Utility Model Application Publication (Kokoku) No. 45-28330 and Japanese Utility Model Application Laid-Open (Kokai) Nos. 63-160707 and 54-58482, it is necessary to interchange the file members among those having different file tooth coarseness depending on the nail dimensions, shape, location, or stage of polishing. As a result, not only is it necessary to have a plurality of file members on hand, but the interchanging operation is bothersome also.

BRIEF SUMMARY OF THE INVENTION

[0006] An object of this invention, devised in view of such circumstances as describe above, is to provide an electric nail polisher that is made so that nails can be subjected to various different treatments using not only the outer circumferential surface of the file member but

also the end surfaces of the file members or ring-shaped V grooves formed between adjacent file members, so that fine nail polishing can be done according to the dimensions, shape, and location of the nail or to the stage of polishing, and so that there is no necessity of such a bothersome operation as interchanging file members.

[0007] The above object is accomplished by a unique structure of the present invention for an electric nail polisher that has a file member rotationally driven by a drive means including a motor; and in the present invention, the polisher comprises: a substantially tube-shaped grip unit that houses the drive means (comprising a motor and, for example, a battery); a rotary shaft that protrudes from the center of one end of the grip unit in the longitudinal direction of the grip unit; a plurality (three) of cylindrical file members securely provided on the rotary shaft in which the file members are of a fixed diameter and of different file tooth coarseness and are in a close contact fashion in the axial direction of the rotary shaft; ring-shaped V grooves formed in the outer circumferences of the contact portions of adjacent cylindrical file members in which file teeth of different coarseness are formed; and a conical file member for nail edge finishing that protrudes from the tip end surface of the file member provided at the tip end of the rotary shaft.

[0008] In the above-described polisher of the present invention, three file members having the same diameter and of different file tooth coarseness are provided in the axial direction in a close contact fashion (or continuously), ring-shaped V grooves which open toward the outer circumferences are provided between the adjacent file members with file teeth of different coarseness formed in the V grooves, and a conical file member for nail edge finishing is provided at the tip end. As a result, fine nail polishing can be performed according to the nail dimensions, shape, location, and stage of polishing by using not only the outer circumferential surfaces of the three types of file members but also the combination of the V grooves and the conical file member for nail edge finishing.

[0009] Moreover, though the three types of file member of fixed (and same) diameter and of different coarseness and the conical file member for nail edge finishing, a total of four types of file member, are provided, the way they are used is not limited to four ways, and a sufficient number of different ways of use can be selected for ordinary use. It is, thus, not necessary to attach, detach, or change file members. In addition, because of the V grooves, the circumferential surfaces of adjacent file members are separated; as a result, when using one of three file members, there is no danger of an adjacent file member becoming a hindrance or making contact with the nail.

[0010] In the present invention, it is preferable that the file teeth of the file members be made finer, in order, from the root end of the rotary shaft to the tip end thereof. In this structure, since the file member having the coarsest file teeth is near the grip unit, it is easy to apply force to

the coarse file member; and since the file member of least coarseness (finest) file teeth is provided farthest from the grip unit, though the force applied to this fine file member may be weak, there is no problem with having such file member at the tip end, making it possible to perform fine, delicate nail care. In addition, when using the V grooves, the upper surface of the tip end edge of the nail is polished by the finer file teeth; as a result, the upper surface of the nails will be beautifully finished; and even if the lower surface of the nail tip end is filed with coarser file teeth, since the lower surface of the nail is difficult to be visually recognized, it is not problematic.

[0011] It is also preferable in the present invention that the conical file member be provided at the tip end of the file member that has the finest file teeth. In this structure, because the conical file member is a file that has fine teeth, it becomes possible to perform fine nail polishing using the tip end and conical surface thereof for nail edge finishing.

[0012] In addition, a cover can be provided so that it covers the file members. The cover is preferably made so that it has an outer diameter that is substantially the same as the diameter of the grip unit and is detachably attachable to the grip unit so as to cover the file members. As a result, when the cover is attached, the cover and grip unit are integrally and continuously connected to form a single rod shape as a whole. Accordingly, the polisher can be easily accommodated in, for instance, a bag and convenient to carry.

