(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 570 122 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.06.2025 Bulletin 2025/25

(21) Application number: **23219497.7**

(22) Date of filing: **21.12.2023**

(51) International Patent Classification (IPC):
A46B 3/00 *(2006.01)* ***A46B 9/02*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A46B 9/021; A46B 3/005; A46B 9/025;
A46B 2200/1053

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

(30) Priority: **14.12.2023 EP 23216799**

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(54) **COSMETIC APPLICATOR WITH SPECIALLY POSITIONED BRISTLES**

(57) Cosmetic applicator comprising a core carrying a plurality of successive bristle crowns, each consisting of a number of bristles integrally attached thereto, whereby each bristle crown has at least one and preferably only bristles whose central longitudinal axis makes an angle of 137.5° with the central longitudinal axis of a bristle of an immediately preceding bristle crown in the direction of the applicator's longitudinal axis.

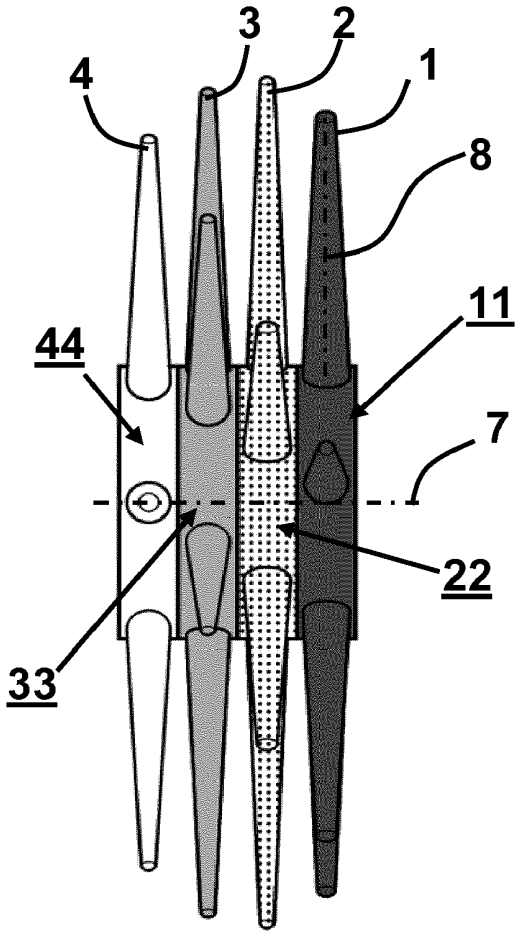

Fig. 1

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Description

[0001] The invention relates to a cosmetic applicator according to the generic portion of claim 1.

TECHNICAL BACKGROUND

[0002] Basically, a distinction is made in applicators between twisted wire-core brushes and brushes having cores that are shaped together with their bristles. The latter bristles and cores (bristle carriers) are produced by injection moulding or 3D-printing.

[0003] In twisted wire core brushes, a number of cut bristles are placed between a bow of two or more parallel wires. These wires are then twisted. In the process, they clamp the individual bristles between them with great force. Such applicators are quite robust and powerful.

[0004] The application behaviour of such applicators can be influenced by grinding and trimming the bristles.

[0005] However, with such applicators it is not possible to give each individual bristle the exact geometric position it should ideally occupy in order to be able to award a specific application behaviour to the applicator.

[0006] An alternative to twisted wire core brushes are brushes in which the bristles and the bristle carrier are created by joint shaping. So far, these have mostly been injection-moulded brushes. In the case of the latter, the bristle trim and thus each individual bristle is injection moulded together with the applicator core. One-component injection moulding is usually used.

[0007] Instead, two-component injection moulding can also be pursued.

[0008] Another method to be mentioned in this context is the well-known moltrusion process. In this process, a tube forming an applicator core is inserted into an injection mould and injected with plastic mass from the inside. The plastic mass makes its way through the tube forming the later bristle carrier where there is a cavity for a fine bristle behind the tube. In this way, completely different materials can become an applicator whose bristles are moulded in one piece to the core.

