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(54) **APPLICATOR FOR APPLYING A COSMETIC, MAKEUP OR CARE, PRODUCT TO THE EYELASHES AND/OR EYEBROWS**

APPLIKATOR ZUM AUFTRAGEN EINES KOSMETIK-, MAKE-UP- ODER PFLEGEPRODUKTS AUF DIE WIMPERN UND/ODER AUGENLIDER

APPLICATEUR PERMETTANT D'APPLIQUER UN PRODUIT COSMÉTIQUE, DU MAQUILLAGE OU UN SOIN SUR LES CILS ET/OU LES SOURCILS

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(73) Proprietor: **L'OREAL**
75008 Paris (FR)

(72) Inventors:
• **MANICI, Davide**
10010 Mercenasco (IT)

• **THENIN, Audrey**
92110 Clichy (FR)
• **BERHAULT, Alain**
92110 Clichy (FR)
• **CAULIER, Eric**
92110 Clichy (FR)

(74) Representative: **Nony**
11 rue Saint-Georges
75009 Paris (FR)

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Description

[0001] The present invention relates to applicators for applying a cosmetic, makeup or care, product to the eyelashes and/or eyebrows, in particular mascara, and to packaging and application devices having a container containing the product to be applied and the applicator.

[0002] The container is conventionally provided with a wiping member which wipes the stem of the applicator as it is withdrawn from the container. The behaviour of the applicator member on passing through the wiping member depends on numerous factors, such as the shape and nature of the lip of the wiping member and the arrangement of the application elements on the applicator member.

[0003] A compromise has to be found with regard to the quantity of product which is left on the applicator member for application of makeup. Excessive wiping of the applicator member causes the latter to be insufficiently loaded and obliges the user to frequently dip the applicator back into the container. Insufficient wiping leaves an excess of product that is difficult to manage and could result in clumps of product on poorly separated eyelashes.

[0004] Applications EP 1 070 466, WO 01/05272 and WO 01/05273 disclose applicators having application elements situated on just one side of a core, said application elements consisting of a base surmounted by a body with a substantially cylindrical or conical shape.

[0005] Application US 2011/229246 discloses an applicator comprising longitudinal rows of an alternation of simple conical spikes and spikes that split at their free end.

[0006] International Application WO2014/174424 describes an applicator in which the longitudinal rows of spikes each have alternations of simple spikes and spikes that have wide bases and narrow towards their free end along a curvilinear path, these spikes extending perpendicularly to the longitudinal axis of the core.

[0007] There is a need to further improve applicators for applying a product to the eyelashes and/or eyebrows, in order to improve the performance thereof, and more particularly to promote the creation on the applicator member of zones that are more heavily laden with product, which allow easy application of makeup and rapid and abundant loading of the eyelashes and/or eyebrows, while retaining a high capacity to separate the eyelashes and/or eyebrows.

[0008] The invention aims to meet this objective and the subject thereof, according to one of its aspects, is an applicator for applying a cosmetic, makeup or care, product to the eyelashes and/or eyebrows, according to claim 1. Preferred embodiments are recited in the dependent claims.

[0009] By virtue of the invention, the spikes which are reinforced bend less during the extraction of the applicator, this tending to reduce the wiping of the core in the region of said reinforced spikes. This makes it possible

to obtain zones that form reservoirs on the applicator member, in particular in the vicinity of these reinforced spikes, between the rows of spikes and between the spikes in the rows, said zones being wiped less as the applicator passes through the wiping member, thus providing, for application of makeup, if desired, a surplus of product along the entire length of the core and all around the latter. This surplus of product allows the eyelashes and/or eyebrows to be loaded with a large and satisfactory amount of product from the first application.

[0010] During application of makeup, these zones that form reservoirs are emptied gradually of their contents, when the eyelashes and/or eyebrows come into contact with said zones. The eyelashes and/or eyebrows are thus properly loaded with product without the user having to reload the applicator too frequently by reintroducing it into the container.

[0011] Moreover, the reinforced spikes can help to smooth the product on the eyelashes and to separate them, creating an additional area of contact with the eyelashes.

[0012] The height and shape of the reinforcements, and the number and arrangement of reinforced spikes, can be varied during manufacturing of the applicator member in order to adjust the level to which the applicator is loaded with product after wiping.

[0013] The expression "*longitudinal axis of the core*" denotes the line connecting all of the centres of mass of the cross sections of the core. The longitudinal axis may be a central axis, or even an axis of symmetry for the core, in particular when the core has a circular cross section or a cross section in the overall shape of a regular polygon. The longitudinal axis of the core may be rectilinear or curved and may be contained in a plane, which may be a plane of symmetry for some, or even for all of the cross sections of the core. Preferably, the longitudinal axis of the core is rectilinear.

[0014] The term "*spike*" denotes an individualizable projecting element intended to come into engagement with the eyelashes and/or eyebrows.

Reinforced spikes

[0015] Preferably, every other spike is reinforced at its base along more than half the length of a longitudinal row.

[0016] Likewise preferably, within every other longitudinal row, every other spike is advantageously reinforced at its base, preferably apart from the spike closest to the distal end of the core, which can remain without a reinforcement.

[0017] In one variant, a plurality of reinforced spikes follow one another within one and the same longitudinal row.

[0018] Within a longitudinal row, the ratio between the number of reinforced spikes and the total number of spikes in this row can be between 1/3 and 3/4, better still between 3/8 and 5/8.

[0019] It is in accordance with the invention for the two

spikes adjacent to a reinforced spike within the circumferential row to which the reinforced spike belongs, and the two closest spikes within the two adjacent longitudinal rows, not to have a reinforcement. This configuration makes it possible to obtain zones that form reservoirs on the applicator member, in the vicinity of these reinforced spikes, between the rows of spikes that do not have a reinforcement and between the spikes that do not have a reinforcement in the rows, said zones being wiped less as the applicator passes through the wiping member. A "circumferential row of spikes", or crown of spikes, should be understood as meaning a row formed by spikes that occupy one and the same axial position on the longitudinal axis of the core.

[0020] Every other circumferential row advantageously has reinforced spikes. The circumferential rows at the proximal and distal ends of the core preferably do not have reinforced spikes.

[0021] The reinforced spikes advantageously have a reinforcement at their base that extends over only a part of the height of the reinforced spike, forming a distinct part from the rest of the reinforced spike.

[0022] The reinforced spikes may have a shoulder that delimits the reinforcement from the rest of the reinforced spike. This shoulder may extend perpendicularly to the elongation axis of the spike. The shoulder of the reinforced spikes makes it possible to create an additional area of contact with the eyelashes, in order to smooth the product on the eyelashes and to separate them.

