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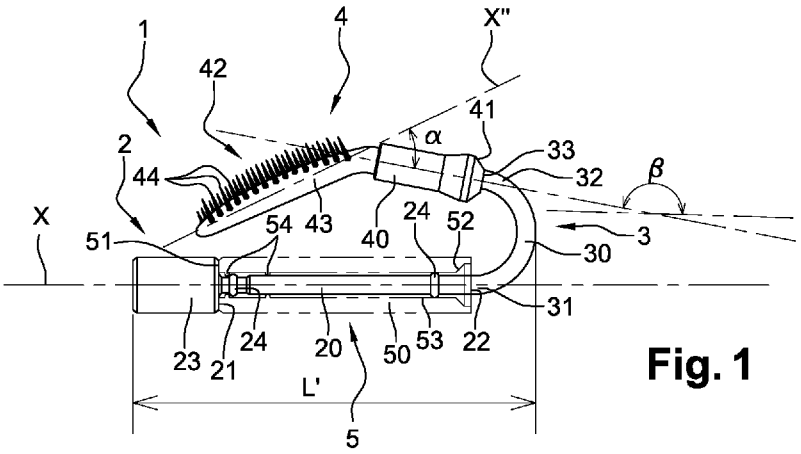

Fig. 1

(57) Abstract: The invention relates to an applicator (1) for a cosmetic product, comprising: - a rigid proximal portion (2) that extends along a longitudinal axis (X) and has a stem (20); - a flexible intermediate portion (3); - a distal application portion (4); - a hollow rigid sleeve (5) arranged so as to be movable along the longitudinal axis (X) between: * a configuration for storing away the applicator (1), in which said sleeve (5) at least partially covers the stem (20) of the proximal portion (2) along the longitudinal axis (X); and * a configuration for using the applicator (1), in which said sleeve (5) covers the intermediate portion (3) along the longitudinal axis (X), elastically deforming said intermediate portion (3), such that the proximal portion (2), the intermediate portion (3) and the sleeve (5) are aligned along the longitudinal axis (X).

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Foldable applicator for cosmetic product and associated packaging and application assembly

The present invention relates to an applicator for a cosmetic product, especially for a cosmetic product in the form of a compact powder, a friable product or a liquid or pasty product.

Such applicators are used especially to pick up and apply compacted pulverulent cosmetic compositions or friable cosmetic compositions, such as mascara, eyeshadows, face powders, blushers, foundations or the like, or liquid or pasty cosmetic compositions, which are especially dispensed through a screen, such as mascaras, foundations or the like, to keratin fibres, such as the eyelashes or eyebrows, or to the skin.

These applicators are generally in the form of an elongate element comprising a handle intended to be held by the user and an applicator member, such as a brush or a comb, that is arranged at the end of the handle and allows the user to pick up a cosmetic product and apply it to keratin fibres or to the skin.

Such applicators are conventionally held inside a housing provided in a case that also contains the cosmetic product in order to constitute a ready-to-use assembly for packaging and applying a cosmetic product, said assembly being easy to carry around in the form of a unitary assembly.

In order to allow satisfactory use, especially in terms of precision of application, that is ergonomic for the user, such an applicator has to be sufficiently long for the user to be able to hold the handle and apply the cosmetic product properly and with the required precision by means of the applicator member.

Furthermore, when it is not used, such an applicator has to be able to be held inside a housing provided in a case that also holds a reserve of cosmetic product. The evolution of the designs of these cases has led to the development of cases of small size, and so it has been necessary to develop foldable applicators that have an unfolded use configuration and a folded configuration in which the applicator can be held in a housing of small size.

Such foldable applicators are generally in the form of an elongate element comprising an applicator member and a handle made of two parts that are hinged with respect to one another by means of a pivot link.

In the use configuration, the two handle parts are arranged in an aligned manner along a longitudinal axis so as to constitute a handle which is sufficiently long to allow the cosmetic product to be picked up and to be applied precisely to the keratin fibres or to the skin by means of the applicator member.

In the storing-away configuration, the two handle parts are folded together such that the applicator has a smaller size along the longitudinal axis and can easily be held inside a suitable housing provided in a case for packaging the cosmetic product.

Such foldable applicators with a hinged handle are not entirely satisfactory, however.

Specifically, there is a need to improve the ergonomics of such applicators with which the operation of unfolding the applicator in order to pass it from the storing-away configuration to the use configuration, and vice versa, can prove to be tricky for a user and lead to a risk of the user soiling their fingers with cosmetic product

remaining on the applicator member during operations of unfolding/folding the applicator.

Moreover, the pivot link of such foldable applicators with a hinged handle is susceptible to being clogged with the cosmetic product contained in the case when the applicator is in the storing-away configuration and held inside a suitable housing provided in this case. Such clogging of the pivot link between the two handle parts is likely to impair proper functioning of this link and make it difficult to pass the applicator between its storing-away configuration and its use configuration.

Finally, such foldable applicators with a hinged handle can prove relatively expensive to manufacture, especially on account of the number of parts employed therein and the various steps that are necessary for the assembly thereof.

Therefore, there is a need to develop a foldable applicator for a cosmetic product, especially for a cosmetic product in the form of a compact powder or friable product, which is ergonomic to use, especially in order to pass it from a storing-away configuration to a use configuration and vice versa, and for applying the cosmetic product when it is in the use configuration, operates reliably and durably and has lower manufacturing costs.

To this end, according to a first aspect, the present invention provides an applicator for a cosmetic product, especially for a cosmetic product in the form of a compact powder, a friable product or a liquid or pasty product, comprising:

- a rigid proximal portion that extends along a longitudinal axis and has a proximal axial abutment and a stem defining a distal end;

- an elastically flexible intermediate portion that is in the overall shape of a U in the absence of external load, with:

* a first leg of the U extending from the distal end of the proximal portion substantially along the longitudinal axis;

* a second leg of the U having a distal end;

* a base of the U connecting the first leg and the second leg;

- a distal application portion extending from the distal end of the second leg and comprising a distal axial abutment and an applicator member;

- a hollow rigid sleeve that is arranged between the proximal axial abutment and the distal axial abutment, has an axial length greater than the opened-out axial length of the U forming the intermediate portion, and is movable along the longitudinal axis between:

* a configuration for storing away the applicator, in which said sleeve is in contact with the proximal axial abutment and at least partially covers the stem of the proximal portion along the longitudinal axis, leaving the intermediate portion at least partially free; and

* a configuration for using the applicator, in which said sleeve is in contact with the distal axial abutment and covers the intermediate portion along the longitudinal axis, elastically deforming said intermediate portion, such that the proximal portion, the intermediate portion and the sleeve are substantially aligned along the longitudinal axis.

The terms “rigid” element, whether this be the proximal portion or the sleeve, and “flexible” element, for characterizing the intermediate portion, should be understood here as relative terms, i.e. the proximal portion and the sleeve are more rigid than the intermediate portion, or, in other words, the

intermediate portion is more flexible than the proximal portion and the sleeve.

