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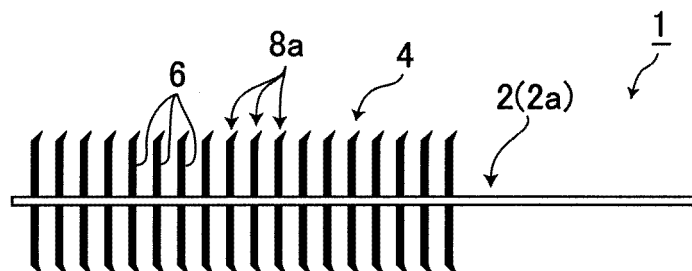
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(54) **COSMETIC BRUSH AND METHOD FOR MANUFACTURING SAME**

(57) Provided is a cosmetic brush having bristles that easily go between thin eyelashes and easily catch eyelashes when rolling up, and a manufacturing method of the same. A cosmetic brush includes an applying portion (4) formed into a substantially columnar shape as a whole in which bristles (6) are spread radially from a core wire

portion (2) evenly in a circumferential direction of the core wire portion and continued in a helicoidal fashion in an axial direction of the core wire portion (2), and tip ends of the bristles are uniformly bent at substantially the same angle forward or rearward in the axial direction of the core wire portion (2), and tapered toward tip ends.

Fig. 1



Description

Technical Field

[0001] The present invention relates to a cosmetic brush to be used to apply a cosmetic liquid such as a mascara, and a manufacturing method of the same.

Background Art

[0002] As shown in Fig. 24, a cosmetic brush 101 to be used to apply a cosmetic liquid such as a mascara is normally manufactured by pinching a number of bristles 106 between a pair of core wires 102a obtained by being folded-back, and twisting the core wires 102a. That is, the cosmetic brush 101 includes an applying portion 104 formed into a substantially columnar shape as a whole in which bristles 106 radially extend from the twisted portions of the twisted wires 102a (hereinafter, referred to as a core wire portion 102) in the circumferential direction of the twisted core wires 102, and evenly spread in a helicoidal fashion in an axial direction of the core wire portion 102.

[0003] In order to form the outer circumference of the applying portion 104 into a desired contour, after pinching the bristles 106 and twisting, the tip ends of the bristles are generally trimmed by a shearing work (Japanese Patent No. 5100985) .

[0004] However, in the state where the bristles are just sheared, the tip ends of the bristles as cut surfaces are not uniformly cut, and cracks or burrs may occur in many cases. Therefore, it is impossible to favorably apply a mascara liquid to eyelashes, and it is not preferable to use the brush with the bristle tip end portions left in this state. Therefore, a method and device of making the bristle tip end portions spherical by thermal processing (Japanese Examined Patent Application Publication No. Hei 6-51010) and a device of rounding the bristle tip ends by machining (Japanese Unexamined Patent Application Publication No. Hei 8-224127) have been proposed.

Prior Technical Publications

Patent Literatures

[0005]

Patent Literature 1: Japanese Patent Publication No. 5100985

Patent Literature 2: Japanese Examined Patent Application Publication No. Hei 6-51010

Patent Literature 3: Japanese Unexamined Patent Application Publication No. Hei 8-224127

Summary of the Invention

Problem to be Solved by the Invention

[0006] However, by the processing disclosed in Patent Literature 2 listed above, the bristle tip end portions are made to swell into spherical shapes with diameters larger than the bristle diameters, so that the bristles cannot sufficiently go between thin eyelashes and cannot be tangled in eyelashes. To the contrary, by the processing disclosed in Patent Literature 3, bristle tip end portions are rounded, so that bristles can easily go between eyelashes, however, when rolling up, the bristles cannot catch the eyelashes and cannot excellently apply a mascara liquid thereto.

[0007] Therefore, an object of the present invention is to provide a cosmetic brush that meets contradictory demands to enable bristles to easily go between thin eyelashes and easily catch eyelashes when rolling up.

Means for Solving the Problems

[0008] In order to solve the above-described problems, as Claim 1, provided is a cosmetic brush including a straight core wire portion formed of a pair of metal-made core wires helically twisted together, and an applying portion in a substantially columnar shape having a number of bristles that are pinched by the twisted portions of the core wires and spread radially and continued in a helicoidal fashion in an axial direction, wherein tip end portions of the bristles constituting the applying portion are uniformly bent at a predetermined angle forward or rearward in the axial direction of the core wire portion, and are tapered toward tip ends.

(Operations)

[0009] As a first operation, tip end portions of the bristles are tapered toward tip ends, and further, uniformly bent at substantially the same angle in substantially the same direction, so that bristles easily go between thin eyelashes.

[0010] As a second operation, the bristle tip end portions are bent forward or rearward in an axial direction of the core wire portion, so that when rolling up, the bent inside portions easily catch eyelashes. Further, the bristle tip ends are thin, so that a mascara liquid or the like applied onto eyelashes are excellently spread.

[0011] As Claim 2, provided is the cosmetic brush according to Claim 1, wherein the bent tip end portion of each of the bristles is provided with a ground surface on a side surface opposite the bent portion, and tapered toward the tip end.

(Operation)

[0012] As compared with a case where a ground surface is provided on a side surface in the same direction

as the bending direction, and a case where ground surfaces are provided on both side surfaces, a bending angle of each bristle is kept large so that the bristle can be easily tangled in eyelashes.

[0013] Further, as Claim 3, provided is the cosmetic brush according to Claim 1 or 2, wherein the applying portion has a truncated cone shape, an inverted truncated cone shape, or a columnar shape, and tip end portions of all bristles constituting the applying portion are bent and tapered toward tip ends.

(Operation)

[0014] Tip ends of all bristles constituting the applying portion are bent and tapered toward tip ends, so that the cosmetic brush can be used in a wide range and is convenient for use.

[0015] Further, as Claim 4, provided is the cosmetic brush according to Claim 1 or 2, wherein a reduced-diameter portion is provided on a tip end side of the applying portion, and tip end portions of all bristles constituting an applying portion region except for the reduced-diameter portion are bent and tapered toward tip ends.

(Operation)

[0016] A mascara liquid or the like can be applied onto eyelashes with the machined bristles on the applying portion rear end side, and eyelashes can be set with the bristles not machined on the applying portion tip end like a comb.

[0017] Further, as Claim 5, provided is a manufacturing method of a cosmetic brush, including a forming step of forming a cosmetic brush before main machining including a straight core wire portion formed of a pair of core wires and a substantially columnar applying portion having bristles spread radially from twisted portions of the core wires and continued in a helicoidal fashion by pinching a number of bristles with predetermined lengths arranged in parallel in the form of a belt by the pair of metal core wires and helically twisting the core wires, a trimming step of forming an external shape of the applying portion by trimming tip ends of the bristles constituting the applying portion, and a grinding step of machining tip end portions of the bristles constituting the applying portion into predetermined shapes by grinding the tip end portions, wherein in the grinding step, the cosmetic brush before main machining is held on a flat grinding surface of a disk-shaped grind stone so that the core wire portion of the cosmetic brush before main machining is orthogonal to a radial direction of the grind stone, and while the cosmetic brush before main machining is rotated around its central axis, a side surface of the applying portion of the cosmetic brush before main machining is relatively pressed against a grinding surface of the rotating disk-shaped grind stone, whereby bending the tip end portions of the bristles while grinding them.

