United States Patent Application Publication	20250255393
Kind Code	A1
Publication Date	August 14, 2025
Inventor(s)	NUZZO; VALERIA et al.

DEVICE FOR TREATING THE HAIR

Abstract

A device for treating, notably for shaping, in particular straightening, the hair, having at least one active portion comprising at least one light emission source that is able to emit, towards the hair, light radiation having a dominant wavelength peak of between 0.8 μm and 5 μm. The invention also relates to a method for treating the hair, notably for straightening it, using such a device.

Inventors: **NUZZO; VALERIA (Saint Ouen, FR), VIC; Gabin (Clichy, FR), LAPIZE; Sandy (Saint Ouen, FR)**

Applicant: **L'OREAL** (Paris, FR)

Family ID: **80595501**

Appl. No.: **18/703439**

Filed (or PCT Filed): **October 27, 2022**

PCT No.: **PCT/EP2022/080145**

Foreign Application Priority Data

FR	FR2111520	Oct. 29, 2021

Publication Classification

Int. Cl.: **A45D1/06** (20060101); **A45D1/00** (20060101); **A45D1/04** (20060101); **A45D1/16** (20060101); **A45D2/00** (20060101); **A45D7/02** (20060101)

U.S. Cl.:

CPC **A45D1/06** (20130101); **A45D1/04** (20130101); **A45D1/16** (20130101); **A45D2/001** (20130101); **A45D7/02** (20130101); A45D2001/008 (20130101); A45D2200/205

(20130101)

Background/Summary

TECHNICAL FIELD

[0001] The present invention relates to devices for treating the hair, and more particularly, but not exclusively, those intended for shaping the hair, notably those intended for straightening, curling or crimping the hair.

PRIOR ART

[0002] Numerous devices of this type, sometimes also known as straightening or curling irons, have already been proposed.

[0003] Round irons for curling the hair with emission of IR, notably far-IR, light radiation are known, as described in the utility model applications CN 203388436 or CN 207912293, or in the application KR20140135462, in which the radiation is generated via the heating element. The emission may be realized from specific materials based notably on metal oxides, as in the application EP 244 522, in a wavelength range of between 5 and 10 μm.

[0004] The utility model CN 207270051 describes the emission of far-IR light radiation using IR light-emitting diodes (LEDs). Similarly, the application JP 2018029815 describes a round iron having brushes and implementing IR radiation emitted by LEDs, in a preferred wavelength range of 4 to 1000 μm with possible replacement or extension by wavelengths in the visible, the near IR or the mid IR. The U.S. Pat. No. 4,602,143 describes a curling iron having a non-specified internal source emitting IR radiation in a wavelength range from 1 to 7 μm. These round curling irons can have an articulated arm for holding the hair during the curling operation, as in the documents CN207270051U, U.S. Pat. No. 4,602,143, CN207912293U, EP244522 mentioned above.

[0005] Also known are irons having flat tongs for straightening the hair. Usually, these devices consist of two arms that are connected together with the aid of a hinge that makes it possible to open and close said arms, and of at least one heating element disposed on the arms. During operations for shaping a lock of hair, the latter is introduced between the two arms in the open position and then the two arms are closed manually over the lock of hair. This lock is then subjected to the heat emitted by the heating element, until the two arms are opened and the lock of hair is removed. These devices may or may not comprise a light source emitting infrared (IR), notably far-IR, light radiation, as described in the utility model CN 202233628.

[0006] The emission of the IR light radiation may be realized via metal oxides, as described in the documents KR 20040104199, KR 20060130975 and KR 20100025383, or EP 273 538, which mentions the far IR between 5 and 10 μm, KR 20120007813, which uses ruthenium oxide, or KR 20170103282, which uses derivatives of magnesium. The application JP 2018015538 discloses the emission of far or near IR via a mineral powder with graphene. The application KR 200441099 discloses a straightening iron having flat tongs having brushes on the bottom, and using ceramic emitting in the far IR with a wavelength range of between 2.5 μm and 1000 μm.

[0007] The utility models CN 206744833, CN 207784575, CN 202335497 and KR 20100008911 describe the use of IR emitters with lamps, and the utility model CN 207912291 also employs a steam generator. The document CN 201504727 mentions the use of LED sources for emitting far-IR light radiation.