These relative rigidity/flexibility characteristics should also be understood as meaning that the rigid elements are able to deform the flexible elements without themselves being deformed.

Although it has been indicated that the intermediate portion is in the shape of a U in the absence of external load, provision could be made, without departing from the scope of the present invention, for the intermediate portion to be in the shape of a V in the absence of external load, the legs of the V being equivalent to the legs of the U and the junction of the legs of the V being equivalent to the base of the U.

More generally, the expression “overall shape of a U” encompasses any curved, that is to say non-rectilinear, overall shape with a radius of curvature that is constant or variable along the axis of extension of the intermediate portion.

At rest, that is to say without any external load causing it to be deformed, the intermediate portion is in the shape of a U, a V or a curved shape as indicated above. Thus, in the configuration for storing away the applicator, this intermediate portion forms a “return” that brings the distal application portion towards the proximal portion of the applicator.

By virtue of these arrangements, an applicator is provided, the ergonomics of which for passing from a storing-away configuration to a use configuration and vice versa is improved, which operates reliably and durably and which has lower manufacturing costs.

In order to pass from the storing-away configuration to the use configuration of the applicator, the user takes hold of the proximal portion of the applicator and then moves the sleeve axially along the longitudinal axis, gradually deforming the flexible intermediate portion until the latter is completely covered along the longitudinal axis when said sleeve reaches the distal abutment of the application portion. In this position of the sleeve, which corresponds to the configuration for using the applicator, the flexible intermediate portion is covered by the rigid sleeve and this sleeve forms, with the rigid proximal portion of the applicator, a rigid handle that extends along the longitudinal axis, has its greatest size along this axis and is intended to be held by the user in order to pick up and apply a cosmetic product.

In order to pass from the use configuration to the configuration for storing away the applicator, the user takes hold of the proximal portion of the applicator and then moves the sleeve axially along the longitudinal axis until it reaches the proximal abutment of the proximal portion. During this movement, the intermediate portion is gradually uncovered at least partially by the sleeve and once again, by elastic return, takes on its balanced shape without external load, namely the shape of a U; in doing so, the intermediate portion brings the distal application portion towards the proximal portion such that the applicator has a smaller size along the longitudinal axis and can especially be received easily inside a housing provided in a case for storing the cosmetic product.

According to further advantageous aspects of the invention, the applicator includes one or more of the following features, individually or in any technically possible combinations:

- the proximal portion, the intermediate portion and/or the distal application portion are made of plastics material, especially by injection or co-injection of plastics materials or by overmoulding plastics materials;

- in a variant or in addition, the elastically flexible intermediate portion comprises an elastically flexible metal element, such as a metal wire, that confers the elastic flexibility on or adds to the elastic flexibility of the intermediate portion. Such a metal element, for example in the form of a wire, may be embedded in an element made of flexible plastics material so as to form the intermediate portion. This metal element may extend along the entire intermediate portion or along a portion of the intermediate portion.

- the distal application portion comprises a base that defines the distal axial abutment and is made from the same material as the proximal portion. By virtue of these arrangements, the manufacturing costs of the applicator can be reduced, the base of the distal application portion and the proximal portion being made of one and the same material, advantageously one and the same plastics material that is employed in one and the same step of the manufacturing method, such as an injection or co-injection step with the plastics material constituting the intermediate portion, if appropriate, or a step of overmoulding on the plastics material constituting the intermediate portion, if appropriate.

- the applicator member comprises a rigid body, advantageously made from the same material as the proximal portion, and flexible application elements, advantageously made from the same material as the intermediate portion, protruding from said body. By virtue of these arrangements, the manufacturing costs of the applicator can be reduced, the body of the distal application portion and the proximal portion being made of one and the same first material, advantageously one and the same first plastics material, and the application

elements and the intermediate portion being made of one and the same second material, advantageously one and the same second plastics material. Thus, the applicator can advantageously be obtained by co-injection of the first, relatively rigid, plastics material, from which the proximal portion and the base of the distal portion and/or the body of the applicator member are made, and of the second, relatively flexible, plastics material, from which the intermediate portion and the application elements are made. In a variant, provision may be made for the method for manufacturing the applicator according to the invention to implement a step of overmoulding the second plastics material, of which the intermediate portion and the application elements are made, on the first plastics material, from which the proximal portion and the base of the distal portion and/or the body of the applicator member are made.

- the body of the applicator member extends in continuation of the base or forms a non-zero angle with the base, especially an angle of between 5° and 90°, preferably between 10° and 60°, in particular around 45°. By virtue of these arrangements, the ergonomics of the applicator in the use configuration are adapted to the needs of the user. In particular, in the embodiment in which the body of the applicator member forms a non-zero angle with the base, the inclination of the body of the applicator member with respect to the base and to the longitudinal axis of the applicator improves the ergonomics of application of the cosmetic product by making it possible to reduce the pressure in the user's arm during application of the cosmetic product to the keratin fibres or to the skin.

- the body of the applicator member forms a non-zero angle with the base so as to extend inside the U formed by the flexible portion when the sleeve is in the configuration for storing away the applicator. Thus, in the storing-away configuration, the size of the applicator is reduced in a first direction corresponding

to that of the longitudinal axis and in a second direction perpendicular to the longitudinal axis, the body of the applicator member extending inside the space defined by the U formed by the intermediate portion.

- in the configuration for storing away the applicator, the second leg of the U extends along a second longitudinal axis substantially parallel to the longitudinal axis of the proximal portion or forms a non-zero angle with the longitudinal axis of the proximal portion, especially an angle of between 135° and 175°, preferably between 150° and 170°, in particular around 160°. The first longitudinal axis corresponds to that along which the proximal portion extends. In the embodiment in which, in the storing-away configuration of the applicator, the second leg of the U extends along a longitudinal axis substantially parallel to the longitudinal axis of the proximal portion, the size of the applicator is reduced in a first direction corresponding to that of the longitudinal axis and in a second direction perpendicular to the longitudinal axis, the body of the applicator member extending inside the space defined by the U formed by the intermediate portion.

- in the configuration for storing away the applicator, the proximal portion, the intermediate portion, the distal application portion and the sleeve are centred on one and the same plane comprising the longitudinal axis. By virtue of these arrangements, the size of the applicator is reduced in a first direction corresponding to that of the longitudinal axis and in a third direction perpendicular to the longitudinal axis and to the second direction, the first, second and third directions belonging to an orthonormal frame of reference.

- in the storing-away configuration, the applicator has a length measured along the longitudinal axis that is less than 80%, preferably less than 60%, better still less than 50%, of the length of the applicator in the use

configuration. In this way, an applicator is provided that has, in the storing-away configuration, a shorter length along the longitudinal axis, corresponding to less than 80%, preferably less than 60%, better still less than half the length of the applicator in the use configuration along the longitudinal axis.