(Operation)

[0018] By pressing the bristle tip end portions against the rotating disk-shaped grind stone, the bristle tip end portions are ground and thinned. Simultaneously, the bristle tip end portions are bent in a rotating direction of the disk-shaped grind stone at a portion heated to near a melting point by frictional heat (abrasive heat). In detail, since the core wire portion of the cosmetic brush before main machining and a radial direction of the disk-shaped grind stone are orthogonal to each other, the rotating direction of the grind stone and the core wire portion axial direction are almost parallel to each other, so that the bristle tip ends are subjected to a force from the grinding surface and uniformly bent in substantially the same direction, forward or rearward in parallel to the core wire portion. Portions of the bristles to be ground by the disk-shaped grind stone are only bristle tip ends at a predetermined position in the circumferential direction of the applying portion in contact with the grinding surface, however, the cosmetic brush itself before main machining rotates, and the bristles in contact with the grinding surface are successively shifted, so that without moving the cosmetic brush or the disk-shaped grind stone, the tip ends of all bristles can be uniformly machined. That is, by one process, all bristle tip end portions constituting the applying portion can be simultaneously ground and bent.

[0019] As Claim 6, provided is the manufacturing method of a cosmetic brush according to Claim 5, wherein in the trimming step, the external shape of the applying portion is formed into a truncated cone shape or an inverted truncated cone shape, and in the grinding step, while the cosmetic brush before main machining is rotated around its central axis, the cosmetic brush is inclined so that a ridge line of the truncated cone shape or inverted truncated cone shape of the applying portion becomes parallel to the grinding surface of the rotating disk-shaped grind stone, and a side surface of the applying portion is relatively pressed against the grinding surface.

(Operation)

[0020] The same machining can also be applied to the applying portion in the truncated cone shape or the inverted truncated cone shape with an inclined surface.

Effects of the Invention

[0021] With the cosmetic brush of the present invention, first, each bristle easily goes between one eyelash and another, and the applying portion is easily tangled in eyelashes, and thereby, a catch feeling is improved. Second, when rolling up, eyelashes are caught by the bent inside portions of the bristles, so that a mascara liquid can be sufficiently applied as far as the eyelash tip ends, and accordingly, feeling of use when rolling up is improved. Since the mascara liquid is excellently spread,

an effect in which clumps and bunching are prevented can also be obtained.

[0022] With the manufacturing method according to the present invention, a cosmetic brush including an applying portion formed of bristles that are uniformly bent at a predetermined angle forward or rearward in the axial direction of the core wire portion and tapered toward tip ends can be easily manufactured at low cost.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023]

Fig. 1 is a schematic view of a cosmetic brush according to a first embodiment of the present invention.

Fig. 2 is a bristle tip end enlarged view of the same brush.

Fig. 3 is a bristle tip end enlarged view of a cosmetic brush for comparison.

Fig. 4 is a bristle tip end enlarged view of a cosmetic brush for comparison.

Fig. 5 is a schematic view of a cosmetic brush according to a second embodiment of the present invention.

Fig. 6 is a schematic view of a cosmetic brush according to a third embodiment of the present invention.

Fig. 7 is a schematic view of a cosmetic brush of a modification.

Fig. 8 is a schematic view of a cosmetic brush of a modification.

Fig. 9 is a schematic view of a cosmetic brush of a modification.

Fig. 10 is an explanatory view to describe a manufacturing process of a cosmetic brush.

Fig. 11 is a schematic view of a cosmetic brush before main machining.

Fig. 12 is a plan view of a disk-shaped grind stone to describe bristle tip end portion machining.

Fig. 13 is a plan view of a disk-shaped grind stone to describe bristle tip end portion machining.

Fig. 14 is a bristle tip end enlarged view after grinding and bending.

Fig. 15 is an explanatory view of holding positions of cosmetic brushes before main machining.

Fig. 16 is a schematic view of a cosmetic brush before main machining.

Fig. 17 is a schematic view of a cosmetic brush before main machining.

Fig. 18 is a schematic view of a cosmetic brush before main machining.

Fig. 19 is a schematic view of a cosmetic brush before main machining.

Fig. 20 is a plan view of a disk-shaped grind stone to describe bristle tip end portion machining.

Fig. 21 is a front view of a disk-shaped grind stone to describe bristle tip end portion machining.

Fig. 22 is a schematic view of a cosmetic brush before main machining.

Fig. 23 is an explanatory view of holding positions of cosmetic brushes before main machining.

Fig. 24 is a front view of a conventional cosmetic brush.

Best Mode for Carrying Out the Invention

[0024] Hereinafter, embodiments of the present invention are described based on examples.

[0025] Fig. 1 is a schematic view of a cosmetic brush according to a first embodiment of the present invention.

[0026] Similarly to a conventional cosmetic brush 101, a cosmetic brush 1 according to a first embodiment of the present invention includes an applying portion 4 formed into a substantially columnar shape as a whole in which bristles 6 pinched by the core wire portion 2 extend evenly radially in the circumferential direction of the core wire portion 2 from twisted portions of twisted core wires 2a (hereinafter, referred to as a core wire portion 2), and spread in a helicoidal fashion in an axial direction of the core wire portion 2.

[0027] The cosmetic brush 1 is characterized in that bristle bent tip end portions 8a on tip ends of the bristles 6 constituting the applying portion 4 are tapered toward tip ends and bent. The bending direction is forward or rearward in the axial direction of the core wire portion 2, and the bristle bent tip end portions 8a are uniformly bent at substantially the same angle in substantially the same direction. It does not matter whether the bending direction is forward or rearward as long as the bristle bent tip end portions are uniformly bent in the same bending direction.

<Effects of the Embodiments>

[0028] Effects of the first embodiment are described.

[0029] Fig. 2 is an enlarged view of bristles 6 of a cosmetic brush 1. Fig. 3 is an enlarged view of bristles 6b for comparison, which does not have the bristle bent tip end portions 8a as a feature of the first embodiment, and are constant in thickness to tip ends and are not bent.

[0030] As shown in Fig. 2 and Fig. 3, a distance D between tip end portions of the bristles 6 is longer than a distance Db between tip end portions of the bristles 6b, and tip ends of the bristles 6 are tapered toward tips, so that eyelashes easily go between the bristles 6, and the bristles 6 can be tangled in more eyelashes. Accordingly, the catch feeling is improved.

