

DEVICE AND METHOD FOR APPLYING A COSMETIC PRODUCT

FIELD OF INVENTION

The invention relates to a device and a method for the application of a cosmetic product. The invention belongs to the field of the cosmetic care devices, as well
5 as wellbeing and beauty, acting superficially on the skin, without intrusion, to get an effect known as draining with an aim of strengthening and of softening the skin and of improving its aspect.

The invention aims at allowing a user, without
10 particular knowhow, to implement during the application of a cosmetic product a superficial mechanical action on the skin similar to a slimming massage also known as "palpate-roll" or "pinch-to roll", more particularly, but not exclusively, on the low parts of the body, like the calves,
15 the thighs, the buttocks, the hips and the abdomen, but also the arms.

The technique of "palpate-roll" is generally performed by a professional and requires, in order to be efficient, regular sessions, and a cosmetic care
20 professional, mastering the gesture consisting in pinching the skin and making propagate the fold thus formed with the appropriate speed and pressure, and in the adapted

direction. In order to further improve the effectiveness of the massage, the skin is advantageously prepared by the application of creams or adapted oils, before the massage. Going to multiple sessions with such a professional in order to carry out the massage, is a constraint that encourages the people to practice themselves this type of massage, either for economic reasons, or for a better match to their pace of life. However, the control of the gesture is delicate, especially taking into account the fact that the person is then oriented with regard to the part of her body in the opposite direction of that of the professional: considering the position of the thumbs, applying the pressure and the propagating the fold of skin manually, are more difficult in the pulling direction than in the pushing direction. Certain parts of the body like the buttocks or the back of the thighs, cannot be reached under good conditions in a situation of self-massage.

Document EP 1.472.953 describes a device allowing, by means of rollers, to subject the skin to a treatment, close in its effects, to the "palpate-roll" gesture, by rolling the aforementioned rollers on the part of the body that is to be massed. However, the ergonomics of this device is badly adapted for a massage in the appropriate direction, i.e. bottom up. In addition, if this device allows the application of a cream or of a massage oil, it must be applied before the passing of the rollers. Consequently, the use of such a device is difficult in some circumstances where it would prove to be most useful, in particular under the shower.

Document US 2005/020948 describes a device that makes it possible to apply to the skin a mechanical effect, by means of notched rollers with secant axes. As in the preceding device, this device does not make it possible to

apply the cosmetic product on the treated region at the same time as the rollers act on this region, the product has to be applied prior to the mechanical action of the rollers, in such a way that the cooperation of the action
5 of the cosmetic product with the mechanical action of the rollers is not optimal.

These devices of prior art, also have the drawback of acting only on one reduced instantaneous surface, due to their design itself and their method of prehension.

10 Without claiming to be a substitute for a massage performed by a professional, the invention aims in its embodiments at solving the drawbacks of prior art by making it possible to easily exert on the skin a mechanical pinching and stretching effect at the same time as the
15 application of a cosmetic product and relates for this purpose to a device for applying a cosmetic product comprising:

a. a structure comprising a contact face and a handling face, the contact face comprising a base, of
20 substantially elliptic contour with, on its periphery, a skirt made of a flexible material configured to glide on the skin;

b. on the contact face of the structure, inside the elliptic contour of the base, a pair of notched rollers,
25 freely rotating around intersecting axes;

c. said notched rollers being attached to the structure by elastic suspensions;

d. on the handling face of the structure, opposite to the contact face, a gripping shape forming a semi-
30 ellipsoidal cap, covering the whole contour of the base of which the dimensions are adapted to a catch in full hand.

e. on the contact face, an orifice for dispensing a cosmetic product contained in a tank in hydraulic

communication with said orifice, said orifice is appreciably aligned with the point of intersection of the rotation axes of the rollers according to the direction of use of the device.

5 Thus, the prehension cap allows a good grip in the hand. As the rollers are placed on the face opposite to the gripping shape, it is easy to apply, at the same time, the required pressure and to carry out the displacement of the device while maintaining this pressure, whatever the
10 part of the body which is the object of the invention, including the bottom and rear parts of the body. The suspensions of the rollers make it possible to control the exerted pressure, and the intersecting axes of rotation of the aforesaid rollers, ensure the effect of pinching and
15 propagation of the skin fold during the subsequent displacement of the device of the invention, while the positioning of the orifice for distributing the product, dispenses the product exactly where required, upstream of the action of the rollers, simultaneously to the mechanical
20 action. The skirt protects the product applied as such from a premature rinsing, in particular during the use of the device in the shower, and participates in controlling the pressure applied.

