Title: APPARATUS FOR PERFORMING AESTHETIC TREATMENTS

Abstract: An apparatus for performing aesthetic treatments that comprises at least one light source (2) that emits ultraviolet radiation in the direction of at least one portion of the user's skin, generally referred to as tanning lamps. The apparatus (1), according to the invention, comprises at least one second light source (3) that faces toward the user's skin. The second source (3) emits in the direction of at least one portion of the user's skin, a light beam with a wavelength comprised between 500 nm and 900 nm, a value that is adapted to stimulate the skin to produce at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides.
APPARATUS FOR PERFORMING AESTHETIC TREATMENTS

Technical Field
The present invention relates to an apparatus for performing aesthetic treatments.

Background Art
As is known, the apparatuses that comprise a plurality of sources which are capable of emitting light radiation including in the ultraviolet range are universally known as tanning lamps.

Anyone who subjects themselves to a treatment using these apparatuses manifests tanning in the portion of skin exposed to the light beam.

According to the type of source installed on the apparatus, the intensity of the light beam changes and hence the effects on the user's skin change.

In practice, apparatuses exist that are capable of inducing a very intense tan in a short time (high intensity, high pressure) and other apparatuses exist that take a long time to achieve clear results (low intensity, low pressure).

In both cases, however, the time for which the skin is exposed to the tanning lamps needs to be limited as much as possible, as indeed it has been proved that a prolonged and excessive exposure can cause erythema, skin burns and, in the worst cases, melanoma.

In order to be able to reduce the exposure time to the light beam of tanning lamps and optimize their effects, ointments, gels, oils and the like are usually used which can act to stimulate the production of melanin and are thus able to boost the intensity of the tan that can be obtained from the treatment.

Disclosure of the invention
The aim of the present invention is to provide an apparatus for performing aesthetic treatments, which is capable of optimizing the results
that can be achieved by a tanning treatment.

Within this aim, an object of the invention is to provide an apparatus for performing aesthetic treatments which stimulates the production of at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides.

Another object of the present invention is to provide an apparatus for performing aesthetic treatments which favors absorption by the skin of substances that are adapted to its protection, moisturisation, stimulation of the production of melanin, in general which prepare for tanning and are adapted to prevent dryout and damage to the skin itself.

Another object of the present invention is to provide an apparatus for performing aesthetic treatments which is low cost, easily and practically implemented and safely applied.

This aim and these objects, as well as others which will become better apparent hereinafter, are achieved by an apparatus for performing aesthetic treatments, comprising at least one light source that emits ultraviolet radiation in the direction of at least one portion of the user's skin, characterized in that it comprises at least one second light source that faces the user's skin and operates on a wavelength comprised between 500 nm and 900 nm, the light beam projected by said source stimulating the user's skin to produce at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides.

**Brief description of the drawings**

Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the apparatus for performing aesthetic treatments, according to the invention, which is illustrated for the purposes of non-limiting example in the accompanying drawings wherein:

Figure 1 is a perspective view of a possible embodiment of an apparatus for performing aesthetic treatments according to the invention;
Figure 2 is a perspective view of a different possible embodiment of the apparatus for performing aesthetic treatments according to the invention;

Figure 3 is a functional block diagram of the apparatus for performing aesthetic treatments, according to the invention.

5 Ways of carrying out the invention

With reference to the figures, the reference numeral 1 generally designates an apparatus for performing aesthetic treatments which comprises at least one light source 2 that emits ultraviolet radiation in the direction of at least one portion of the user's skin, generally referred to as tanning lamps.

Various different types of tanning lamps exist which differ in the different power of the light beam emitted: currently the main distinction is between high pressure lamps (which enable a strong tan in a short time, but are mainly adapted to skins that are already tanned or have a low tendency to burn) and low pressure lamps (with which the time necessary to obtain an evident tan is rather long, and which can treat very fair skins, which burn easily).

The apparatus 1, according to the invention, comprises at least one second light source 3 that faces toward the user's skin.

The second source 3 emits, in the direction of at least one portion of the user's skin, a light beam with a wavelength comprised between 500 nm and 900 nm, an interval value that is adapted to stimulate the skin to produce at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides.

In particular, melanin, or more properly melanins, are biological molecules that are common in animals, plants and protists, with different functions, the best-known of which (but not the only one) is the pigmentary property, i.e. which confers an own coloring on structure.