[0031] Further, the bending direction is substantially parallel to the axis of the core wire portion 2, so that when rolling-up the cosmetic brush, eyelashes are caught by the bent portion inside portions 11, and a mascara liquid can be accordingly sufficiently applied as far as the tip ends of the eyelashes. In detail, by an offset K in the axial direction of the bristle bent tip end portion 8a, the distance between the bristles is reduced, and by this reduction, it is made difficult for eyelashes that have gone between

the bristles to come out, and further, eyelashes that try to come out from the portions between the bristles are caught by the bent portion inside portions 11. Accordingly, the eyelashes can be kept between the bristles, so that a mascara liquid can be applied as far as the tip ends of the eyelashes, and the rolling-up feeling is improved.

[0032] As described above, by the shape that makes easy for bristles to go between eyelashes and difficult to come out, feeling of use is improved.

[0033] In addition, when rolling-up, eyelashes can be held at the bent portion inside portions 11, so that an effect as an eyelash curler can also be expected. Since the tip ends of the bristles are thin, a mascara liquid or the like applied onto eyelashes are excellently spread. A mascara liquid or the like applied onto eyelashes is excellently spread, and an effect of preventing clumps and bunching is obtained.

[0034] The cosmetic brush 1 has a handle attached to a rear end of the core wire portion 2, and is used as an applicator in combination with a container containing a cosmetic liquid such as a mascara.

[0035] As a bending angle of the bristle bent tip end portions 8a, when a bending angle in a straight state is defined as 0 degrees, if the bending angle is excessively small, eyelash catching strength is weak, and if the bending angle is excessively large, it becomes difficult for the bristles to go between eyelashes. In order to obtain a well-balanced effect, the bending angle is particularly preferably set to 25 to 35 degrees.

[0036] Further, the bristle bent tip end portions 8a according to the present embodiment are described in greater detail.

[0037] Fig. 4 is a bristle enlarged view to describe effects of the present embodiment.

[0038] As shown in Fig. 4, the bristle bent tip end portions 8a of the bristles 6 according to the present embodiment are provided with ground surfaces 10 on side surfaces opposite the bending direction, and tapered toward tip ends.

[0039] The reference symbol 6 denotes a bristle 6 according to the present embodiment, and the reference symbols 6c and 6d denote a bristle 6c provided with a ground surface 10 on a side surface in the same direction as the bending direction, and a bristle 6d provided with ground surfaces on both side surfaces.

[0040] The bristle 6 of the present embodiment keeps a large bending angle so as to be easily tangled in eyelashes as compared with the bristle 6c and the bristle 6d. Accordingly, the catch feeling can be kept high.

[0041] Next, a second embodiment of the present invention is described with reference to Fig. 5.

[0042] Fig. 5 is a schematic view of a cosmetic brush 14 according to the second embodiment.

[0043] As shown in Fig. 5, the applying portion 4 of the cosmetic brush 14 has a truncated cone shape. As in the case of the above-described embodiment, the bristle bent tip end portions 8a of all bristles 6 constituting the applying portion are bent, and tapered toward tip ends.

<Effects of the Present Embodiment>

[0044] Effects of the cosmetic brush according to the second embodiment are described.

5 [0045] Since tip ends of all bristles constituting the applying portion are bent and tapered toward tip ends, the cosmetic brush can be used in a wide range, and is highly convenient for use, and improved in feeling of use.

10 [0046] In the present embodiment, the applying portion 4 has a truncated cone shape, however, it may have an inverted truncated cone shape or a columnar shape.

[0047] Further, a third embodiment of the present invention is described with reference to Fig. 6.

15 [0048] Fig. 6 is a schematic view of a cosmetic brush 15 according to the third embodiment of the present invention.

[0049] As shown in Fig. 6, the cosmetic brush 15 is characterized in that a reduced-diameter portion 21 is provided on a tip end of its applying portion 4. The applying portion 4 includes the reduced-diameter portion 21 and a base end portion 20. The configuration in which bristle bent tip end portions 8a on tip ends of the bristles 6 constituting the base end portion 20 are tapered toward tip ends and bent is the same as in the embodiments described above. A diameter of the reduced-diameter portion 21 is smaller than a diameter of the base end portion 20, and the bristle tip end portion 8 of the bristle 6 constituting the reduced-diameter portion is constant in thickness to its tip end and straight to its tip end.

20 [0050] The reduced-diameter portion 21 is reduced in diameter toward its tip end. The applying portion 4 has a bullet shape including a reduced-diameter portion 21 whose diameter is reduced and a base end portion 20 having a columnar shape.

35 <Effects of the Present Embodiment>

[0051] Effects of the cosmetic brush according to the third embodiment are described.

40 [0052] With the bristles of the base end portion 20, a mascara liquid or the like can be applied onto eyelashes as in the case of using the cosmetic brush of the embodiment described above, and with bristles provided straight to the tip end of the reduced-diameter portion 21, eyelashes can be set up as in the case of using a comb. This cosmetic brush is multi-functional and improved in convenience for use.

[0053] Modifications of the cosmetic brush according to the third embodiment are described.

50 [0054] Fig. 7 to Fig. 9 are schematic views of cosmetic brushes of modifications, and the reference symbols 16 to 18 denote cosmetic brushes of modifications.

55 [0055] As shown in Fig. 7 to Fig. 9, the diameter of the reduced-diameter portion 21 of the applying portion 4 is required to be smaller than the diameter of the base end portion 20. Like the cosmetic brush 16 shown in Fig. 7, the shape of the reduced-diameter portion 21 may be a columnar shape with a diameter smaller than the diam-

eter of the base end portion 20. Like the cosmetic brush 17 shown in Fig. 8, the shape of the reduced-diameter portion 21 may be a truncated cone shape. Like the cosmetic brush 18 shown in Fig. 9, the shape of the base end portion may be a truncated cone shape. Further, although not shown, the reduced-diameter portion may have a shape with two tiers, and the base end portion has a truncated cone shape or an inverted truncated cone shape so that its tip end portion is reduced in diameter toward the tip end. When the base end portion has an inverted truncated cone shape, the diameter of the reduced-diameter portion is required to be smaller than a diameter of an upper surface of the inverted truncated cone shape.

[0056] A preferred embodiment of a manufacturing method of a cosmetic brush having bristles described above is described.

[0057] Fig. 10 is an explanatory view to describe a manufacturing process, and Fig. 11 is a schematic view of a cosmetic brush 1a before main machining. Fig. 12 is a plan view of a rotating disk-shaped grind stone 30 to describe machining of bristle tip end portions 8, and Fig. 13 is an enlarged view of Fig. 12 viewed from the front side. Fig. 14 is a tip end enlarged view of bristles 6 after grinding and bending.

[0058] As shown in Fig. 10 and Fig. 11, the bristles 6 are cut into the same length and pinched between a pair of core wires 2a, and the core wires 2a are twisted to fix the bristles 6, and accordingly, the core wire portion 2 and the applying portion 4 are formed. Thereafter, the bristle tip end portions 8 are sheared so that the applying portion 4 is formed into a substantially columnar shape. So far, the method is the same as the conventional method. The cosmetic brush 1a before main machining is accordingly completed.

[0059] Next, the bristle tip end portions 8 of the cosmetic brush 1a before main machining are machined with a rotating disk-shaped grind stone 30.

