

【DESCRIPTION】

【Invention Title】

EYELASH MASCARA DEVICE EQUIPPED WITH HEATING ELEMENT,
AND METHOD FOR CONTROLLING SAME

5

【Technical Field】

The present invention relates to an eyelash mascara
device equipped with a heating element and a method of
controlling the same. More particularly, the present
10 invention relates to an eyelash mascara device equipped
with a heating element and a method of controlling the same,
in which the heating element is mounted in the mascara
device, and the state of the heating element is displayed
to the outside so that eye makeup is performed at a heating
15 temperature most suitable for eyelash, and power is
automatically cut off after a predetermined time elapses to
prevent eyelashes from being heated for a long time.

【Background Art】

20 The reference of beauty has existed regardless of ears,
and numerous women have developed their beauties. The
desire for the beauty develops the techniques of cosmetics
and various cosmetics.

Accordingly, recently, various types of cosmetics, such as skin care creams, lotions, powders, perfumes, lipsticks, nail polishes, and mascaras, have been developed and used

Among the cosmetics, the mascara, which is a product
5 used to make eyelashes appearing longer or to curl up ends of eyelashes of a user to make the eyes of the user beautiful, is a cosmetic to make the eyelashes appearing darker and longer and to raise a three dimensional (3D) effect.

10 In general, as shown in FIG. 1, a mascara device includes a vessel 100 having contents received therein and a cap 200 to cover the container 100 equipped with a brush 300. In the case of the mascara device having the above structure, a user may usually apply a preferable amount of
15 contents to the brush and use the contents while rotating the brush.

According to the mascara device of the related art, since the user must simply apply a mascara liquid to a brush of a brush rod and rotate the brush rod to coat the
20 mascara liquid on the eyelashes of the user in order to make the eyelashes in a desired shape, the user, who is unfamiliar with the use of the mascara device, may not only feel bothersome or inconvenient, but also the mascara liquid coated on the eyelashes may flow down due to sweat
25 or tears after makeup, and makeup time may be increased.

In addition, according to the mascara device of the related art, since brush bristles are produced by twisting iron cores, the brush bristles have various orientations, so that the eyelashes of the user may not be uniformly organized in makeup.

In order to solve the above problems, a curler for mascara is disclosed in Korean Unexamined Patent Publication No. 10-2011-0116403.

The curler for mascara rapidly dries the mascara liquid coated on the eyelashes so that the makeup of the eyelashes can be conveniently formed. The curler for mascara dries and hardens the mascara liquid by heat emitted from a hot wire, thereby allowing the user to make up eyes in a desired shape, so that the makeup time can be reduced.

However, according to the related art, since the head of the curler has the shape of a cylinder around which the hot wire is simply wound, the curler has limitations in fine, elegant and natural eye makeup.

Further, since the hot wire is exposed to the outside of the head of the curler, the hot wire may make contact with the skin of the user due to the carelessness of the user in makeup, so that the user may suffer a burn. In addition, the hot wire may pierce the eyes of the user so that the user may lose the eyesight.

In addition, after performing eye makeup using the mascara, the eyelashes are hardened using the curler. In this case, a user may want to produce various effects on the eyelashes. In other words, the user may want to a
5 volume effect of making the eyelashes appearing fuller, or a curling effect of curling up an end portion of the eyelashes. Further, there may be a user who wants a long lash effect of making the eyelashes appearing longer. In order to produce various effects as described above,
10 variously-shaped curlers are required. However, the variously-shaped curlers may cause problems in volume and economical aspect.

In addition, when the user makes up the eyelashes using the curler, the eyelash makeup must be performed in the
15 state that the curler is heated to a predetermined temperature. Nevertheless, there is no method of checking whether or not the curler has an appropriate temperature until now. In addition, it is difficult for a user to check whether or not a heating element is overheated, but
20 continuously maintained at the appropriate temperature. Accordingly, the user may use the curler wrongly or for excessively long time, so that the safety accident may be caused.

25 **【Disclosure】**

【Technical Problem】

In order to solve the above problem, an object of the present invention is to check a heating element and turn on a green lamp if the heating element is heated to a set temperature after a predetermined time elapses in a power-on state, to automatically turn on/off the heating element to prevent the temperature of the heating element from exceeding the predetermined temperature so that eyelash makeup can be performed while maintaining an appropriate temperature, and to automatically cut off power if use time is exceeded so that the safety accident resulting from excessive use can be previously prevented.