[0013] It is preferable that the grip unit be formed with such shape and thickness as to be easily gripped, as when holding a pen, with the fingers, and it is also preferable that the grip unit be made in a tube-shape having a cross-section that is circular, square, or hexagonal or the like.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0014]

Fig. 1 is a front view of the nail polisher according to one embodiment of the present invention.

Fig. 2 is a front view of the internal structure thereof.

Fig. 3 shows a manner of use of the polisher of the present invention for nail shaping.

Fig. 4 shows a manner of use of the polisher of the present invention for polishing the surface of a nail

DETAILED DESCRIPTION OF THE INVENTION

[0015] Fig. 1 is a front elevational view of a polisher according to one embodiment of the present invention, Fig. 2 is a front elevational view of the internal structure thereof, Fig. 3 shows a manner of use of the polisher for shaping of a nail, and Fig. 4 is a diagram showing a manner of use of the polisher for polishing the surface of a nail.

[0016] In Figs. 1 and 2, the reference numeral 10 des-

ignates a substantially cylindrical grip unit that internally accommodates a drive means comprising a power source, such as battery(s) (AAA type, for example) 12 installed in the lower part of the grip unit and a motor 14 above that. The "power source" includes an external power supply such as, for instance, a wall outlet at home, and the battery(s) 12 can be a rechargeable one(s). The grip unit 10, provided with a switch 16 for the ON/OFF control of the motor 14, has an outer diameter (approximately 1.5 cm) that is suitable for holding it with the fingers like a pen.

[0017] To the upper end of this grip unit 10, that is, into the end surface thereof on the motor 14 end, a bearing member 18 is fitted, and a rotary shaft 20 is axially supported in the center of the bearing member 18. The upper part of that rotary shaft 20 protrudes in the longitudinal direction of the grip unit 10, and the lower end of the rotary shaft 20 is connected to the drive shaft of the motor 14, so that the rotary shaft 20 is rotationally driven by the motor 14.

[0018] On the rotary shaft 20, three cylindrical file members 22 (22A, 22B, 22C) are securely provided in a close contact fashion in the axial direction. These file members 22 have the same outer diameter, and the file surfaces 24 (24A, 24B, 24C), which are of cylindrical outer surfaces, respectively, have different file tooth coarseness (roughness). More specifically, the file member 22A in the lower part (located on the grip unit 10 side) has coarse teeth and is for coarse finishing. The file member 22B in the middle part has an intermediate coarseness and is for intermediate finishing. The file member 22C in the upper part (at the tip end) has fine teeth and is for glossy finishing.

[0019] At the outer circumferences of the contact portions of the adjacent two file members 22A and 22B, and at the outer circumferences of the contact portions of the adjacent two file members 22B and 22C, respectively, ring-shaped V grooves 26 (26A, 26B) are formed. In the respective two inclined surfaces that form the V groove 26A between the two file members 22A and 22B, file teeth same as the file members 22A and 22B, respectively, are formed. In the respective two inclined surfaces that form the V groove 26B between the two file members 22B and 22C, file teeth of the file members 22B and 22C, respectively, are formed.

[0020] On the tip end surface of the file member 22C which is at the tip end of the rotary shaft 20, a conical file member 28, which is for nail edge finishing, is integrally formed. The bottom of this conical file member 28 has the same diameter as the outer diameter of the file member 22A. In other words, the tip end surface of the file member 22C is made into a conical shape to make the conical file member 28.

[0021] With the structure described above, a great variety of different nail polishing can be performed by combining the three cylindrical file members 22A, 22B, and 22C, which have different file tooth coarseness, the V grooves 26A and 26B, and the conical file member 28.

[0022] In Figs. 1 and 2, a cylindrical cover (cap) 32 is illustrated. This cover 32 has the same outer diameter as the grip unit 10, and it is mounted from the tip end of the file member 22 and is fitted onto and secured to the bearing member 18 as indicated by the imaginary lines in Fig. 1. In this condition (or when the cover 32 is fitted on the grip unit 10), the grip unit 10 and the cover 32 form an integrated rod shape which is convenient to accommodate and carry.

[0023] In the present invention, the three file members (22A, 22B and 22C), two V grooves (26A, 26B) and tip end file member (28) can be formed on a single steel bar, with this single steel bar formed thereon with file teeth of different coarseness (roughness) connected to the rotary shaft 20.

[0024] Manner of use, which is done by switching on the switch 16 and rotating the motor 14, of the nail polisher described above will be given below.