[0060] As shown in Fig. 12 and Fig. 13, the rotation axis Y of the disk-shaped grind stone Y is orthogonal to an axial direction of the core wire portion 2 of the cosmetic brush 1a before main machining in a front side view.

[0061] As shown in Fig. 13, the cosmetic brush 1a before main machining is held so that the axial direction of the core wire portion 2 is orthogonal to a radial direction R of the disk-shaped grind stone 30 (parallel to a tangential direction of the disk-shaped grind stone 30).

[0062] While the cosmetic brush 1a before main machining is rotated around its central axis X, the applying portion 4 is relatively pressed against a flat grinding surface 31 of the grind stone. The central axis X matches the axial direction of the core wire portion 2. The applying portion 4 in contact with the grinding surface 31 of the grind stone, that is, the bristle tip end portions 8 are pressed and accordingly ground and thinned. Simultaneously, the bristle tip end portions 8 are heated to near a melting point by frictional heat (abrasive heat), and by a force applied from the grinding surface 31, the bristle

tip end portions 8 are bent in a rotating direction of the disk-shaped grind stone 30. The bristle bent tip end portions 8a are thus formed.

[0063] The axial direction of the core wire portion 2 of the cosmetic brush 1a before main machining is orthogonal to the radial direction R of the disk-shaped grind stone 30 (parallel to a tangential direction of the disk-shaped grind stone 30), and the axial direction of the core wire portion 2 and the direction of the force are almost parallel to each other, and the bristle tip end portions 8 are uniformly bent in substantially the same direction forward or rearward in the axial direction of the core wire portion 2. At this time, the rotating direction of the disk-shaped grind stone 30 must be one direction although it does not matter whether the rotating direction is counterclockwise or clockwise. That is, the bristle bent tip end portions 8 are uniformly bent in the same direction although it does not matter whether the bending direction of the bristle bent tip end portions 8a is forward or rearward in the axial direction of the core wire portion 2.

[0064] As shown in Fig. 14, ground portions 9 on either front or rear side surfaces of the bristle tip end portions 8 of the bristles 6 in the axial direction of the core wire portion 2 are ground and tapered by the disk-shaped grind stone 30, and ground surfaces 10 are accordingly formed. Simultaneously, the bristle tip end portions 8 are bent in a direction opposite the ground surfaces 10, and the bristle bent tip end portions 8a are accordingly formed. For example, when the ground surfaces 10 are on the front sides in the axial direction of the core wire portion 2, the bristle bent tip end portions 8a are bent rearward in the axial direction of the core wire portion 2. The bristle bent tip end portions 8a are tapered toward tip ends.

[0065] The bristles 6 to be ground by the disk-shaped grind stone 30 are only bristles 6 at a predetermined position in the circumferential direction of the applying portion 4 in contact with the grinding surface 31, however, the cosmetic brush 1a itself before main machining rotates around the central axis X, so that bristles in contact with the grinding surface 31 are successively shifted, and without moving the cosmetic brush 1a before main machining and the disk-shaped grind stone 30, the side surface of the applying portion 4 in contact with the grinding surface 31, that is, the bristle tip end portions 8 can be uniformly machined by one process.

[0066] The rotation around the central axis X of the cosmetic brush 1a before main machining is for shifting the portion to be machined, and it does not matter whether the rotating direction is clockwise or counterclockwise around the axis. It is also possible that the cosmetic brush is rotated clockwise and then rotated counterclockwise. By making the rotation of the cosmetic brush 1a before main machining sufficiently slower than rotation of the disk-shaped grind stone 30, an influence of the rotation of the cosmetic brush on bending and grinding in the circumferential direction becomes slight, and the bristle bent tip end portions 8a are formed by being ground and

bent in the axial direction of the core wire portion 2 mainly by rotation of the disk-shaped ground stone 30.

[0067] Fig. 15 shows an example of holding positions of the cosmetic brushes 1a before main machining. As shown in Fig. 15, a position at which the cosmetic brush 1a before machining is held may be any position on the grinding surface 31 of the disk-shaped grind stone 30 as long as the axial direction of the core wire portion 2 is orthogonal to the radial direction R of the disk-shaped grind stone 20 (parallel to a tangential direction of the disk-shaped grind stone 30). It is also possible that a plurality of cosmetic brushes are held at even intervals in the circumferential direction of the disk-shaped grind stone and machined (in Fig. 16, four cosmetic brushes are disposed in four directions by way of example), and a plurality of cosmetic brushes are arranged parallel to each other in the radial direction R and simultaneously machined. As the radius of the disk-shaped grind stone 30 increases and the machining position comes closer to the outer edge, the bending directions of the bristles can be better matched.

<Effects of the Present Embodiment>

[0068] Effects of the manufacturing method of a cosmetic brush according to the present embodiment are described.

[0069] The bristle tip end portions 8 constituting the applying portion 4 can be simultaneously ground and bent by one process, so that the number of processes is small and the machining time is short. A cosmetic brush with ground and bent tip end portions can be efficiently and easily manufactured at low cost.

[0070] Hereinafter, preferred modifications are shown.

[0071] Fig. 16 to Fig. 18 are schematic views of modifications. The reference symbols 15a to 17a denote cosmetic brushes before main machining.

[0072] The applying portion 4 is formed in the same manner as in the embodiment described above. At this time, as shown in Fig. 16, the applying portion 4 is formed into a bullet shape by a shearing work. The applying portion 4 includes a reduced-diameter portion 21 reduced in diameter and a base end portion 20 having a columnar shape, and a diameter of the reduced-diameter portion 21 is smaller than a diameter of the base end portion 20a, and the reduced-diameter portion 21 is reduced in diameter toward its tip end.

[0073] Accordingly, the cosmetic brush 15a before main machining, including the reduced-diameter portion 21, is completed.

[0074] This applying portion 4 is relatively pressed against the grinding surface 31 of the disk-shaped grind stone 30. The diameter of the reduced-diameter portion 21 is smaller than the diameter of the base end portion 20a, so that the reduced-diameter portion 21 does not come into contact with the grinding surface 31. Therefore, only bristles 6 of the base end portion 20a except for the reduced-diameter portion are bent and ground, and ac-

cordingly, bristle bent tip end portions 8a are formed.

[0075] The reduced-diameter portion 21 may have any shape as long as the diameter thereof is smaller than the diameter of the base end portion 20a. As shown in Fig. 17 and Fig. 18, the reduced-diameter portion 21 may have a columnar shape or a truncated cone shape. The same machining as described above can be applied to the base end portion 20a of the applying portion 4 including the reduced-diameter portion 21. The reduced-diameter portion 21 not machined serves as a comb.

[0076] Another embodiment of the manufacturing method is described with reference to Fig. 19 to Fig. 21.

[0077] Fig. 19 is a schematic view of the cosmetic brush 14a before main machining according to the present embodiment, Fig. 20 is a plan view of a rotating disk-shaped grind stone 30 to describe machining of bristle tip end portions 8 of the present embodiment, and Fig. 21 is an enlarged view of Fig. 20 viewed from the front side. Fig. 23 is an explanatory view of holding positions of the cosmetic brushes before main machining. Fig. 23 is a schematic view of the cosmetic brush before main machining.