[0023] The reinforced spikes preferably have a semi-conical or semi-prismatic body above the corresponding reinforcements, that is to say for example having a first, flat face and a second, rounded or prismatic face. In one variant, the reinforced spikes have a body with any other shape above the corresponding reinforcements, in particular a rotationally symmetrical, cylindrical or tapered, for example conical, shape, or a frustoconical or pyramidal shape, in particular with a hexagonal base.

[0024] The reinforced spikes advantageously extend along a rectilinear elongation axis.

[0025] The reinforcements of the reinforced spikes have a cross section with an elongate shape in the direction of the longitudinal axis of the core. This can increase bending resistance with regard to a force exerted in the direction of the longitudinal axis of the core, this being the case during the extraction of the applicator. The reinforcements of the reinforced spikes may have a cross section which increases in size towards the core.

[0026] The reinforcements of the reinforced spikes advantageously have a cross section, taken perpendicularly to the elongation axis of the spikes, which is substantially rectangular and, when observed from the front in a direction perpendicular to the major axis along which the long sides of their cross section extend, a profile in the form of an isosceles trapezium. In variants, the reinforcements of the reinforced spikes have, in front view, some other shape, for example a triangular or rectangular profile.

[0027] Preferably, the major axis, along which the long sides of the cross section of the reinforcements of the reinforced spikes extend, is oriented parallel to the longitudinal axis of the core. In one variant, this major axis is oriented obliquely or perpendicularly with respect to the longitudinal axis of the core.

[0028] The reinforcements of the reinforced spikes are advantageously not joined to other spikes at their base.

[0029] The height of the reinforcements may be less than half the total height of the reinforced spikes. The expression "*height of a reinforcement*" denotes the distance measured along the elongation axis of the spike between the top of the reinforcement and its base by way of which it is connected to the core. The expression "*total height of a reinforced spike*" denotes the distance measured along the elongation axis of the spike between its free end and the base of the reinforcement by way of which it is connected to the core.

[0030] The ratio between the height of each reinforcement and the total height of the spike it reinforces is preferably between 0.2 and 0.78.

[0031] The height of the reinforcements may be constant along the longitudinal axis of the core, and is in particular between 0.1 mm and 2.5 mm, better still between 0.17 mm and 1.55 mm. In one variant, the height of the reinforcements varies along the longitudinal axis of the core, for example within one or more longitudinal rows and/or from one longitudinal row to another.

[0032] The reinforced spikes are advantageously the same height as the spikes that do not have a reinforcement.

[0033] The thickness of the reinforcements may be between 0.35 mm and 1.2 mm, better still between 0.45 mm and 1 mm, and is in particular equal to around 0.85 mm. The expression "*thickness of a reinforcement*" denotes the largest transverse dimension of the reinforcement, in section, perpendicularly to the longitudinal axis of the core.

[0034] The width of the reinforcements at their base is advantageously constant along the longitudinal axis of the core. The expression "*width of a reinforcement at its base*" denotes the transverse dimension of the reinforcement, in section, along the longitudinal axis of the core, at the point at which the reinforcement is attached to the core. The width of the reinforcements at their base may be between 0.35 mm and 1.5 mm, and is for example equal to around 0.85 mm.

[0035] The width of the reinforcements at their top may be between 0.3 mm and 1.2 mm, and is for example equal to around 0.7 mm. The expression "*width of a reinforcement at its top*" denotes the transverse dimension of the reinforcement, in section, along the longitudinal axis of the core, at the point at which it is attached to the rest of the spike it reinforces.

Core and spikes

[0036] The spikes advantageously extend from the

core and all around the latter. The number of longitudinal rows may be even. There may be at least eight longitudinal rows of spikes in total, in particular 16 rows, of which eight longitudinal rows have reinforced spikes.

[0037] The longitudinal rows are preferably rectilinear. The axis of each longitudinal row is preferably parallel to the longitudinal axis of the core.

[0038] Each longitudinal row is preferably offset axially with respect to the consecutive longitudinal row. The expression "*axially offset longitudinal rows*" should be understood as meaning that the spikes of the same rank in these rows do not occupy the same position along the longitudinal axis of the core.

[0039] The spikes of the same rank in the longitudinal rows that do not have reinforced spikes may all occupy the same axial position along the longitudinal axis of the core.

[0040] The reinforced spikes of the same rank in the longitudinal rows that have reinforced spikes may all be at the same axial position along the longitudinal axis of the core.

[0041] The spikes in two adjacent longitudinal rows may be not joined at their base.

[0042] Within one and the same longitudinal row, the spacing between two spikes of ranks n and $n+1$, measured along the longitudinal axis of the row, between the two respective median planes of the two spikes, may be between 0.5 mm and 2.5 mm, better still between 1 mm and 2 mm, and is in particular equal to around 1.7 mm.

[0043] Within one and the same longitudinal row that has reinforced spikes, the interval between two spikes of ranks n and $n+1$, one of which is reinforced and the other is not, measured along the longitudinal axis of the row, between the base of the reinforcement and the base of the adjacent spike, may be between 0.3 mm and 2 mm, better still between 0.7 mm and 1.4 mm, and is in particular equal to around 1 mm.

[0044] Within one and the same longitudinal row that does not have reinforced spikes, the interval between two spikes of ranks n and $n+1$, measured along the longitudinal axis of the row, between the two bases of the spikes facing one another, may be between 0.3 mm and 2 mm, better still between 0.9 mm and 1.7 mm, and is in particular equal to around 1.2 mm.

[0045] The implantation of the spikes may be such that the angular offset α about the longitudinal axis of the core, between the spikes of two consecutive crowns of spikes, is non-zero, being preferably equal to half the angular pitch β between two consecutive spikes in one and the same crown.

[0046] At least one spike may extend from the core along an elongation axis perpendicular to the surface of the core at the point at which the spike is attached to the core. Preferably, the spikes each extend from the core along an elongation axis perpendicular to the surface of the core at the point at which the spikes are attached to the core. This elongation axis may be radial. The surface of the core to which the spikes are attached may be a

rotationally symmetrical surface.

[0047] In a variant, the elongation axis of the spikes forms an angle other than 90° with the surface of the core at the point at which the spikes are attached to the core.

[0048] The height of at least one spike, better still each spike or the majority of spikes, measured from the core, may be between 0.5 mm and 3.5 mm, better still between 0.75 mm and 2 mm.

[0049] Preferably, the height of the spikes varies, for example in a monotonous manner, along the longitudinal axis of the core. Within one longitudinal row, the height of the spikes preferably decreases in the direction of the distal end of the core, in particular along at least half the visible length of the applicator member. In one variant, the height of the spikes is constant along the longitudinal axis of the core.