The present invention also relates to an assembly for packaging and applying a cosmetic product, especially a cosmetic product in the form of a compact powder, a friable product or a liquid or pasty product, comprising:

- an applicator as described above, and
- a case comprising a housing for receiving a cosmetic product and a housing suitable for receiving the applicator in the storing-away configuration.

The present invention finally provides a method for using an assembly for packaging and applying a cosmetic product according to the invention, comprising the following steps of:

- removing the applicator from the housing of the case;
- moving the sleeve from the configuration for storing away the applicator to the configuration for using the applicator;
- picking up cosmetic product contained in the housing of the case by way of the distal application portion;
- applying the picked-up cosmetic product (P) to keratin fibres or to the skin.

According to a second aspect, the present invention provides an applicator for a cosmetic product, especially for a cosmetic product in the form of a compact powder, a friable product or a liquid or pasty product, comprising:

- a rigid proximal portion that extends along a longitudinal axis and has a proximal axial abutment and a stem defining a distal end;

- an intermediate portion comprising a proximal end joined to the distal end of the proximal portion, at least one elastically flexible portion and a distal end;

- a distal application portion extending along an axis of extension from the distal end of the intermediate portion and comprising a distal axial abutment and an applicator member, said elastically flexible portion being configured such that, in the absence of external load, the axis of extension of the distal application portion forms a first, non-zero angle with the longitudinal axis of the proximal portion;

- a hollow rigid sleeve that is arranged between the proximal axial abutment and the distal axial abutment, has an axial length greater than the opened-out axial length of the intermediate portion, and is movable along the longitudinal axis between:

* a first configuration for using the applicator, in which said sleeve is in contact with the proximal axial abutment and at least partially covers the stem of the proximal portion along the longitudinal axis, leaving at least the flexible portion of the intermediate portion free; and

* a second configuration for using the applicator, in which said sleeve is in contact with the distal axial abutment and covers the intermediate portion along the longitudinal axis, elastically deforming the flexible portion, such that the proximal portion, the intermediate portion and the sleeve are substantially aligned along the longitudinal axis, and such that the axis of extension of the distal application portion forms a second angle with the longitudinal axis, said second angle being different from the first angle.

By virtue of these arrangements, the invention provides, according to this second aspect, an applicator that can

take on two different use configurations, with the distal application portion forming a different angle with the longitudinal axis depending on whether the sleeve is in the position corresponding to the first use configuration, the axis of extension of the application portion then forming a first, non-zero angle with the longitudinal axis, or whether the sleeve is in the position corresponding to the second use configuration, the axis of extension of the application portion then forming a second angle, different from the first, with the longitudinal axis.

Furthermore, when the sleeve is in the position corresponding to the first use configuration, the flexible portion of the intermediate portion is not covered by the sleeve; the distal application portion thus has elastic mobility with respect to the proximal portion intended to be held by the user in order to apply a cosmetic product by means of the applicator in this first use configuration, thereby making it possible to improve the comfort of application of the cosmetic product, in particular to the skin or the lips.

The rigidity of the flexible portion will be suited to the body surface to which the cosmetic product is applied. In particular, in the scope of application of mascara to the eyelashes, the rigidity of the flexible portion will be chosen such that the latter does not deform by reaction in contact with the eyelashes, specifically in order to ensure good precision of application. By contrast, in the scope of application of a foundation to the skin or a lipstick or lip gloss, the rigidity of the flexible portion will be chosen so as to be able to deform elastically by reaction in contact with the application surface, specifically in order to improve the comfort of application.

According to one advantageous arrangement of the second aspect of the present invention, the first angle is between 5° and 180°, preferably between 20° and 90°, for example around 45°.

According to another advantageous arrangement of the second aspect of the present invention, the second angle is strictly less than the first angle. In one particular embodiment of the second aspect of the present invention, the second angle is zero, the axis of extension of the distal application portion then being coincident with the longitudinal axis of the proximal portion when the sleeve is in the position corresponding to the second configuration for using the applicator.

According to one advantageous arrangement of the second aspect of the present invention, the intermediate portion may be entirely made of elastically flexible material.

In a variant, the intermediate portion comprises an elastically flexible portion provided at its proximal end that is joined to the distal end of the proximal portion and a rigid portion that extends between the flexible portion and the distal end joined to the distal application portion, and/or an elastically flexible portion at its distal end joined to the distal application portion and a rigid portion that extends between the proximal end joined to the distal end of the proximal portion and the flexible portion.

According to another variant, the intermediate portion comprises a first rigid portion joined to the distal end of the proximal portion, a second rigid portion joined to the distal application portion, and a flexible portion between said first rigid portion and said second rigid portion.

Advantageously, the distal application portion comprises a base that defines the distal axial abutment and extends along the axis of extension of the distal application portion.

Advantageously, in the first configuration for using the applicator, the base of the distal application portion extends along a longitudinal axis that forms a non-zero angle with the longitudinal axis of the proximal portion, especially an angle of between 5° and 90°, preferably between 10° and 60°, in particular around 45°.

Advantageously, when the body of the applicator member forms a non-zero angle with the base, especially of between 5° and 90°, preferably between 10° and 60°, in particular around 45°, and, in the first configuration for using the applicator, the base of the distal application portion extends along a longitudinal axis that forms a non-zero angle with the longitudinal axis of the proximal portion, especially an angle of between 5° and 90°, preferably between 10° and 60°, in particular around 45°, the sum of these angles, which corresponds to the angle formed between the body of the applicator member belonging to the distal application portion and the longitudinal axis of the proximal portion is preferably close to 90°.

Advantageously, in a variant or in addition, the elastically flexible portion of the intermediate portion comprises an elastically flexible metal element, such as a metal wire, that confers the elastic flexibility on or adds to the elastic flexibility of the elastically flexible portion of the intermediate portion. Such a metal element, for example in the form of a wire, may be embedded in an element made of flexible plastics material so as to form the elastically flexible portion of the intermediate portion. This metal element may extend along the entire elastically flexible portion of the

intermediate portion or along a part of the elastically flexible portion of the intermediate portion.

One or more of the features described above in connection with the applicator according to the first aspect of the invention can be applied to the applicator according to this second aspect of the invention.

According to one advantageous arrangement of the invention according to the first or second aspect, the elastically flexible intermediate portion or the elastically flexible portion of the intermediate portion, and also the application elements of the distal application portion, if appropriate, are made of a relatively flexible thermoplastic material, such as SEBS, a silicone, latex, a thermoplastic elastomer, a polyester elastomer or a vinyl elastomer, this list not being limiting.

According to one advantageous arrangement of the invention according to the first or second aspect, the rigid proximal portion, the rigid portion(s) of the intermediate portion, the sleeve, and the base and the body of the applicator member belonging to the distal application portion, if appropriate, are made of relatively rigid plastics material, for example a polyolefin such as PE or PP, a PVC, an EVA, a PS, an SEBS, an SIS, a PET, a POM, a PU, an SAM, a PA, a PBT, or a PMMA, this list not being limiting.