[0078] The applying portion 4 is formed of bristles 6 and the core wires 2a in the same manner as in the embodiment described above. Thereafter, as shown in Fig. 19, the applying portion 4 is subjected to a shearing work so as to have a substantially truncated cone shape. Accordingly, a cosmetic brush 14a before main machining including the applying portion 4 that has a substantially truncated cone shape is completed. An inclination angle of the substantially truncated cone shape of the applying portion 4 is α .

[0079] Next, bristle tip end portions 8 of the cosmetic brush 14a before main machining are machined with a rotating disk-shaped grind stone 30.

[0080] As in the case of the embodiment described above, as shown in Fig. 20, the cosmetic brush 14a before main machining is held so that an axial direction of the core wire portion 2 is orthogonal to a radial direction R of the disk-shaped grind stone 30 (parallel to a tangential direction of the disk-shaped grind stone 30).

[0081] As shown in Fig. 21, the cosmetic brush 14a before main machining is inclined by the inclination angle α so that a ridge line of the truncated cone shape of the applying portion 4 becomes parallel to the grinding surface 31 of the rotating disk-shaped grind stone 30.

[0082] While the cosmetic brush 14a before main machining is rotated around its central axis X, the applying portion 4 is relatively pressed against the flat grinding surface 31 of the grind stone. The applying portion 4 in contact with the grinding surface 31 of the grind stone, that is, bristle tip end portions 8 are ground and thinned by being pressed.

[0083] Thus, the same machining as in the embodiment described above can also be applied to the bristle tip end portions 8 of the applying portion 4 in a truncated cone shape having an inclined surface.

[0084] The holding position of the cosmetic brush 19a

before main machining is not limited as long as the cosmetic brush is held orthogonal to the radial direction R of the disk-shaped grind stone 30, and as shown in Fig. 23, a plurality of cosmetic brushes may be disposed in the circumferential direction or a plurality of cosmetic brushes may be arranged parallel to each other.

[0085] As shown in Fig. 22, the same machining can also be applied to the cosmetic brush 18a before main machining including the reduced-diameter portion 21. In this case, bristle bent tip end portions 8a are formed only on the base end portion 20a.

<Effects of the Present Embodiment>

[0086] The same machining of bending and grinding can also be applied to the applying portion 4 in a substantially truncated cone shape having an inclination angle α , and variations on the shape of the applying portion to which the same machining can be applied increase.

[0087] In the present embodiment, the applying portion 4 having a substantially truncated cone shape is machined, and the same machining can also be applied to an applying portion 4 having a substantially inverted truncated cone shape. The same machining can also be applied to an applying portion 4 including a reduced-diameter portion and a base end portion 20a that has an inverted truncated cone shape. In this case, it is required that a diameter of the reduced-diameter portion 21 is smaller than a diameter of an upper surface of the base end portion 20a having the inverted truncated cone shape.

[0088] Embodiments and modifications of the present embodiment are described above, and the embodiments and modifications can be combined based on knowledge of a person skilled in the art, and such a mode is included in the scope of the present invention.

Description of Symbols

[0089]

- 1 Cosmetic brush
- 1a Cosmetic brush before main machining
- 2 Core wire portion
- 2a Core wire
- 4 Applying portion
- 6 Bristle
- 6b Bristle (for comparison)
- 6c Bristle (for comparison)
- 6d Bristle (for comparison)
- 8 Bristle tip end portion
- 8a Bristle bent tip end portion
- 9 Ground portion (of bristle)
- 10 Ground surface (of bristle)
- 11 (Bristle) bent portion inside portion
- 14 Cosmetic brush
- 14a Cosmetic brush before main machining
- 15 Cosmetic brush

- 15a Cosmetic brush before main machining
- 16 Cosmetic brush
- 16a Cosmetic brush before main machining
- 17 Cosmetic brush
- 17a Cosmetic brush before main machining
- 18 Cosmetic brush
- 18a Cosmetic brush before main machining
- 20 Base end portion
- 20a Base end portion (of cosmetic brush before main machining)
- 21 Reduced-diameter portion
- 30 Disk-shaped grind stone
- 31 Grinding surface (of disk-shaped grind stone)
- 101 Conventional cosmetic brush
- 102 Core wire portion
- 102a Core wire
- 104 Applying portion
- 106 Bristle
- Db Distance between bristle tip end portions
- D Distance between bristle tip end portions
- K Projection amount (offset) of bent portion
- R Radial direction (of disk-shaped grind stone)
- X Central axis of cosmetic brush before main machining
- Y Rotation axis of disk-shaped grind stone
- α Inclination angle of applying portion having truncated cone shape

Claims

1. A cosmetic brush comprising:

a straight core wire portion formed of a pair of metal-made core wires helically twisted together; and
an applying portion in a substantially columnar shape having a number of bristles that are pinched by the twisted portions of the core wires and spread radially and continued in a helicoidal fashion in an axial direction, wherein
tip end portions of the bristles constituting the applying portion are uniformly bent at a predetermined angle forward or rearward in the axial direction of the core wire portion, and are tapered toward tip ends.

2. The cosmetic brush according to Claim 1, wherein the bent tip end portion of each of the bristles is provided with a ground surface on a side surface opposite the bent portion, and tapered toward the tip end.

3. The cosmetic brush according to Claim 1 or 2, wherein the applying portion has a truncated cone shape, an inverted truncated cone shape, or a columnar shape, and tip end portions of all bristles constituting the applying portion are bent and tapered toward tip

ends.

of the applying portion is relatively pressed against the grinding surface.

4. The cosmetic brush according to Claim 1 or 2, wherein
 - a reduced-diameter portion is provided on a tip end side of the applying portion, and tip end portions of all bristles constituting an applying portion region except for the reduced-diameter portion are bent and tapered toward tip ends.
5. A manufacturing method of a cosmetic brush, comprising:
 - a forming step of forming a cosmetic brush before main machining including a straight core wire portion formed of a pair of core wires and a substantially columnar applying portion having bristles spread radially from twisted portions of the core wires and continued in a helicoidal fashion by pinching a number of bristles with predetermined lengths arranged in parallel in the form of a belt by the pair of metal core wires and helically twisting the core wires;
 - a trimming step of forming an external shape of the applying portion by trimming tip ends of the bristles constituting the applying portion; and
 - a grinding step of machining tip end portions of the bristles constituting the applying portion into predetermined shapes by grinding the tip end portions, wherein
 - in the grinding step,
 - the cosmetic brush before main machining is held on a flat grinding surface of a disk-shaped grind stone so that the core wire portion of the cosmetic brush before main machining is orthogonal to a radial direction of the grind stone, and
 - while the cosmetic brush before main machining is rotated around its central axis, a side surface of the applying portion of the cosmetic brush before main machining is relatively pressed against a grinding surface of the rotating disk-shaped grind stone, whereby bending the tip end portions of the bristles while grinding them.
6. The manufacturing method of a cosmetic brush according to Claim 5, wherein
 - in the trimming step, the external shape of the applying portion is formed into a substantially truncated cone shape or a substantially inverted truncated cone shape, and
 - in the grinding step, while the cosmetic brush before main machining is rotated around its central axis, the cosmetic brush is inclined so that a ridge line of the substantially truncated cone shape or substantially inverted truncated cone shape of the applying portion becomes parallel to the grinding surface of the rotating disk-shaped grind stone, and a side surface

