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(54) **COSMETIC BRUSH UNIT**

(57) The invention relates to a cosmetic brush unit (1) comprising a bristle carrier (2) in the form of at least two twisted wires (3) holding a plurality of filaments (4) clamped so that each filament (4) forms outwardly extending bristles (4) constituting a brush, characterised in that the bristles (4) preferably have a diameter in the range 0. 076 mm to 0.3556 mm and wherein the bristles (4) are divided into several preferably at least four bristle fingers (5) in the region of their free distal ends.

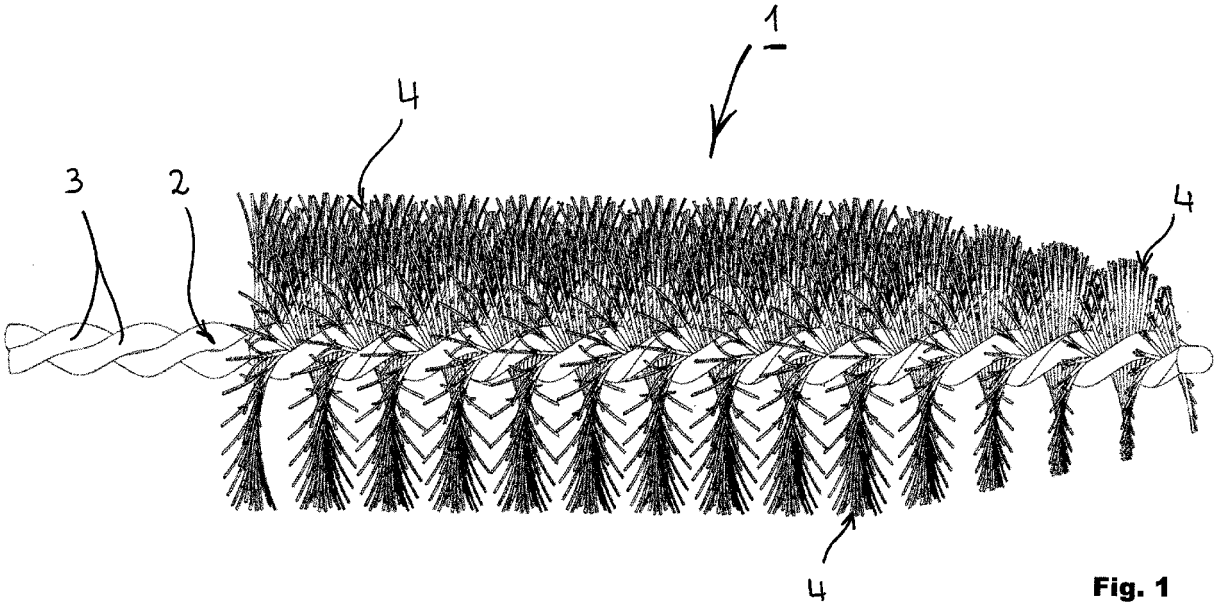

Fig. 1

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Description

[0001] The invention relates to a cosmetic brush unit comprising a bristle carrier according to the generic portion of claim 1, and to a cosmetic applicator comprising in most cases a stem and in all cases a corresponding cosmetic brush unit according to the generic portion of claim 11, and to a method of manufacturing the cosmetic brush unit according to the generic portion of claim 12.

TECHNICAL BACKGROUND

[0002] Cosmetic brush units are part of a cosmetic applicator and are used to apply make-up and care products, which is referred to collectively as "make-up" below. To do this, the bristles are first wetted with the make-up. The make-up is then applied to the desired area with the help of the bristles. In the case of an eyelash brush, the bristles are first dipped into a container of mascara. Then, mostly after wiping the bristle covering, the eyelashes are mascaraed using the bristles residually wetted with mascara. To do this, the cosmetic brush unit is brought into contact with the eyelashes with rotating and stroking movements.

STATE OF THE ART

[0003] Typically, cosmetic brush units designed as eyelash brushes can be divided into two categories that differ in the arrangement and material of their bristles.