[0008] In these documents describing straightening irons, the main role of the IR is to exert a physiological action, such as the activation of blood circulation in and the metabolism of the scalp, or protection from damage to the hair. The IR light emitted by the appliances is not sufficiently effective with respect to the operation of shaping the hair, and require the additional presence of a heating device, which may entail a risk of degradation of the hair.

[0009] Therefore, there is a need to improve the hair treatment devices, notably those designed for straightening the hair, in order to afford effective, uniform, durable and rapid shaping of the hair, preserving the hair fibre to the best possible extent.

DISCLOSURE OF THE INVENTION

Treatment Device

[0010] The invention aims to meet this need and its subject is a device for treating, notably for shaping, in particular straightening, the hair, having at least one active portion comprising at least one light emission source that is able to emit, towards the hair, light radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.

[0011] This preferred wavelength range lies in the near infrared and in the start of the mid infrared.

[0012] The invention makes it possible, by virtue of the controlled heat supplied by the infrared light radiation in the particular wavelength range in which the dominant emission peak is located, to achieve rapid, effective, uniform and durable shaping, notably straightening, of the hair with limited degradation. Specifically, the hair is submitted, in this wavelength range, to lower temperatures, and the device according to the invention preserves the integrity of the head of hair better, even after repeated uses over time. It is possible notably to dispense with applying steam to the hair.

[0013] In fact, the main elements that make up the hair, namely keratin, water and melanin, have different light absorptions: the more the wavelength increases, the less the melanin absorbs the light, contrary to the water. In particular, the invention makes it possible, given the resonance frequency of each of the components of the hair, not to bleach the hair since, in the dominant wavelength peak range used, the light acts mainly on the water and very little on the melanin.

[0014] The device according to the invention is preferably a device for straightening, curling or crimping the hair. The invention is very particularly suitable for straightening the hair.

[0015] The device according to the invention can be used on wet hair, the infrared light acting mainly on the molecules of water, thereby making it possible to dry the hair while shaping it without degrading the other components of the hair.

[0016] The device may have a member for applying a cosmetic product. This may be an end piece made of felt or foam, which is porous and filled with said product. In this case, the device may have a reservoir containing the cosmetic product to be applied.

[0017] The device may be configured to apply steam to the hair, and to this end notably has a water reservoir, a heating element and a steam outlet.

Arm and Jaws

[0018] The device according to the invention advantageously has two arms that are able to move relative to one another between a moved-together configuration for treating the hair and a spaced-apart configuration for inserting hair to be treated between said arms, the arms defining half-handles that are continued towards their distal ends by jaws, said at least one light emission source according to the invention being carried by one of the two jaws.

[0019] Preferably, at least one of the two jaws is flat, and better still both of the jaws are flat.

[0020] In a variant, each of the two jaws carries at least one active portion comprising at least one light emission source according to the invention that is able to emit, towards the hair, radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.

[0021] Preferably, the two arms extend along respective longitudinal axes. Preferably, the two arms are connected by a hinge present at their proximal end, this hinge defining an axis of rotation that is oriented preferably perpendicularly to a plane defined by the longitudinal axes of the arms.

[0022] Preferably, the two jaws that come into contact with the hair are flat.

[0023] The jaws advantageously do not have heating elements other than the active portion or portions comprising the light source or sources. This makes it possible to dispense with a complementary heating device such as ceramic heating plates incorporating an electrical resistor.

[0024] Said at least one light source may be disposed at the centre or at the ends of the jaws of the