Fig. 1

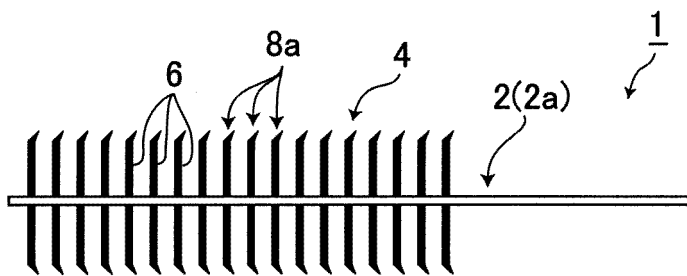


Fig. 2

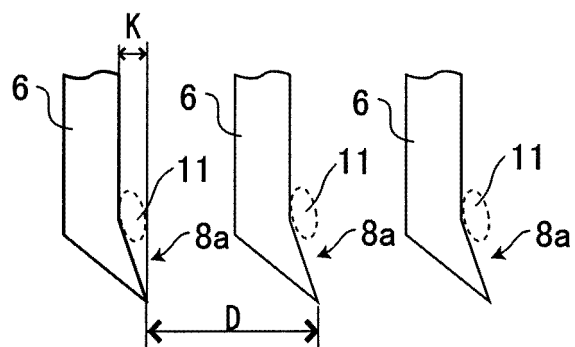


Fig. 3

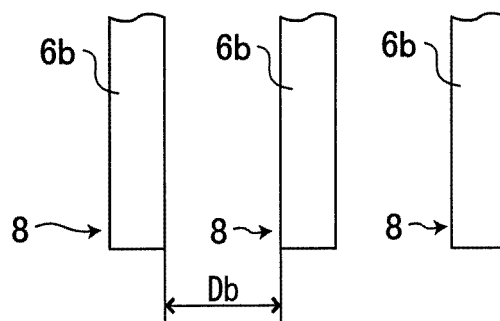


Fig. 4

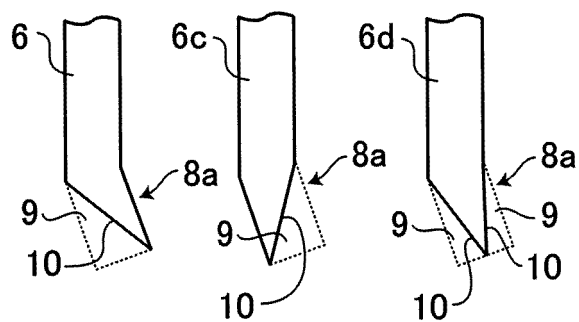


Fig. 5

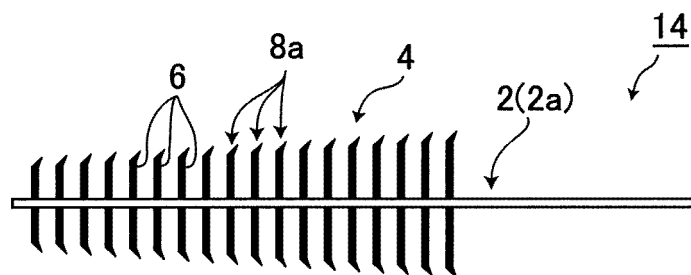


Fig. 6

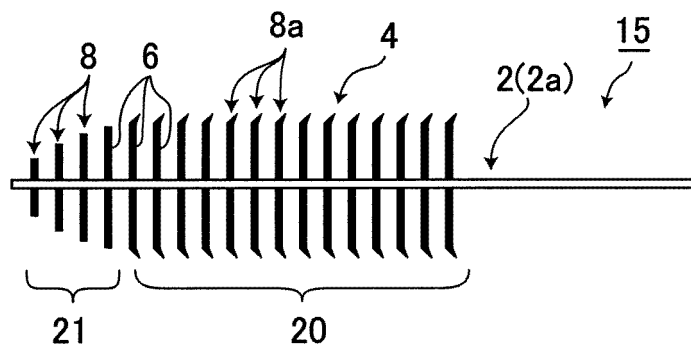


Fig. 7

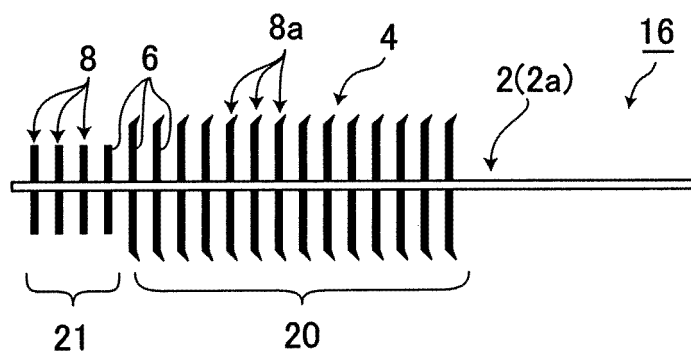


Fig. 8

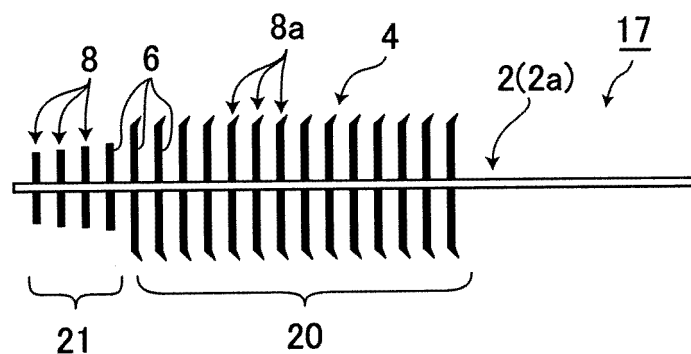


Fig. 9

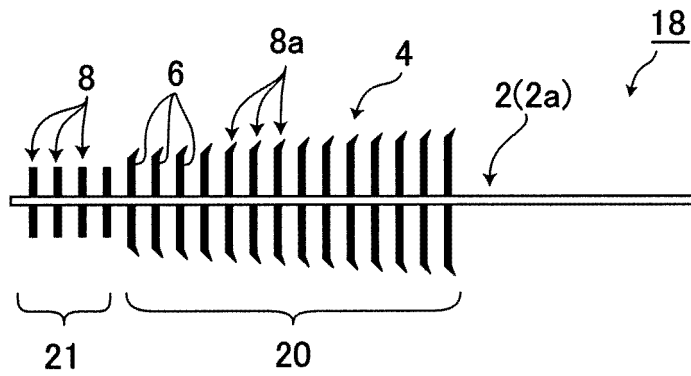


Fig. 10

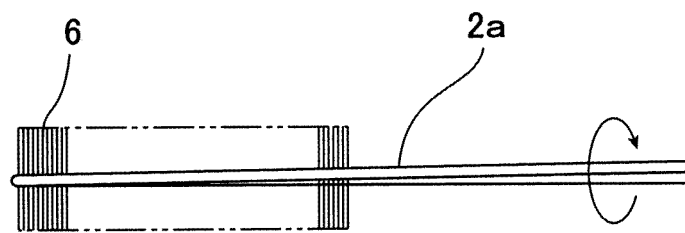


Fig. 11

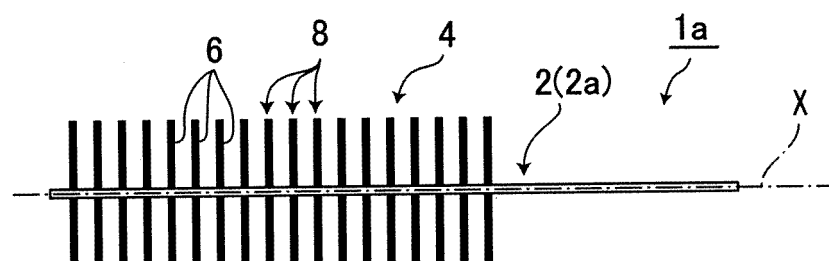


Fig. 12

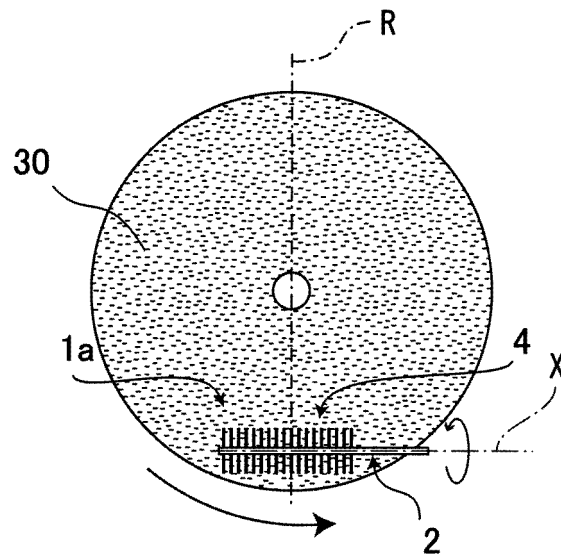


Fig. 13

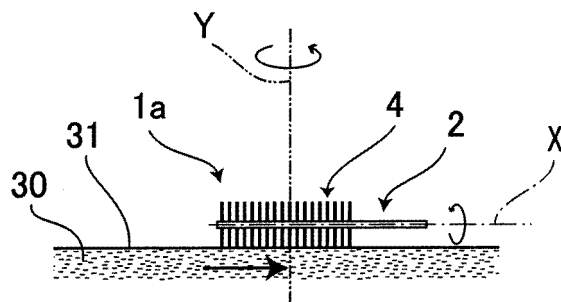


Fig. 14

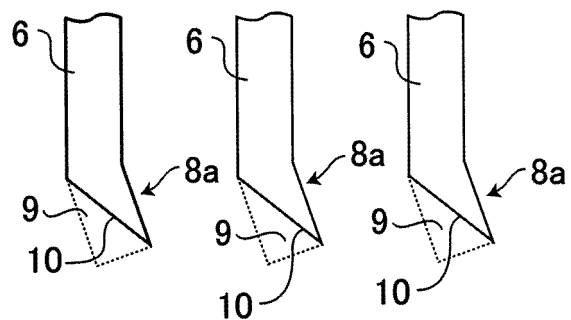


Fig. 15

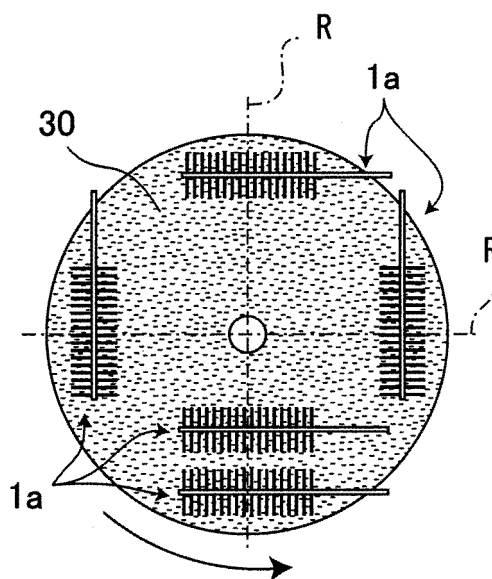


Fig. 16

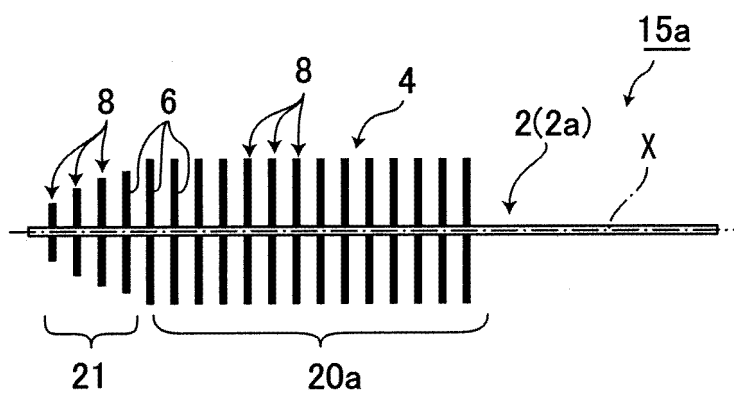


Fig. 17

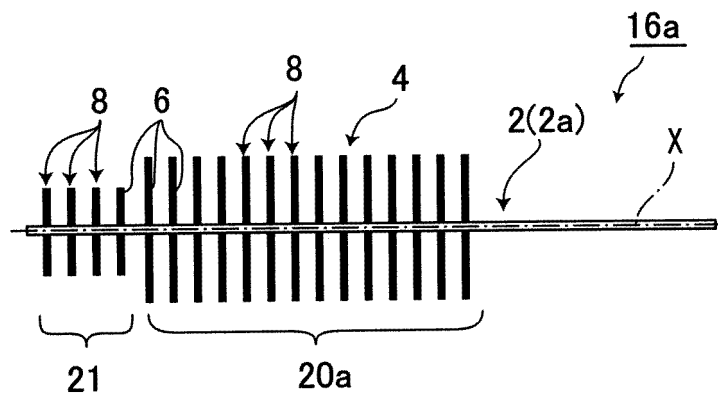


Fig. 18

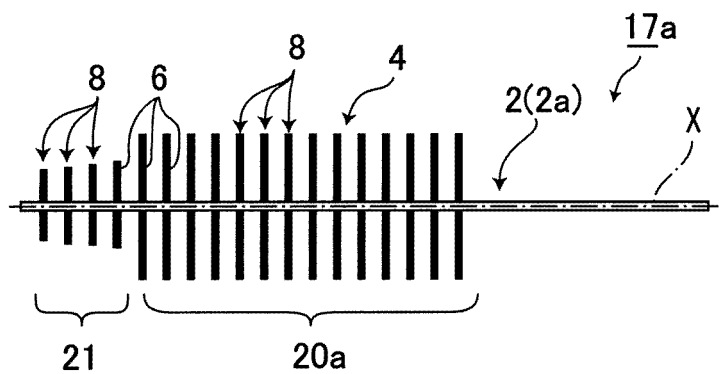


Fig. 19