[0025] First, the way in which it is used for forming the shape of the nails (shaping) will be described with reference to Fig. 3. Fig. 3 (A) illustrates how shaping is done, with the file surface 24A of the rotating file member 22A of coarse file teeth brought lightly against the tip end of a nail 34. At this time, the fingertip end is, preferably, moved smoothly so as to draw a circular arc. Fig. 3(B) illustrates how shaping is done with the tip end of the nail 34 brought against the rotating V groove 26A. Needless to say, the other file member 22B or 22C of different tooth coarseness or the V groove 26B can also be used as appropriate.

[0026] As seen from the description above regarding the V grooves, in the respective V grooves 26A and 26B, the upper inclined surface has finer file teeth than the lower inclined surface. As a consequence, as illustrated in Fig. 3(B), when a nail tip end is placed in the rotating V groove 26, the lower surface of the tip end of the nail 34 is filed with coarser file teeth than is the upper surface thereof; and since the conspicuous upper surface of the nail is beautifully finished by the finer file teeth, there is no problem with lower surface that is less conspicuous than the upper surface.

[0027] Next, the way the surface of a nail is polished is described with reference to Fig. 4.

[0028] Fig. 4(A) illustrates the coarse finishing of the surface. More specifically, the rotary shaft 20 is oriented laterally with respect to the nail 34, the rotating file member 22A in the lower part of the polisher is used to correct irregularities in the surface of the nail 34, and vertical lines are removed. At this time, since the file member 22A that has the coarse teeth and is close to the grip unit 10, is brought to contact with the nail 34 with a strong force, vertical lines in the nail can be efficiently removed.

[0029] Fig. 4(B) illustrates intermediate finishing. More specifically, the rotary shaft 20 is oriented laterally with respect to the nail 34, and the file surface 24B of the rotating intermediate file member 22B is brought to contact with the nail 34.

[0030] Fig. 4(C) illustrates glossy finishing, where, sim-

ilarly, the file surface 24C of the rotating file member 22C having the finest file teeth is brought to contact with the nail 34. The fine-toothed file member 22C, which is for glossy finishing, does not need to be pushed against the nail with a strong force. For this reason, there is no problem with its being at the tip end of the rotary shaft 20. Thus, nails can be efficiently and beautifully finished by polishing while changing the rotating file members 22A, 22B, and 22C in the order of coarse, intermediate, and fine.

[0031] Fig. 4(D) illustrates how the file member 28 having the conical tip end is used. More specifically, when the rotating file member 28 is used, the tip end of the file member 28 is brought to contact with the edge 36 of the nail 34, and, thereby, the thin skin (cuticle or the like) of the nail edge 36 is removed. By moving the tip end of the file member 28 along the nail edge 36 or bringing the conical surface thereof to contact with, the nail edge 36 can be beautifully and efficiently treated.

[0032] Though the description above is made with the switch 16 turned on, the nail polisher of the present invention can be used without turning the switch 16 on so as to be used like manual (non-electric) nail files.

Claims

1. An electric nail polisher having a file member rotationally driven by a drive means including a motor, **characterized in that** the nail polisher comprises:

a substantially tube-shaped grip unit (10) for housing the drive means;

a rotary shaft (20) that protrudes from a center of one end of the grip unit (10) in a longitudinal direction of the grip unit (10);

a plurality of file members (22A, 22B, 22C) provided on the rotary shaft (20), the file members (22A, 22B, 22C) having a fixed diameter, of different file tooth coarseness, and in close contact in an axial direction of the rotary shaft (20);

ring-shaped V grooves (26A, 26B) formed in outer circumferences of contact portions of adjacent file members (22A, 22B, 22C) in which file teeth of different coarseness are formed; and
a conical file member (28) protruding from a tip end surface of the file member (22C) provided at a tip end of the rotary shaft (20).

2. An electric nail polisher according to claim 1, wherein the plurality of file members (22A, 22B, 22C) are provided such that file teeth thereof become finer, in order, from a root end of the rotary shaft (20) to a tip end thereof.

3. An electric nail polisher according to claim 2, wherein a tip end surface of the file member (22C) at the tip end is formed in a conical shape to make the conical

file member (28).