Dermal melanin is produced by melanocytes which are found in the bottom layer of the epidermis.
When they are exposed to the light, and in particular to ultraviolet radiation (UV), melanocytes, due to the mediation of neurons of the nervous system, produce melanin.

Keratin is a filamentary protein that is rich in sulfur, is very stable and resistant, and is contained in amino acid residues of cysteine.

This protein is produced by keratinocytes and it is the main constituent of the horny layer of the epidermis, nails and hair.

Hyaluronic acids are some of the fundamental components of connective tissues in humans and other mammals, and they give the skin the specific properties of resistance and maintenance of shape.

A deficiency thereof leads to weakening of the skin, thus accelerating the formation of wrinkles and blemishes; such deficiency increases with the advance of age.

Collagen is the main protein of the connective fabric of animals and humans.

It is an essential protein of the dermis, cartilage, bones, tendons and of every connective fabric like blood, bones and lymph, and its function is to support the human physique.

Our figure experiences negative effects if the quantity of collagen decreases.

What can be manifested in particular are wizening of the skin, thin wrinkles marking the face, as well as fatigue, afflictions and a major drop in efficiency, symptoms that increase with the advance of age.

In addition to these typical organic characteristics, collagen is the essential active ingredient for activating the repair processes of almost all the tissues of the human body.

Ceramides are a family of lipid molecules which are found in high concentration in cellular membranes.

They perform a moisturizing and emollient action on the dermis.

They belong to the group of "barrier lipids", which are fatty
substances the function of which is to cement the cells that make up the
horny layer (the topmost of the skin) and protect the epidermis.

Indeed, ceramides fill the space between one cell and the next, thus
building a barrier that prevents the loss of moisture, thus ensuring elasticity
and softness.

With the ageing of the skin, the barrier formed by ceramides weakens
and loses thickness.

Conveniently, the second light source 3 comprises at least one
photoemitting diode 3 commercially known by the name LED (Light
Emitting Diode).

The LEDs 3 are adapted to emit a light beam that can stimulate the
absorption of topical pharmacological products, cosmetics and the like
which are previously applied to the skin.

Indeed, the action thereof, by improving dermal drainage, by means
of warming the ceramides, makes it possible to partially liberate the
intercellular space, so that the topical products can penetrate faster through
the keratinocytes.

Keratinocytes, which are the predominant cell type present in the
epidermis, are found in the horny layer, in the spinous layer and in the
granular layer and they form the structural framework of the various strata
of the epidermis.

It is often difficult to identify a precise boundary between these cells
with an optical microscope.

Their main function is to protect against attack by pathogen
organisms, heat, UV radiation, and water loss.

In addition to this, the physiological substances, i.e. keratin, melanin,
hyaluronic acids, collagen, and ceramides, the production of which is
stimulated by the action of the LEDs 3, allow the skin to absorb faster, and
in a higher percentage, the active ingredients contained in the topical
products that are applied.
Furthermore, the stimulation of the light of the LEDs 3 creates a slight vasodilation and hence increases the activity of the follicles and of the sudoriferous glands, thereby ensuring a deep absorption of the topical products.

According to an embodiment of undoubted practical and applicative interest, the apparatus comprises two devices 4 and 5.

The first device 4 is provided with at least one light source 2 that emits ultraviolet radiation of the type generally known as a tanning lamp.

Advantageously, the second device 5 is provided with at least one photoemitting diode 3 (or any other light source that is adapted to generate a light beam with similar optical and energy characteristics) that operates on a wavelength comprised between 500 nm and 900 nm.

In particular, it should be noted that a source adapted to emit a light beam with a wavelength comprised between 570 nm and 830 nm is considered preferable.

According to a further embodiment, of particular simplicity and effectiveness, the apparatus 1 comprises a tanning bed, of the traditional type, which has at least one light source 2 that emits ultraviolet radiation, and at least one photoemitting diode 3.

Naturally, and as an alternative to the two solutions just described, the apparatus 1 can also comprise a tanning booth of the traditional type, which has at least one light source 2 that emits ultraviolet radiation, and at least one photoemitting diode 3.

It should be pointed out that, with a tanning booth, it may be advantageous to provide a supporting platform 6 of the rotating type for the user, so that during the rotation every portion of the user's skin can be made to face toward each one of the active sources 2 and 3 for a suitable time.