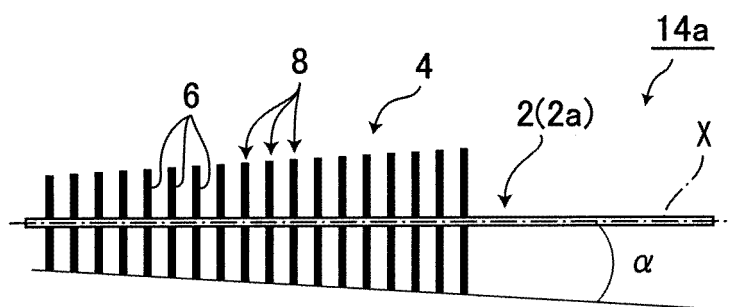


Fig. 20

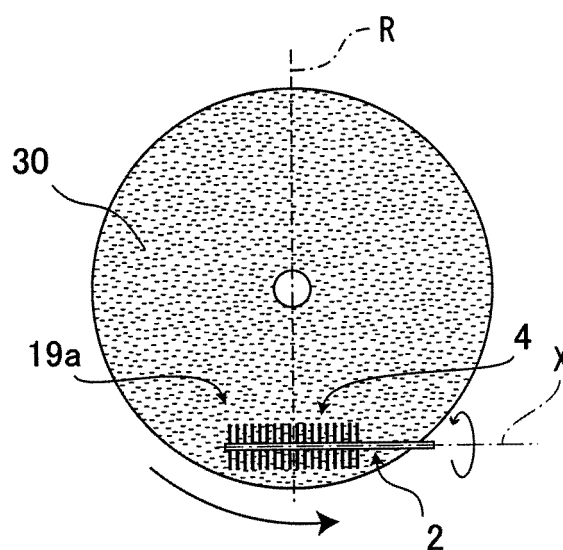


Fig. 21

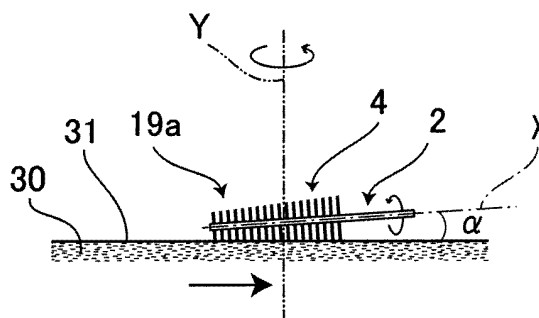


Fig. 22

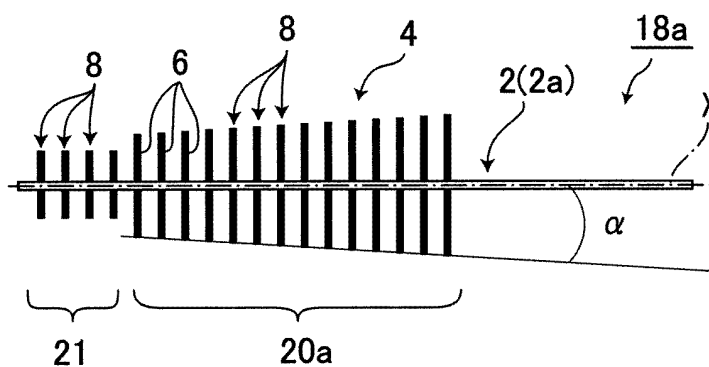


Fig. 23

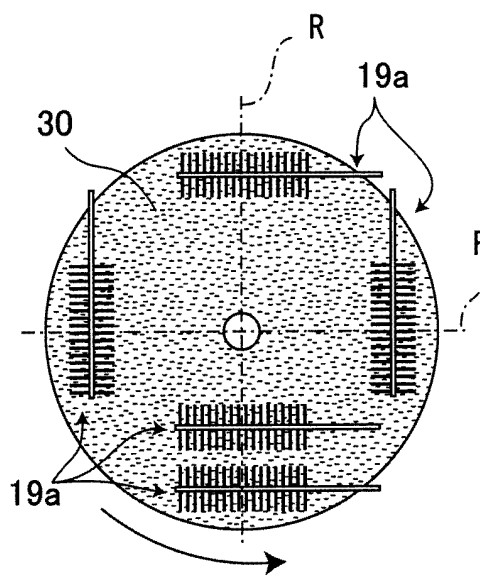
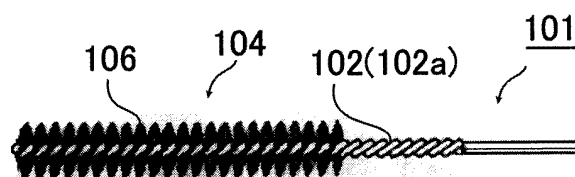


Fig. 24



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2016/068515

A. CLASSIFICATION OF SUBJECT MATTER

A45D34/04(2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A45D34/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2016

Kokai Jitsuyo Shinan Koho 1971-2016 Toroku Jitsuyo Shinan Koho 1994-2016

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	JP 2008-307304 A (Tokyo Parts Kabushiki Kaisha), 25 December 2008 (25.12.2008), paragraphs [0005], [0016] to [0017], [0021], [0025] to [0026], [0032], [0034]; fig. 6, 9, 12 (Family: none)	1, 3 2, 4 5-6
Y A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 53282/1979(Laid-open No. 152133/1980) (Kaneka Corp.), 01 November 1980 (01.11.1980), pages 1 to 4; fig. 1 to 3 (Family: none)	2, 4 5-6

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search
12 September 2016 (12.09.16)Date of mailing of the international search report
20 September 2016 (20.09.16)Name and mailing address of the ISA/
Japan Patent Office
3-4-3, Kasumigaseki, Chiyoda-ku,
Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2016/068515

C (Continuation).	DOCUMENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2009-291344 A (Tokyo Parts Kabushiki Kaisha), 17 December 2009 (17.12.2009), paragraph [0037]; fig. 18(b) & US 2010/0154928 A1 & WO 2008/156111 A1 & CN 101686897 A & KR 10-2010-0023797 A	4
A	JP 2001-299455 A (Taihei Kogyo Co., Ltd.), 30 October 2001 (30.10.2001), paragraphs [0018] to [0019]; fig. 4 (Family: none)	5, 6

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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- JP HEI8224127 B [0004] [0005]