 The invention is advantageously implemented according
25 to the embodiments described hereafter which are to be considered individually or according to any technically operative combination.

 According to an embodiment of the massager device of the invention, the dispensing orifice is closed by an
30 obturator which opens when a pressure is applied to the contact face. Thus, the obturator avoids the leak of the cosmetic product by the dispensing orifice when the device is not used.

Advantageously, the opening of the obturator is controlled by the move of the suspensions of the notched rollers. Thus, only the application of the massage pressure makes it possible to dispense the cosmetic product.

5 Advantageously, the device of the invention comprises:

f. a pump for expelling the product in the tank by the dispensing orifice;

g. a knob to actuate the pump on the handling face.

Thus the user easily controls the dispense of the
10 cosmetic product when carrying out the massage.

Advantageously, the pump and the knob consist in a flexible membrane closing the tank on the handling face, so that a pressure on the aforementioned membrane changes the volume of the tank. Thus, the pump is entirely
15 mechanical, without moving parts and without the need for an internal energy supply.

According to a specific embodiment, the device of the invention comprises all or a portion of:

i. a sensor indicating the pressure applied on the
20 rollers;

j. a sensor indicating the moving speed of the device and the direction of rotation of the rollers;

k. a sensor to measure the temperature of the skin;

According to an embodiment, the device of the
25 invention comprises an aperture with a specific interface for the filling of the tank by a cosmetic product contained in a container, said container comprising a complementary connecting interface adapted to cooperate with said specific interface. Thus, only the cosmetic products
30 adapted to the use of the device of the invention are usable to fill the tank.

According to another embodiment of the device of the invention, the cosmetic product tank is removable and

interchangeable. Thus, the user changes easily the nature of the applied product, said product being proposed as capsules having the shape of the aforesaid tank.

Advantageously, the device of the invention comprises:

5 l. means for reading an identifying code related to the product contained in the tank.

The various sensors make it possible, by their measurements, to qualify the conditions of application of the product.

10 For this purpose, the device of the invention comprises advantageously:

 m. an electronic module comprising:

 mi. memory means;

 mii. an input port and an output port;

15 miii. a microprogram for the acquisition and the analysis of information issued by the sensors.

 Thus, through its microprogram, the electronic module allows to define the cosmetic product application conditions, according to a parameter or to a combination
20 of parameters measured by means of the sensors.

Advantageously, the device of the invention comprises:

 n. a sensory means of information, controlled by the electronic module, delivering an information derived from the analysis of the signals from the sensors.

25 According to a particularly advantageous embodiment, the electronic module of the device of the invention comprises:

 miv. radio transceiving means and means to establish a wireless personal network with a connected object.

30 Thus, the analysis capabilities of product application parameters are enhanced by the capabilities of the connected object.

The invention also relates to a method of cosmetic product application implementing the device including an electronic module and a sensory means of information, comprising the steps consisting in:

5 i. recording, in the memory means of the electronic module, a range of admissible values of a parameter measured by the information issued from a sensor:

 ii. assessing the aforementioned parameter during application of the product;

10 iii. issuing an information to the user, by the sensory means, if the measured parameter is inside the acceptable range or if the measured parameter is outside of the acceptable range.

 Thus, the device of the invention interacts with its
15 user in order to guide him in his gesture.

Advantageously, the method of the invention implements a device according to the invention and a connected object and comprises the steps consisting in:

20 iv. pairing the connected object with the electronic module;

 v. transmitting to the connected object, the values of the parameter that is measured during the application of the product.

 Thus the connected object can keep in its memory the
25 parameters qualifying the product application conditions and opens the possibility of a further analysis of those.

According to an advantageous embodiment, the method of the invention comprises, before step v), a step consisting in:

30 vi. recording the values of the measured parameter in the memory means of the electronic module.

 Thus, the further advantage brought by the enhanced analysis capabilities of the connected object, does not

require that said connected object be close to the device of the invention during the application of the product.

Advantageously, the connected object is capable to connect to the Internet, and the method of the invention
5 comprises the steps consisting in:

vii. downloading from a server, via Internet, an update of the microprogram of the electronic module;

viii. transferring in the electronic module, via the wireless personal network, the update of the microprogram.