[0004] Some have relatively many thin and soft bristles and are used to distribute mascara as evenly as possible on the lashes. Bristles with a low stiffness are advantageous for this. The bristles wetted with mascara then penetrate the spaces between the individual lashes when pressed against them, instead of pushing the lashes away. This distributes the make-up evenly along the lash line and makes the lashes appear more voluminous.

[0005] The other category of cosmetic brush units designed as eyelash brushes have fewer and especially stiffer bristles. They are used to make the eyelashes look longer. For this purpose, the bristles wetted with mascara are pressed against the base of the lashes in the area of the eyelid and then moved towards the free end of the lashes under constant pressure against the lashes. This straightens the lashes so that their free end is brought to a greater distance from the eyelid. This makes the lashes appear longer.

[0006] However, to achieve both effects in the best way possible, both cosmetic brush units have to be used, which is cumbersome and tedious.

THE PROBLEM UNDERLYING THE INVENTION

[0007] In view of this, it is the object of the invention to provide a cosmetic brush unit with which the spaces between eyelashes can be evenly wetted with mascara and at the same time the eyelashes can be straightened.

THE SOLUTION ACCORDING TO THE INVENTION

[0008] According to the invention, this is solved with the features of the main claim directed to the cosmetic brush unit.

[0009] Accordingly, the solution to the problem is provided by a cosmetic brush unit having a bristle carrier in the form of at least two twisted wires. The twisted wires hold a plurality of filaments. These are clamped in such a way that each filament forms bristles extending outwards, preferably substantially radially. The bristles constitute a brush. The solution according to the invention is characterised in that the bristles - measured where their cross-section is monolithic and not divided - preferably have a diameter in the range from 0.076 mm to 0.3556 mm. All or at least some, preferably at least the majority of the bristles are divided into at least two, preferably at least four bristle fingers in the area of their free distal ends. Ideally the majority of the bristles shows not more than five bristle fingers.

[0010] Due to this shape of the bristles, the material of the filaments forming the bristles can be selected in such a way that when the bristles wetted with mascara are pressed against the eyelashes, the bristles are only slightly deflected in the area of their monolithic cross-section. The mascara-wetted bristles can then be pressed against the eyelashes in the area of the eyelid in such a way that the eyelashes are deflected in the direction of the eyelid. If the bristles are then moved towards the free end of the eyelashes under constant pressure, this leads to a straightening of the eyelashes. This makes the eyelashes appear longer.

[0011] The individual bristle fingers in the area of the free distal ends of the bristles, on the other hand, are deflected due to their reduced diameter in such a way that they penetrate into the spaces between the individual lashes. In addition, the reduced diameter of the bristle fingers facilitates their penetration into the spaces between the individual lashes. This ensures that the mascara is evenly applied to the spaces between the lashes. This makes the lashes appear more voluminous.

[0012] The term "filament" means a textile fibre and in particular a plastic fibre whose length exceeds its diameter by at least a factor of 10.

[0013] The term bristle finger refers to a region of a bristle that has a reduced resultant diameter and shares only a common root with the other bristle fingers of a bristle, but is not connected to the other bristle fingers in the region of its free end.

A FURTHER PROBLEM UNDERLYING THE INVENTION

[0014] Furthermore, it is the object of the invention to provide a cosmetic applicator with which the spaces between eyelashes can be evenly wetted with mascara and at the same time the eyelashes can be straightened.

THE FURTHER SOLUTION ACCORDING TO THE INVENTION

[0015] The solution to the aforementioned problem is provided by a cosmetic applicator with a handle and an inventive cosmetic brush unit as disclosed before. The cosmetic applicator is characterised in that a handle preferably adjoins the stem usually in the form of a closure cap for a cosmetic storage container.

[0016] To apply make-up, the cosmetic brush unit of the cosmetic applicator is first dipped into a cosmetic supply container so that the brushes of the cosmetic brush unit are evenly wetted with make-up. The cosmetic brush unit is then moved to the area where the make-up is to be applied. The cosmetic applicator is held by its handle.