【Technical Solution】

In order to accomplish the above object, there is provided an eyelash mascara device equipped with a heating element. The eyelash mascara device includes a handle (10) which is able to be gripped, a battery case (20) formed inside the handle (10), a battery (30) mounted in the battery case (20), a connection member (40) coupled to a lower end of the handle (10), including a switch (41) and red and green light emitting device (LED) lamps (42a and 42b), and provided therein with a printed circuit board (P), a curler part (50) coupled to a lower end of the connection member 40 and including a curler rod (52) and a curler head

(53), and a heating element (58) provided in the curler rod (52) and the curler head (53), a cover (60) to protect the curler part, and an operation control unit (70) installed on the printed circuit board, including one-chip micro controller, and performing a control operation to check a temperature of the heating element, to cut off power supplied to the heating element if the temperature of the heating exceeds a reference temperature, and to supply power to the heating element to heat the heating element to a constant temperature if the temperature of the heating element is equal to or less than the reference temperature. The operation control unit (70) has program codes of supplying power to the heating element if the user powers on, to heat the heating element while turning on the red LED, and counting time from a time point at which the power is supplied to the heating element, of determining if the temperature of the heating element reaches 85 °C within a preset time range, of determining the heating element as being troubled if the heating element is not heated to a temperature of 85 °C within the preset time range, to stop supplying the power to the heating element and to turn off the red LED, of turning off the green LED and counting use time if the temperature of the heating element reaches 85 °C within the specific time range, and of stopping the supplying of the power if the temperature of the heating

element exceeds 85 °C, and supplying the power to lead the temperature of the heating element to have 85 °C if the temperature of the heating element is less than 85 °C, and automatically cutting off the power supplied to the heating
5 element if specific time elapses.

In addition, there is provided a method of controlling an eyelash mascara device equipped with a heating element. The method includes supplying power to the heating element if a user powers on to heat the heating element while
10 turning on a red LED, and counting time from a time point at which the power is supplied to the heating element, determining if a temperature of the heating element reaches 85 °C within a preset time range, determining the heating element as being troubled if the heating element is not
15 heated to 85 °C within the preset time range, to stop supplying power to the heating element and to turn off the red LED, turning off a green LED and counting use time if the temperature of the heating element reaches 85 °C within a specific time range, and stopping the supplying of the
20 power if the temperature of the heating element exceeds 85 °C, and supplying the power to lead the temperature of the heating element to become 85 °C if the temperature of the heating element is less than 85 °C, and automatically cutting off the power supplied to the heating element if
25 specific time elapses.

【Advantageous Effects】

As described above, according to the present invention, if the heating element is heated to the set temperature after a predetermined time elapses in a power-on state, the heating element is checked to turn on a green lamp, the heating element is automatically turned on/off to prevent the temperature of the heating element from exceeding the predetermined temperature so that eyelash makeup can be performed while making the appropriate temperature. In addition, if use time is exceeded, power is automatically turned off so that the safety accident resulting from excessive use can be previously prevented.

【Description of Drawings】

FIG. 1 is a view showing the structure of a mascara device according to the related art.

FIG. 2 is a view showing the structure of a mascara device according to the present invention.

FIG. 3 is an exploded perspective view showing the mascara device according to the present invention.

FIG. 4 is a view showing the outer appearance of the mascara device according to a first embodiment of the present invention.

FIG. 5 is a view showing the outer appearance of the mascara device according to a second embodiment of the present invention.

FIG. 6 is a sectional view according to the present
5 invention.

FIG. 7 is a circuit diagram showing a switching circuit according to the present invention.

FIG. 8 is a circuit diagram showing a booster circuit according to the present invention.

10 FIG. 9 is a circuit diagram showing an operation control unit according to the present invention.

【Best Mode】

【Mode for Invention】

Hereinafter, the operating principle according to
15 exemplary embodiments of the present invention will be described with reference to accompanying drawings. The following description and the accompanying drawings are provided only for illustrative purpose in order to effectively describe the features of the present invention,
20 and the present invention is not limited thereto.

In addition, in the following description, if detailed description about well-known functions or configurations may make the subject matter of the disclosure unclear, the detailed description will be omitted. The terminology,
25 which is described below, are defined based on the

functions of the present invention, and varied depending on the intent of a user or an operator, or customers. Accordingly, the terminology used in the present invention should be defined based on the whole context throughout the present specification

In addition, in order to effectively describe the technical components according to exemplary embodiments of the present invention, the details of components previously provided in each system or system components generally known in the art are omitted, and the following description will be made while focusing on additional components for the present invention.