The invention may be understood better from reading the following description of non-limiting implementation examples thereof, with reference to the appended drawings, in which:

- Figure 1 illustrates a plan view of a foldable applicator according to a first aspect of the invention in the storing-away configuration, the sleeve being

illustrated in chain line so as to render the elements therein visible;

- Figure 2 illustrates a plan view of a foldable applicator according to the first aspect of the invention in the use configuration, the sleeve being illustrated in chain line so as to render the elements therein visible;

- Figure 3 is a schematic perspective view illustrating a case belonging to an assembly for packaging and applying a cosmetic product, within which an applicator according to the first aspect of the invention can be employed;

- Figure 4 illustrates a plan view of a foldable applicator according to a second aspect of the invention in the first use configuration, the sleeve being illustrated in chain line so as to render the elements therein visible;

- Figure 5 illustrates a plan view of a foldable applicator according to the second aspect of the invention in the second use configuration, the sleeve being illustrated in chain line so as to render the elements therein visible.

As can be seen in Figures 1 and 2, the foldable applicator 1 according to the first aspect of the invention comprises a rigid proximal portion 2 extending along a longitudinal axis X.

The rigid proximal portion 2 comprises a proximal gripping element that is in the form of a solid cylinder 23 of revolution about the longitudinal axis X here.

The proximal gripping element 23 defines a proximal axial abutment 21 that is formed by a front surface of the cylinder 23 here.

The rigid proximal portion 2 also comprises a stem 20 that extends along the longitudinal axis X and defines a distal end 22.

The applicator 1 according to the first aspect of the invention also comprises a distal portion 4 for picking up and applying the cosmetic product, comprising a distal axial abutment 41 and an applicator member 42.

The distal application portion 4 comprises a base that is in the form of a solid cylinder 40 of revolution about a second longitudinal axis X' here, the first longitudinal axis X being the one along which the proximal portion 2 extends. This second longitudinal axis X' will also be referred to below as axis of extension of the distal application portion 4, in particular in the scope of the second aspect of the invention.

The base 40 of the distal application portion 4 defines a distal axial abutment 41 that is in the form of a frustoconical portion centred on the second longitudinal axis or axis of extension of the distal application portion X' here.

The applicator member 42 comprises a body 43 and application elements 44 protruding from the body 43.

The body 43 of the applicator member 42 may extend along the second longitudinal axis X' in continuation of the base 40, or, as can be seen especially in Figures 1 and 2, the body 43 of the applicator member 42 may extend along a third longitudinal axis X" that forms a non-zero angle α with the second longitudinal axis X' along which the base 40 extends, this angle α being close to 45° here.

The applicator 1 according to the first aspect of the invention also comprises an elastically flexible

intermediate portion 3 extending between the proximal portion 2 and the distal application portion 3.

The elastically flexible intermediate portion 3 is designed to have the overall shape of a U in the absence of external load. In other words, when the intermediate portion is at rest, that is to say when it is not subjected to an external stress, it has the overall shape of a U.

The intermediate portion 3 has, in the absence of external load, a first leg 31 that extends from the distal end 22 of the proximal portion 2 substantially along the longitudinal axis X, a second leg 32 that has a distal end 33 joined to the distal application portion 4, and a base 30 that joins the first leg 31 to the second leg 32.

In the embodiment illustrated, the intermediate portion 3 is in the form of a soft cylinder of revolution that is in the overall shape of a U at rest. In a variant or in addition, an elastically flexible metal wire can be embedded in the soft cylinder forming the intermediate portion in order to confer the elastic flexibility on or add to the elastic flexibility of the elastically flexible intermediate portion 3, by being fixed by any appropriate means both to the proximal portion 2, for example crimped on the end of the stem 20, and to the distal application portion 4, for example crimped on the base 40.

The applicator 1 according to the first aspect of the invention finally comprises a hollow rigid sleeve 5 that is arranged so as to be movable at least in translation along the longitudinal axis X between the proximal axial abutment 21 belonging to the proximal portion 2 and the distal axial abutment 41 belonging to the distal application portion 4.

The sleeve 5 has an axial length l measured along the longitudinal axis X that is greater than the opened-out axial length l' of the U forming the intermediate portion 3.

In this case, this rigid sleeve 5 comprises a hollow cylinder 50 of revolution about the longitudinal axis X, through which there passes a longitudinal channel 53 that is suitable for allowing the sleeve 5 to move along the stem 20 of the proximal portion 2 and the intermediate portion 3, and which defines a proximal axial abutment 51 formed by a front surface of the cylinder 50, and a distal axial abutment 52 formed by a frustoconical internal surface of the cylinder 50.

Advantageously, in order to make it easier to assemble the sleeve 5 on the proximal portion 2 and the intermediate portion 3, the hollow cylinder 50 forming the sleeve 5 is produced in two parts, for example as two half-cylinders that are joined together by any appropriate means.

According to the first aspect of the invention, the sleeve 5 is movable along the longitudinal axis X between a configuration for storing away the applicator 1, illustrated in Figure 1, and a configuration for using the applicator 1, illustrated in Figure 2.

In the configuration for storing away the applicator 1, the proximal axial abutment 51 of the cylinder 50 is in contact with the proximal axial abutment 21 defined on the proximal gripping element 23 of the proximal portion 2, and the cylinder 50 at least partially covers the stem 20 of the proximal portion 2 along the longitudinal axis X, leaving the intermediate portion 3 free.

In this position of the sleeve 5, the intermediate portion 3 is left free by the sleeve 5 along the

longitudinal axis X, i.e. it is not loaded/deformed by the sleeve 5 and is thus in the overall shape of a U as described above.

In the embodiment illustrated in Figures 1 and 2, and as can be seen in particular in Figure 1, the body 43 of the applicator member 42 forms a non-zero angle α with the base 40 so as to extend inside the U formed by the flexible portion 3 when the sleeve 5 is in the configuration for storing away the applicator.

Furthermore, in the embodiment illustrated in Figures 1 and 2, and as can be seen in particular in Figure 1, in the configuration for storing away the applicator, the proximal portion 2, the intermediate portion 3, the distal application portion 4 and the sleeve 5 are centred on one and the same plane comprising the longitudinal axis X.

Thus, the size of the applicator 1 is smaller in the three spatial directions in the storing-away configuration.

In the configuration for storing away the applicator, the second leg 32 of the U extends along the second longitudinal axis X', which may be substantially parallel to the longitudinal axis X of the proximal portion 2 or, as illustrated in Figure 1, form a non-zero angle β with the longitudinal axis X of the proximal portion 2, especially an angle β of between 135° and 175°, preferably between 150° and 170°, in particular close to 160° here.