A FURTHER PROBLEM UNDERLYING THE INVENTION

[0017] It is further the object of the invention to provide a method of manufacturing a cosmetic brush unit according to the invention.

THE FURTHER SOLUTION ACCORDING TO THE INVENTION

[0018] The solution to the above problem is provided by an inventive method of manufacturing the cosmetic brush comprising the steps of: a) first arranging the bristles between at least two wires; b) then twisting the at least two wires so that a portion of the bristles is held between the at least two twisted wires; c) then the tips of the bristles are beaten using a special striking tool preferably in the shape of a rotating wire brush, i. e. a brush carrying bristle covering formed bristles consisting of metal wires so that preferably each tip of the bristles is divided into at least two better at least four cross-sectional segments which are separated from each other in the region of their free ends and form at least four bristle fingers. The bristle covering of the rotating wire brush preferably has the shape of a cylinder, at least essentially.

[0019] This method of production allows the cosmetic brush unit, which combines the two categories of eyelash brushes described above, to be manufactured with little effort.

PREFERRED EMBODIMENTS

[0020] There are a number of ways in which the invention can be designed to further improve its effectiveness and usefulness.

[0021] Thus, it is particularly preferred that the at least four bristle fingers make up at least 10% of the total length of the bristle to which they belong. Even better, the bristle fingers make up at least 20% of the total length of the bristle to which they belong. This is clearly preferred but shorter bristle fingers could be a matter of choice for some particular applications, too.

[0022] This ensures that the bristle fingers have a noticeably lower stiffness compared to the rest of the bristle section.

[0023] Another preferred embodiment is that the at least four bristle fingers extend above their root side by side in diverging directions. In this case, the bristle fingers are separated from each other by essentially V-shaped gaps.

[0024] This leads to the bristle fingers having a very low stiffness in the area of their free ends. Towards the root, the stiffness of the bristle fingers increases continuously.

[0025] This means that the bristle fingers are only deflected in the area of the free ends when the bristles are pressed against the eyelashes. If, on the other hand, the bristle fingers had the same stiffness along their entire length, this would possibly result in the bristle fingers not penetrating into the spaces between the lashes, but merely bridging over the spaces between several lashes.

[0026] In another preferred embodiment, the bristle fingers are grouped around a free central space. The cross-section of the free central space increases continuously, often essentially conically, in the direction of the distal end.

[0027] When the cosmetic brush unit is dipped into the make-up container, make-up enters the free centre space. The make-up is held there until the bristles come into contact with the eyelashes. The free central space thus serves as a reservoir for the make-up and its transportation. This has the advantage that the cosmetic brush unit does not have to be immersed so frequently in the make-up container and yet there is always enough make-up on the bristles.

[0028] Ideally, each bristle finger is stiff enough to essentially return to its original position after being deflected by a more than insignificant load.

[0029] Each bristle finger behaves like an elastic bristle. This prevents the individual bristle fingers from sticking or catching on each other. In addition, a certain stiffness of the bristle fingers prevents the bristle fingers from bridging over the spaces between several eyelashes when they are pressed against the eyelashes, instead of penetrating into the spaces.

[0030] The term "deflection due to a more than insignificant load" means in particular the deflection of the bristle fingers that occurs when the bristles are pressed against the eyelashes.

[0031] In another preferred embodiment, each bristle finger bears a beard of a plurality of substantially limp strands at its distal end.

[0032] With the help of the beard, which consists of a multitude of essentially limp strands, the make-up applied to the lashes with help of the bristles is spread evenly along the lashes.

[0033] The term "essentially slack" describes the property of the material not to return to its original position on its own after being deflected by a more than insignificant

load.

[0034] In another preferred embodiment, each bristle finger has a substantially rounded lateral surface portion. This lateral surface portion is mostly continuously convex in the circumferential direction. In addition, each bristle finger has two substantially non-circular lateral surface portions. These are preferably substantially straight. The substantially straight lateral surface portions meet along a line. In the direction of the substantially rounded lateral surface section, the substantially rounded lateral surface sections diverge or diverge from each other. Preferably, said lateral surface sections together form the entire lateral surface.