10 Thus, the processing of the product application data is evolutionary.

The invention is hereafter exposed according to its preferred embodiments, in no way restrictive, and in reference to the figures 1 to 10 in which:

15 - figure 1 represents the contact face according to an exemplary embodiment of the device of the invention;

- figure 2 shows the device of figure 1 seen from the top in reference to this same figure in a "free" configuration, not applied to the skin;

20 - figure 3 is a perspective exploded view of the device represented in figures 1 and 2;

- figure 4 exemplifies, according to a perspective view, the gripping of the device represented figures 1 to 3, during its application on the skin;

25 - figure 5 illustrates the use of the device of the invention in its connected version;

- figure 6 shows, according to a partial sectional view AA defined in figure 1, an exemplary embodiment of an obturator for an orifice dispensing a cosmetic product of
30 the device of the invention, sealed in figure 6A, and opened in figure 6B.

- figure 7 shows, according to a diagrammatical view, an exemplary embodiment of the device of the invention in a version comprising an electronic module;

5 - figure 8 is a sectional view along BB defined in figure 1, of an exemplary embodiment of the device of the invention;

- figure 9 is a profile view of another exemplary embodiment of the device of the invention;

10 - and figure 10 is a flowchart of an exemplary embodiment of the method of the invention.

The device of the invention makes it possible to apply on the skin a cosmetic product specifically adapted to an application implementing a simultaneous mechanical action on the portion of the body of this application.

15 Figure 1, according to an exemplary embodiment, the device of the invention is built on a basis (100) of elliptic contour. According to this embodiment, the aforementioned base is appreciably planar and made up of a rigid plastic, obtained, for example, by injection
20 molding. It constitutes the contact face of the device of the invention, said contact face is turned towards the skin at the time of the use of the device of the invention. According to other exemplary embodiments, the shape the base is not planar and is curved according a simple or a
25 double curvature, or its contour follows a more angular design, for example octagonal, or follows a circular form, without these examples being restrictive. The device of the invention comprises 2 rollers (101, 102), set up free to rotate around their respective axes (111, 112) extending
30 in secant directions. According to this embodiment, each roller is assembled free to rotate in a cage (121, 122) said cage being elastically linked to the base by suspension arms (131, 132). The contact face of the device

of the invention comprises one or more orifices (140) for dispensing of a cosmetic product. According to this embodiment, the contact face also includes a filling aperture (150), for the filling of a cosmetic product tank, said tank being in fluid communication with the
5 aforementioned dispensing orifices (140). According to a specific embodiment, the aforementioned filling aperture (150) comprises a specific mechanical interface (not shown) to allow its filling only by means of containers comprising
10 the adapted complementary mechanical interface, and thus limits the nature of the products likely to be introduced into the aforementioned tank. According to a non restrictive example, the aforementioned tank comprises a diaphragm or a valve that only a nozzle of adapted conicity
15 or diameter is capable to open.

The cosmetic product dispensing orifices (140) are placed so that, according to the recommended direction (190) of use of the device of the invention, the cosmetic product is delivered on the skin right before the passage
20 of the rollers (101, 102) on the application zone. Thus, the product begins to act on the skin some time before the rollers come into contact with the treated zone, time as a function of the moving speed of the device of the invention. The position of the aforesaid orifices (140)
25 is, according to this embodiment, appreciably aligned with the point of intersection of the rotation axes (111, 112) of the rollers. Thus, the cosmetic product is precisely dispensed on the zone subjected to the mechanical effect of the rollers. The aforementioned dispensing orifices
30 (140) being placed on the contact face, the distributed product is protected from the washout during the use of the device under the shower. This position upstream of the product distribution orifice or orifices, combined with

the rotation of the rollers according to secant axes, of which the intersection points in the moving direction of the device, makes it possible to ensure a substantially uniform distribution of the product, transported by the rollers during their rotation, over the entire width of the portion subjected to the mechanical action of the latter, although the device of the invention acts of a much wider surface, of about the width of a hand, than the devices of prior art.

10 According to this embodiment the shape of the rollers (101, 102) comprises a plurality of polygonal discs with rounded angles, juxtaposed according to the axis of rotation (111, 112) of the roller, and angularly shifted around this axis from one to the other. Each angle of the
15 aforesaid polygonal discs constitutes a projecting notch with regard to the inscribed circle in the polygonal profile. The notched shape of the rollers, combined with their secant axes of rotation (111, 112), makes it possible to obtain, during the displacement of the device applied
20 to the skin, a kneading effect, the skin located in front of the rollers, in the recommended direction (190) of progression, being compressed, whereas the skin located behind the rollers is stretched. Thus, the displacement of the device of the invention on the skin, driving the
25 rollers in rotation, produces an effect that is similar to a "palpate-roll" massage. The rollers are made out of a material having a certain flexibility like an elastomer, for example out of silicone.