4. An electric nail polisher according to any one of claims 1 to 3, further comprising a cover (32) that has an outer diameter substantially the same as a diameter of the grip unit (10) and is detachably held on the grip unit (10) so as to cover the file members (22A, 22B, 22C). 5
5. An electric nail polisher according to claim 1, wherein the drive means comprises a motor (14) and a power source. 10
6. An electric nail polisher according to claim 5, wherein the power source is a battery (12) or an external power supply. 15

20

25

30

35

40

45

50

55

FIG. 1

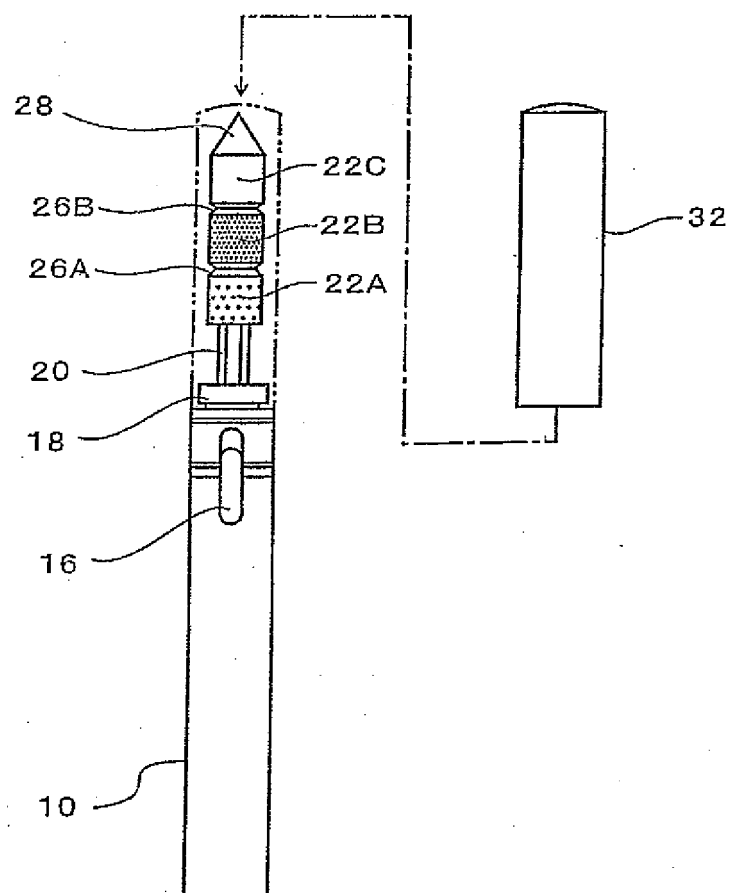


FIG. 2

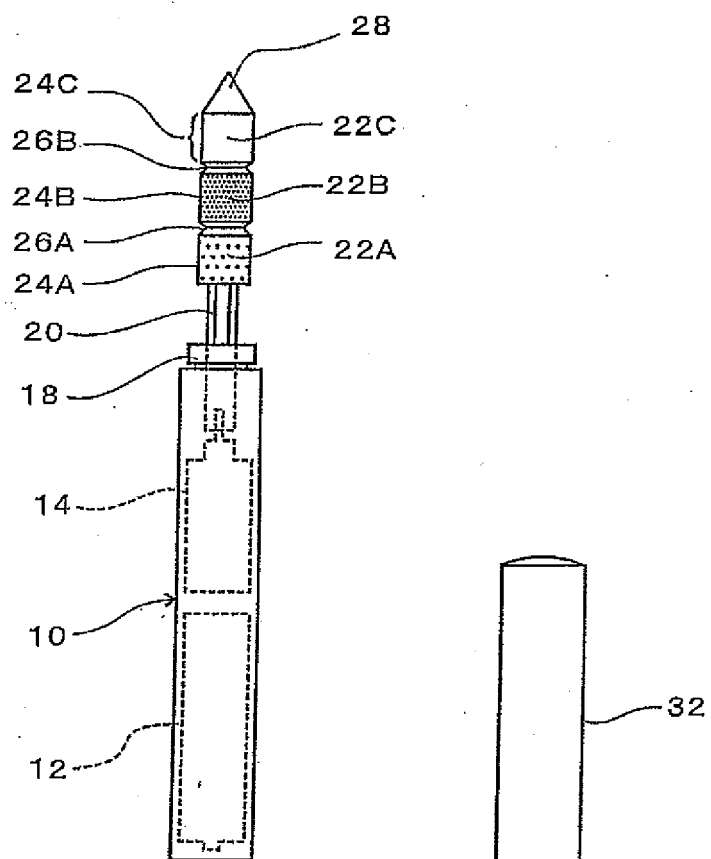
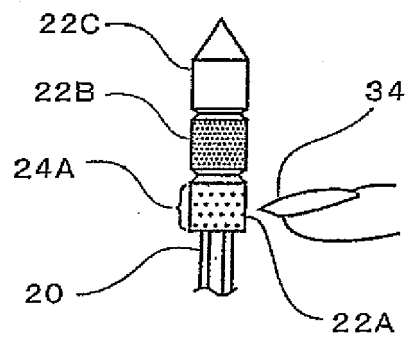