[0050] The spikes in the longitudinal rows that do not have reinforcements advantageously have a conical shape. In variants, said spikes have any shape, in particular a cylindrical or tapered, semi-conical, frustoconical or pyramidal shape, in particular with a hexagonal base. In a further variant, the spikes have, in front view, a non-symmetrical shape and an outwardly convex edge, narrow over at least a part of their height away from the core and have a width that decreases towards said convex edge.

[0051] The cross section of the spikes in the longitudinal rows that do not have reinforcements may have a substantially circular, semi-circular (referred to as a half moon), elliptical or semi-elliptical shape, or may also be, for example, polygonal, in particular hexagonal.

[0052] The spikes that do not have a reinforcement and belong to a longitudinal row having reinforced spikes advantageously have the same overall shape as the bodies of said reinforced spikes in the row above the reinforcement, and have in particular a semi-conical shape.

[0053] The cross section of the spikes that do not have a reinforcement and belong to a longitudinal row having reinforced spikes advantageously has a semicircular shape (referred to as a half-moon).

[0054] Within the longitudinal rows that have reinforced spikes, in the case in which the spikes in these rows all have a semi-conical shape, the flat faces of each spike are advantageously oriented in the same circumferential direction about the longitudinal axis of the core.

[0055] At least one spike may be ended by a rounded, in particular hemispherical, free end, the radius of curvature of which may be between 0.05 mm and 0.2 mm, and is for example equal to around 0.15 mm.

[0056] Some spikes on the applicator, in particular the spikes that belong to the longitudinal rows that do not have reinforcements, may have a thickness of between 0.2 mm and 0.85 mm, better still between 0.45 mm and 0.75 mm, said thickness being in particular equal to around 0.5 mm. The expression "*thickness of a spike*" denotes the largest transverse dimension of the spike, in section, perpendicularly to the elongation axis of the spike and to the longitudinal axis of the core.

[0057] The thickness of the spikes that do not have a reinforcement and belong to the longitudinal rows that have reinforced spikes may be equal to half the thickness of the spikes that belong to the longitudinal rows that do not have reinforcements, in particular in the case in which the spikes that do not have a reinforcement and belong to the longitudinal rows having reinforced spikes have a semi-conical shape.

[0058] The spikes that do not have a reinforcement may have a width of between 0.2 mm and 0.8 mm, better still between 0.35 mm and 0.65 mm, said width being in particular equal to around 0.5 mm. The expression "*width of a spike*" denotes the largest transverse dimension of the spike, in section, along the longitudinal axis of the core.

[0059] The free ends of the spikes of the applicator member define an envelope surface of the applicator member, which is for example in the form of a cylinder of revolution along at least a part of its length.

[0060] The envelope surface of the applicator member may have a largest transverse dimension that is substantially constant along at least a part of the length of the applicator member, in particular along more than half the part of the core that carries the spikes.

[0061] The envelope surface may also have a cross section that varies along all or part of the length of the applicator member. The cross section of the envelope surface may for example have one or more extremes and for example at least one local minimum and two local maxima. The diameter of the envelope surface that passes through the tops of the spikes of smallest height may be between 4 mm and 7.5 mm, and is for example equal to around 5.5 mm. The diameter of the envelope surface of the applicator member that passes through the tops of the spikes of greatest height may be between 6.5 mm and 12 mm, and is for example equal to around 7.7 mm.

[0062] The core may have a cross section, taken perpendicularly to its longitudinal axis, with any, in particular a circular, shape. The largest cross section of the core, namely its diameter in the case in which the cross section of the core has a circular shape, may be between 1.8 mm and 3.2 mm, and is in particular equal to around 2.8 mm.

[0063] The core, the spikes and the reinforcements and bodies of the reinforced spikes may be moulded from one and the same material, or in a variant they can be made from at least two different materials.

[0064] The core and/or the spikes and/or the reinforcements are preferably made of a thermoplastic material, in particular from an elastomeric thermoplastic material.

Applicator

[0065] The applicator may have a stem that carries the applicator member at a first end and is fixed to a gripping member at a second end.

[0066] The core may be solid, being for example moulded with an end piece for fixing to the stem of the

applicator.

[0067] The applicator member may be fixed to the stem by snap-fastening, adhesive bonding, welding, crimping, pressing, stapling, force-fitting, fitting in a cold state or fitting in a hot state, for example by an end piece of the applicator member being mounted in a housing in the stem. In a variant, the stem is received in a housing provided in the core.

[0068] It is also possible for the stem and the applicator member to be moulded or not to be moulded in one piece and from the same thermoplastic material.

[0069] The spikes and/or their reinforcements may be made of a material that is more or less rigid than a material used to produce the stem of the applicator to which the core is attached.

[0070] The core may extend along a longitudinal axis which, at at least one point along its length, forms a non-zero angle with the longitudinal axis of the stem to which the core is fixed. The applicator member may be angled at its attachment to the stem.

[0071] The stem may have a first, rigid portion that is extended on the distal side by a second, more flexible portion, for example made of elastomer, that carries the applicator member.

[0072] The visible length of the applicator member may be between 15 mm and 35 mm, better still between 22 mm and 29 mm, and is for example equal to around 24.5 mm.

[0073] The applicator may have between 108 and 600 spikes, for example between 128 and 256 spikes.

[0074] The first spike along the longitudinal axis of the core starting from the stem may be disposed at a non-zero distance from the proximal end of the core, in particular between 0.2 mm and 0.7 mm. The last spike along the longitudinal axis of the core starting from the stem may be disposed at a non-zero distance from the distal end of the core, in particular between 0.25 mm and 0.9 mm.

Application device

[0075] A further subject of the invention is a device for packaging and applying a product to the eyelashes and/or eyebrows, having an applicator according to the invention, as defined above, and a container containing the product to be applied.

[0076] The gripping member of the applicator may form a cap for closing the container.

[0077] The container preferably has a wiping member suitable for wiping the stem and the applicator member, having a wiping lip.

[0078] The ratio between the diameter of the circumscribed circle that has as its centre the longitudinal axis of the core and passes through the tops of the reinforcements, in cross section perpendicular to the longitudinal axis of the core, and the diameter of the orifice defined by the lip of the wiping member may be between 0.7 and 1.45.

[0079] The product is preferably a mascara.