[0035] The cross-sectional area of the individual bristle fingers thus forms a pie-cut-like geometry.

[0036] The edge of each bristle finger formed in this way enables the bristle finger to penetrate the space between two lashes like a wedge. In this way, the lateral surfaces of the individual lashes adjacent to the respective gap are ideally coated with make-up.

[0037] Ideally, the bristles are made of or contain a polymeric material. This is ideally polyamide.

[0038] The choice of polyamide as the material for the bristles makes it possible to produce the bristles as fibres by melt spinning. This allows the bristles to be mass-produced at low cost.

[0039] Ideally, the bristles have a Shore D hardness in the range of 55 to 85 and preferably from 70 to 85. The Shore D Hardness measurements should be performed according to the standards ASTM D2240, ISO 868.

[0040] This allows the cuts - being mandatory or at least recommended to form the bristle fingers - to be made easily and the bristles still have sufficient hardness for the intended use. Preferably, the at least two twisted wires are made of stainless steel. Each of the at least two twisted wires has a diameter in the range of at least 0.4 mm to preferably 0.9 mm.

[0041] The good formability of stainless steels enables cost-effective production. The corrosion resistance also ensures a long service life of the cosmetic brush unit. With the diameters mentioned, the bristle carrier formed by the twisted wires has a relatively small overall diameter. This is advantageous for the manageability of the cosmetic brush unit or the cosmetic applicator during make-up application.

FIGURE LIST

[0042]

Fig. 1 shows a side view of a whole cosmetic brush unit according to the invention.

Fig. 2 shows an enlarged partial view of the cosmetic brush unit shown in Fig. 1.

Fig. 3 shows the bristle fingers of a single bristle in side view.

Fig. 4 shows a top view of the bristle shown in Fig. 3.

PREFERRED EMBODIMENT

[0043] The mode of operation of the invention is described by way of example using Figures 1 to 4. For reasons of clarity, the bristles 4 and the surface sections 9 and 10 of the bristle fingers 5 are only given reference signs as examples.

[0044] Fig. 1 shows a side view of a cosmetic brush unit 1 according to the invention. The cosmetic brush unit 1 is formed by the bristles 4 and the bristle carrier 2 carrying the bristles 4.

[0045] The bristle carrier 2 consists of two wires 3 twisted together. The bristles 4 are held on the bristle carrier 2 by being clamped between the twisted wires 3. For this purpose, the bristles 4 were placed between the two wires 3 before the twisting of the wires 3 and held there during the twisting process. The free ends of the bristles 4 protrude in a radial direction from the bristle carrier 2. The bristles 4 have a constant length over approximately two thirds of the length of the bristle carrier 2, so that in this area a cylindrical bristle set or a cylindrical brush section may result. In the area of the last third of the bristle carrier 2, the length of the bristles 4 can continuously be reduced. In this area, the result is then a truncated pyramid-like bristle trim or truncated pyramid-like brush section.

[0046] In the region of a certain axial axis section of the bristle carrier 2, the bristles 4 are not arranged uniformly around the bristle carrier 2 in the circumferential direction. Rather, the bristles 4 are arranged helically around the longitudinal axis of the bristle carrier 2.

[0047] The bristle carrier 2 protrudes at one end beyond the bristle set formed by the bristles 4, i.e. is not occupied by bristles 4 along a section. This section of the bristle carrier 2 serves to connect the cosmetic brush unit to a handle of a cosmetic applicator, see Figure 1.

[0048] Fig. 2 shows an enlarged partial view of the cosmetic brush unit from Fig. 1. This clearly shows how the individual bristles 4 are clamped between the twisted wires 3. In addition to fixing the bristles 4 to the bristle carrier 2 by means of the clamping force resulting from the twisting of the wires 3, the bristles 4 can also be glued to one of the wires 3 before twisting.