FIG. 3

(A)



(B)

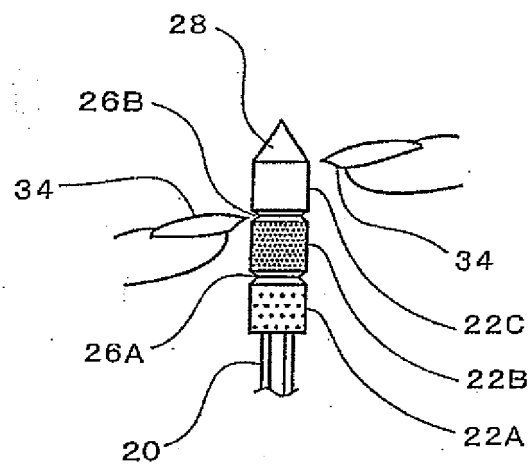
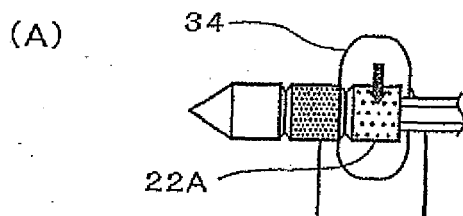
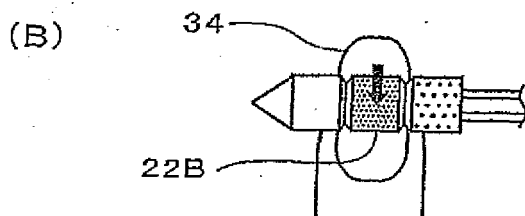


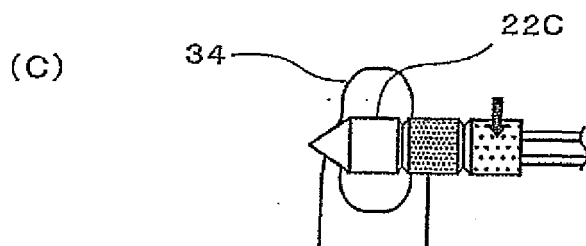
FIG. 4



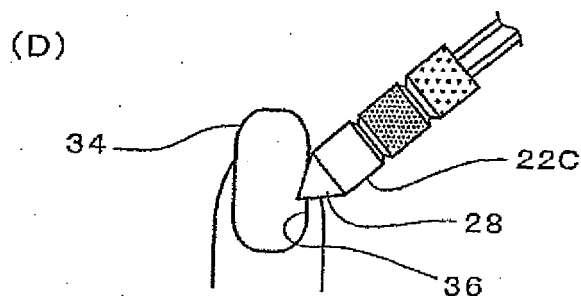
- COARSE FINISHING
USE THE LOWER PART
TO CORRECT
IRREGULARITIES
IN THE NAIL SURFACE.
REMOVE UNWANTED
VERTICAL LINES.



- INTERMEDIATE FINISHING
USE THE MIDDLE PART
TO MAKE
THE SURFACE OF THE
NAIL SMOOTH.



- GLOSSY FINISHING
USE THE UPPER PART
TO POLISH THE NAIL
SURFACE.



- NAIL EDGE FINISHING
USE THE TIP TO TREAT
PROBLEMATIC NAIL
EDGES.

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 56039442 A [0003] [0004]
- JP 4528330 B [0003] [0005]
- JP 63160707 A [0003] [0005]
- JP 54058482 A [0003] [0005]