[0080] The invention may be better understood from reading the following detailed description of a non-limiting implementation example thereof, and with reference to the attached drawing, in which:

- Figure 1 is a schematic elevation view, in partial longitudinal section, of an exemplary packaging and application device produced in accordance with the invention,
- Figure 2 shows a perspective view of the applicator member from Figure 1 on its own,
- Figures 2A and 2B show details of the applicator member from Figure 2,
- Figure 3 is a section along III-III of a detail of the applicator member from Figure 2,
- Figure 4 is a section along IV-IV of a detail of the applicator member from Figure 2,
- Figure 5 is a section along V-V of the applicator member from Figure 2, and
- Figure 6 is a flat developed view illustrating the arrangement of some of the spikes on the surface of the core of an applicator member according to the invention.

[0081] Figure 1 shows a packaging and application device 1 produced in accordance with the invention, having an applicator 2 and an associated container 3 containing a product P to be applied to the eyelashes and/or eyebrows, for example mascara or a care product.

[0082] The container 3 has, in the example in question, a threaded neck 4 and the applicator 2 has a closure cap 5 designed to be fixed on the neck 4 so as to close the container 3 in a sealed manner when it is not in use, the closure cap 5 also forming a gripping member for the applicator 2.

[0083] The latter has a stem 7 of longitudinal axis Y, which is attached at its upper end to the closure cap 5 and at its lower end to an applicator member 8. The latter has a core 10 that carries spikes 18, 15 and 16 that extend from the core 10 and all around the latter. As can be seen in Figure 2, the first spike 18 along the longitudinal axis X of the core 10 starting from the stem 7 is disposed at a non-zero distance d_1 from the proximal end 11 of the core, for example equal to around 0.51 mm. The last spike 15 along the longitudinal axis X of the core 10 starting from the stem 7 is disposed at a non-zero distance d_d from the distal end 12 of the core 10, for example equal to around 0.55 mm.

[0084] The container 3 also has a wiping member 6, inserted into the neck 4.

[0085] This wiping member 6, which may be of any suitable type, has, in the example in question, a lip designed to wipe the stem 7 and the applicator member 8 when the applicator 2 is withdrawn from the container 3. The lip defines a wiping orifice 6a having a diameter adapted to that of the stem 7. The wiping member 6 may be made of elastomer. The wiping orifice 6a has for ex-

ample a circular shape.

[0086] The diameter φ_a of the wiping orifice 6a is typically between 3 and 5.5 mm, and is for example around 4.5 mm or 5 mm.

[0087] In the example illustrated, the stem 7 has a circular cross section, but if the stem 7 has some other section, this does not depart from the scope of the present invention, it then being possible to fix the cap 5 on the container 3 in some other way than by screwing, if necessary. The wiping member 6 is adapted to the shape of the stem 7 and to that of the applicator member 8, if appropriate.

[0088] Preferably, and as in the example in question, the longitudinal axis Y of the stem 7 is rectilinear and coincident with the longitudinal axis of the container 3 when the applicator 2 is in place thereon, but if the stem 7 is not rectilinear, forming for example an elbow, this does not depart from the scope of the present invention.

[0089] If need be, the stem 7 may have an annular narrowing at its portion that is positioned opposite the lip of the wiping member 6, so as not to mechanically stress the latter unduly during storage.

[0090] As illustrated in Figure 2, the applicator member 8 may have an end piece 9 for fixing it in a corresponding housing of the stem 7.

[0091] The applicator member 8 may be fixed in this housing of the stem 7 by any means, and in particular by force-fitting, snap-fastening, adhesive bonding, welding, stapling or crimping.

[0092] With reference to Figure 2, it can be seen that the core 10 has a shape that is elongate along a longitudinal axis X, which is rectilinear in the example described. The longitudinal axis X may be central, as illustrated.

[0093] The visible length H of the applicator member 8 is for example equal to 24.5 mm.

[0094] In the example illustrated, the spikes 18, 15 and 16 each extend from the core 10 along an elongation axis W perpendicular to the surface of the core at the point at which the spikes are attached to the core 10.

[0095] As can be seen in particular in Figure 2, within every other longitudinal row 17, every other spike 16 is reinforced at its base and extends between two spikes 15 that do not have a reinforcement, apart from the spike that is closest to the distal end 12 of the core 10, which remains without a reinforcement. The circumferential rows situated at the proximal 11 and distal 12 ends of the core 10 advantageously do not have reinforced spikes 16.

[0096] As can be seen in Figure 6, a reinforced spike 16 is thus advantageously surrounded by six spikes 18, 15 that do not have a reinforcement: the two spikes 15 which are adjacent thereto within the crown 21 of spikes to which it belongs, and two spikes 18 that each belong to the two adjacent longitudinal rows 19 and 20.

[0097] Preferably, as in the example described, every other crown 21 of spikes has reinforced spikes 16.

[0098] The spikes 18, 15 and 16 may be disposed on

the applicator member 8 in a plurality of rectilinear longitudinal rows 17, 19, 20, as can be seen in Figures 2 and 6, each longitudinal row 17 of spikes being offset axially with respect to the adjacent longitudinal row 19.

[0099] The spikes 18 in each longitudinal row that does not have reinforcements advantageously all occupy the same axial position along the longitudinal axis X of the core 10, as illustrated in Figure 6, for example between the longitudinal rows 19 and 20. The reinforced spikes 16 in every other longitudinal row having reinforced spikes may all be at the same axial position along the longitudinal axis X of the core 10.

[0100] In the example in question, the number of longitudinal rows is even, and is for example equal to 16, of which eight longitudinal rows have reinforced spikes 16.

[0101] Preferably, the reinforced spikes 16 extend along a rectilinear elongation axis W and advantageously have a reinforcement 13 at their base 16a that extends over only a part of their height.

[0102] The reinforced spikes 16 advantageously have a shoulder 16e that delimits the reinforcement 13 from the rest of the reinforced spike.

[0103] As can be seen in the figures, the reinforced spikes 16 have a body 16b with a semi-conical shape above the corresponding reinforcements 13.

[0104] The reinforcements 13 of the reinforced spikes 16 may have a cross section with an elongate and substantially rectangular shape, visible in particular in Figure 6. When viewed from the front in a direction perpendicular to the axis Z along which the long sides 13a of their cross section extend, the reinforcements 13 have a profile in the form of an isosceles trapezium, visible in Figure 3, their cross section increasing in size towards the core 10. Preferably, the axis Z, along which the long sides 13a of the cross section of the reinforcements 13 of the reinforced spikes 16 extend, is oriented parallel to the longitudinal axis X of the core 10.

[0105] As can be seen in Figure 2B, when the reinforcements 13 are viewed from the front, the lateral flanks 13g of the latter can be attached to the front face 13f of the reinforcement by roundings 13b. The lateral flanks 13g are flat, as is the front face 13f.