Starting from this position of the sleeve 5 corresponding to the configuration for storing away the applicator and wishing to put the applicator into the use configuration, a user takes hold of the proximal gripping element 23 and moves the sleeve 5 along the longitudinal axis X until

the distal axial abutment 52 of the cylinder 50 has been brought into contact with the distal axial abutment 41 defined on the base 40 of the distal application portion 4. In doing so, the sleeve 5 gradually and elastically deforms the flexible intermediate portion 3, covering the latter along the longitudinal axis X, and brings the proximal portion 2, the intermediate portion 3 and the sleeve 5 substantially into alignment along the longitudinal axis X.

In the embodiment illustrated in Figures 1 and 2, the second longitudinal axis X', along which the base 40 of the distal application portion 4 extends, is coincident with the longitudinal axis X of the proximal portion 2 when the applicator 1 is in the use configuration. Thus, in this embodiment, in the configuration for using the applicator 1 that is illustrated in Figure 2, the proximal portion 2, the intermediate portion 3, the sleeve 5 and the base 40 of the distal application portion 4 are substantially aligned along the longitudinal axis X.

Advantageously, the applicator 1 has, in the storing-away configuration illustrated in Figure 1, a length L' measured along the longitudinal axis X that is less than 80%, preferably less than 60%, better still less than 50%, of the length L of the applicator 1 in the use configuration illustrated in Figure 2.

Preferably, the stem 20 of the proximal portion 2 comprises two annular bulges 24 that are situated respectively close to the proximal axial abutment 21 and close to the distal end 22. These bulges 24 are designed to be in contact with and to slide along the internal surface of the longitudinal channel 53 of the cylinder 50 as the sleeve 5 moves along the longitudinal axis X. Furthermore, the longitudinal channel 53 of the cylinder 50 is provided with two annular bulges 54 that extend

towards the inside of the channel and are spaced apart along the longitudinal axis X by a distance greater than the axial extent of the annular bulge 24 on the stem 20 that is situated close to the proximal axial abutment 21. These annular bulges 54 that are provided in the channel 53 of the cylinder 50 are designed to cooperate with the annular bulge 24 on the stem 20 that is situated close to the proximal axial abutment 21 so as to form a friction point to be overcome in order to place the applicator 1 in the stored-away configuration, as can be seen in Figure 1, and to cooperate with the annular bulge 24 on the stem 20 that is situated close to the distal axial abutment 41 so as to form a friction point to be overcome in order to place the applicator 1 in the use configuration, as can be seen in Figure 2.

According to advantageous arrangements of the invention, in order to make it easier to manufacture the applicator and to reduce the intrinsic costs thereof:

- the proximal portion 2, the base 40 and the body 43 of the application portion 4 and the sleeve 5 are made of one and the same material, preferably from one and the same relatively rigid plastics material; and/or
- the intermediate portion 3 and the application elements 44 of the application portion 4 are made of one and the same material, preferably from one and the same relatively flexible plastics material.

With reference to Figure 3, the present invention also relates to an assembly for packaging and applying a cosmetic product, employing a foldable applicator as described above.

This packaging and application assembly comprises an applicator as described above and a case 10.

The case 10 comprises a base 100 and a lid 110 that is hinged to the base 100 by means of a symbolically depicted

hinge 14. The inner face of the lid 110 is advantageously equipped with a mirror 13.

The base 100 of the case 10 comprises a housing 11 for receiving a cosmetic product P, such as a cosmetic product in the form of compact powder or friable product, or a liquid or pasty product, the housing 11 then optionally being combined with a screen for dispensing the product. The base 100 of the case 10 also comprises a housing 12 of suitable size to be able to accommodate the applicator 1 as described above when it is in the storing-away configuration.

An applicator according to a second aspect of the invention will now be described in relation to Figures 4 and 5.

In these figures, those elements of the applicator according to the second aspect of the invention that are identical or similar to those of the applicator according to the first aspect of the invention bear the same reference signs, optionally with the addition of a ' sign.

This second aspect of the applicator according to the invention differs from the first aspect in that the storing-away configuration of the first aspect is replaced in the second by a first use configuration, and in that the use configuration of the first aspect corresponds to a second use configuration that is different from the first use configuration.

Thus, according to this second aspect of the present invention, the applicator for a cosmetic product, especially for a cosmetic product in the form of compact powder, friable product or liquid or pasty product, comprises:

- a rigid proximal portion 2 that extends along a longitudinal axis X and has a proximal axial abutment 21 and a stem 20 defining a distal end 22;

- an intermediate portion 3′ comprising a proximal end 34′ joined to the distal end 22 of the proximal portion 2, at least one elastically flexible portion 30′ and a distal end 33′;

- a distal application portion 4 that extends along an axis of extension X′ from the distal end 33′ of the intermediate portion 3′ and comprises a distal axial abutment 41 and an applicator member 42, said elastically flexible portion 30′ being configured such that, in the absence of external load, the axis of extension X′ of the distal application portion 4 forms a first, non-zero angle β with the longitudinal axis X of the proximal portion 2;

- a hollow rigid sleeve 5 that is arranged between the proximal axial abutment 21 and the distal axial abutment 41, has an axial length l greater than the axial opened-out length l′ of the intermediate portion 3′, and is movable along the longitudinal axis X between:

* a first configuration for using the applicator 1, in which said sleeve 5 is in contact with the proximal axial abutment 21 and at least partially covers the stem 20 of the proximal portion 2 along the longitudinal axis X, leaving at least the flexible portion 30′ of the intermediate portion 3′ free; and

* a second configuration for using the applicator 1, in which said sleeve 5 is in contact with the distal axial abutment 41 and covers the intermediate portion 3′ along the longitudinal axis X, elastically deforming the flexible portion 30′ such that the proximal portion 2, the intermediate portion 3′ and the sleeve 5 are substantially aligned along the longitudinal axis X, and such that the axis of extension X′ of the distal application portion 4 forms a second angle β′ with the longitudinal axis X, said second angle β′ being different from the first angle β.

According to an advantageous arrangement of the second aspect of the present invention, the first angle β is between 5° and 180°, preferably between 20° and 90°, for example around 45°, as illustrated in Figure 4.

In the embodiment illustrated in Figures 4 and 5, advantageously, in the second configuration for using the applicator, the axis of extension X' of the distal application portion 4 forms a second, zero angle β' with the longitudinal axis X of the proximal portion 2. The axis of extension X' of the distal application portion 4 and the longitudinal axis X of the proximal portion 2 are thus coincident in the second configuration for using the applicator 1, as can be seen in particular in Figure 5.

According to one advantageous arrangement of the second aspect of the present invention, the intermediate portion 3' may be made entirely of elastically flexible material.

In a variant (not illustrated), the intermediate portion 3' may comprise an elastically flexible portion provided at its proximal end joined to the distal end 22 of the proximal portion 2 and a rigid portion extending between the flexible portion and the distal end joined to the distal application portion 4, and/or an elastically flexible portion at its distal end joined to the distal application portion 4 and a rigid portion extending between the proximal end joined to the distal end 22 of the proximal portion 2 and the flexible portion.