arms.
[0025] However, in one variant, at least one of the two jaws has at least one additional heating element intended to come into contact with the hair, or even each of the two jaws has at least one additional heating element. The additional heating element or elements preferably has or have a plate defining a hot surface for contact with the hair, this plate notably being made of a good conductor of heat, for example of metal, glass or ceramic. This heating plate or these heating plates may define a surface for contact with the hair, the temperature of which is greater than or equal to 90° C., better still from 90 to 250° C., even better still from 110 to 230° C. Preferably, the device has two flat heating plates that are each disposed on a jaw and face one another in the moved-together configuration of the arms.
[0026] Preferably, the heating plate or plates has or have a flat surface that comes into contact with the hair.
[0027] In this case, the treatment is carried out, preferably, at a surface temperature of the jaws ranging from 90° C. to 250° C., better still from 110 to 230° C.
[0028] Said at least one light source may be disposed at the periphery of the additional heating elements, upstream or downstream of the additional heating elements with regard to the direction of passage through the hair, perpendicularly to the longitudinal axis of the arm. The light source or sources thus extend(s) laterally with respect to the heating element carried by the same arm, preferably upstream of the heating element during the use of the device on the hair.
[0029] In a variant, the light source or sources extend(s) on or within an additional heating element carried by the same arm. Coupling the light sources with such additional heating elements makes it possible notably to increase the temperature more quickly and to reduce the energy delivered by the additional heating elements in order to limit the damage to the hair.
[0030] In this case, the light source or sources and the additional heating element or elements can be powered independently of one another, notably by different electrical power sources. The light source or sources may be powered while the additional heating element or elements are not, or vice versa. In one variant, the light source or sources and the additional heating element or elements are powered by one and the same power source.
[0031] The light source or sources may be separated from the additional heating element or elements carried by the same arm by a thermal barrier limiting transfers of heat between the light source or sources and the additional heating element or elements. The thermal barrier may be formed by an empty space between the sources and the additional heating elements or consist of a material that does not conduct heat.
[0032] The device may have one or more sensors for sensing the temperature of the additional heating element or elements.
[0033] The device may have a plate that is transparent to the radiation of said at least one light source, situated between the latter and the hair. Said plate may be smooth or have elements having optical effects, such as lenses, in order to concentrate the light or, conversely, diffuse it.
[0034] Said plate that is transparent to the radiation of said at least one light source May be situated at a non-zero distance from the light source or sources, thereby forming a void between the latter and the plate, said distance preferably being less than or equal to 10 mm, more specifically less than or equal to 5 mm.
[0035] Preferably, the two arms extend along respective longitudinal axes. Preferably, the two arms are connected by a hinge present at their proximal end, this hinge defining an axis of rotation that is oriented preferably perpendicularly to a plane defined by the longitudinal axes of the arms.
Light Source(s)
[0036] In one embodiment, the light source or sources may have at least one light-emitting diode emitting in the infrared.
[0037] The light source or sources may have a plurality of light-emitting diodes having different wavelengths.

[0038] In another embodiment, the light source or sources has or have a carbon infrared emitter, notably a halogen lamp with a carbon filament.
[0039] These light sources are advantageous compared with: [0040] non-IR incandescent lamps, which are fragile and energy-consuming, have a short service life, afford very low light outputs and heat up during their use, and [0041] non-IR halogen lamps, which have average efficiency, a short service life, a low light output and heat up during their use.
[0042] The light source or sources may have at least one infrared emitter comprising a carbon filament with a diameter ranging from 8 mm to 25 mm, notably being equal to 10 mm or to 19 mm.
[0043] The light source or sources may have at least one infrared emitter comprising a carbon filament with a length ranging from 200 mm to 400 mm, notably being equal to 300 mm.
[0044] The surface power density brought about by the light source or sources on the hair may range from 0.1 W/cm.sup.2 to 100 W/cm.sup.2, better still from 0.2 W/cm.sup.2 to 70 W/cm.sup.2, better still from 0.3 W/cm.sup.2 to 50 W/cm.sup.2.
[0045] In one variant, the light source or sources advantageously emit(s) light radiation having a dominant wavelength peak ranging from 1.1 μm to 2 μm, notably being equal to 1.6 μm.
[0046] In another variant, the light source or sources emit(s) light radiation having a dominant wavelength peak ranging from 2.9 μm to 4 μm, notably being equal to 3.4 μm.
[0047] When the device according to the invention does not have heating elements other than the light source or sources, said at least one light source may be disposed at the centre or at the ends of the jaws of the arms of the device. The latter may have a plurality of light sources, which are disposed notably in one or more rows, or in an array of light sources.
[0048] Said at least one light source may be a pulsed-light source.
[0049] Said at least one light source may have a variable wavelength, such as semiconductor lasers subjected to hydrostatic pressures.
[0050] The device according to the invention may have a sensor configured to detect the opening of the jaws and a deactivation element for deactivating said at least one light emission source when the jaws are open.
[0051] When the device has a plurality of light sources, the device may have an element for selective lighting of the light sources, notably depending on their emission wavelength, on the width and/or the length of the lock and/or on the treatment to be carried out. When the light sources are disposed in a plurality of rows, the selective lighting element may be configured to light only one or some of the rows. This may also make it possible to provide irregular shaping effects.
[0052] The device may have a sensor for sensing the temperature of the hair and a system for regulating the power of said at least one light source, notably by pulse width modulation.