[0009] For years, people have been struggling to find the optimal orientation of the bristles of such brushes for each application. Especially in the cosmetics sector, namely for the application of mascara, such applicators are approached very differently to the eyelash set in order to apply mascara to the eyelashes, or to give the eyelashes the desired shape.

OBJECT OF THE INVENTION

[0010] Against this background, it is the object of the invention to provide for a cosmetic applicator which is shaped together with its bristles - in such a way that it exhibits optimal application properties. Desired is an applicator that shows optimized application properties when it is brought tangentially to the eyelashes - i.e., in such a way that its longitudinal axis is aligned essentially orthogonally to the longitudinal axis of the eyelashes.

[0011] But that is not all.

[0012] The applicator should also show optimized application properties when it is brought to the lashes frontally - i.e., in such a way that its longitudinal axis is roughly coaxial to the longitudinal axes of the lashes.

[0013] Ideally, it shows attractive application properties when it is applied diagonally to the lash line.

THE SOLUTION ACCORDING TO THE INVENTION

[0014] To solve this problem, a cosmetic applicator with a core carrying a plurality of bristle crowns is proposed. Each of the bristle crowns consists of a number of bristles held integrally on the core.

[0015] The cosmetic applicator according to the invention is characterized in that each of the bristle crowns has at least one and preferably only bristles which fulfil the following condition:

The central longitudinal axis of the aforementioned bristle encloses an angle of 137.5° with the central longitudinal axis of a bristle belonging to a bristle crown immediately preceding it in the direction of the longitudinal axis.

[0016] Experiments have shown that in an effort to achieve the effect according to the invention, certain tolerances may be allowed. Therefore, in the broadest but only slightly advantageous embodiment of the invention, the term of 137.5° includes a tolerance of +/- 5°. In order to significantly improve the effect according to the invention, preferably only a tolerance of +/-2.5° is allowed. Ideally, a tolerance range of +/- 1° is observed.

[0017] This design results in a set of bristles that gives the applicator a particularly high degree of variability in use:

Immediately adjacent bristles of two bristle crowns immediately following each other in the direction of the longitudinal axis form one, or better several bristle pairs of closely adjacent bristles. Closely adjacent bristles in this sense are those that are separated from each other by less than 0.5 bristle base diameters. With this, when the applicator is brought tangentially to the lash arch, a targeted treatment of a lash can be carried out, for example a coating with mascara mass from two flank sides, or combing or curling. It has to be mentioned that a cosmetic applicator according to the invention is preferably used for cosmetic mass, especially mascara, but can also be used for other applications such as dental applications like applying dental mass or for interdental cleaning.

[0018] At the same time, in the applicator according to the invention, bristle crowns further apart from each other form a bristle pair consisting of two bristles arranged further apart from each other (by at least 2.5 bristle base diameters), which is readily accessible to one of its lashes when the applicator is approached head-on to the lash arch. Such a formation makes it easy to impart curling to a single lash or individual lashes.

[0019] The applicator, which is positioned oblique or at

an angle to the lash arch, allows individual lashes to be placed in a zone with pronounced mass storage and to be coated particularly intensively with cosmetic mass.

OPTIONAL WAYS TO FURTHER DEVELOP THE INVENTION

[0020] Further advantages, design possibilities and modes of action or effects result from the following description of a particularly preferred embodiment example of the invention.

[0021] The effect according to the invention becomes even more intensive, because even more advantageously positioned bristles result, when the longitudinal centre axis of a bristle not only forms an angle of 137.5° with the longitudinal centre axis of a bristle belonging to a bristle crown immediately preceding in the longitudinal axis direction, but also with the longitudinal centre axis of a bristle belonging to a bristle crown immediately following in the longitudinal axis direction.

[0022] It is favourable if each bristle crown consists of 3 to 12 bristles aligned in the circumferential direction. Particularly favourable conditions for the action on the eyelashes are achieved when at least the majority of the bristle crowns according to the invention consist of only 6 bristles each.