According to another variant, illustrated in Figures 4 and 5, the intermediate portion 3' comprises a first rigid portion 31' joined to the distal end 22 of the proximal portion 2, a second rigid portion 32' joined to the distal application portion 4 and a flexible portion 30' between said first rigid portion 31' and said second rigid portion 32'.

In the embodiment illustrated, the elastically flexible portion 30′ of the intermediate portion 3 is in the form of a soft cylinder of revolution that has a curved shape at rest. In a variant or in addition, an elastically flexible metal wire may be embedded in the soft cylinder forming the elastically flexible portion 30′ of the intermediate portion 3′ so as to confer the elastic flexibility on or add to the elastic flexibility of the elastically flexible portion 30′ of the intermediate portion 3′, being fixed by any appropriate means both to the proximal portion 2, for example crimped on the first rigid portion 31′ joined to the proximal portion 2, and to the distal application portion 4, for example crimped on the second rigid portion 32′ joined to the distal application portion 4.

Advantageously, the distal application portion 4 comprises a base 40 that defines the distal axial abutment 41 and extends along the axis of extension X′ of the distal application portion 4.

Advantageously, in the first configuration for using the applicator, the base 40 of the distal application portion 4 extends along a longitudinal axis X′ that forms a non-zero angle β with the longitudinal axis X of the proximal portion, especially an angle of between 5° and 90°, preferably between 10° and 60°, in particular around 45°.

Advantageously, and as can be seen in particular in Figure 4, when the body 43 of the applicator member 42 forms a non-zero angle α with the base 40, especially of between 5° and 90°, preferably between 10° and 60°, in particular around 45°, and when, in the first configuration for using the applicator, the base 40 of the distal application portion 4 extends along a longitudinal axis X′ that forms a non-zero angle β with the longitudinal axis X of the proximal portion 2,

especially an angle of between 5° and 90°, preferably between 10° and 60°, in particular around 45°, the sum of these angles $\gamma=\alpha+\beta$, which corresponds to the angle formed between the body 43 of the applicator member 42 belonging to the distal application portion 4 and the longitudinal axis X of the proximal portion 2, is preferably close to 90°.

Thus, according to this second aspect, the invention provides an applicator that can take on two different use configurations, with the distal application portion 4 forming a different angle β with the longitudinal axis X depending on whether the sleeve 5 is in the position corresponding to the first use configuration, the axis of extension X' of the application portion then forming a first, non-zero angle β with the longitudinal axis, or whether the sleeve is in the position corresponding to the second use configuration, the axis of extension X' of the application portion then forming a second angle β', different from the first angle β, with the longitudinal axis X, said second angle β' being zero in the embodiment illustrated in Figures 4 and 5.

Furthermore, when the sleeve 5 is in the position corresponding to the first use configuration, the flexible portion 30' of the intermediate portion 3 is not covered by the sleeve 5; the distal application portion 4 then has elastic mobility with respect to the proximal portion 2 intended to be held by the user in order to apply a cosmetic product by means of the applicator 1 in this first use configuration, this making it possible to improve the comfort of application of the cosmetic product, in particular to the skin or the lips.

The rigidity of the flexible portion 30' will be adapted to the body surface to which the cosmetic product is applied. In particular, in the scope of application of mascara to the eyelashes, the rigidity of the flexible

portion 30' will be chosen such that it does not deform by reaction in contact with the eyelashes. By contrast, in the scope of application of foundation to the skin or of a lipstick or lip gloss, the rigidity of the flexible portion 30' will be chosen so as to be able to deform elastically by reaction in contact with the application surface.

CLAIMS

1. Applicator (1) for a cosmetic product, especially for a cosmetic product in the form of a compact powder, a friable product or a liquid or pasty product, characterized in that it comprises:

- a rigid proximal portion (2) that extends along a longitudinal axis (X) and has a proximal axial abutment (21) and a stem (20) defining a distal end (22);
- an elastically flexible intermediate portion (3) that is in the overall shape of a U in the absence of external load, with:
  * a first leg (31) of the U extending from the distal end (22) of the proximal portion (2) substantially along the longitudinal axis (X);
  * a second leg (32) of the U having a distal end (33);
  * a base (30) of the U connecting the first leg (31) and the second leg (32);
- a distal application portion (4) extending from the distal end (33) of the second leg (32) and comprising a distal axial abutment (41) and an applicator member (42);
- a hollow rigid sleeve (5) that is arranged between the proximal axial abutment (21) and the distal axial abutment (41), has an axial length (l) greater than the opened-out axial length (l') of the U forming the intermediate portion (3), and is movable along the longitudinal axis (X) between:
  * a configuration for storing away the applicator (1), in which said sleeve (5) is in contact with the proximal axial abutment (21) and at least partially covers the stem (20) of the proximal portion (2) along the longitudinal axis (X), leaving the intermediate portion (3) at least partially free; and
  * a configuration for using the applicator (1), in which said sleeve (5) is in contact with the distal axial abutment (41) and covers the intermediate portion

(3) along the longitudinal axis (X), elastically deforming said intermediate portion (3), such that the proximal portion (2), the intermediate portion (3) and the sleeve (5) are substantially aligned along the longitudinal axis (X).

2. Applicator (1) according to Claim 1, wherein the distal application portion (4) comprises a base (40) that defines the distal axial abutment (41) and is made from the same material as the proximal portion (2).

3. Applicator (1) according to either one of Claims 1 and 2, wherein the applicator member (42) comprises a rigid body (43), advantageously made from the same material as the proximal portion (2), and flexible application elements (44), advantageously made from the same material as the intermediate portion (3), protruding from said body (43).

4. Applicator (1) according to Claim 3, wherein the body (43) of the applicator member (42) extends in continuation of the base (40) or forms a non-zero angle (α) with the base (40), especially an angle (α) of between 5° and 90°, preferably between 10° and 60°, in particular around 45°.

5. Applicator (1) according to Claim 4, wherein the body (43) of the applicator member (42) forms a non-zero angle (α) with the base (40) so as to extend inside the U formed by the flexible portion (3) when the sleeve (5) is in the configuration for storing away the applicator.

6. Applicator (1) according to any one of Claims 1 to 5, wherein, in the configuration for storing away the applicator, the second leg (32) of the U extends along a second longitudinal axis (X') substantially parallel to the longitudinal axis (X) of the proximal portion (2) or forms a non-zero angle (β) with the longitudinal axis (X)

of the proximal portion (2), especially an angle (β) of between 135° and 175°, preferably between 150° and 170°, in particular around 160°.

7. Applicator (1) according to any one of Claims 1 to 6, wherein, in the configuration for storing away the applicator, the proximal portion (2), the intermediate portion (3), the distal application portion (4) and the sleeve (5) are centred on one and the same plane comprising the longitudinal axis (X).

8. Applicator (1) according to any one of Claims 1 to 7, wherein, in the storing-away configuration, the applicator (1) has a length (L') measured along the longitudinal axis (X) that is less than 80%, preferably less than 60%, better still less than 50%, of the length (L) of the applicator (1) in the use configuration.