Treatment Method

[0053] A further subject of the invention, according to another of its aspects, is a method for treating, notably shaping, in particular straightening, the hair, using a device for treating the hair, notably according to the invention, wherein, in said method, in order to treat the hair, at least one lock of hair is exposed to light radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.
[0054] Preferably, the treatment device is the device according to the invention.
[0055] The device can be moved towards a lock of hair or said device can be moved along a lock of hair in order to carry out the treatment.
[0056] The method may involve the treatment of a lock in one pass.
[0057] Additionally, a heat treatment is advantageously carried out by passing the lock through in contact with at least one additional heating element of the device, notably a heating plate, better still by passing it between two additional heating elements of the device that are located opposite one another.
[0058] The method according to the invention may have an additional step of applying one or more hair compositions to all or part of the head of hair to be treated, before, during or after, and

preferably before, the use of the device according to the invention.
[0059] The hair composition used advantageously comprises at least one agent for breaking the disulfide bridges present in the hair, the composition preferably comprising at least one thiol. In variants, the hair composition used is a haircare, dyeing or bleaching composition.
[0060] In this case, the light source or sources may be chosen to react with the hair composition used, depending on the light absorption spectrum of said composition, in order to be more effective.
[0061] The method according to the invention may also comprise a step of treatment using steam, notably during the exposure to light. The steam flow rate may be less than 1 g/min, and better still ranges from 0.7 to 0.9 g/min.
[0062] The features mentioned above for the device apply to the method, and vice versa.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0063] The invention will be understood better from reading the following description and examining the accompanying figures. These are presented only by way of non-limiting indication of the invention.
[0064] FIG. **1** schematically shows a perspective view of a hair treatment device according to the invention,
[0065] FIG. **2** shows a top view of the lower arm on its own,
[0066] FIG. **3** shows a view similar to the one in FIG. **2** of a variant of the device according to the invention,
[0067] FIG. **4** shows a view similar to the one in FIG. **2** of a variant of the device according to the invention,
[0068] FIG. **5** shows a view similar to the one in FIG. **2** of a variant of the device according to the invention, and
[0069] FIG. **6** is a schematic view in cross section of the device in FIG. **4**.
DETAILED DESCRIPTION
[0070] FIG. **1** shows the handpiece **2** of an example of a hair treatment device according to the invention.
[0071] In this example, the device is a straightening device, with the handpiece **2** having two jaws **3** and **4** that are able to move with respect to one another between a spaced-apart configuration (not shown) for introducing a lock of hair between said jaws, and a moved-together configuration for treatment, illustrated in FIG. **1**.
[0072] The jaws **3** and **4** are carried by an upper arm **5** and a lower arm **6**, respectively, which, in the example in question, are connected together at one end by a joint **8**, the handpiece **2** thus forming tongs.
[0073] The arms **5** and **6** define, between the joint **8** and the jaws **3** and **4**, respective half-handles **10** and **11** on which the user can press in order to move the jaws **3** and **4** together.
[0074] An elastic return member (not visible) is preferably provided to return the jaws **3** and **4** into the spaced-apart configuration, this elastic return member being for example a spring disposed around a pin of the joint **8**.
[0075] The invention is not limited to a particular manner of connecting the arms **5** and **6** together and the jaws **3** and **4** may be rendered able to move in some other way without departing from the scope of the present invention. However, the presence of a joint is largely preferred for the ergonomics that it affords.
[0076] The jaws **3** and **4** define between one another a region for treating the hair, said region being intended to receive a lock of hair to be treated, along which the handpiece **2** is moved during the