 According to alternate embodiments, the dispensing of
30 the cosmetic product by the orifices (140), is carried out either by gravity or by pumping means.

 Figure 6, in a case as in the other, according to a specific embodiment, the cosmetic product dispensing

orifices are equipped with obturators making it possible to prevent the leak of the product by the aforementioned orifices when the device of the invention is not applied on the skin. Thus, according to an embodiment, the
5 aforementioned obturators consist of flexible nipples (640), made of an elastomer, crimped in the dispensing orifices. Figure 6A, each nipple (640) comprises one or more side slits (641), the edges of the said slits being jointed when the nipple (640) is not compressed, i.e. when
10 the device of the invention is not applied on the skin. The viscosity of the cosmetic product is in generally high enough for the product not to flow through a slit (641) with jointing edges. Figure 6B, in a situation of use, the pressure (690) exerted on the skin tends to crush the
15 nipple (640) and to draw aside the edges of the slit (641), enabling the cosmetic product to flow through the slit. When the pressure (690) is released, the nipple (640) returns to its initial shape by elasticity, the edges of the slit (641) are again jointed and prevent the flow of
20 the product,

According to another embodiment (not shown) the obturators of the dispensing orifices are valves, whose opening is triggered by the displacement, under the effect of the application pressure, of the suspension arms of the
25 rollers. This last embodiment of the obturators makes it possible to contain a very fluid cosmetic product,

Figure 2, the device of the invention comprises a handling face (200) in the shape of a cap covering the whole contour of the base. According to this embodiment,
30 the cap is of semi-ellipsoidal shape. The dimensions of the cap constituting the handling face (200) are adapted to a catch in full hand of the device of the invention, with, according to this exemplary embodiment, a length,

measured along the major axis of the ellipse, ranging between 120mm and 170mm, a width, according to the minor axis of the ellipse, ranging between 70mm and 100mm, and a height measured from the base to the top of the cap,
5 ranging between 30mm and 50mm.

Thus, as shown on figure 4, the hand (490) of the user fits the shape of the handling face (200) of the massager device (400), in a configuration comparable with what the hand would take when making a caress on the region
10 where the product is applied, leading to a natural gesture with a better control of the exerted pressure.

The contact face of the device of the invention thus covers over a surface of about 100 cm², by applying a substantially uniform pressure on this surface, due to its
15 method of prehension, while the devices of prior art, described for example in documents EP 1 472 953 and US 2005/020948, are applied on a surface of about 10 cm² in light of their design and with regards to their method of prehension.

20 The handling face (200) is made of a rigid plastic, and, figure 9, according to an embodiment, advantageously comprises, locally or over its whole surface, one or more zones with a higher flexibility (211) or in relief (911) in order to ease and to secure gripping thereof.
25 Advantageously, the zones in relief (911) are also comprised of a more flexible material.

Going back to figure 2, this figure shows the device of the invention in a "free" configuration i.e. before the application thereof on the skin. During the application of
30 the device on the skin, the rollers (101, 102), mounted on the suspension arms thereof, are displaced towards the inside of the base in the direction of the cap (200) for handling until a skirt (210), mounted at the periphery on

the contour of the base, comes into contact with the skin. According to this embodiment, the skirt (210) is made up of a more flexible material, for example of silicone.

5 Figure 8, the skirt (210) thus mounted projects under the base (100) in such a way that it comes into contact with the skin at the time of the application of the device by exerting sufficient pressure. It thus participates mechanically and passively in the control of the pressure
10 applied.

 Going back to figure 2, according to this embodiment, a part (211) of the skirt is prolonged as flush on a portion of the cap, said portion falling under the thumb
15 of the user during the use of the device of the invention. This part of the skirt thus provides a certain flexibility in the aforementioned cap so as to improve gripping.

 Figure 2 and figure 9, according to an embodiment, in which the cosmetic product is dispensed by the
20 implementation of pumping means, a knob (240) slightly projects from the cap, for example in an area located under the thumb during the use of the device of the invention. The aforementioned knob (240) actuates the pumping means, making it possible to dispense the cosmetic product
25 contained in the tank.