[0049] Figs. 3 and 4 show a more detailed view to the free end of a single bristle 4 as shown by Fig. 2. The bristle 4 is shown in Fig. 3 more or less in side view and in Fig. 4 essentially in top view.

[0050] Fig. 3 and in particular Fig. 4 show the bristle fingers 5 of the bristle 4. Each of the four bristle fingers 5 has a quarter-circle cross-section. The lateral surface of the individual bristle fingers 5 thus consists of a rounded, essentially circular arc-shaped lateral surface section 9 and - here - two essentially flat lateral surface sections 10. The two essentially or more or less flat lateral surface sections 10 meet along a straight line and thus form an edge on the bristle finger 5.

[0051] Between the edges of the individual bristle fin-

gers 5 formed in this way is a free central space 6 with a circular cross-section. The diameter of the free central space 6 decreases, in most cases continuously, from the free end of the bristle fingers 5 to the value 0, so that the bristle fingers 5 merge into each other or into the bristle 4. The area where the bristle fingers 5 merge into the bristle 4 forms the root 7 of the individual bristle fingers 5.

[0052] There is a gap 11 between each two facing, essentially flat lateral surface sections 10 of two bristle fingers 5. The gap thickness of the gap 11, measured orthogonally to the essentially flat lateral surface sections 10, also decreases continuously from the free end of the bristle fingers 5 to the root 7 to the value 0. This results in a V-shaped geometry of the gap 11 in the side view of the bristle 4.

[0053] A beard 8 is also attached to the free ends of each bristle finger 5, which consists of a plurality of individual strands of the bristle finger 5, see Fig. 3, while Fig. 4 shows the status after removal of the beards 8.

REFERENCE LIST

[0054]

1	cosmetic brush unit
2	bristle carrier
3	wire / twisted wire
4	filaments/ bristles
5	bristle finger
6	free or central space of the bristle fingers
7	root of the bristle fingers
8	beard of a bristle finger
9	rounded mantle surface section of a bristle finger
10	out-of-round mantle surface sections of a bristle finger / flat lateral surface sections
11	V-shaped gap

Claims

1. A cosmetic brush unit (1) comprising a bristle carrier (2) in the form of at least two twisted wires (3) holding a plurality of filaments (4) clamped so that each filament (4) forms outwardly extending bristles (4) constituting a brush, **characterised in that** the bristles (4) preferably have a diameter in the range 0. 076 mm to 0.3556 mm and wherein the bristles (4) are divided into several preferably at least four bristle fingers (5) in the region of their free distal ends.

2. Cosmetic brush unit (1) according to claim 1, **characterised in that** the said several bristle fingers (5) represent at least 10%, preferably at least 20%, of the total length of the bristle (4) to which they belong.

3. Cosmetic brush unit (1) according to claim 1 or 2, **characterised in that** the at least four bristle fingers (5) above their root (7), separated from each other by substantially V-shaped gaps (11), extend side by side in diverging directions.

4. Cosmetic brush unit (1) according to one of the preceding claims, **characterised in that** the bristle fingers (5) are grouped around a free central space (6), the cross-section of which increases continuously in the direction of the distal end.

5. Cosmetic brush unit (1) according to any one of the preceding claims, **characterised in that** each bristle finger (5) is stiff enough to substantially return to its initial position after being deflected by a more than insignificant load.

6. A cosmetic brush unit (1) according to any one of the preceding claims, **characterised in that** each bristle finger (5) carries at its distal end a beard (8) of a plurality of essentially slack strands.

7. Cosmetic brush unit (1) according to any one of the preceding claims, **characterised in that** each bristle finger (5) has a substantially rounded, mostly continuously convex in circumferential direction, mantle surface portion (9) and two substantially non-circular, preferably substantially straight, mantle surface portions (10) which meet along a line and diverge towards the substantially rounded mantle surface portion (9), said mantle surface portions (9, 10) preferably together forming the entire mantle surface.

8. Cosmetic brush unit (1) according to one of the preceding claims, **characterised in that** the bristles (4) consist of or contain a polymeric material, ideally polyamide.