treatment, for example in the direction from the root to the end of the hairs.
[0077] In the example in question, the device is configured to carry out a heat treatment of the hair via the exposure of the latter to a light source having a particular dominant wavelength peak, as described below.
[0078] The direction D of movement of the handpiece **2** over the hair is preferably substantially perpendicular to the longitudinal axis X thereof.
[0079] In the example in question, the handpiece **2** is connected by a line **14** to a base station (not shown) that is fixed during the treatment and is connected to the mains.
[0080] This base station supplies power to the handpiece **2** and may also carry out additional functions of processing electrical signals received from the handpiece **2**. The line **14** that connects the handpiece **2** to the base station may thus have various electrical conductors.
[0081] A user interface (not shown in the figures) may be present on the handpiece in order to allow the user, for example, to start up or not to start up certain components thereof.
[0082] The device according to the invention has at least one active portion **16**, shown in FIG. **2**, comprising at least one light emission source **22** that is able to emit, towards the hair, light radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.
[0083] The device according to the invention advantageously has at least one sensor (not shown) configured to detect the opening of the jaws **3**, **4** and to bring about the deactivation of the source or sources **22** when the jaws are open.
[0084] In the example in FIG. **2**, each of the two jaws **3**, **4** carries an active portion **16** comprising a plurality of, pulsed-light, light sources **22** disposed at the lateral ends of the jaws of the arms. In this example, the light source or sources have at least one light-emitting diode emitting in the infrared. In one variant, the light sources have a plurality of light-emitting diodes having different wavelengths, but at least some of which have a dominant wavelength peak according to the invention. In another variant, the light sources have at least one carbon infrared emitter.
[0085] The surface power density brought about by the light sources **22** on the hair may range from 0.1 W/cm.sup.2 to 100 W/cm.sup.2, better still from 0.2 W/cm.sup.2 to 70 W/cm.sup.2, better still from 0.3 W/cm.sup.2 to 50 W/cm.sup.2.
[0086] In the example illustrated, the device has a plate **18**, which is smooth and transparent to the radiation of the light sources **22** and which is situated between the latter and the hair.
[0087] The length l of the active portions **16** defines the extent of the treatment region perpendicularly to the direction D of movement of the handpiece **2** relative to the hair. The active portions **16** are for example flat and have a rectangular contour, as illustrated in FIG. **2**.
[0088] In the variant in FIG. **3**, the light emission source **22** is disposed at the centre of the active portion **16** and has a halogen lamp with a carbon filament having a diameter equal to 10 mm and a length equal to 300 mm. The light source **22** is able to emit, towards the hair, light radiation having a dominant wavelength peak equal to 1.64 μm. In a variant that is not shown, the diameter of the filament is equal to 19 mm and its length is equal to 300 mm, the dominant wavelength peak being equal to 3.48 μm.
[0089] In the examples described with respect to FIGS. **2** and **3**, the jaws of the arms do not have additional heating elements other than the active portion **16** comprising the light source or sources.
[0090] In a variant shown in FIG. **4**, each of the two jaws has an additional heating element intended to come into contact with the hair, these additional heating elements each having a plate **14**, **15** defining a hot surface for contact with the hair and carried respectively by the upper arm **5** and lower arm **6**. The heating plates **14** and **15** are made of any material suitable for the treatment to be carried out, for example a metal, ceramic or glass.
[0091] In this case, the light sources **22** can be disposed at the periphery of the heating plates **14**, **15** and extend laterally with respect to the latter, upstream of the additional heating element during the use of the device on the hair, as can be seen in FIG. **4**. The device may have one or more sensors for sensing the temperature of the additional heating element or elements (not shown).