 When free from pressure, the rollers (101, 102) are projecting under the base and the skirt (210). At the time of the application of the product on the skin, said rollers are applied to the skin and the pressure of the hand on
30 the cap making the handling face (200), makes it possible to deform the suspension arms and to lift up the rollers in the base, until the skirt (210) comes into contact with the skin. Thus, the applied pressure by the rollers on the

skin, is set precisely by the way of the stiffness of the suspension arms, and their relative position with regard to the contact face and the skirt (210), according to this embodiment. The aforementioned pressure remains thus appreciably constant as long as that the skirt (210) remains in contact with the skin. Each roller being suspended independently, the device adapts itself to the shapeliness of the region, whereon the device is applied, and the contact of the contact face with the skin, via the skirt ensures a perfect positioning of the rollers with regard to the application region, and during the displacement of the device, thus ensuring an optimal effectiveness of the mechanical effect of the aforesaid rollers on the skin. The shape and the constitution of the skirt (210) are designed so that it glides easily on the wet skin or on a skin on which a cosmetic product was applied. Thus, the user of the device of the invention easily keeps an adapted pressure while moving the device on the application region, by keeping the skirt (210) in contact with the skin, without experiencing an unpleasant rubbing of the aforesaid skirt on the skin. According to a particular embodiment, the inside surface (212) of the skirt coming into contact with the skin, comprises dissymmetrical reliefs (not shown) which make the gliding of the aforesaid skirt on the skin, easier in the appropriate massage direction (190, figure 1), and more resistant in another direction of use. Thus, the user instinctively uses the device in the right direction.

Figure 3, the base (100) and the cap making the handling face (200) are assembled by clipping, the skirt (210) being inserted between the two during the assembly. This embodiment provides an easy assembly of the device of the invention in the framework of a mass production. The

rigid base (100) is used as a support for modules conferring on the device of the invention additional functionalities, said modules being hidden and protected by the cap making the handling face (200). Thus, the tank (340) of cosmetic product is fixed to the aforementioned base. According to this embodiment, the aforementioned tank (340) comprises a flexible membrane (341), projecting, after assembly, on the surface of the cap, said membrane constituting the actuation knob for the pumping means. According to this purely mechanical embodiment, a pressure exerted on the aforementioned membrane modifies the interior volume of the tank (340) and produces the pumping effect for expelling the product contained in the tank through the dedicated orifices. This embodiment of the pump also makes it possible to dispense the appropriate quantity of product, the expelled volume being defined by the projecting volume of the membrane (341). Typically the tank has a capacity between 5 ml and 10 ml of product.

According to another embodiment, the pump is an electric pump, and the knob, on the gripping face drives the actuation of the pump. Advantageously, the start of the electric pump is conditioned with the closing of a contact actuated by the suspension arms of the rollers, so that the cosmetic product can be dispensed only if the aforementioned rollers are applied to the skin.

According to a specific embodiment (not shown), the tank is a removable tank. In this case, the opening (311) of the cap accommodating the prolongation (211) of the skirt, is used to introduce said removable tank. In such an embodiment, the skirt does not include such a prolongation (211) towards the cap, this part being integrated into the removable tank.

According to an embodiment, the base (100) comprises housings (391, 392) receiving electronic means, making it possible to measure and to analyze the product application conditions and the mechanical effect generated by the rollers, as well as batteries for supplying these means with energy.

Figure 7, as a non-limiting example, the aforementioned electronic means comprise individually or in combination:

- 10 - a clock for measuring the duration of the massage and its date of performance;
- an accelerometer (711) for assessing the direction and the velocity of the device during the massage;
- a strain gauge (712) or a position sensor of the rollers suspension arms, to determine the pressure exerted during the massage;
- 15 - a temperature gauge (713), for example an infrared sensor, for measuring the temperature of the skin;
- and means suitable for reading an identification code of the cosmetic product contained in the tank.

In an embodiment of the device of the invention, where the tank is a removable interchangeable tank, said tank comprises means suitable to cooperate with the means for reading the identification of the product.

25 In an embodiment of the device of the invention comprising a fixed tank and a filling aperture, said aperture is equipped with means cooperating with complementary means carried by the container used for the filling of the tank, so as to identify the product.

30 In both of these embodiments, the means of identification, carried by the container of the refill of product, comprise, according to nonrestrictive examples:

- a microchip, or

- a zone comprising electrically conductive and electrically isolating areas, laid out according to a specific pattern, or

- pins or wedges laid out according to a specific
5 pattern.

The reading means carried by the massager device comprise:

- means for reading the microchip of the refill, or
- a set of electrical contacts interacting with the
10 conductive and isolated areas of the refill, or
- knobs actuated by the pins or wedges of the refill.