9. Cosmetic brush unit (1) according to one of the preceding claims, **characterised in that** the bristles (4) have a Shore D hardness in the range from 55 to 85 and more prferrd in the range from 70 to 85.

10. A cosmetic brush unit (1) according to any one of the preceding claims, **characterised in that** said at least two twisted wires (3) are made of stainless steel and wherein each of said at least two twisted wires (3) has a diameter in the range of 0.40 mm to 0.90 mm.

11. Cosmetic applicator with a handle and a cosmetic brush unit (1) according to one of the preceding claims, **characterised in that** the handle is preferably adjoined by a grip, usually in the form of a closure cap for a cosmetic storage container.

12. A method of manufacturing the cosmetic brush unit (1) according to any one of claims 1 to 10, comprising the steps of: a) arranging the bristles (4) between at least two wires (3), b) twisting the at least two wires

(3) so that a part of the bristles (4) is held between the at least two twisted wires (3), c) cutting the tips of the bristles (4) with a knife so that each tip of the bristles (4) is divided into at least four cross-sectional segments separated from each other in the region of their free ends and forming at least four bristle fingers (5).

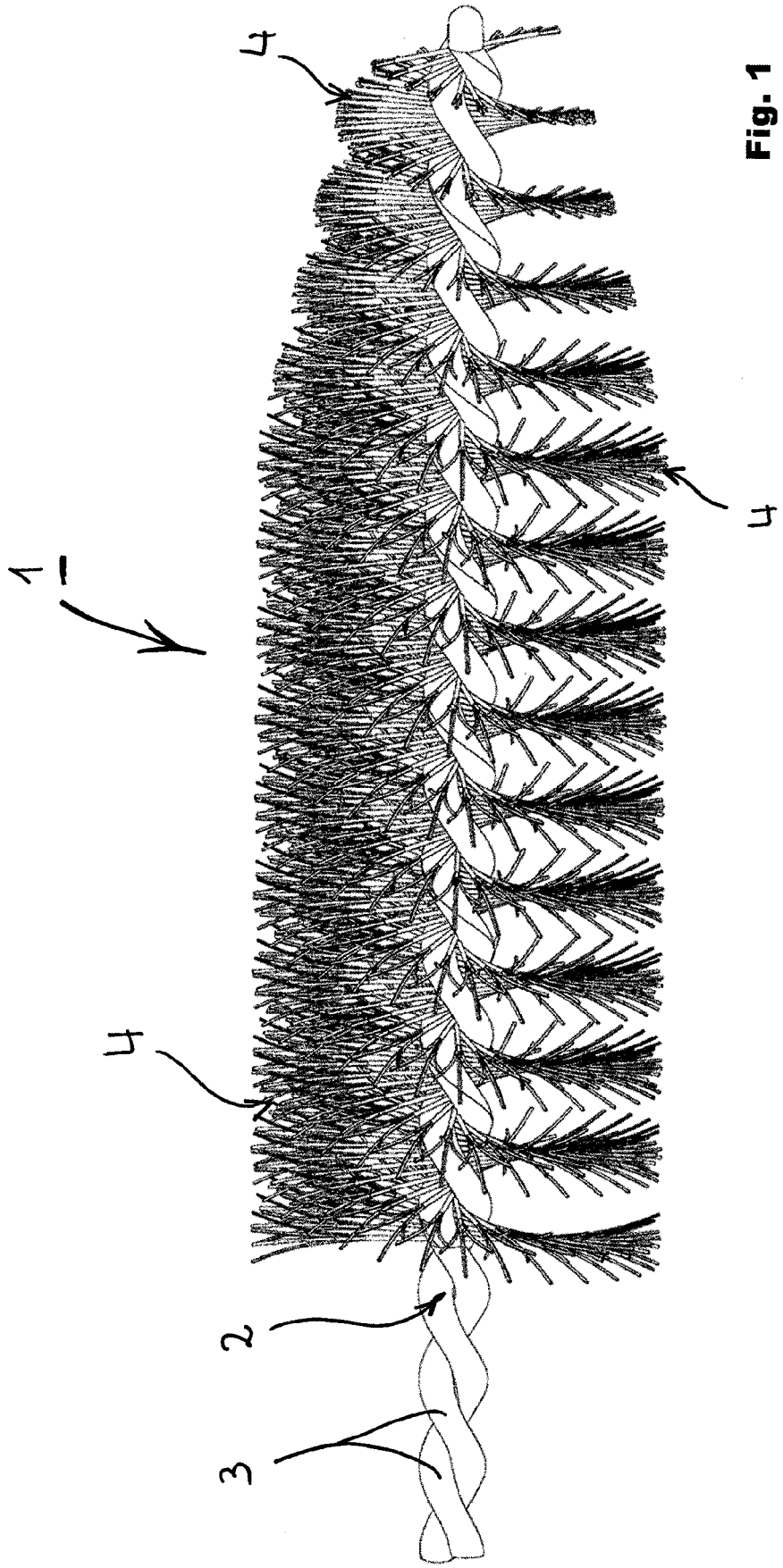


Fig. 1

Fig. 2

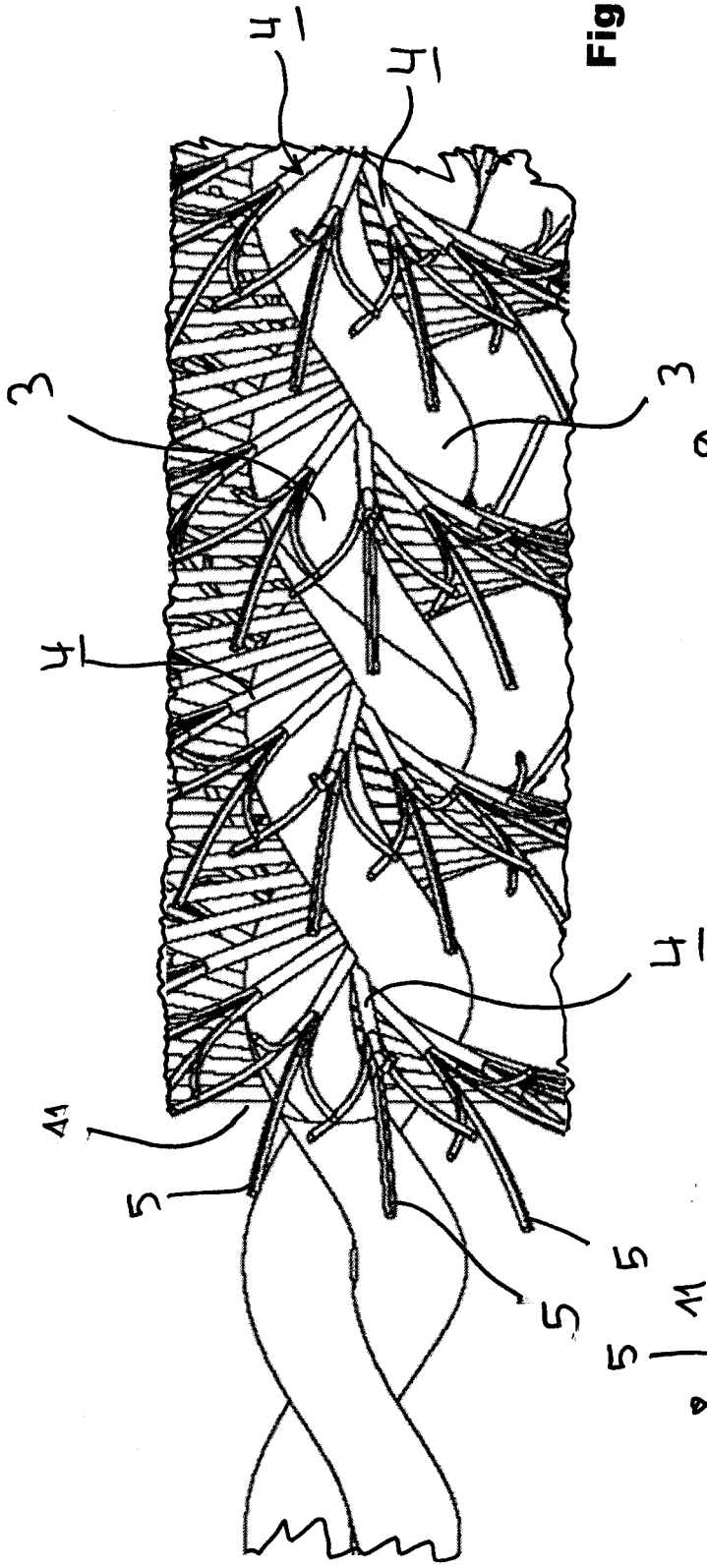


Fig. 4

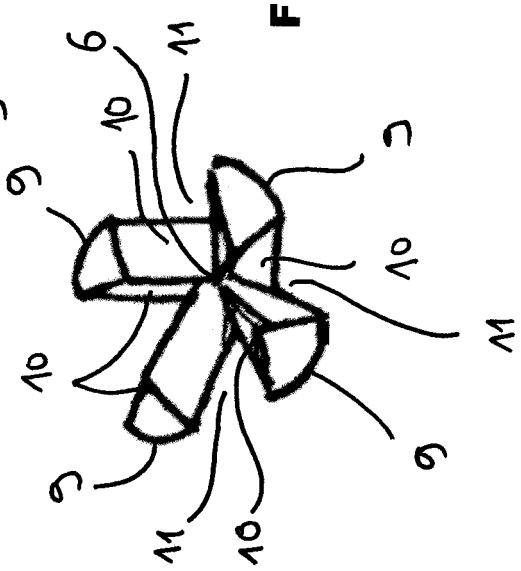
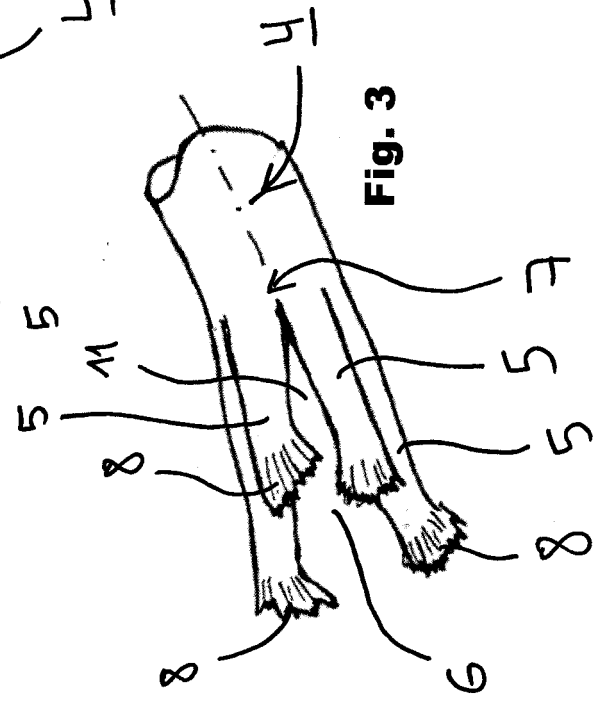


Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 21 18 6171

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 6 241 411 B1 (BRIEVA HERNANDO [US] ET AL) 5 June 2001 (2001-06-05) * column 4, line 1 - line 26 * * column 3, line 52 - line 54 * * figures 1, 6, 7 * -----	1-5,7-11 6,12	INV. A46B3/16 A46B9/02 A46B3/18 A46D1/00
Y	GB 750 509 A (RAYMOND LAFOND) 20 June 1956 (1956-06-20) * line 2 - page 2, left-hand column, line 21 * * figures 1-4 * -----	6,12	

TECHNICAL FIELDS SEARCHED (IPC)

A46B
A46D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 September 2021	Kun, Karla

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6241411 B1	05-06-2001	NONE	
GB 750509 A	20-06-1956	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82