[0106] As shown in Figure 6, the body 16b of each reinforced spike 16 can extend in line with the reinforcement 13 and above the latter on the side of the flat face 16d of the spike 16. On the opposite side, the body 16b can form an indentation of width d_b with the reinforcement 13, above the latter. The width d_b is for example between 0.05 mm and 0.65 mm. In one variant, the body 16b of the reinforced spikes 16 does not form an indentation with the reinforcement 13, above the latter.

[0107] In the example in question, the height h_r of the reinforcements 13 is less than half the total height h_t of the reinforced spikes 16, as shown in Figure 3.

[0108] The ratio h_r/h_t between the height of each reinforcement 13 and the total height of the spike 16 it reinforces is between 0.2 to 0.78.

[0109] The height h_r of the reinforcements 13 may be

constant along the longitudinal axis X of the core 10, as in the example described, and be for example between 0.1 mm and 2.5 mm, better still between 0.17 mm and 1.55 mm. In a variant that is not shown, the height h_r of the reinforcements 13 varies along the longitudinal axis X of the core 10, for example within one or more longitudinal rows 17 and/or from one longitudinal row to another.

[0110] The reinforced spikes 16 are advantageously the same height as the spikes 18, 15 that do not have a reinforcement.

[0111] The thickness e_r of the reinforcements 13, visible in Figure 6, may be between 0.45 mm and 1.5 mm, and is for example equal to around 0.85 mm.

[0112] The width l_b of the reinforcements 13 at their base 13a is advantageously constant along the longitudinal axis X of the core 10. The width l_b of the reinforcements 13 at their base 13a may be between 0.35 mm and 1.5 mm, and is for example equal to around 0.85 mm.

[0113] The width l_r of the reinforcements 13 at their top 13c may be between 0.3 mm and 1.2 mm, and is for example equal to around 0.7 mm.

[0114] The ratio φ_v/φ_a between the diameter φ_v of the circumscribed circle that has as its centre the longitudinal axis X of the core 10 and passes through the tops 13c of the reinforcements 13 and the diameter φ_a of the orifice 6a defined by the lip of the wiping member 6 may be between 0.7 and 1.45.

[0115] The spikes 18 and 15 may have various shapes. In the example in question, and as can be seen in particular in Figure 4, the spikes 18 that belong to the longitudinal rows that do not have reinforcements have a conical shape. As can be seen in particular in Figure 2, the spikes 15 that do not have a reinforcement and belong to the longitudinal rows that have reinforced spikes 16 have a semi-conical shape, the flat faces of each spike advantageously being oriented in the same circumferential direction.

[0116] The spikes 18, 15 and 16 in two adjacent longitudinal rows 17, 19 may be not joined at their base, as can be seen in Figure 2A. Advantageously, none of the reinforcements 13 of the reinforced spikes 16 are joined at their base.

[0117] As can be seen in Figure 2, the height of the spikes 18, 15 and 16 may vary along the longitudinal axis X of the core 10. The height may decrease towards the distal end 12 of the core 10, so as to facilitate insertion into the container 3.

[0118] The height h_p of the spikes 18, 15 that do not have a reinforcement may be between 0.5 mm and 3.5 mm, better still between 0.75 mm and 2 mm.

[0119] With reference to Figure 5, the diameter φ_2 of the envelope surface formed by the spikes 18, 15 and 16 of smallest height may be between 4 mm and 7.5 mm, and is for example equal to around 5.5 mm. The diameter φ_1 of the envelope surface of the applicator member 8 formed by the spikes 18, 15 and 16 of greatest height may be between 6.5 mm and 12 mm, and is for example

equal to around 7.7 mm.

[0120] The thickness e_p of the spikes 18 that belong to the longitudinal rows that do not have reinforcements may be between 0.45 mm and 0.75 mm, and is for example equal to around 0.5 mm, as in the example in question.

[0121] The thickness e_s of the spikes 15 that do not have a reinforcement and belong to the longitudinal rows that have reinforced spikes 16 may be equal to half the thickness e_p of the spikes 18 that belong to the longitudinal rows that do not have reinforcements, in particular in the case in which the spikes 15 that do not have a reinforcement and belong to the longitudinal rows having reinforced spikes 16 have a semi-conical shape.

[0122] The width l_p of a spike 18, 15 that does not have a reinforcement may be between 0.2 mm and 0.65 mm, and is for example equal to around 0.5 mm.

[0123] As can be seen in Figure 5, the implantation of the spikes 18, 15 and 16 may be such that the angle α about the longitudinal axis X of the core 10 between two consecutive crowns 21 and 22 of spikes 18, 15 and/or 16, said crowns each being formed by spikes 18, 15 and/or 16 that occupy one and the same axial position on the longitudinal axis X of the core 10, is non-zero, being for example equal to half the angular pitch β between two consecutive spikes in a crown.

[0124] Within one and the same longitudinal row 17 or 19, the spacing S_p between two consecutive spikes 18 or 15 and 16 may be between 1 mm and 2 mm, and is for example equal to 1.7 mm, as in the example described.

[0125] Within one and the same longitudinal row 17 that has spikes 16 having a reinforcement 13, the interval S_r between two spikes of ranks n and n+1, one 16 of which has a reinforcement 13 and the other 15 does not, measured between the base 13a of the reinforcement 13 and the base 15a of the adjacent spike 15, may be between 0.7 mm and 1.4 mm, and is for example equal to around 1 mm.

[0126] Within one and the same longitudinal row 19 that does not have spikes having a reinforcement, the interval S_b between two spikes 18 of ranks n and n+1, measured between the two bases 18a of the spikes 18 facing one another, may be between 0.9 mm and 1.7 mm, and is for example equal to around 1.2 mm.

[0127] In the example in question, the free ends 28 of the spikes 18, 15 and 16 define an envelope surface S of the applicator member 8, having a rectilinear longitudinal axis that is coincident with the longitudinal axis X of the core 10, and is rotationally symmetrical about said axis X.

[0128] The spikes 18, 15, 16 and the reinforcements 13 are made, in the example in question, in one piece with the core 10 by moulding thermoplastic material.

[0129] In order to mould the applicator member 8, use can be made of any thermoplastic material which is or is not relatively rigid, for example SEBS, a silicone, latex, a material having improved slip, butyl, EPDM, a nitrile, a

thermoplastic elastomer, a polyester elastomer, a polyamide elastomer, a polyethylene elastomer or a vinyl elastomer, a polyolefin such as PE or PP, PVC, EVA, PS, SEBS, SIS, PET, POM, PU, SAM, PA or PMMA. It is also possible to use a ceramic, for example based on alumina, a resin, for example of the urea-formaldehyde type, and possibly a material containing graphite as filler. It is possible in particular to use the materials known under the trade names Teflon®, Hytrel®, Cariflex®, Alixine®, Santoprene®, Pebax® and Pollobas®, this list not being limiting.