In addition, those skilled in the art can easily understand generally-known components which are omitted from the following description, and clearly understand the relationship between the omitted components and the additional components.

Further, in order to effectively describe the technical features of the present invention, the terminology can be modified to the extent that those skilled in the art can clearly understand the meaning of the modified terminology, and the present invention is not limited thereto.

Accordingly, the technical spirit of the present invention is determined by accompanying claims, and the following embodiment is only one means used to effectively

describe the technical spirit of the present invention having the inventive step to those skilled in the art.

FIG. 2 is a view showing the structure of a mascara device according to the present invention.

5 FIG. 3 is an exploded perspective view showing the mascara device according to the present invention.

FIG. 4 is a view showing the outer appearance of the mascara device according to a first embodiment of the present invention.

10 FIG. 5 is a view showing the outer appearance of the mascara device according to a second embodiment of the present invention.

FIG. 6 is a sectional view according to the present invention.

15 FIG. 7 is a circuit diagram showing a switching circuit according to the present invention.

FIG. 8 is a circuit diagram showing a booster circuit according to the present invention.

20 FIG. 9 is a circuit diagram showing an operation control unit according to the present invention.

Components of the present invention mainly include a handle 10, a battery case 20, a battery 30, a connection member 40, a curler part 50, a cover 60, and an operation control unit 70.

In general, the handle 10, which is held by a user when the user uses an eyelash curler according to the present invention, preferably has the shape of a long cylinder. In addition, the handle 10 may have the shape of an oval column or a polygonal column, or may have an atypical shape. In other words, the handle 10 may have various shapes only if the handle 10 can be easily held in a hand.

The battery case 20 is formed inside the handle 10. The battery case 20 has the shape of a long cylinder and one side that is open. Accordingly, a battery 30 may be mounted in the battery case 20. The battery case 20 is provided at an inner upper portion thereof with a negative grounding terminal 21, and at an inner lower portion thereof with a positive grounding terminal 22. A connection grounding terminal 23 is formed in opposition to one side of the battery case 20 that is open. The negative grounding terminal 21 of the battery case 20 is grounded with respect to a negative electrode of the battery 30, and the positive grounding terminal 22 of the battery case 20 is grounded with respect to a positive electrode of the battery 30. The connection grounding terminal 23 is located in opposition to the one side of the battery case 20 that is open to connect the negative grounding terminal 21 with the positive grounding terminal 22.

The battery 30 is mounted in the battery case 20, and may include one of a consumable battery and a rechargeable battery. The rechargeable battery may be manufactured in a socket type, or a universal serial bus (USB) connector type.

5 When the rechargeable battery is manufactured in the USB connector type, the battery 30 may be charged with power through a USB connector of a computer.

The connection member 40 includes a switch 41 and light emitting device (LED) lamps 42a and 42b. The connection
10 member 40 is provided therein with a printed circuit board P and coupled with a lower end of the handle 10. The switch 41 is installed on the printed circuit board P. When the switch 41 is turned on, the connection grounding terminal 23, which connects the positive grounding terminal 22
15 grounded to the positive electrode of the battery 30 with the negative grounding terminal 21 grounded to the negative electrode of the battery 30, is grounded so that the positive electrode and the negative electrode of the battery 30 are electrically connected with each other. When
20 the positive electrode is electrically connected with the negative electrode as described above, a heating element 58 of the curler unit 50 is heated by power supplied from the battery 30.

The LED lamps 42a and 42b include a red LED lamp and a
25 green LED lamp. Accordingly, the red LED lamp is turned on

in an initial stage that the switch 41 is turned on, thereby indicating that the switch is turned on. The green LED lamp is turned on in a predetermined time after the red LED lamp is turned on. The green LED lamp is turned on if
5 the temperature of the heating element reaches a desired temperature. In addition, when the LED is turned on, the red LED is turned off.

The operation control unit 70 is installed on the printed circuit board and includes one-chip micro
10 controller to check the temperature of the heating element. The operation control unit 70 cuts off power supplied to the heating element if the temperature of the heating element exceeds a reference temperature, and supplies power to the heating element to heat the heating element to a
15 constant temperature if the temperature of the heating element is equal to or less than the reference temperature.