[0023] The interaction of an eyelash with the applicator approaching the lash bow frontally is significantly improved if the bristles of each first and each fourth bristle crown according to the invention overlap in their base area when the cosmetic applicator is viewed in the direction parallel to its central longitudinal axis. This is because the first and fourth bristles - despite their comparatively large distance in the direction of the applicator's longitudinal axis (as defined above) - can then interact very effectively with an eyelash running in essentially the same direction.

[0024] A particularly effective application behaviour is achieved when the bristles each form a straight central longitudinal axis and taper continuously and preferably conically in a radially outward direction from the bristle root to the bristle tip. This is because a plurality of pairs of bristles are then formed from adjacent bristle crowns which define a V-shaped gap between them. This V-shaped gap has a formative influence on how the respective lash inserted into the gap is acted upon. The deeper the bristle is pulled into the V-shaped gap, the more it is stripped and the more it can be bent or pulled.

FIGURE LIST

[0025]

Figure 1 shows a preferred example of an applicator according to the invention, seen from the side.

Fig. 2 shows the interaction of the applicator according to the invention with an eyelash when the applicator is brought tangentially to the lash arch.

Fig. 3 shows the interaction of the applicator according to the invention with an eyelash when the applicator is approached frontally to the lash arch.

Fig. 4 shows the interaction of the applicator according to the invention with an eyelash when the applicator is approached at an angle to the lash arch.

Fig. 5 shows a frontal view onto the embodiment of Figs 1 to 4.

Fig. 6 shows how the applicator according to the invention can look as a whole.

PREFERRED EMBODIMENT

[0026] The Figure 1 shows a preferred embodiment of an applicator according to the invention, viewed from the side.

[0027] The ideally cylindrical, otherwise also barrel-like or banana-like curved core or bristle carrier 5 of the applicator is clearly visible.

[0028] This applicator has been created by injection moulding or 3D-printing. The bristles 1, 2, 3 and 4 are therefore shaped together with the core. They are therefore integrally connected to the core 5, regardless of whether the bristles and the core are made of the same plastic material or not.

[0029] The bristle with the reference number 1 is in alignment with preferably five or seven, ideally only five other, mostly identical bristles - seen in the circumferential direction of the applicator core. The same applies to the bristles with reference numbers 2, 3 and 4, which are aligned with a similar or (better) equal number of bristles - again seen in the circumferential direction of the applicator core. They thus form the bristle crowns 11, 22, 33 and 44.

[0030] An inventive applicator possesses - at its free and outer end - at least one set of bristle crowns 11, 22, 33 and 44, as shown by Fig. 1. Preferably, it possesses n such sets of bristle crowns - beginning at its free end. Preferred n is > 8 and at least > 5. Ideally, the radial bristle length of all bristles belonging to one set of crowns is identical, at least essentially. In some cases the length of all bristles of all sets of crowns is identical.

[0031] Ideally, all bristles belonging to the same bristle crown are exactly aligned with each other. Otherwise, deviations of plus or minus 10% of the bristle base diameter are not critical. The bristles are preferably straight, i.e., they have a straight central longitudinal axis.

[0032] Figures 2, 3 and 4 show the great versatility of the applicator according to the invention in different application scenarios.

[0033] As shown in Figure 2, an eyelash 6 can be comfortably pulled through between two directly adjacent, closely spaced bristles 1, 2 when the applicator is

brought tangentially to the lash arch. The lash 6 thus comes into intensive contact with the mascara mass stored between these bristles. The fact that the two bristles 1 and 2 are close together and thus form a clamping gap means that the lash can also be bent or drawn out.

[0034] As shown in Figure 3, an eyelash can also be conveniently pulled through between two bristles 1 and 4 which are not placed directly next to each other, but further away from each other - if the applicator is brought to the lash bow frontally. By placing these two bristles 1 and 4 overlapping one behind the other as seen in projection along the applicator's longitudinal axis, the lash inserted between these two bristles can be cleverly given a curvature. This makes the eye look more attractive. Besides this overlapping of the two bristles 1 and 4, it is sometimes also preferable that additionally or alternatively also other bristles overlap; for example bristles 1 and 2 and/or bristles 1 and 3 and/or bristles 2 and 3 and/or bristles 2 and 4 and/or bristles 3 and 4.