[0130] In order to use the device 1, the user unscrews the closure cap 5 and withdraws the applicator member 8 from the container 3.

[0131] Once the applicator member 8 has passed through the wiping member 6, a particular quantity of product P remains around the spikes 16 that have a reinforcement 13, the reinforced spikes 16 not bending at their base on passing through the wiping member 6, creating reservoirs of product P along the entire length of the core 10 and on all sides, making it possible to load the eyelashes and/or eyebrows with product P in a satisfactory manner.

[0132] Of course, the invention is not limited to the exemplary embodiment which has just been described.

[0133] The applicator member 8 may be able to vibrate, that is to say that it is possible to apply vibrations thereto during application, combing or picking up of the product P, for example as described in application WO 2006/090343.

[0134] In a further variant, the applicator member 8 may be able to rotate, that is to say that it may be made to carry out a rotational movement about the longitudinal axis X of the core 10, for example during application, combing or picking up of the product P.

[0135] In a further variant, the applicator member 8 may be heated, that is to say have a heating element for heating the keratin fibres, the eyelashes and/or eyebrows, and/or the spikes 18, 15, 16 and/or the core 10 and/or the reinforcements 13 of the applicator member 8.

[0136] It is also possible for the applicator member 8 to be able to vibrate, to be able to rotate and to be heated, or only to be able to vibrate and to rotate, or only to be able to vibrate and to be heated, or only to be able to rotate and to be heated, or only to be able to vibrate or only to be able to rotate or only to be able to be heated.

[0137] The applicator member 8 may comprise any bactericidal agent such as silver salts, copper salts, preservatives and at least one preservative for the product P.

[0138] The core 10 and/or the spikes 18, 15, 16 and/or the reinforcements 13 may, furthermore, comprise particles, for example a filler, in particular a compound which is magnetic, bacteriostatic or absorbs moisture, or else a compound intended to produce roughness on the surface of the spikes 18, 15, 16 and/or of the reinforcements 13 or to help the eyelashes and/or eyebrows to slide on the spikes and/or the reinforcements. At least one of the core 10 and a spike 18, 15, 16 and a reinforcement 13

may be flocked, or undergo any heat or mechanical treatment.

[0139] The expression "*having a*" should be understood as being synonymous with "*having at least one*", and "*between*" is understood as including the limits, unless specified to the contrary.

Claims

1. Applicator (2) for applying a cosmetic, makeup or care, product (P) to the eyelashes and/or eyebrows, having a moulded applicator member (8) having:

- a core (10) that extends along a longitudinal axis (X),
 - spikes (18, 15, 16) that are carried by the core (10) and are disposed in a plurality of longitudinal rows (17, 19, 20),
- wherein, within one longitudinal row (17) out of at least two about the longitudinal axis (X) of the core (10), at least one spike (16) is reinforced at its base (16a) and extends between spikes (15) that do not have a reinforcement, the applicator being **characterized by** the fact that the two spikes adjacent to a reinforced spike (16) within a circumferential row to which said reinforced spike belongs and the two closest spikes within the two adjacent longitudinal rows do not have a reinforcement, and by the fact that the reinforcements of the reinforced spikes have a cross section with an elongate shape in the direction of the longitudinal axis of the core.

2. Applicator according to Claim 1, wherein one spike out of two (16) is reinforced at its base along more than half the length of said longitudinal row (17).

3. Applicator according to any one of the preceding claims, wherein the reinforcements (13) of the reinforced spikes (16) have a cross section which increases in size towards the core (10).

4. Applicator according to any one of the preceding claims, wherein the reinforcements (13) of the reinforced spikes (16) extend over only a part of the height (h_t) of the reinforced spike (16).

5. Applicator according to any one of the preceding claims, wherein the reinforced spikes (16) have a semi-conical body above the corresponding reinforcements (13).

6. Applicator according to any one of the preceding claims, wherein the reinforced spikes (16) have a shoulder that delimits the reinforcement (13) from the rest of the reinforced spike.

7. Applicator according to any one of the preceding claims, wherein the height (h_r) of the reinforcements (13) is less than half the total height (h_t) of the reinforced spikes (16).

8. Applicator according to any one of the preceding claims, wherein the ratio (h_r/h_t) between the height of each reinforcement and the total height of the spike it reinforces is between 0.2 and 0.78.

9. Applicator according to any one of the preceding claims, wherein the height (h_r) of the reinforcements (13) is constant along the longitudinal axis (X) of the core (10), and is in particular between 0.1 mm and 2.5 mm, better still between 0.17 mm and 1.55 mm.

10. Applicator according to any one of the preceding claims, wherein the reinforced spikes (16) are the same height as the spikes (18, 15) that do not have a reinforcement.

11. Applicator according to any one of the preceding claims, wherein the spikes (18) in the longitudinal rows that do not have reinforcements have a conical shape.

12. Applicator according to any one of the preceding claims, wherein the reinforcements (13) of the reinforced spikes (16) are moulded together with and from the same material as the core (10).

13. Device (1) for packaging and applying a product (P) to the eyelashes and/or eyebrows, having an applicator (2) according to any one of the preceding claims and a container (3) containing the product (P).

Patentansprüche

1. Applikationseinrichtung (2) zum Applizieren eines kosmetischen, Make-up- oder Pflegeproduktes (P) auf die Wimpern und/oder Augenbrauen, der einen geformten Applikationsabschnitt (8) hat, der aufweist:

- einen Kern (10), der sich entlang einer Längsachse (X) erstreckt,
 - Erhöhungen bzw. Stacheln (18, 15, 16), die durch den Kern (10) getragen werden und in mehreren Längsreihen (17, 19, 20) angeordnet sind,
- wobei innerhalb einer Längsreihe (17) von zumindest zwei entlang der Längsachse (X) von dem Kern (10) zumindest eine Erhöhung bzw. ein Stachel (16) an seiner Basis (16a) verstärkt ist und sich zwischen Erhöhungen bzw. Stacheln (15) erstreckt, die keine Verstärkung haben,