In addition, if the heating element is not heated to the desired temperature in a predetermined time (for example 20 seconds), the operation control unit determines
20 errors as occurring on a substrate or the heating element to turn of the red LED and cut off the power supplied to the heating element.

In other words, when the red LED is turned on, the user can recognize that power is smoothly supplied to the
25 heating element. When the green LED is turned on, the user

can recognize that the heating element is operated at the desired temperature. In addition, when the red LED is turned off (blinked), the user can recognize that errors may occur in the device.

5 To this end, the operation control unit 70 has program codes of supplying power to the heating element if the user powers on to heat the heating element while turning on the red LED, and counting time from a time point at which the power is supplied to the heating element, of determining if
10 the temperature of the heating element reaches 85 °C within a preset time range, of determining the heating element as being troubled if the heating element is not heated to 85 °C within the preset time range, to stop supplying power to the heating element and to turn off the red LED, of
15 turning off the green LED and counting use time if the temperature of the heating element reaches 85 °C within a specific time range, and of stopping the supplying of the power if the temperature of the heating element exceeds 85 °C, and supplying the power to lead the temperature of
20 the heating element to become 85 °C if the temperature of the heating element is less than 85 °C, and automatically cutting off the power supplied to the heating element if specific time elapses.

Hereinafter, description will be made regarding the
25 structure in which the connection member 40 and the curler

part 50 are detachably attached to each other and replaceable with new ones.

The curler part 50 is coupled to a lower end of the connection member 40 and includes a curler rod 52 and a
5 curler head 53. The heating element 58 is provided in the curler rod 52 and the curler head 53.

A heating element 58 is heated due to resistance force against current of the power applied thereto from the battery 30. In general, the heating element 58 includes the
10 mixture of a nichrome wire, carbon and quartz

The curler head 53 is coupled to the lower end of the curler rod 52, and includes a silicon brush 54 having a comb 55.

The silicon brush 54 is formed of silicon rubber, and
15 the silicon rubber, which is a rubber elastic material made by mixing pulverized silica serving as a reinforcement agent with highly polymerized diorganopolysiloxane having a linear chain shape, is used as a special material for a heat emitting object. The silicon rubber is extensively
20 used as an electrically insulating material to represent an excellent heat resisting property, excellent flexibility, and excellent elasticity. The silicon rubber has elasticity which is not changed in even a wide temperature range (-50°C to 150 °C).

The silicon brush 54 is formed of a silicon rubber which is a single material to represent excellent productivity and save the manufacturing cost. In addition, the silicon brush 54 can be mass-produced with stable
5 quality through rubber molding, which is significantly effective. The silicon brush 54 may be substituted with fluorine rubber and urethane rubber to represent an excellent heat resisting property, flexibility and elasticity.

10 In addition, the silicon brush 54 has various shapes, so that a user may obtain a desired effect. In this case, the user may want a volume effect of making the eyelashes appearing fuller, or a curling effect of curling up an end portion of the eyelashes of the user. In addition, some
15 users may want a long lash effect of making the eyelashes appearing longer.

In order to produce various effects as described above, variously-shaped curlers are required. However, the variously-shaped curlers may cause problems in volume and
20 economical aspect.

As shown in FIG. 4, protrusions 56 of the silicon brush 54 radially protrude in a wedge shape. In addition, as show
in FIG. 5, the silicon brush 54 has plate-shaped discs 57 repeatedly spaced apart from each other. Further, the discs
25 57 are sequentially and eccentrically provided from the

center of the silicon brush 54 while protruding in a zigzag pattern, so that heat can be more effectively and uniformly transferred throughout the whole eyelashes of the user.

Since the curler rod 52 coupled with the silicon
5 brushes 54 having various shapes is replaceable, the silicon brush 54 having a shape able to produce an effect desired by a user is mounted in an eyelash curler, thereby providing the use convenience for the user.

The curler head 53 preferably includes the silicon
10 brush 54 having the comb 55. The cover 60 stores the curler part 50 and is formed at an upper end thereof with an opening part 61. The opening part 61 is provided therein with a first thread 62. The first thread 62 is screw-coupled with the connection member 40 and a fixedly
15 connection member 45. Although the screw-coupling is performed according to the embodiment of the present invention, various coupling manners, such as an undercut coupling manner or a press-fitting coupling manner, may be performed.