An electronic module (790) comprising an input port (795) and an outlet port (796) makes it possible to collect the data issued by all the sensors of the device of the
15 invention and to combine them for their analysis implementing a microprogram (792) recorded in the electronic module.

The surface of the base and the volume available under the handling cap of the device of the invention make it
20 possible to easily integrate all of these means.

Figures 8 and 9, according to an embodiment, the device of the invention, in its version known as electronic, advantageously comprises a sensory means of communication with the user. As examples, the aforementioned sensory
25 means comprise, individually or in combination:

- a visual means, like one or more colored light emitting diodes (950) installed on the cap, or a liquid crystal display;
- sound emitting means, straight or modulated;
- 30 - tactile means (850), like a vibrator, for example fixed on the cap inside the latter.

The activation of said sensory means is controlled by the electronic module.

The sensors (711, 712, 713, 714), the sensory means (950, 850) of communication, the electronic module (790), the battery (710) and all connections between these elements are protected with respect to water jets and an immersion up to 1 meter in depth, and are IP 67 compliant according to IEC 60529 standard. Thus, the device of the invention, in its electronic version, can be used under the shower or in the bath. The electronic components are also selected and protected so that they can withstand, under operation and without any damage, an exposure to a wet temperature of 70°C, during 5 minutes at least.

According to this electronic version of the device of the invention, the electronic module (790) comprises, in the memory means (791), the ranges of values relating to the parameters characterizing the product application conditions and mechanical action on the skin, and which are assessed by the processing of the data issued from the various sensors. For example, if to be effective the application of the product must be carried out during displacements from bottom to top of the device on the treated region, with a given minimal pressure and a given maximum speed, the electronic module detects the beginning of the application by the simultaneous change of the values of the pressure on the rollers and of the displacement of the device. The speed and the direction of displacement are assessed by analyzing the information issued from the accelerometer. Alternatively or in a complementary way, information concerning the displacement of the device is obtained by a sensor (714) measuring the rotation of the rollers. As long as the parameters related to the speed, the pressure and the direction of application are each kept inside a permissible value range recorded in the memory means (791) of the electronic module, a LED (950),

located for example in a visible area on the handling face of the massager device, lights up in green. If the pressure drops or if the displacement speed becomes too important, or too low, then the LED lights up in red, or, if the
5 sensory means of communication comprise a vibrator (850), the latter vibrates. Thus, the user is informed instantaneously that he is drifting from the ideal conditions of application of the product and corrects itself his gesture. For example, if the effectiveness is
10 optimal when repeating several times, for example 3 times, a passage of the device on the same part of the body, according to strokes of a length ranging between 30cm and 50cm, from bottom to top in the standing position, and with a speed ranging between 5cm.s^{-1} and 10cm.s^{-1} , the 3
15 strokes being made in a 45 seconds maximum time lapse. According to an embodiment, the device of the invention includes an init button (960) on the handling face. Before carrying out the strokes on a given part of the body, the user pushes the init button thus starting a timing of the
20 45 seconds open time by the clock, and the lighting of an orange LED, informing the user that the system awaits an action. The orange LED blinks after a 30 seconds time if the 3 strokes were not carried out. The microprogram of the electronic module interprets the data from the sensors
25 in order to detect the performance of each stroke. The detection of a massage stroke is, for example, carried out by the detection of the application of the pressure and the displacement of the device followed by the detection of a stop of the displacement and a release of the pressure.
30 The microprogram counts the strokes and lights a green LED if the three strokes were carried out according to the appropriate time lapse and the planned massage conditions.

Advantageously, the electronic module comprises in memory several ranges of values corresponding to the various phases of a care program, implementing various cosmetic products according to its various phases. The nature of the product contained in the tank being detected, the range of value used for the monitoring of the massage conditions is selected accordingly by the microprogram.

According to a simplified embodiment of the electronic version of the device of the invention, the LED (950) lights up in green when the adapted applied pressure is reached, and shuts off if this pressure leaves the recommended range.

Advantageously, the LED (950) is also used to inform the user about the state of the battery.

Thus, the implementation of sensors and of an electronic module brings a technical assistance about the adequate use of the device and in the performance of the application of a cosmetic product under optimal conditions.

Figure 5, according to a specific embodiment, the electronic module of the device of the invention (400) includes means of radio communication (793), suitable to set up a short distance communication with one or more connected objects, for example with a smartphone (500), according to a wireless personal area network, or WPAN. As nonrestrictive examples, the WPAN is established according to a BLUETOOTH® protocol (registered trademark of Bluetooth Sig, Inc., preferentially Bluetooth 4.0 or "low energy", for a lesser power consumption, or according to the "ZIGBEE" protocol. The range of said short distance radio signals lies between 5 meters and 10 meters and thus allows the data exchange between the device (400) of the invention and the connected object, whereas the user is

under the shower and that the aforementioned connected object stays in a dry place.