- wobei die Applikationseinrichtung durch die Tatsache gekennzeichnet ist, dass die zwei Erhöhungen bzw. Stacheln benachbart zu einer verstärkten Erhöhung bzw. Stachel (16) innerhalb einer umfänglichen Reihe, zu welcher die verstärkte Erhöhung bzw. Stachel gehört, und die zwei nächsten Erhöhungen bzw. Stacheln innerhalb der zwei benachbarten Längsreihen keine Verstärkung haben, und durch die Tatsache, dass die Verstärkungen von den verstärkten Erhöhungen bzw. Stacheln einen Querschnitt mit einer länglichen Form in der Richtung von der Längsachse von dem Kern haben.
2. Applikationseinrichtung gemäß Anspruch 1, wobei eine Erhöhung bzw. ein Stachel von zweien (16) an seiner Basis entlang mehr als der Hälfte der Länge von der Längsreihe (17) verstärkt ist.
 3. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die Verstärkungen (13) von den verstärkten Erhöhungen bzw. Stacheln (16) einen Querschnitt haben, welcher in seiner Größe in Richtung des Kernes (10) größer wird.
 4. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die Verstärkungen (13) von den verstärkten Erhöhungen bzw. Stacheln (16) über lediglich einen Teil von der Höhe (h_t) von der verstärkten Erhöhung bzw. Stachel (16) erstreckt sind.
 5. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die verstärkten Erhöhungen bzw. Stacheln (16) einen halbkonischen Körper über den entsprechenden Verstärkungen (13) haben.
 6. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die verstärkten Erhöhungen bzw. Stacheln (16) eine Schulter haben, die die Verstärkung (13) von dem Rest von der verstärkten Erhöhung bzw. Stachel abgrenzen.
 7. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die Höhe (h_r) von den Verstärkungen (13) weniger als die Hälfte von der gesamten Höhe (h_t) von den verstärkten Erhöhungen bzw. Stacheln (16) ausmacht.
 8. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei das Verhältnis (h_r/h_t) zwischen der Höhe von jeder Verstärkung und der gesamten Höhe von der Erhöhung bzw. dem Stachel, den sie verstärkt, zwischen 0,2 und 0,78 liegt.
 9. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die Höhe (h_r) von den Verstärkungen (13) konstant entlang der Längsachse (X) von dem Kern (10) ist, und insbesondere zwischen 0,1 mm und 2,5 mm, besser noch zwischen 0,17 mm und 1,55 mm liegt.
 10. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die verstärkten Erhöhungen bzw. Stacheln (16) die gleiche Höhe wie die Erhöhungen bzw. Stacheln (18, 15) haben, die keine Verstärkung haben.
 11. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die Erhöhungen bzw. Stacheln (18) in der Längsreihe, die keine Verstärkungen hat, eine konische Form haben.
 12. Applikationseinrichtung gemäß irgendeinem der voranstehenden Ansprüche, wobei die Verstärkungen (13) von den verstärkten Erhöhungen bzw. Stacheln (16) zusammen mit und aus dem gleichen Material wie der Kern (10) geformt sind.
 13. Einrichtung (1) zum Verpacken und Anwenden eines Produktes (P) auf die Wimpern und/oder Augenbrauen, die eine Applikationseinrichtung (2) gemäß irgendeinem der voranstehenden Ansprüche und einen Behälter (3), der das Produkt (P) enthält, aufweist.

Revendications

1. Applicateur (2) permettant d'appliquer un produit (P) cosmétique, de maquillage ou de soin sur les cils et/ou les sourcils, comportant un organe d'application moulé (8) comportant :
 - une âme (10) s'étendant selon un axe longitudinal (X),
 - des picots (18, 15, 16) portés par l'âme (10) et disposés selon une pluralité de rangées longitudinales (17, 19, 20), dans lequel, au sein d'une rangée longitudinale (17) sur au moins deux autour de l'axe longitudinal (X) de l'âme (10), au moins un picot (16) est renforcé à sa base (16a) et s'étend entre des picots (15) dépourvus de renfort, l'applicateur étant **caractérisé par le fait que** les deux picots adjacents à un picot renforcé (16) sur une rangée circonférentielle à laquelle ledit picot renforcé appartient et les deux picots le plus proches sur les deux rangées longitudinales adjacentes ne possèdent pas de renfort, et **par le fait que** les renforts des picots renforcés possèdent une section transversale avec une forme allongée dans la direction de l'axe longitudinal de l'âme.

2. Applicateur selon la revendication 1, dans lequel un picot sur deux (16) est renforcé à sa base sur plus de la moitié de la longueur de ladite rangée longitudinale (17). 5
3. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les renforts (13) des picots renforcés (16) possèdent une section transversale qui croît en rapprochement de l'âme (10). 10
4. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les renforts (13) des picots renforcés (16) s'étendent sur une partie seulement de la hauteur (h_t) du picot renforcé (16). 15
5. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les picots renforcés (16) présentent au-dessus des renforts (13) correspondants un corps de forme semi-conique. 20
6. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les picots renforcés (16) présentent un épaulement délimitant le renfort (13) du reste du picot renforcé. 25
7. Applicateur selon l'une quelconque des revendications précédentes, dans lequel la hauteur (h_r) des renforts (13) est inférieure à la moitié de la hauteur totale (h_t) des picots renforcés (16). 30
8. Applicateur selon l'une quelconque des revendications précédentes, dans lequel le ratio (h_r/h_t) entre la hauteur de chaque renfort et la hauteur totale du picot qu'il renforce est compris entre 0,2 et 0,78. 35
9. Applicateur selon l'une quelconque des revendications précédentes, dans lequel la hauteur (h_r) des renforts (13) est constante le long de l'axe longitudinal (X) de l'âme (10), étant notamment comprise entre 0,1 mm et 2,5 mm, mieux entre 0,17 mm et 1,55 mm. 40
10. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les picots renforcés (16) sont de même hauteur que les picots (18, 15) dépourvus de renfort. 45
11. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les picots (18) des rangées longitudinales dépourvues de renfort sont de forme conique. 50
12. Applicateur selon l'une quelconque des revendications précédentes, dans lequel les renforts (13) des picots renforcés (16) sont moulés avec l'âme (10) dans la même matière. 55
13. Dispositif (1) de conditionnement et d'application

d'un produit (P) sur les cils et/ou les sourcils, comportant un applicateur (2) selon l'une quelconque des revendications précédentes et un récipient (3) contenant le produit (P).