20 Hereinafter, the assembling method and the use state of the eyelash curler according to the embodiment of the present invention will be described in detail. In order to assemble the eyelash curler of the present invention, the battery 30 is mounted in the battery case 20. Then, the
25 battery case 20 is mounted on the upper end of the

connection member 40 including the switch 41 and the LED lamps 42a and 42b and mounted therein with the printed circuit board P.

5 In order to fix the battery case 20, the handler 10 is coupled to the outside of the upper end of the connection member 40. Thereafter, the curler part 50 including the curler rod 52 and the curler head 53, and including the heating element 58 provided in the curler rod 52 and the curler head 53 is connected with an inner portion of the
10 lower end of the connection member 40. Then, in order to store the curler part 50, the cover 70 is coupled to an outer portion of the lower end of the connection member 40, thereby finishing the assembling of the eyelash curler according to the present invention.

15 In order to use the eyelash curler assembled in the above manner, the user separates the cover 60 from the eyelash curler, grips the handle 10, and turns on the switch 41 mounted in the connection member 40. Thereafter, power is applied to the heating element 58 to heat the
20 heating element 58, so that the silicon brush 54 of the curler part 50 is heated to an appropriate temperature. A mascara liquid applied to eyelashes of the user is dried and hardened by the heated silicon brush 54, so that eye makeup, which is more delicate and natural, can be
25 performed. In addition, various silicon brushes 54 for

producing the volume effect of making eyelashes appearing fuller, the curling effect of curling up the end portion of the eyelashes, and the long lash effect of making the eyelashes appearing longer may be coupled to the curler part 50 and the curler part 50 may be replaced and used. Accordingly, since the user does not need to purchase various types of curlers, the user can more conveniently and economically use the eyelash curler.

[Description of Reference Numerals]

- 10 10: Handle
- 20: Battery case
- 30: Battery
- 40: Connection member
- 50: Curler
- 15 60: Cover
- 70: Operation control unit

【CLAIMS】

【Claim 1】

An eyelash mascara device equipped with a heating
5 element, the eyelash mascara device comprising:
a handle (10) which is able to be gripped;
a battery case (20) formed inside the handle (10);
a battery (30) mounted in the battery case (20);
a connection member (40) coupled to a lower end of the
10 handle (10), including a switch (41) and red and green
light emitting device (LED) lamps (42a and 42b), and
provided therein with a printed circuit board (P);
a curler part (50) coupled to a lower end of the
connection member 40 and including a curler rod (52) and a
15 curler head (53), and a heating element (58) provided in
the curler rod (52) and the curler head (53);
a cover (60) to protect the curler part; and
an operation control unit (70) installed on the printed
circuit board, including one-chip micro controller, and
20 performing a control operation to check a temperature of
the heating element, to cut off power supplied to the
heating element if the temperature of the heating exceeds a
reference temperature, and to supply power to the heating
element to heat the heating element to a constant

temperature if the temperature of the heating element is equal to or less than the reference temperature,

wherein the operation control unit (70) has program codes of supplying power to the heating element if the user powers on, to heat the heating element while turning on a red LED, and counting time from a time point at which the power is supplied to the heating element,

of determining if the temperature of the heating element reaches 85 °C within a preset time range,

of determining the heating element as being troubled if the heating element is not heated to a temperature of 85 °C within the preset time range, to stop supplying the power to the heating element and to turn off the red LED,

of turning off the green LED and counting use time if the temperature of the heating element reaches 85 °C within the specific time range, and

of stopping the supplying of the power if the temperature of the heating element exceeds 85 °C, and supplying the power to lead the temperature of the heating element to have 85 °C if the temperature of the heating element is less than 85 °C, and automatically cutting off the power supplied to the heating element if specific time elapses.

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【Claim 2】

A method of controlling an eyelash mascara device equipped with a heating element, the method comprising:

supplying power to the heating element if a user powers
5 on to heat the heating element while turning on a red LED,
and counting time from a time point at which the power is
supplied to the heating element;

determining if a temperature of the heating element
reaches 85 °C within a preset time range;

10 determining the heating element as being troubled if
the heating element is not heated to 85 °C within the preset
time range, to stop supplying power to the heating element
and to turn off the red LED;

turning off a green LED and counting use time if the
15 temperature of the heating element reaches 85 °C within a
specific time range; and

stopping the supplying of the power if the temperature
of the heating element exceeds 85 °C, and supplying the
power to lead the temperature of the heating element to
20 become 85 °C if the temperature of the heating element is
less than 85 °C, and automatically cutting off the power
supplied to the heating element if specific time elapses.