Naturally it is also possible to provide an apparatus 1 that comprises a device that is adapted exclusively to tanning the face, or any other localized part of the human body, in which sources 2 of the traditional type for
emitting UV rays can be combined with sources 3, in particular photoemitting diodes 3 that are adapted to emit light beams with a wavelength comprised between 500 nm and 900 nm.

It can easily be seen that the combination of light sources that are different in nature makes it possible to optimize the spaces used. Indeed, a single item of equipment is capable of performing the different treatments on the user (both at different times and at the same time).

It is preferable to adopt a plurality of ultraviolet sources and a multiplicity of LEDs in order to ensure that the entire surface of the exposed skin is reached by a light beam of the correct intensity, thus ensuring furthermore that the surface to be treated is arranged at the ideal distance from each source.

More specifically, the photoemitting diodes 3 can be activated before the ultraviolet sources 2, or they can be substantially active at the same time as them.

Use of the apparatus 1 according to the invention is the following.

First of all, during the performance of the aesthetic treatments, it is necessary to have the user be arranged at a distance comprised between 1 mm and 500 mm from the light sources 2 and 3 with the skin exposed to the light beams thereof.

According to a preferred embodiment, the optimal results are achieved by arranging the user at a distance comprised between 5 mm and 300 mm.

At this point, following a procedure for use that is preferred but not exclusive, it is necessary to activate the photoemitting diodes 3 that are adapted to emit a light beam with a wavelength comprised between 500 nm and 900 nm, in order to stimulate the production of at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides.

The exposure must be extended for a preset time, depending on the
characteristics of the user's skin and on any previously existing tan.

Substantially at around the moment of deactivating the photoemitting diodes 3 (in practice toward the end of the exposure to the light beam emitted by the diodes 3 or shortly after the diodes 3 have been deactivated), it is necessary to activate the light sources 2, which emit ultraviolet radiation, in the direction of the user.

The user's skin at this point will be particularly receptive (to ultraviolet radiation and to its tanning effect) following the previous exposure to the light of the photoemitting diodes 3.

The exposure of the user's skin to the light sources 2 occurs for periods of time that are substantially shorter than traditional tanning apparatuses, because in it the production of melanin, keratin, hyaluronic acids, collagen and ceramides has been previously stimulated by the light radiation emitted by the photoemitting diodes 3 and therefore obtaining a tan is faster and more intense and the tan can be obtained in a shorter time thus reducing the risk of excessive exposure of the skin to ultraviolet radiation.

The process can also comprise a preliminary step that consists in applying topical products to the user's skin, such as creams, gels, oils and the like, with functions chosen from among moisturisation, protection, stimulation of production and fixing of melanin, the absorption of these products being facilitated by the treatment with the LEDs 3.

By following an alternative procedure for use, after the tanning treatment it is possible to perform an accessory step that consists in subjecting the user again to the beam emitted by the photoemitting diodes 3 in order to stimulate (before or after the subjection to ultraviolet radiation has finished) the production of keratin, hyaluronic acids, collagen and ceramides, in order to boost the moisturisation of the user's skin and the fixing of the tan.

In practice it has been found that the apparatus 1 for performing
aesthetic treatments fully achieves the intended aim in that it makes it possible to optimize the results that can be obtained from a tanning treatment, by stimulating the production of melanin, keratin, hyaluronic acids, collagen and ceramides.

Furthermore, the LEDs 3 are adapted to emit a light beam that can stimulate the absorption of topical pharmacological products, cosmetics and the like, previously applied to the skin, with functions chosen from among moisturisation, protection, stimulation of production and fixing of melanin.

Indeed, the action thereof, by improving dermal drainage, by means of warming the ceramides, makes it possible to partially liberate the intercellular space, so that the topical products can penetrate faster.

In addition to this, the physiological substances, i.e. keratin, melanin, hyaluronic acids, collagen, and ceramides, the production of which is stimulated by the action of the LEDs 3, allow the skin to absorb faster, and in a higher percentage, the active ingredients contained in the topical products that are applied.

In particular, the stimulation of the light of the LEDs 3 creates a slight vasodilation and hence increases the activity of the follicles and of the sudoriferous glands, thereby ensuring a deep absorption of the topical products.

The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Furthermore, all the details may be substituted by other, technically equivalent elements.