[0092] In the variant shown in FIG. **5**, the light source **22**, a halogen lamp having a carbon filament, is disposed within the heating plate **15** along the longitudinal axis X of the handpiece.
[0093] FIG. **6** shows the plate **18** transparent to the radiation of the light source **22**, which is situated at a non-zero distance d.sub.p from the latter, thereby forming a void between the latter and the plate. In this example, a heating plate **15** is also present, the light source being disposed laterally with respect to the latter.
[0094] In the examples described, the light sources and the additional heating elements are powered independently of one another, notably by different electrical power sources. In one variant, the light sources and the additional heating elements are powered by one and the same power source.
[0095] The surface state of the plates **14** and **15**, in the region of contact with the hair, depends on the desired treatment, and preferably the plates are substantially smooth when the device is intended to straighten the hair.
[0096] One of the plates is for example mounted in a fixed manner on the corresponding arm while the other is mounted in an articulated manner, for example with the aid of a ball joint, so as to allow the plates to extend parallel to one another and to a median treatment plane in the closed configuration of the jaws. If appropriate, at least one of the plates is disposed on one of the arms **5** and **6**, being supported by a structure that forms a spring.
[0097] The heating plates **14** and **15** may each have an electrical resistor electrically powered by the base station, preferably with temperature regulation by virtue of one or more sensors disposed in the vicinity of the heating resistors or in contact with the plates.
[0098] When a user wishes to shape their hair, they move the device according to the invention towards the lock of hair or they move said device along a lock of hair in order to expose the latter to the active portion **16**. They then repeat the operation on other locks of hair until the desired shaping result has been achieved.
[0099] The treatment makes it possible to fix the shape of the hair.
[0100] Numerous modifications can be made to the devices that have just been described, without departing from the scope of the present invention.
[0101] Other types of light emission sources can be used, and/or the light sources can be disposed in some other way.
[0102] The device may also be configured to carry out a treatment by spraying steam and/or applying a hair product in the form of one or more cosmetic compositions, comprising preferably at least one agent for breaking the disulfide bridges present in the hair, the composition preferably comprising at least one thiol. The device may have a vaporization member and a member for applying a cosmetic product disposed so as to come into contact with the hair extending through the treatment region (these not being shown).
[0103] The vaporization member may consist of a resistive element present in an evaporation chamber supplied with water by the base station or from a reservoir present in the device. The evaporation chamber is disposed on one of the arms, the steam outlet being provided on the same arm. The base station may have an electrically driven pump, preferably a peristaltic pump, that draws up water to be sent to the handpiece **2** from a reservoir of water. The device itself may have a peristaltic pump. The pump is for example as disclosed in the publication FR 2 967 018. The evaporation chamber may be produced in accordance with the teaching in the application EP 2449909A1 or in some other way, and communicate with at least one steam outlet.
[0104] The steam flow rate ranges preferably from 0.7 to 0.9 g/min.
[0105] The cosmetic product is preferably contained in a reservoir carried by the upper arm **5** of the handpiece **2**. The applicator member **23** is supplied with the aid of a product dispensing mechanism which is actuated automatically during the use of the handpiece **2**.

Claims

1. A device for treating, notably for shaping, in particular straightening, the hair, having at least one active portion comprising at least one light emission source that is able to emit, towards the hair, light radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.
2. The device according to claim 1, which is a straightening, curling or crimping device, having two arms that are able to move relative to one another between a moved-together configuration for treating the hair and a spaced-apart configuration for inserting hair to be treated between said arms, the arms defining half-handles that are continued towards their distal ends by jaws, said at least one active portion being carried by one of the two jaws.
3. The device according to claim 2, wherein at least one of the two jaws is flat, and better still both of the jaws are flat.
4. The device according to claim 2, wherein each of the two jaws carries at least one active portion comprising at least one light emission source that is able to emit, towards the hair, radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.
5. The device according to claim 1, wherein the light source or sources has or have at least one light-emitting diode emitting in the infrared.
6. The device according to claim 1, wherein the light source or sources has or have at least one carbon infrared emitter, notably a halogen lamp with a carbon filament.
7. The device according to claim 6, wherein the light source or sources has or have at least one infrared emitter comprising a carbon filament with a diameter ranging from 8 mm to 25 mm.
8. The device according to claim 6, wherein the light source or sources has or have at least one infrared emitter comprising a carbon filament with a length ranging from 200 mm to 400 mm.
9. The device according to claim 2, wherein the jaws of the arms do not have heating elements other than the active portion or portions comprising the light source or sources.
10. The device according to claim 9, wherein said at least one light source is disposed at the centre or at the ends of the jaws of the arms, the device having notably a plurality of light sources disposed in one or more rows, or in an array of light sources.
11. The device according to claim 2, wherein at least one of the two jaws has at least one additional heating element intended to come into contact with the hair, and better still each of the two jaws has at least one additional heating element, the additional heating element or elements preferably having a plate defining a hot surface for contact with the hair, notably made of metal, glass or ceramic.
12. The device according to claim 1, wherein said at least one light source is a pulsed-light source.
13. A method for treating, notably shaping, in particular straightening, the hair, using a device for treating the hair, notably according to claim 1, wherein, in said method, in order to treat the hair, at least one lock of hair is exposed to light radiation having a dominant wavelength peak of between 0.8 μm and 5 μm.
14. The method according to claim 13, having an additional step of applying one or more hair compositions to all or part of the head of hair to be treated, before, during or after the use of the treatment device.
15. The method according to claim 14, wherein the hair composition used comprises at least one agent for breaking the disulfide bridges present in the hair, preferably at least one thiol.
16. The method according to claim 13, also comprising a step of treatment using steam, notably during the exposure to light, the steam flow rate being notably less than 1 g/min.