[0035] As shown in Figure 4, the applicator can also be brought to the lash arch at an angle. The lash can then be inserted into a spiral groove between the bristles. This is attractive because this spiral groove can store a particularly large amount of mass, which results in particularly intensive wetting of the eyelash when it has been inserted into the spiral groove and is now slowly pulled out of it again. This is particularly important if the lashes are to appear more voluminous.

[0036] Figure 6 shows very clearly how an applicator according to the invention can look as a whole.

[0037] The almost "magical" angle of α = 137.5° according to the invention, which is tolerated as described, can be seen clearly in Figure 5. Each of the bristles 2 of the bristle crown 22 makes the decisive angle of 137.5° in relation to one of the bristles 1 of the bristle crown 11, cf. Fig. 5. This angle α = 137.5° can be used as it is shown in Fig. 5, but this angle can also be used in the other direction - so either clockwise or counter-clockwise.

[0038] The same applies mutatis mutandis to each of the bristles 2 of the bristle crown 22 in relation to one of the bristles 3 of the bristle crown 33.

[0039] Overall, the cosmetic applicator as a whole or parts of it are preferably manufactured by injection molding and/or 3D printing. Possible materials therefore can be Acrylonitrile Butadiene Styrene (ABS), Nylon, High density Polyethylene (HDPE), Low density Polyethylene (LDPE), Polycarbonate (PC), Polyoxymethylene (POM), Acrylic (PMMA), Thermoplastic Polyurethane (TPU), Thermoplastic Rubber (TPR) and/or Polypropylene (PP) or others.

LIST OF REFERENCE NUMBERS

[0040]

1 Bristles of the first bristle crown 11
2 Bristles of the second bristle crown 22
3 Bristles of the third bristle crown 33
4 Bristles of the fourth bristle crown 44
5 Core or bristle carrier
6 Lash
7 (Applicator) longitudinal axis
8 (Bristle) longitudinal axis
11 First bristle crown
22 Second bristle crown
33 Third bristle crown
44 Fourth bristle crown

α Angle

Claims

1. Cosmetic applicator comprising a core (5) carrying a plurality of successive bristle crowns (11, 22, 33 or 44), each consisting of a number of bristles (1, 2, 3 or 4) integrally attached thereto, **characterized in that** each bristle crown has at least one and preferably only bristles whose central longitudinal axis (7) makes an angle of 137.5° with the central longitudinal axis (8) of a bristle of an immediately preceding bristle crown in the direction of the applicator's longitudinal axis (7).

2. Cosmetic applicator according to claim 1, **characterized in that** each bristle crown (11, 22, 33 or 44) has at least one and preferably only bristles (1, 2, 3 or 4) whose central longitudinal axis (7) encloses an angle of 137.5° with the central longitudinal axis (8) of a bristle of a bristle crown immediately following in the applicator's longitudinal axis (7) direction.

3. Cosmetic applicator according to any one of the preceding claims, **characterized in that** each bristle crown (11, 22, 33 or 44) consists of six bristles (1, 2, 3 or 4) preferably being evenly spaced from each other in the circumferential direction.

4. Cosmetic applicator according to any one of the preceding claims, **characterized in that** the bristles (1 and 4) of each first and each fourth bristle crown (11 and 44) overlap in their base region when the cosmetic applicator is viewed in a direction parallel to its central longitudinal axis.

5. Cosmetic applicator according to one of the preceding claims, **characterized in that** each bristle crown (11, 22, 33 or 44) consists of bristles (1, 2, 3 or 4) which are arranged in alignment one behind the other in the circumferential direction.