As nonrestrictive examples, the connected object is a smartphone, a tablet PC, a laptop computer, the computer
5 of a house automation system, a connected watch or a connected wristband, or a simplified connected device, specifically dedicated to the device of the invention. The connected object comprises memory means, a processor, a display and an input device, like a touch screen or a
10 keyboard.

The connected object, for example a smartphone (500), exchanges data with the electronic module once paired with it, thus creating a WPAN. According to an embodiment, the smartphone (500) is set as master on the network thus
15 created, the electronic module of the device (400) of the invention being slave.

According to an advantageous embodiment, the aforementioned connected object is connected to Internet (550) by a connection separate from the one that connects
20 it with the device (400) of the invention. According to the nature of the connected object, this connection with Internet is a wireless connection, for example via a WiFi® connection or via a cell phone network, or a wire connection.

25 According to this embodiment of the device of the invention, known as the connected version, the technical functions for the monitoring of the conditions of use of said device are shared between the microprogram of the electronic module and a software application, setup in the
30 smartphone (500), or in a wider sense, in the connected object.

According to a first aspect, the connected version of the device of the invention enhances the possibilities of

interpretation of the data compared to the electronic version, by offering extended calculation capabilities and more memory, and by offering the opportunity of a post treatment of the data, after the performance of the application of the product, notably in order to take these data into account in a cosmetic care program, the data in the course of the application remaining treated by the microprogram. For this purpose, the parameters characterizing the application conditions are stored and timestamped in the memory of the electronic module of the massager device (400) of the invention, and uploaded to the smartphone (500) when both are paired. Thus, the monitoring of the application conditions is performed even if the smartphone (500) was shut down or was out of range at the time of application of the product on the skin.

According to a second aspect, the connected version of the device of the invention, opens the possibility to update of the microprogram of the electronic module. For this purpose, according to an update proceeding, the smartphone (500) connects to an application server (591) via Internet (550), downloads an update of the microprogram, and when paired with the electronic module, transfers the updated microprogram in the memory of the electronic module. According to another embodiment, the information downloaded from the smartphone (500) towards the electronic module of the device (400) of the invention is limited to the admissible ranges of values of the application parameter, corresponding to the conditions adapted to the phase of the cosmetic care program in progress.

According to a third aspect, the device of the invention, in its connected version, makes it possible to build a cosmetic care program adapted to the result aimed

by the user. For this purpose, the smartphone (500) comprises a software expert system, capable of building the personalized cosmetic care program, according to the information indicated by the user in the aforementioned application, such as his age, his weight, his size, his body measurements and the body regions where he aims an improvement of the skin aspect. Starting from these data, the expert system proposes a cosmetic care program, in terms of the number of sessions and the conditions of each session: the application region, the number of strokes ... but also defines the corresponding parameters and the nature of the cosmetic products to apply at said sessions. The data exchange between the device (400) of the invention and the smartphone (500) makes it possible to ensure the monitoring of the cosmetic care program, but also to guide and encourage the user, by the display of messages on the screen of the smartphone (500).

According to a fourth aspect, the smartphone is connected with other connected objects via the WPAN. Said connected objects are, for instance, related to lifestyle and to well-being, for example, a connected scale (510), a connected fitness apparatus, or a connected wristband measuring the physical activity. The expert system of the smartphone recommends an evolutionary cosmetic care program adapted to the lifestyle of the user and its follow-up of the program, and displays encouragement messages prompting him to persevere in the aforementioned program.

According to a fifth aspect, the smartphone (500) is connected via Internet (550) to a social network server (592) and connects the user to other users of the device, also connected via their smartphones (501), in order to share their experience and their results, thus creating a

community of users, supporting each other in the observance of the proposed cosmetic care programs that are proposed to them.

Advantageously, the application installed on the
5 smartphone (500) allows the user to order on line the cosmetic products adapted to its program, so that they are timely delivered in accordance with its needs in the course of the aforesaid cosmetic care program.