9. Assembly for packaging and applying a cosmetic product, especially a cosmetic product in the form of a compact powder, a friable product or a liquid or pasty product, comprising:

- an applicator (1) according to any one of Claims 1 to 8, and
- a case (10) comprising a housing (11) for receiving a cosmetic product (P) and a housing (12) suitable for receiving the applicator (1) in the storing-away configuration.

10. Method for using an assembly for packaging and applying a cosmetic product according to Claim 9, comprising the following steps of:

- removing the applicator (1) from the housing (12) of the case (10);
- moving the sleeve (5) from the configuration for storing away the applicator (1) to the configuration for using the applicator (1);

- picking up cosmetic product (P) contained in the housing (11) of the case (10) by way of the distal application portion (4);

- applying the picked-up cosmetic product (P) to keratin fibres or to the skin.

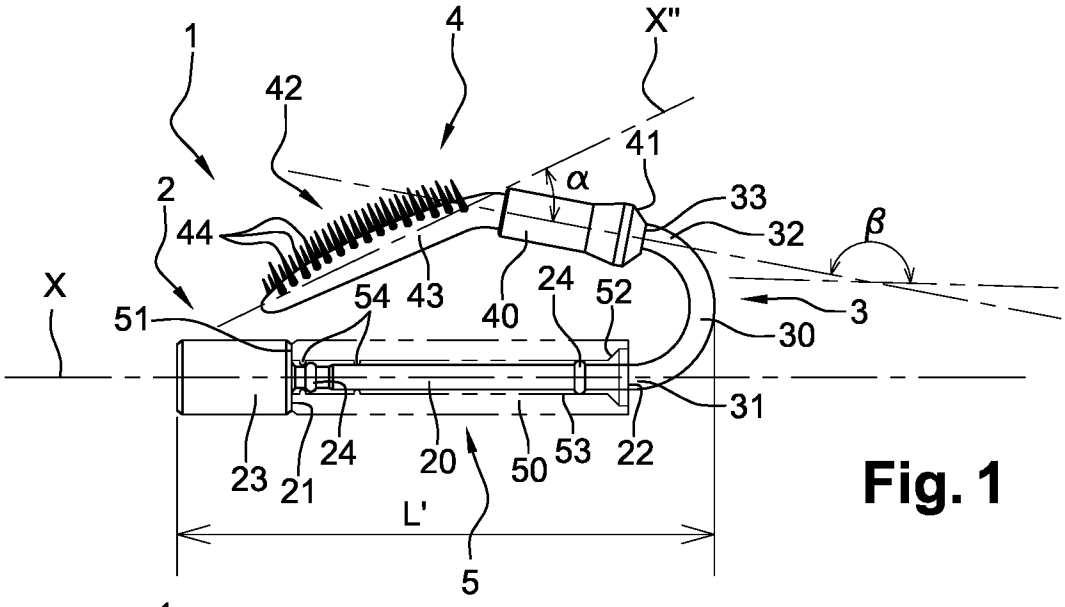


Fig. 1

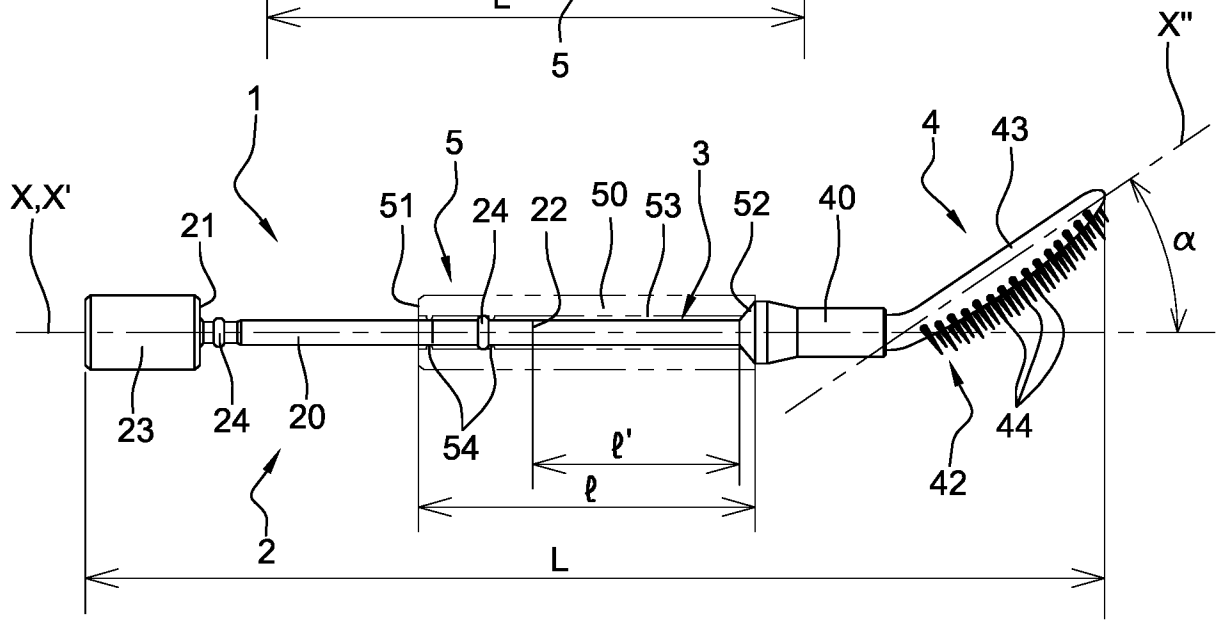


Fig. 2

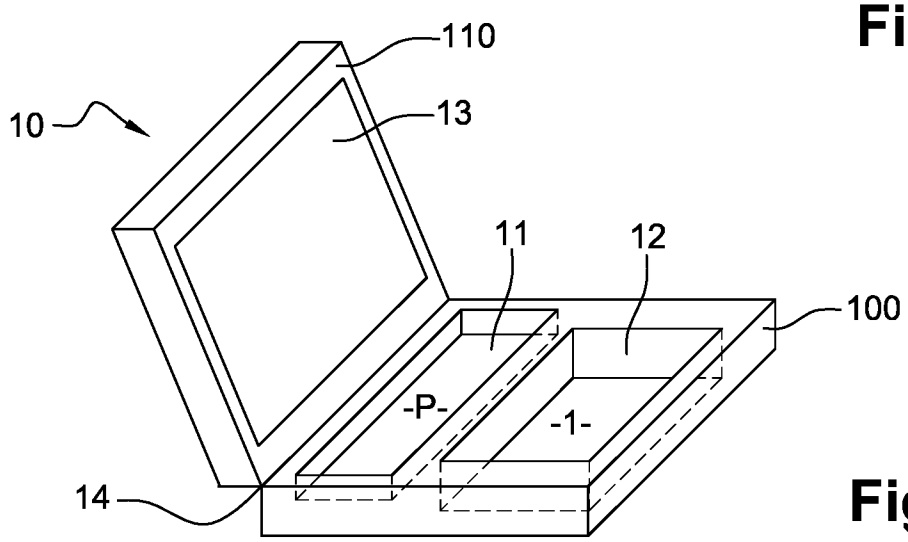
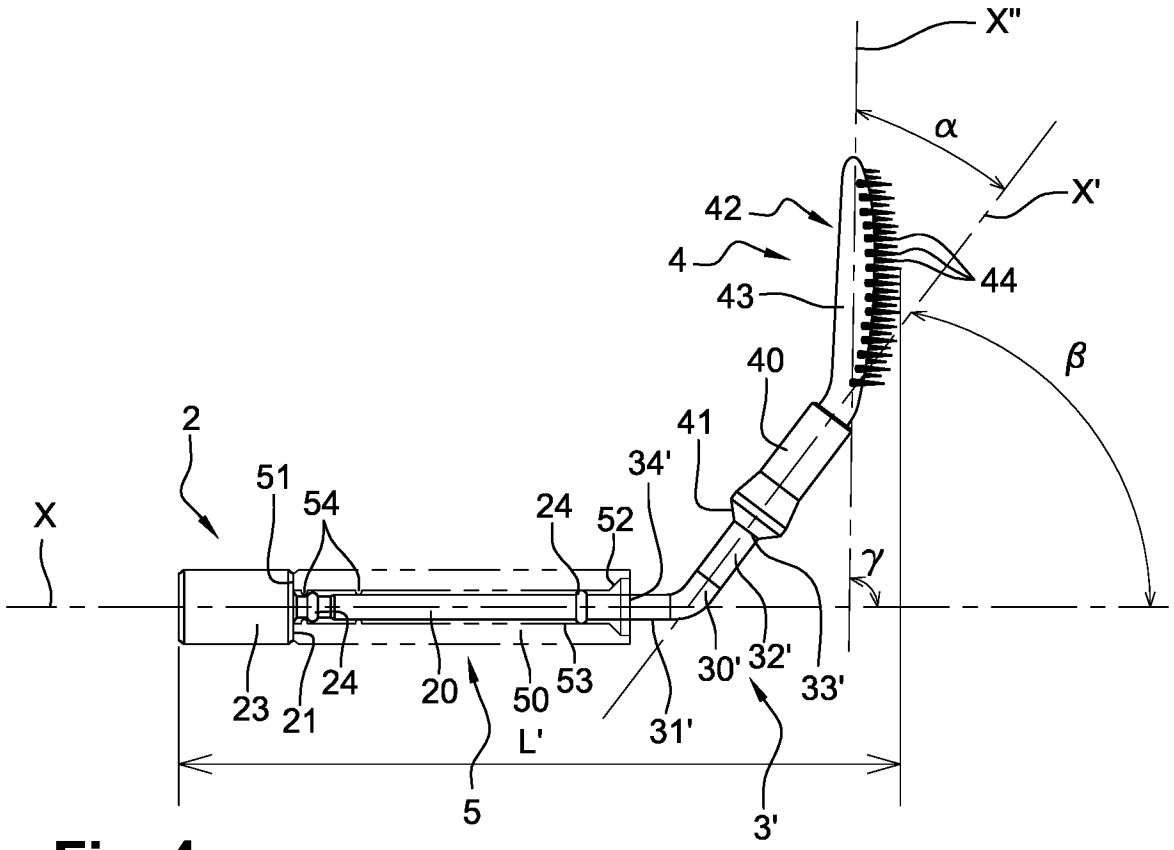


Fig. 3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α
X'
42
4
44
43
β
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41
34'
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51
54