6. Cosmetic applicator according to any one of the preceding claims, **characterized in that** the predominant number and better each of the bristles of the cosmetic applicator has a central longitudinal axis extending in a straight line.

7. Cosmetic applicator according to any one of the preceding claims, **characterized in that** the predominant number and preferably each of the bristles of the cosmetic applicator tapers continuously and preferably conically in radially outward direction from the bristle root to the bristle tip.

8. Cosmetic applicator according to any one of the preceding claims, **characterized in that** the cosmetic applicator as a whole or parts of it are manufactured by injection molding.

9. Cosmetic applicator according to any one of the preceding claims, **characterized in that** the cosmetic applicator as a whole or parts of it are manufactured by 3D printing.

10. Cosmetic application unit with an applicator according to one of the preceding claims, and a container filled with cosmetic mass.

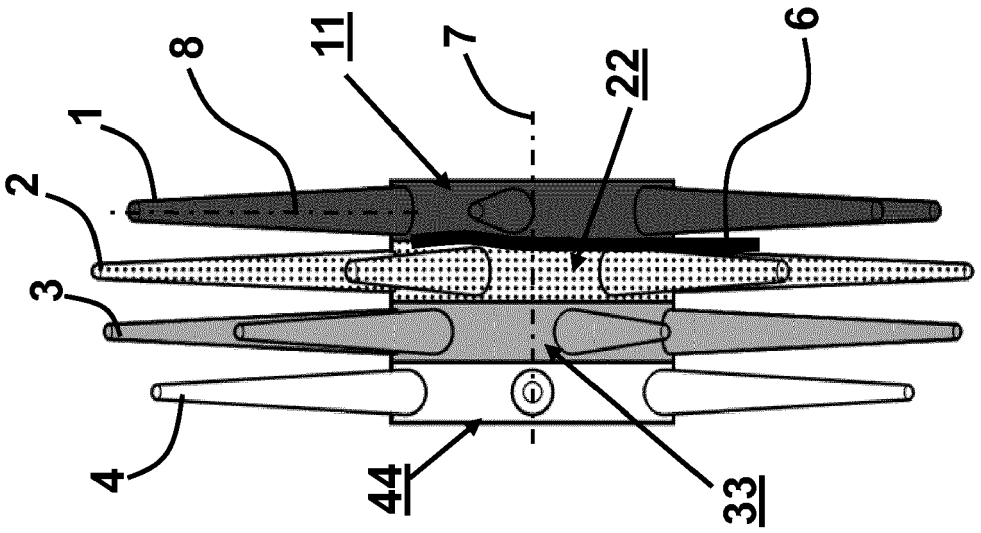

Fig. 2

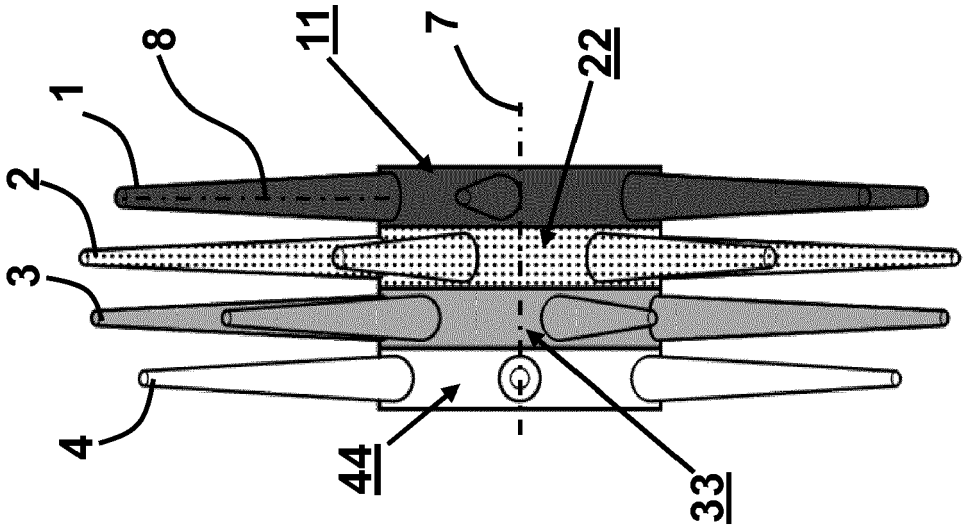

Fig. 1

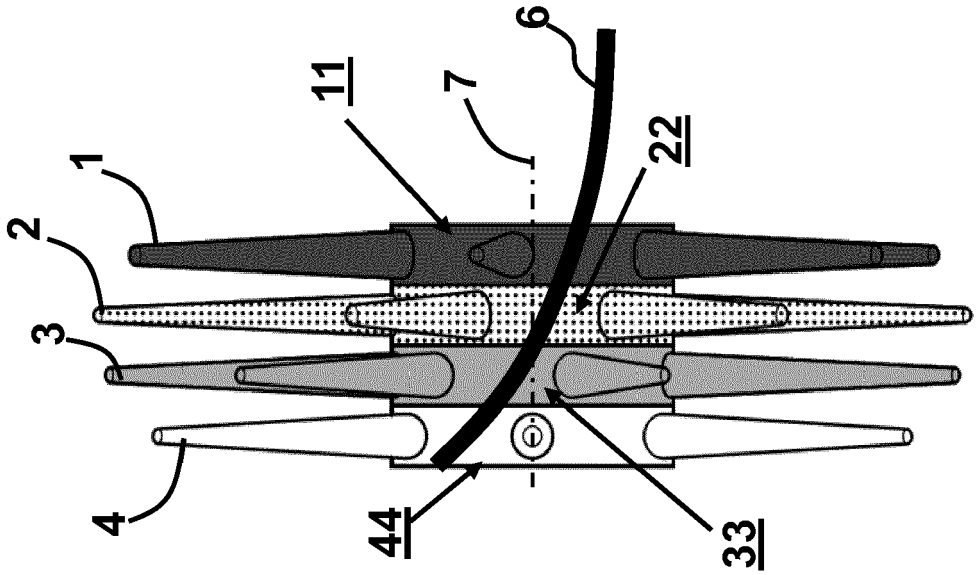

Fig. 4

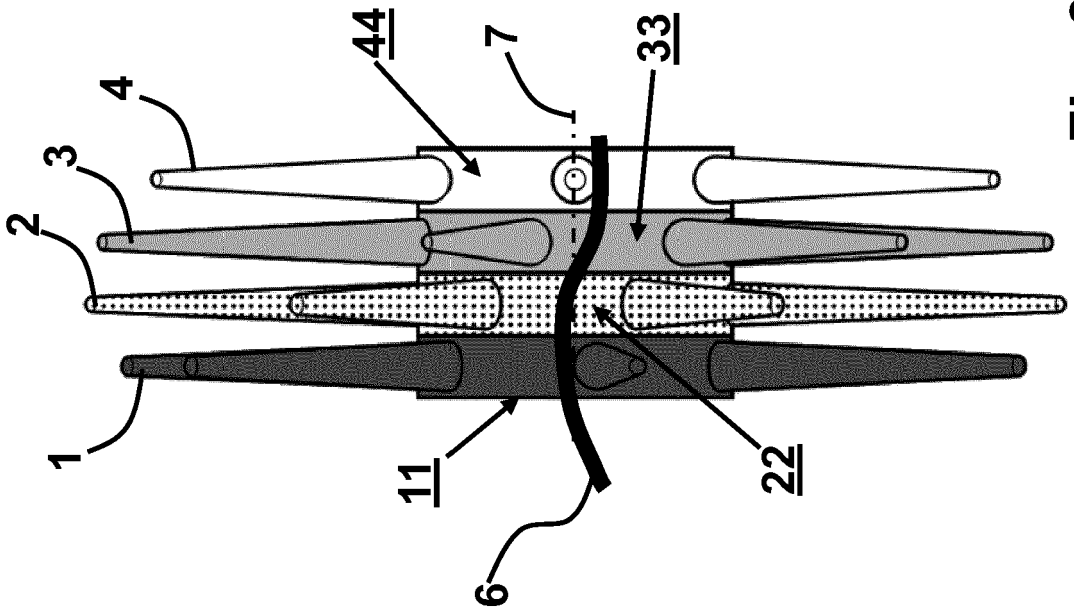

Fig. 3

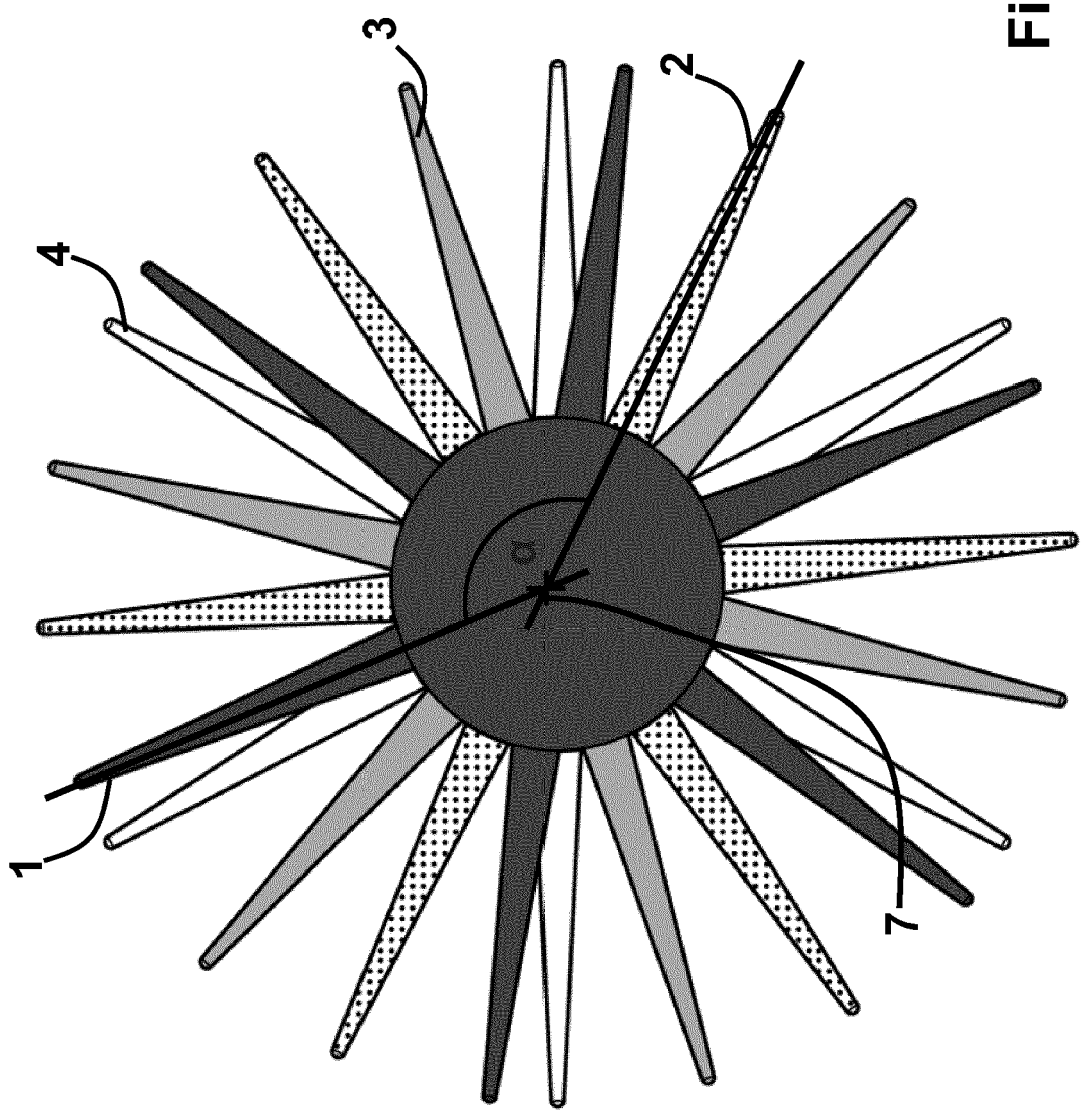

Fig. 5

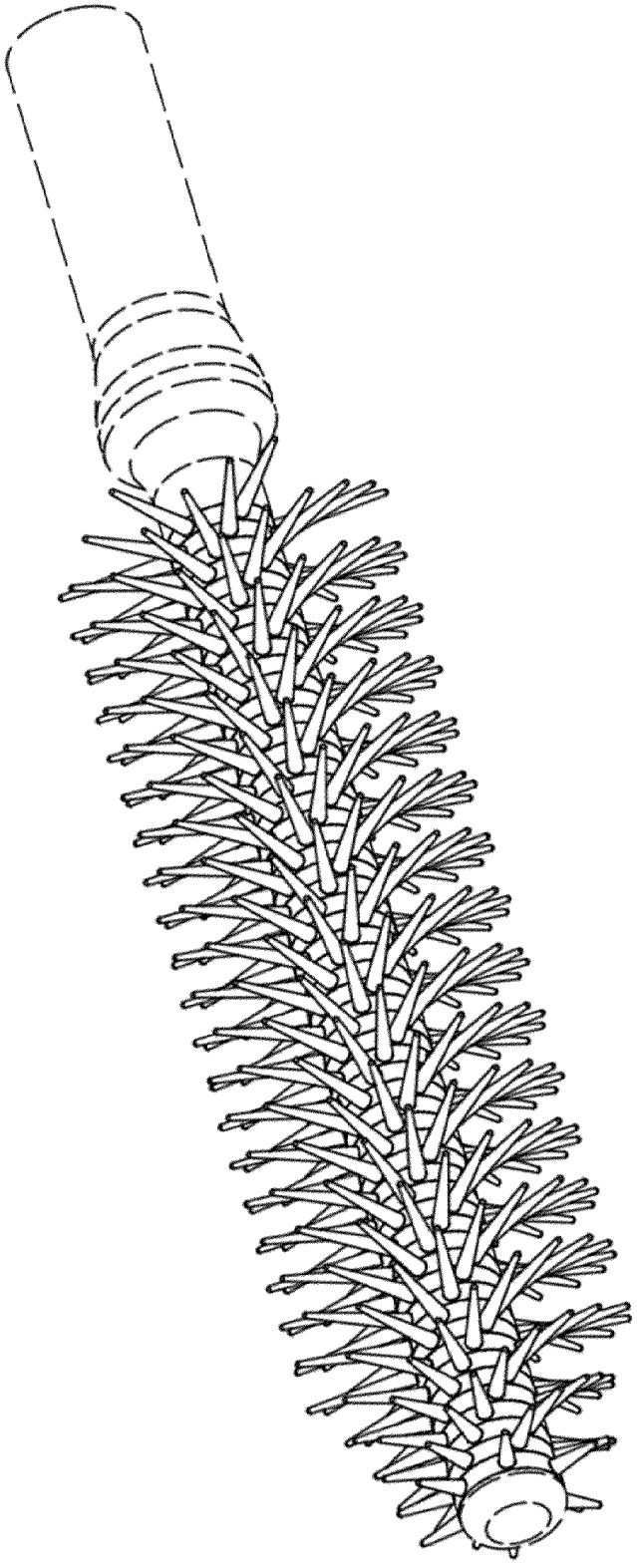

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 23 21 9497

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	US 2014/105667 A1 (CASTEX NICOLAS [FR] ET AL) 17 April 2014 (2014-04-17) * paragraphs [0039] - [0050], [0056]; figures 1-6 *	1-10	INV. A46B3/00 A46B9/02
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TECHNICAL FIELDS SEARCHED (IPC)

A46B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 May 2024	Rossini, Marco

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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