Figure 10, thus, according to an exemplary
10 implementation of the method of the invention, during a step of comparing (1040) the microprogram comprised in the electronic module compares the ranges of permissible values (1020) of a parameter concerning the application of the cosmetic product by means of the device of the
15 invention and recorded in the memory means of the electronic module, with the value of this parameter (1030) measured by means of the at least one of the sensors of the device of the invention or using a combination of the data from the various sensors. If during a test step (1045)
20 the measured parameter is within the permissible range of values, the microprogram informs (1050) the user using sensory means, LED or vibrator for example, arranged on the device of the invention, according to a certain configuration of these sensory means, for example by
25 lighting a LED in green, or by not vibrating the vibrator. If the parameter measured is not within the permissible range, then the microprogram informs the user (1060) via the sensory means of the device of the invention by placing the latter in a suitable configuration, for example, by
30 lighting the LED in red or by vibrating the vibrator. According to embodiments, the permissible ranges of parameters are initially listed in the memory means of the electronic module, or the latter are obtained by a

downloading (1010) of said ranges, for example, from a connected object paired with said electronic module. According to an improved embodiment, the values of the parameter or parameters measured during the use of the
5 device of the invention are also sent (1070) by the microprogram of the electronic module to the paired connected device. According to alternative embodiments, this transmission is carried out in real time, or once the use of the device of the invention is completed, in this
10 latter case they are stored (1080) in the memory of the electronic module until the transmission thereof.

The description hereinabove and the exemplary embodiments, show that the invention achieves the targeted aim, more specifically, the structural characteristics of
15 the device of the invention supplemented by the sensors, allow the implementation of a cosmetic care program under optimal conditions. In its connected version, the device of the invention enables the user to implement a personalized cosmetic care program and to support him in
20 the progress of this program through the expert system and a community of users.

Claims

1. Device for the application of a cosmetic product characterized in that it comprises:
 - a. a structure comprising a contact face and a handling face, the contact face comprising a base (100) of substantially elliptical contour;
 - b. on the contact face of the structure, inside the elliptical contour of the base (100), a pair of notched rollers (101, 102) freely rotating around intersecting axes (111, 112);
 - c. means (131, 132) for elastically suspension of said notched rollers (101, 102) relative to the structure;
 - d. on the handling face of the structure, opposite the contact face, a gripping shape in the form of a semi-ellipsoidal cap (200), covering the entire contour of the base (100) whose dimensions are adapted to be hold in the hand;
 - e. on the contact face, an orifice (140) for dispensing a cosmetic product contained in a tank (340) in hydraulic communication with said orifice, which orifice is substantially aligned with the point of intersection of the rotation axes (111, 112) of the rollers in the direction of use (190) of the device, characterized by the contact face comprising, on its periphery, a skirt (210) made of a flexible material adapted to glide on the skin;
2. The device according to claim 1, wherein the dispensing orifice (140) is closed by a shutter (640) and comprises means for opening said shutter when a pressure is applied to the contact face.
3. The device according to claim 2, wherein the means for opening the shutter are controlled by the movement of the means (131, 132) of suspension of the rollers.
4. The device according to claim 1, comprising:
 - f. a pump (341) to expek the product contained in the tank (340) to the dispensing orifice (140);
 - g. a knob (240) to actuate the pump.
5. The device according to claim 4, wherein the pump and the knob are constituted by a flexible membrane (341) closing the tank (340) on the handling face (200) so that a pressure on said membrane (341) changes the volume of the tank (340).
6. The device according to claim 1, comprising at least one of:
 - h. a transducer (712) for assessing the pressure applied to the notched rollers;
 - i. a transducer (711, 714) for assessing the moving speed of the device and the direction of rotation of the notched rollers;
 - j. a sensor (713) to measure the temperature of the skin.

7. The device according to claim 1, comprising an orifice (150) comprising a specific interface for filling the tank (340) with a cosmetic product contained in a container that has a connection interface configured to cooperate with said specific interface.
8. The device according to claim 1, wherein the tank is removable and interchangeable.
9. The device according to claim 7 or claim 8, comprising:
 - l. means for detecting, by reading an identification code, the nature of the product contained in the tank.
10. The device according to claim 6, comprising:
 - m. a electronic module (790) comprising:
 - mi. memory means (791);
 - mii. an input port (795) and an output port (796);
 - miii. a firmware (792) for the acquisition and analysis of information issued by at least one of the sensors.
11. The device according to claim 10 comprising:
 - n. sensory means (850, 950) driven by the electronic module for outputting information based on the analysis of signals from the sensors (711, 712, 713, 714).
12. The device according to claim 10 or claim 11, wherein the electronic module comprises:
 - miv. radio transceiving means (793) and means for establishing a wireless personal area network with a connected object (500).