In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

Where the technical features mentioned in any claim are followed by
reference numerals and/or signs, those reference numerals and/or signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs.
1. An apparatus for performing aesthetic treatments, comprising at least one light source (2) that emits ultraviolet radiation in the direction of at least one portion of the user's skin, characterized in that it comprises at least one second light source (3) that faces the user's skin and operates on a wavelength comprised between 500 nm and 900 nm, the light beam projected by said source (3) stimulating the user's skin to produce at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides.

2. The apparatus for performing aesthetic treatments according to claim 1, characterized in that said second light source (3) comprises at least one photoemitting diode (3) commercially known by the name LED.

3. The apparatus according to claim 2, characterized in that said at least one photoemitting diode (3) is adapted to emit a light beam in order to stimulate the absorption of topical pharmacological products, cosmetics and the like which are previously applied to the skin.

4. The apparatus according to claims 1 and 2, characterized in that it comprises two devices, a first device (4) having at least one light source (2) that emits ultraviolet radiation and a second device (5) having at least one said photoemitting diode (3) that operates on a wavelength comprised between 500 nm and 900 nm.

5. The apparatus according to claims 1 and 2, characterized in that it comprises a bed that has at least one light source (2) that emits ultraviolet radiation and at least one said photoemitting diode (3).

6. The apparatus according to claims 1 and 2, characterized in that it comprises a tanning booth that has at least one light source (2) that emits ultraviolet radiation and at least one said photoemitting diode (3).

7. The apparatus according to one of the claims 4, 5 and 6, characterized in that said at least one photoemitting diode (3) is substantially active during a first step of operation for preparing the skin for
a second step of deactivation of the diode (3) and activation of the light source (2) that emits ultraviolet radiation.

8. The apparatus according to one of the claims 4, 5 and 6, characterized in that said at least one photoemitting diode (3) is substantially active at the same time as said light source (2) that emits ultraviolet radiation.

9. A procedure for performing aesthetic treatments using the apparatus according to the invention, comprising the steps that consist in:
- arranging the user at a distance comprised between 1 mm and 500 mm from the light sources (2 and 3) with the skin exposed to the light beam emitted by said sources (2 and 3);
- activating the photoemitting diodes (3) that are adapted to emit a light beam comprised between 500 nm and 900 nm, in order to stimulate at least one of the physiological substances chosen from among melanin, keratin, hyaluronic acids, collagen and ceramides, in order to prepare the user's skin for the tanning treatment;
- activating for a preset time, at the same time or after said photoemitting diodes (3), the sources (2) that are adapted to emit ultraviolet radiation in the direction of the user in order to perform the tanning treatment.

10. The procedure for performing aesthetic treatments according to claim 9, characterized in that it comprises a preliminary step that consists in applying topical products to the user's skin such as creams, gels, oils and the like with functions chosen from among moisturisation, protection, stimulation of production and fixing of melanin.

11. The procedure for performing aesthetic treatments according to claim 9, characterized in that it comprises an accessory step, after the tanning treatment, which consists in subjecting the user again to the beam emitted by said photoemitting diodes (3) in order to stimulate the production of keratin, hyaluronic acids, collagen and ceramides, so as to moisturize the user's skin.
12. The procedure for performing aesthetic treatments according to claims 9, 10 and 11, characterized in that it comprises an intermediate step that consists in repeating said preliminary step, of application of topical products on the user's skin, before performing said accessory step, in order to boost the moisturisation of the user's skin and thus prevent its drying out and possible damage.
START

APPLY TOPICAL PRODUCTS?

NO

APPLICATION OF TOPICAL PRODUCTS

ARRANGE THE USER IN PROXIMITY TO THE LIGHT SOURCES

ACTIVE THE PHOTOEMITTING DIODES

PERFORM THE TANNING TREATMENT

APPLY TOPICAL PRODUCTS?

YES

APPLICATION OF TOPICAL PRODUCTS

NO

PERFORM POST-TREATMENT?

YES

ACTIVATE THE PHOTOEMITTING DIODES

NO

END

Fig. 3

SUBSTITUTE SHEET (RULE 26)
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**
INV. A61N5/06
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)
A61N  A61Q

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 practical, search terms used)

EPO-Internal , WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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* Further documents are listed in the continuation of Box C. See patent family annex.

**Date of the actual completion of the international search**
30 September 2011

**Date of mailing of the international search report**
14/10/2011

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

**Authorized officer**

Buchler Costa, Joana

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