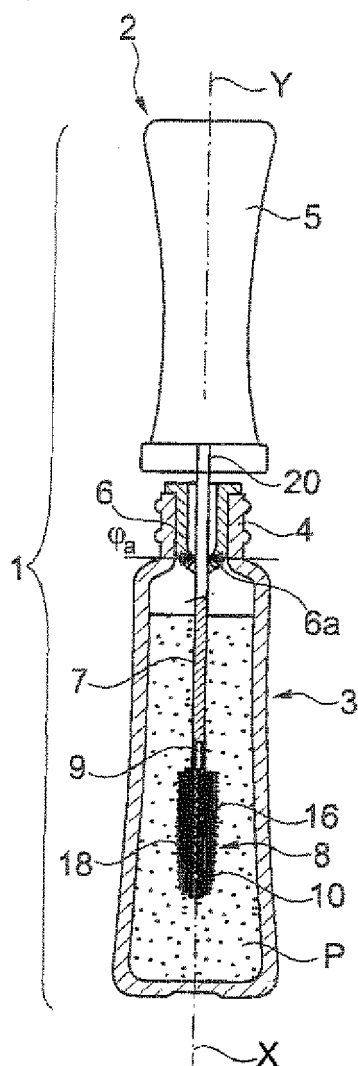


Fig. 1

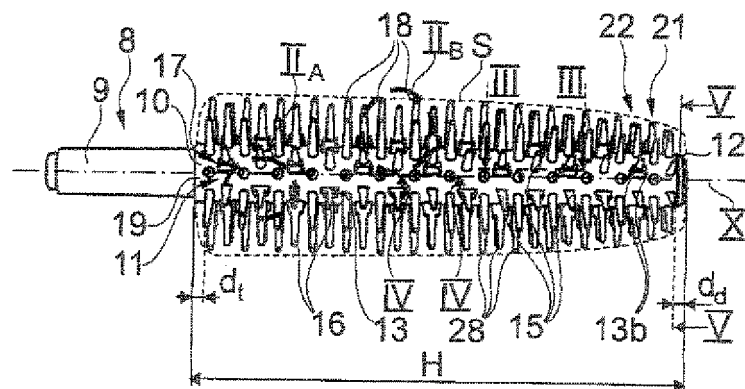


Fig. 2

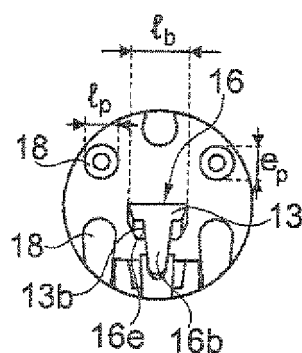


Fig. 2A

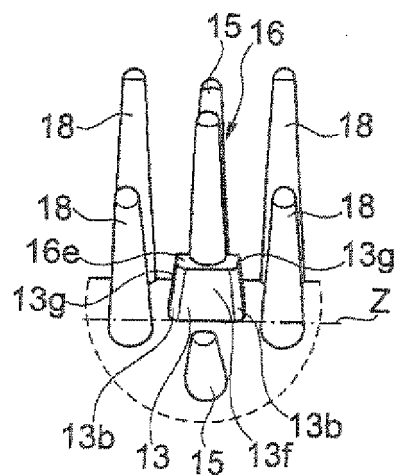


Fig. 2B

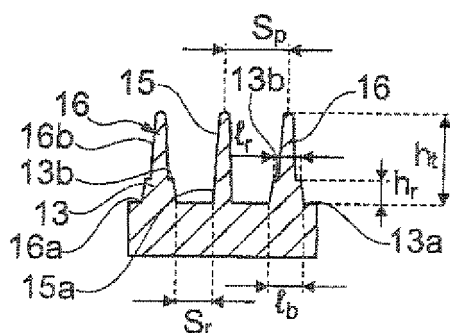


Fig. 3

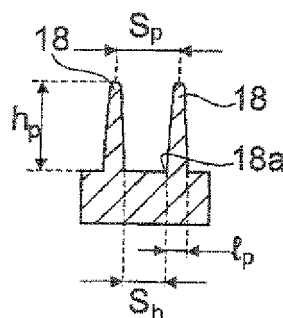


Fig. 4

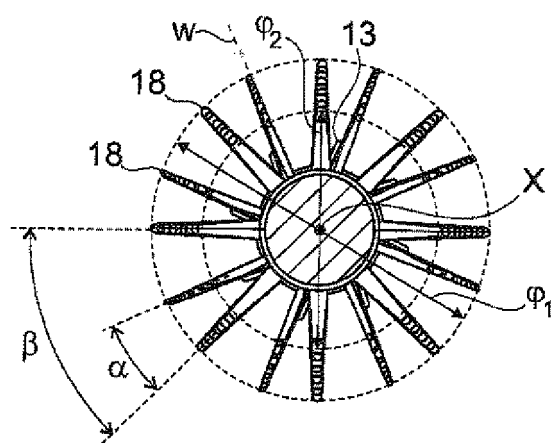


Fig. 5

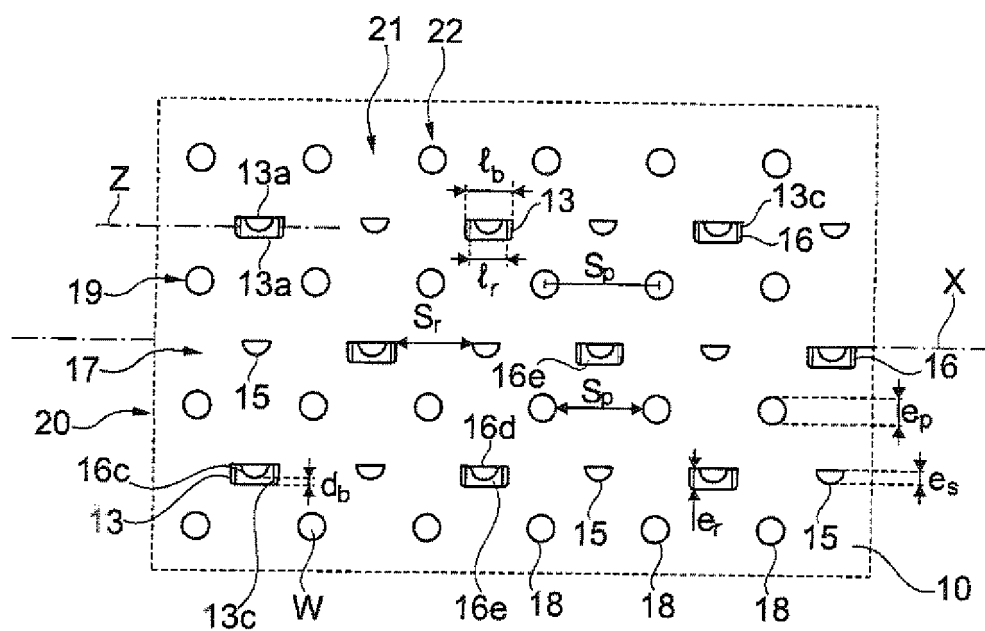


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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