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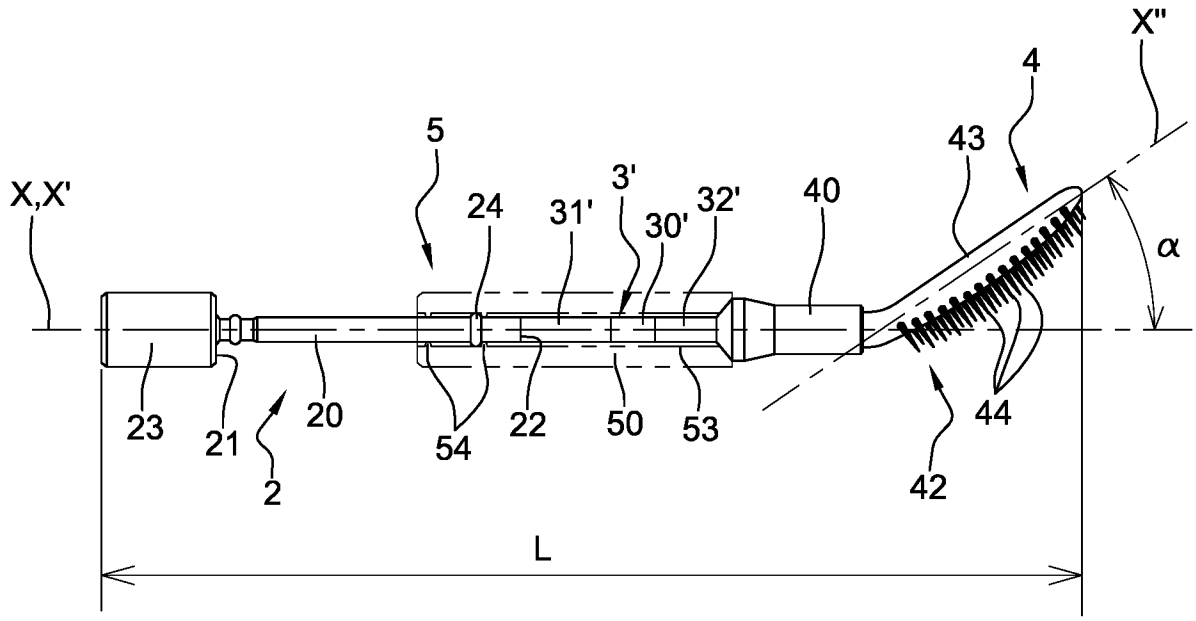
Fig. 4


X"
4
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X,X'
24
31'
30'
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40
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23
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22
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53
44
42
2
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Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/082844

A. CLASSIFICATION OF SUBJECT MATTER
INV. A45D33/00 A45D40/26 A45D40/22
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A45D A46B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 309 125 B1 (PETERS ANDREA [US]) 30 October 2001 (2001-10-30) column 3, lines 1-10,28,37-38,55,65 - columns 41-45; figures 1-5	1
A	FR 2 868 265 A1 (TECHPACK INT SA [FR]) 7 October 2005 (2005-10-07) page 9, lines 27-30; figures 4a,4b	1
A	US 2016/075475 A1 (APODACA ADRIAN CHARLES [US]) 17 March 2016 (2016-03-17) abstract; figures 4-6	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 February 2018	16/02/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Longo dit Operti, T

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2017/082844

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6309125 B1	30-10-2001	NONE	
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